

INTERTEK FISHERIES CERTIFICATION

February 2014

Ref: (82502)

**Gulf of St. Lawrence Northern Shrimp Trawl Fishery
Shrimp Fishing Areas 8, 9, 10, 12**

FINAL CERTIFICATION REPORT

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Contents

CONTENTS	I
GLOSSARY	III
1. EXECUTIVE SUMMARY	1
2. AUTHORSHIP AND PEER REVIEWERS	5
3. DESCRIPTION OF THE FISHERY	7
3.1 UNIT(S) OF CERTIFICATION AND SCOPE OF CERTIFICATION SOUGHT	7
3.1.1 <i>Scope of Assessment in Relation to Enhanced Fisheries</i>	8
3.1.2 <i>Scope of Assessment in Relation to Introduced Species Based Fisheries (ISBF)</i>	8
3.2 OVERVIEW OF THE FISHERY	8
3.2.1 <i>Shrimp Fishing and Fleets</i>	9
3.3 PRINCIPLE ONE: TARGET SPECIES BACKGROUND	10
3.3.1 <i>Fishery Resource and Life History</i>	10
3.3.2 <i>Stock Status</i>	12
3.3.3 <i>History of Fishery and Management</i>	18
3.4 PRINCIPLE TWO: ECOSYSTEM BACKGROUND	20
3.4.1 <i>The marine ecosystem</i>	20
3.4.2 <i>Retained, discarded, ETP species</i>	23
3.4.3 <i>Specific constraints</i>	27
3.4.4 <i>Critical environments</i>	27
3.5 PRINCIPLE THREE: MANAGEMENT SYSTEM BACKGROUND	28
3.5.1 <i>Area of operation of the fishery, and the jurisdiction under which it falls</i>	28
3.5.2 <i>Recognised groups with interests in the fishery</i>	29
3.5.3 <i>The management system</i>	29
3.5.4 <i>Consultation</i>	33
3.5.5 <i>Details of non-fishery users or activities which could affect the fishery, and arrangements for liaison and cooperation</i>	37
3.5.6 <i>Details of the decision making process or processes, including the recognised participants</i>	37
3.5.7 <i>Objectives for the fishery</i>	41
3.5.8 <i>Development of the fishery, fleets, access rights and resource sharing</i>	42
3.5.9 <i>Regulatory Measures</i>	46
3.5.10 <i>Conservation and Protection</i>	47
3.5.11 <i>Education and training</i>	51
4. EVALUATION PROCEDURE	53
4.1 HARMONISED FISHERY ASSESSMENT	53
4.2 PREVIOUS ASSESSMENTS	53
4.3 ASSESSMENT METHODOLOGIES	53
4.4 EVALUATION PROCESSES AND TECHNIQUES	53
4.4.1 <i>Site Visits</i>	53
4.4.2 <i>Consultations</i>	54
4.4.3 <i>Evaluation Techniques</i>	54
5. TRACEABILITY	56
5.1 ELIGIBILITY DATE	56
5.2 TRACEABILITY WITHIN THE FISHERY	56
5.3 ELIGIBILITY TO ENTER FURTHER CHAINS OF CUSTODY	57

5.4 ELIGIBILITY OF INSEPARABLE OR PRACTICALLY INSEPARABLE (IPI) STOCK(S) TO ENTER FURTHER CHAINS OF CUSTODY	58
6. EVALUATION RESULTS.....	60
6.1 PRINCIPLE LEVEL SCORES	60
6.2 SUMMARY OF SCORES.....	60
6.3 SUMMARY OF CONDITIONS.....	61
REFERENCES	62
APPENDICES.....	73
APPENDIX 1: SCORING AND RATIONALES	73
APPENDIX 1.1: PERFORMANCE INDICATOR SCORES AND RATIONALE.....	73
ANNEX 1: EXCERPTS FROM FRAMEWORK, POLICY AND PLAN DOCUMENTS.....	179
ANNEX 2: MSC VARIATION REQUEST AND RESPONSE REGARDING IPI APPLICATION AND EXEMPTION.....	182
APPENDIX 1.2: CONDITIONS.....	191
APPENDIX 2: PEER REVIEW REPORTS	199
APPENDIX 3: STAKEHOLDER SUBMISSIONS	224
APPENDIX 4: AGENCY SUPPORT OF CLIENT ACTION PLAN.....	241
APPENDIX 5: STAKEHOLDER COMMENTS AND IFC RESPONSES FROM PUBLIC COMMENT DRAFT REPORT	245
APPENDIX 5.1: IFC RESPONSES TO STAKEHOLDER COMMENTS RECEIVED FROM DAVID SUZUKI FOUNDATION/ ECOLOGY ACTION CENTRE.....	245
APPENDIX 5.2: IFC RESPONSES TO MSC REVIEW AND REPORT ON COMPLIANCE WITH THE SCHEME REQUIREMENTS, 24 JANUARY 2014.	249
APPENDIX 6: SURVEILLANCE FREQUENCY	257
APPENDIX 7: CLIENT AGREEMENT	258
APPENDIX 5.1 OBJECTIONS PROCESS	259

Tables

TABLE 1: NOMINAL CATCHES AND TACs (T) BY YEAR AND SHRIMP FISHING AREA.....	9
TABLE 2: BYCATCH AND TARGET SPECIES CATCH IN THE NORTHERN SHRIMP FISHERY.....	26
TABLE 3: SITE VISIT PARTICIPANTS AND ISSUES DISCUSSED FOR THE GULF OF ST. LAWRENCE NORTHERN SHRIMP FISHERY RECERTIFICATION NOVEMBER 2012.	54
TABLE 4: FINAL PRINCIPLE SCORES	60
TABLE 5: INDIVIDUAL SCORES AWARDED FOR EACH PERFORMANCE INDICATOR.....	60
TABLE 6: SUMMARY OF CONDITIONS.....	61

Figures

FIGURE 1: SHRIMP FISHING AREAS IN THE GULF OF ST. LAWRENCE	10
FIGURE 2: STOCK STATUS ZONES DEFINED BY A LIMIT REFERENCE POINT (LRP) AT THE CRITICAL:CAUTIOUS ZONE BOUNDARY, AND AN UPPER STOCK REFERENCE POINT (USR).	13
FIGURE 3: HARVEST GUIDELINES BY FISHING AREA.....	15
FIGURE 4: MAIN STOCK STATUS INDICATOR BY FISHING AREA AND YEAR, AND LIMIT (LRP) AND UPPER (USR) STOCK REFERENCE POINTS FOR EACH FISHING AREA.	17
FIGURE 5: THE GULF OF ST. LAWRENCE.....	20
FIGURE 6: SEDIMENTS IN THE GULF OF ST. LAWRENCE.	21
FIGURE 7: HISTORICAL LANDINGS OF THE SHRIMP FISHERY IN THE ESTUARY AND THE NORTH OF THE GULF OF ST. LAWRENCE AND HIGHLIGHTS OF MANAGEMENT MEASURES SINCE THE START OF THE FISHERY	43

Glossary

ACAG	Association des Crevettiers Acadiens du Golfe
ACPG	Association des capitaines propriétaires de la Gaspésie
APCM	Association des pêcheurs de crevette de Matane
AQIP	Association Québécoise de l'Industrie de la Pêche
ASP	Association of Seafood Producers
B _{MSY}	Biomass supporting Maximum Sustainable Yield
CIL	Cold Intermediate Layer
CoC	Chain of Custody
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CPUE	Catch Per Unit Effort
CSAS	Canadian Science Advisory Secretariat
DFO	Department of Fisheries and Oceans (Canada)
ENGO	Environmental/ Conservation Non-Governmental Organization
F	Fishing mortality
FCM	Fishery Certification Methodology
FFAWU	Fish, Food and Allied Workers Union
F _{MSY}	Fishing mortality at Maximum Sustainable Yield
FRAPP	Fédération régionale acadienne des pêcheurs professionnels
GSAC	Gulf Shrimp Advisory Committee
GSL	Gulf of St. Lawrence
ICES	International Commission for the Exploration of the Sea
IFMP	Integrated Fisheries Management Plan
ITQ	Individual Transferrable Quota
LNSFAR	Lower North Shore Fisher's Associations Regroupment
LRP	Limit Reference Point
MSE	Management Strategy Evaluation
MSI	Main Stock Indicator
MSY	Maximum Sustainable Yield
NPUE	Number per unit effort
NAFO	Northwest Atlantic Fisheries Organization
NGO	Non-Governmental Organization
P1	MSC Principle 1
P2	MSC Principle 2
P3	MSC Principle 3
PI	Performance Indicator
QFPA	Québec Fish Processors Association
RAP	Regional Assessment Process
SARA	Species at Risk Act
SFA	Shrimp Fishing Area
SFF	Sustainable Fisheries Framework
SG	Scoring Guidepost
SSB	Spawning Stock Biomass
TAC	Total Allowable Catch
TRP	Target Reference Point
UoC	Unit of Certification
URP	Upper Reference Point
USR	Upper Stock Reference (synonymous with URP)
VPA	Virtual Population Analysis
Y/R	Yield per Recruit

1. Executive Summary

The Gulf of St. Lawrence Northern Shrimp Trawl Fisheries (Shrimp Fishing Areas (SFA) 9, 10, 12) were initially certified to the MSC sustainable fishery standard by TAVEL Certification Inc in September 2008 for a client group of processors based in Québec and New Brunswick. TAVEL Certification certified SFA 8 as a separate Unit of Certification (UoC) in March 2009 for the same client group and, as part of the first harmonised MSC assessment, SFA 8 was also certified on the same date by Moody Marine Ltd for a client group of processors based in Newfoundland.

Moody Marine Ltd bought TAVEL Certification in 2010 and remained the certifier for both client groups. Moody Marine Ltd has since had two name changes and is now called Intertek Fisheries Certification Ltd.

Prior to commencing the re-certification assessments for these UoCs the client groups agreed to consolidate the re-certification assessments of all the SFAs into a single UoC evaluation. A certificate sharing agreement was agreed between them that maintains the interests in SFA 8, 9, 10 & 12 for the Québec and New Brunswick based client group and the interest in SFA 8 only for the Newfoundland based client group. As a result of this agreement, there will be one fishery certificate issued, which will cover all four units of certification and identify the eligibility for each client group.

In keeping with current MSC Certification Requirements, Intertek Fisheries Certification Ltd announced the re-certification assessment coincidently with the fourth annual surveillance audit cycle. The fishery re-assessment, client sharing agreement and assessment team nomination was announced on 18 September 2012. The recertification assessment team of Mr Don Parsons (Principle 1), Dr Howard Powles (Principle 2), Dr Colin Bannister (Principle 3) and Mr Steven Devitt (Lead Auditor) was confirmed on 4 October 2012. The team announced its intention to use the MSC default assessment tree, as defined in the MSC Certification Requirements, version 1.2 (January 2012), on 9 October 2012. The site visit meetings were conducted in Québec, Québec from 7 - 9 November 2012.

Species: Northern Shrimp *Pandalus borealis*
Geographical Area: Gulf of St. Lawrence in Shrimp Fishing Areas (SFA) 8, 9, 10, 12
Method of Capture: Otter Trawl only
Management System: DFO led management, through Quebec, Gulf and Newfoundland-Labrador Regions (Resource Management) and Mont Joli (Science), supported by an Advisory Committee

Clients: **SFA 8, 9, 10, 12**

Association Québécoise de l'Industrie de la Pêche
Québec, Québec

L'association Coopérative Des Pêcheurs De L'île Ltee.
Lamèque, New Brunswick

Produits Belle-Baie Ltee.
Caraquet, New Brunswick

SFA 8

Association of Seafood Producers
St. John's, Newfoundland and Labrador

The assessment was undertaken in accordance with the MSC Certification Requirements (v. 1.2, January 10th, 2012) and using the MSC Guidance to MSC Certification Requirements (v. 1.0, August 15, 2011) which sets out the assessment and certification process. As a result, to date, the following steps have been undertaken:

- Announcement of the assessment
- Appointment of the recertification assessment team
- Notification on the use of the assessment tree
- Notification and undertaking of the site visit
- Production of the Client Draft Report that describes the background to the fishery, the fishery management operation and the evaluation procedure and results
- Production of the Peer Review Draft report which was reviewed by two peer reviewers
- Production of the Public Comment Draft Report which takes account of the peer review comments
- Production of this Final Certification Report which takes account of issues raised by stakeholders

The following strengths and weaknesses were identified with respect to each MSC Principle:

Principle 1

Strengths

- The stocks are assessed as healthy. Stock abundance indicators in each of the shrimp fishing areas (SFAs) have been in the healthy zone, above the upper stock reference (USR), for several years.
- There is a precautionary, reference point framework in place that provides the basis for harvest control rules.
- There is a comprehensive Integrated Fisheries Management Plan (IFMP) containing a harvest strategy that is responsive to the state of the stock.

Weaknesses

- The fishery, which has been at an all time high, is potentially vulnerable to any reversal of the currently favourable ecological regime, whose cause is still not well understood. Consequently, it is uncertain whether or when any reversal is likely to occur, and it is equally uncertain how well the new reference point and harvest rule system will perform under such a scenario. This weakness is not confined to the Gulf fishery but affects all the shrimp fisheries in Eastern Canada

Principle 2

Strengths

- Bycatch is extremely low and is not impacting populations of retained or discard species; there is an effective strategy in place to minimise bycatch.
- The impact (bycatch) on the two ETP species is extremely low and the fishery is not impeding their recovery.

- Sensitive habitats have been identified and their distribution has been mapped.
- The fishery impacts a small proportion (around between 4% and 8%) of potential habitat in any given year.

Weaknesses

- No assessment of the need for a strategy to manage impacts on benthic habitats or biodiversity has been carried out, and no strategy is in place.

Principle 3

Strengths

- The DFO management system in Quebec and adjacent regions delivers effective management of the shrimp fishery consistent with meeting the objectives of MSC Principle 1, and is developing improvements consistent with meeting the principal objectives of MSC Principle 2.
- There is an informative integrated fisheries management plan that describes the history of the fishery, the long term and fishery specific objectives based on the precautionary approach and scientific advice, and that describes the expected outcomes with performance indicators that are measurable.
- Roles and responsibilities in DFO Québec Region are well defined, and there is a high degree of consultation between managers, stakeholders, and scientists through the Advisory Committee, and other operational and informal practices. Decision making is timely, effective and transparent, and there are no ongoing or recurrent disputes.
- The fishery is well regulated by a limited entry licensing system, resource sharing agreements between fleets, a TAC based on scientific advice, and the allocation of ITQs to licence holders. Technical measures regulate the selectivity of the trawl gear, and the impact of shrimp trawling on habitat and sensitive species in the Gulf has recently been assessed to be moderate to low.
- The allocation system is derived from historic rights, adapted to meet obligations to Aboriginal Communities, but gradual rationalisation of the fleets helps to maintain economic viability.
- Compliance and Protection officers are confident that the level of compliance is high and that there is no evidence of systematic non-compliance.
- There is a good record of research and assessment science carried out by the Institute Maurice-Lamontagne, Mont Joli in support of the productivity and biodiversity objectives, and the results are disseminated in timely fashion through DFO publications, and industry workshops and symposia.

Weaknesses

- The fishery is currently well supported by research, as noted above, but there is currently no written plan to provide a strategic approach to planning and carrying out the research needed by managers in the future.
- There is some concern about the possible impact on the management system should there be any reduction in funding for shrimp surveys.

- The fishery, which has been at an all time high, is potentially vulnerable to any reversal of the currently favourable ecological regime, the cause of which is still not well understood. Consequently, it is uncertain whether or when any reversal is likely to occur, and it is equally uncertain how well the new reference point and harvest rule system will perform under such a scenario. This weakness is not confined to the Gulf fishery but affects all the shrimp fisheries in Eastern Canada.
- It is arguable that the level of enforcement and surveillance of the Gulf shrimp fishery is relatively low, but managers claimed to be confident that the risk of shrimp fishermen breaking the regulations is low.
- Although the Regional Advisory Process ensures that there are regular internal and periodic external reviews of the science and the advice, and science publications in journals are peer reviewed internationally, there does not appear to be any formal mechanism to require that external experts who participate in reviews of the assessment or the management system should periodically include an expert from outside Canada.

Based on the information available to date, the Gulf of St. Lawrence Northern Shrimp Trawl Fishery achieved overall scores of 95.0 for Principle 1, 88.3 for Principle 2 and 92.5 for Principle 3. As such, it is determined that the fishery be recertified against the MSC Standard, as no indicator scored less than 60, and overall Principle scores were above 80.

Three conditions of certification were raised on the fishery for PIs 2.4.2 (Habitat Strategy), 2.5.2 (Ecosystem Strategy), and 3.2.4 (Research Plan). The conditions and milestones are detailed in Appendix 1.2 of this report.

2. Authorship and Peer Reviewers

The Gulf of St. Lawrence Shrimp Trawl Fishery recertification assessment team consisted of four individuals: Don Parsons (Principle 1 Expert Assessor), Howard Powles (Principle 2 Expert Assessor), Colin Bannister (Principle 3 Expert Assessor) and Steven Devitt (Associate Lead Assessor).

Don Parsons, M.Sc. - Principle 1 Expert Assessor - Don is a retired research scientist of Fisheries and Oceans Canada, Newfoundland Region. He was the Principle Scientific Investigator for the biology, ecology and population dynamics of northern and striped shrimp (*Pandalus borealis* and *P. montagui*) and fisheries research in the Newfoundland and Labrador Region from 1978 to 2005. He has been a member of the International Commission for the Exploration of the Sea (ICES) *Pandalus* Working Group and a designated expert for the Scientific Council of the Northwest Atlantic Fisheries Organization (NAFO). He also served as the scientific advisor for the Northern Shrimp Advisory Committee in eastern Canada. Don has represented Canada at various other international fora on *Pandalus* species and has published extensively on the biology and population dynamics of northern shrimp. Since retirement, he has been a team member for MSC fisheries assessments of Pandalid shrimp (Principles 1 and 2), participated in the preparation of MSC pre-assessments and conducted MSC peer reviews.

Howard Powles, Ph.D. - Principle 2 Expert Assessor - Howard has worked in fishery science, stock assessment, and conservation and management of fishery resources since the mid-1960's, as a working scientist, science manager, program manager, and consultant, with an ongoing interest in crustacean resources. As Director of Fisheries Science and of Biodiversity Science (1998-2004) at Canada's Department of Fisheries and Oceans Headquarters he was active in developing ecosystem-based approaches to ocean management, in particular approaches based on defining ecosystem objectives and indicators, and led a review of the Department's stock assessment program. Howard is/has been a member of MSC assessment teams for three *Pandalus* fisheries, two American lobster fisheries and a snow crab fishery.

Colin Bannister, Ph.D. - Principle 3 Expert Assessor - Colin is the former Head of the Shellfish Resource Group at Lowestoft in the UK and from 2001 until retirement in 2004 was the Senior Fisheries Science Advisor at the Centre for Environment, Fisheries and Aquaculture Science providing high level advice to the UK government's Department of Environment, Food and Rural Affairs and the fishing industry on all aspects of the assessment and management of finfish stocks. He has extensive knowledge and experience of the management of wild shellfish stocks, both crustacean and molluscan, and of scientific research and advice on the same. He has been a scientific member of the Canadian Review Panel for the Snow Crab fishery in the Gulf Region of Canada, and is a member of the Committees and Council of the Shellfish Association of Great Britain, for whom he writes and advises on shellfish management. He is/has been a team member on a number of MSC assessments and undertaken MSC peer reviews for other fishery certifications.

Steve Devitt, B.Sc. – Associate Lead Assessor - Steve Devitt is an Associate Auditor with Intertek Fisheries Certification Ltd. in Dartmouth, Nova Scotia. Formerly, he was the Operations Manager and Lead Auditor for TAVEL Certification Inc. from 2000 until sold to Moody Marine in 2009. His principle responsibilities include management of the project, verification of proper MSC Fisheries Certification Methodology (FCM) procedural implementation during the full assessment, preparation of report and client contact. Mr Devitt brings a broad environmental and fisheries background to the project, he is a trained

ISO 14000 lead auditor. He worked for 10 years in the environmental services industry in various capacities including Project Manager, Aquatic Scientist and Operations Manager at four different Atlantic Canadian environmental consulting companies. Mr Devitt has participated in over 30 MSC pre-assessments and 10 MSC full certification assessments, as well he has conducted over 50 MSC Chain of Custody (CoC) audits for fishing companies, seafood processors, value added processors, brokerage companies.

Peer Reviewers

Julian Addison, Ph.D. – Peer Reviewer - Dr Julian Addison is an independent fisheries consultant with 30 years' experience of stock assessment and provision of management advice on shellfish fisheries, and a background of scientific research on crustacean biology and population dynamics and inshore fisheries. Until December 2010 he worked at the Centre for Environment, Fisheries and Aquaculture Science (CEFAS) in Lowestoft, England where he was Senior Shellfish Advisor to Government policy makers, which involved working closely with marine managers, legislators and stakeholders, Government Statutory Nature Conservation Organisations and environmental NGOs. He has also worked as a visiting scientist at DFO in Halifax, Nova Scotia and at NMFS in Woods Hole, Massachusetts where he experienced shellfish management approaches in North America. For four years he was a member of the Scientific Committee and the UK delegation to the International Whaling Commission providing scientific advice to the UK Commissioner. He has worked extensively with ICES and was Chair of the Working Group on the Biology and Life History of Crabs, a member of the Working Group on Crangon Fisheries and Life History and a member of the Steering Group on Ecosystems Function. He has recently completed or is currently undertaking MSC full assessments for the Newfoundland and Labrador snow crab fishery, the Ireland and Northern Ireland bottom grown mussel fisheries, and Estonia and Faroe Islands Barents Sea cold water prawn fisheries. He is also currently undertaking various MSC pre-assessments and has carried out peer reviews of MSC assessments in both Europe and North America of lobster, cold water prawn, razorfish, cockle and scallop fisheries. Other recent work includes a review of the stock assessment model for blue crabs in Chesapeake Bay, USA, and an assessment of three Alaskan crab fisheries under the FAO-based Responsible Fisheries Management scheme.

Jerry Ennis, Ph.D. – Peer Reviewer - Following undergraduate and graduate degrees at Memorial University of Newfoundland in the 1960s, Dr. Ennis completed a Ph.D. in marine biology at the University of Liverpool in the early 1970s. He retired in 2005 following a 37-year research career with the Science Branch of the Department of Fisheries and Oceans. He has produced an extensive list of scientific/technical reports and journal articles (40 in the primary, peer reviewed literature) focused primarily on lobster fishery and population biology and on various aspects of larval, juvenile and adult lobster behavior and ecology in Newfoundland waters. Dr. Ennis was Head of Shellfish Section for 27 years, in which capacity he oversaw research projects lead by 4-5 other scientists focused primarily on fisheries management related research on northern shrimp, snow crab, scallops, squid and other shellfish throughout the Newfoundland-Labrador area of the Northwest Atlantic. Throughout his career, Dr. Ennis was heavily involved in the review and formulation of scientific advice for management of shellfish in Atlantic Canada as well as the advisory/consultative part of managing the Newfoundland lobster fishery.

In retirement, Dr. Ennis has published several articles aimed at presenting fishery science primarily to harvesters but to other interested parties as well. For several years he served as rapporteur for annual stock assessments of shellfish resources in the Newfoundland-Labrador area and has participated in MSC certification projects for several Atlantic Canada fisheries as assessor for pre-assessments, team member for a full assessment and as peer reviewer.

3. Description of the Fishery

3.1 Unit(s) of Certification and scope of certification sought

The MSC Certification Requirements, Section 27.4.4 state that in order for a fishery to be eligible for certification, it must be in conformity with Principle 3, Criterion A1 and Principle 3, Criterion B14:

- Principle 3, Criterion A1: A fishery shall not be conducted under a controversial unilateral exemption to an international agreement.
- Principle 3, Criterion B14: Fishing operation shall not use destructive fishing practices such as fishing with poisons or explosives.

The assessment team and IFC have confirmed that the Gulf of St. Lawrence Northern Shrimp Trawl Fishery conforms to these criteria.

The MSC Guidelines to Certifiers specify that the unit of certification is *"The fishery or fish stock (=biologically distinct unit) combined with the fishing method/gear and practice (=vessel(s) pursuing the fish of that stock) and management framework."* The fishery proposed for certification is therefore defined as:

Species: Northern Prawn/ Northern Shrimp (*Pandalus borealis*)
Geographical Area: Gulf of St. Lawrence in Shrimp Fishing Areas (SFA) 8, 9, 10, 12
Method of Capture: Otter Trawl only
Management System: DFO led management, through Quebec, Gulf and Newfoundland-Labrador Regions (Resource Management) and Mont Joli (Science), supported by an Advisory Committee

Clients: **SFA 8, 9, 10, 12**

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The rationale for choosing these units of certification is based on the clients' interest for having these four shrimp fishing areas (SFAs) certified, where client members currently procure raw materials for supplying certified product. The definition of the unit of certification is supported by the current Fisheries and Oceans Canada (DFO) management and stock assessment activities for these four SFAs.

3.1.1 Scope of Assessment in Relation to Enhanced Fisheries

This fishery is conducted on a wild stock, MSC certification requirements with relation to enhanced fisheries do not apply.

3.1.2 Scope of Assessment in Relation to Introduced Species Based Fisheries (ISBF)

This fishery is conducted on a wild stock, MSC certification requirements with relation to introduced species based fisheries do not apply.

3.2 Overview of the fishery

The shrimp fishery in the Gulf of St. Lawrence began off Sept-Îles in 1965, subsequently expanding to the Esquiman Channel, to the north and south of Anticosti Island and to the Estuary of the Gulf of St. Lawrence by 1980. These five areas were managed separately when TACs were introduced but the number of management areas was reduced to four in 1993 (Figure 1) in an adjustment of boundaries that more closely aligns management areas with areas of high shrimp production (CAFSAC 1992). The fishery occurs primarily at depths of 150 to 350m.

In the development phase from the mid-1970s, fisheries developed in the Gulf, north of Anticosti Island (SFAs 9 and 8), and on the eastern Scotian Shelf (SFAs 13-16), but the main development occurred further north when vessels from Newfoundland discovered shrimp concentrations along the Labrador coast in Hawke (SFA 6), Hopedale and Cartwright Channels (SFA 5), as well as north to Davis Strait (SFAs 4 to 1) when ice conditions permitted. Limited entry licensing and TACs were introduced and developed from 1978. Initially, developments were constrained by weak markets and the problem of meeting permitted groundfish by-catch limits, but after 1986 markets improved, and the groundfish by-catch issue was significantly reduced by the voluntary introduction of the Nordmore groundfish separator grate. The grate became mandatory in the Gulf of St. Lawrence in 1993.

In the mid-1990's, a major expansion in the shrimp fishery was facilitated by an increase in shrimp biomass, which appears to have followed the decline in groundfish abundance (Worm & Myers, 2003). TACs in many Atlantic Canadian SFAs were increased stepwise in line with the natural increase in shrimp stocks, allowing more fishing effort and landings by traditional licence holders, but also new allocations to be made in some areas to new temporary licence holders, some of whom have since been made permanent. Following these developments, the Canadian fishery for *P. borealis* has become the primary supplier of cold water shrimp resources in the North Atlantic.

In the period of 1990 to 2012, landings in the Gulf of St. Lawrence doubled, with the peak year for landings in 2010. Landings have been relatively stable since 2004, with a range of 30,982mt to 36,300mt. Table 1 displays the total allowable catches and catches for the period of 1990 to 2012 for the mobile gear commercial shrimp fisheries in SFAs 8, 9, 10 and 12.

Table 1: Nominal catches and TACs (t) by year and shrimp fishing area.

Year	Estuary (SFA 12)		Sept-Îles (SFA 10)		Anticosti (SFA 9)		Esquiman (SFA 8)		Total
	Catch	TAC	Catch	TAC	Catch	TAC	Catch	TAC	
1990	507	500	6839	6400	4723	4200	3303	4700	15372
1991	505	500	6411	6400	4590	5000	4773	4700	16279
1992	489	500	4957	6400	4162	5000	3149	4700	12757
1993	496	500	5485	6400	4791	5000	4683	4700	15455
1994	502	500	6165	6400	4854	5000	4689	4700	16210
1995	486	500	6386	6400	4962	5000	4800	4700	16634
1996	505	500	7014	7040	5469	5500	5123	5170	18111
1997	549	550	7737	7744	6058	6050	5957	5687	20301
1998	634	633	8981	8966	6932	7004	6554	6584	23101
1999	646	633	9239	8966	7022	7004	6732	6584	23639
2000 ¹	739	709	10160	10042	7941	7844	7396	7374	26236
2001 ¹	832	786	10965	11136	5399	8700	7815	8178	25011
2002 ¹	799	786	11493	11136	8638	8700	8250	8178	29180
2003	796	802	11357	11360	8742	8874	6773	6674	27668
2004	1033	995	15932	15611	10404	10226	8555	8502	35924
2005	1101	995	12851	15611	8202	10226	8828	9352	30982
2006	1052	995	15550	15611	8563	10226	8951	9352	34116
2007	1022	995	15971	15939	10180	10226	8833	9024	36006
2008	1016	1020	15972	15995	9635	10478	8966	9269	35733
2009	992	1018	15872	15970	9644	10461	9474	9567	35983
2010	906	916	15755	15969	10100	10461	9538	9567	36300
2011	880	916	14375	15172	9831	9938	9177	9089	34264
2012	948	1053	12483	12896	8197	8447	10276	10452	31905

¹ From 2000 onward part of the TAC increase is a 2% allowance for non-marketable pink glass shrimp and ice remaining in the catch. The 2% allowance for pink shrimp and ice is still in place. From 2000 to 2007, it was part of the TAC and from 2008 to present it is deducted after landing.

3.2.1 Shrimp Fishing and Fleets

The shrimp fishing in the Estuary and the Gulf is conducted by otter trawlers ranging in length from 16.7 m (55 feet) to 27.4 m (90 feet). Fishing licenses are issued in accordance with section 7 of the Fisheries Act. The policies governing the issue of licenses, including license renewal and re-assignment, vessel replacement, and registration of boats and of harvesters, is described in the Commercial Fisheries Licensing Policy for Eastern Canada. In 2007, the Estuary and Gulf shrimp fleet regrouped 112 fishing licenses, including Aboriginal First Nations. According to the 2011 draft IFMP, the number of licenses is currently 140, including temporary licenses to fish allocations (i.e. new access).

In addition, the management plan includes a sharing formula that allows some temporary sharing and could result in an increase in the number of participants in a given year. The names of the permanent and temporary license holders and the characteristics of their fishing vessels can be obtained each year from DFO's statistical branch.

Harvesters (permanent and temporary license holders) are required to fill out a logbook, indicating their fishing location, number of hours of trawling and estimated catch. Catch and effort data are recorded by statistical square (10 min of latitude by 10 min of longitude), day and fishing vessel.

Clear and effective procedures are in place to close the fishery on short notice when the TAC is reached and to take action if any shrimp exploitation or significant bycatch problem is identified.

3.3 Principle One: Target Species Background

3.3.1 Fishery Resource and Life History

The following is abridged from the draft IFMP for Northern Shrimp in the Estuary and Gulf of St. Lawrence (DFO, in revision).

Initially, five shrimp fishing areas were established in the 1970s based on historical fishing patterns. As the fishery expanded, additional information on shrimp distribution (juveniles and adults) led to the identification and establishment of four areas. Although distinct populations could not be identified genetically (Seigny *et al.*, 2000), the four "stock" areas provided a close match between areas of shrimp production and exploitation (Fig. 1). The four shrimp fishing areas (SFAs) are Esquiman (SFA 8), Anticosti (SFA 9), Sept-Iles (SFA 10) and Estuaire (SFA 12).

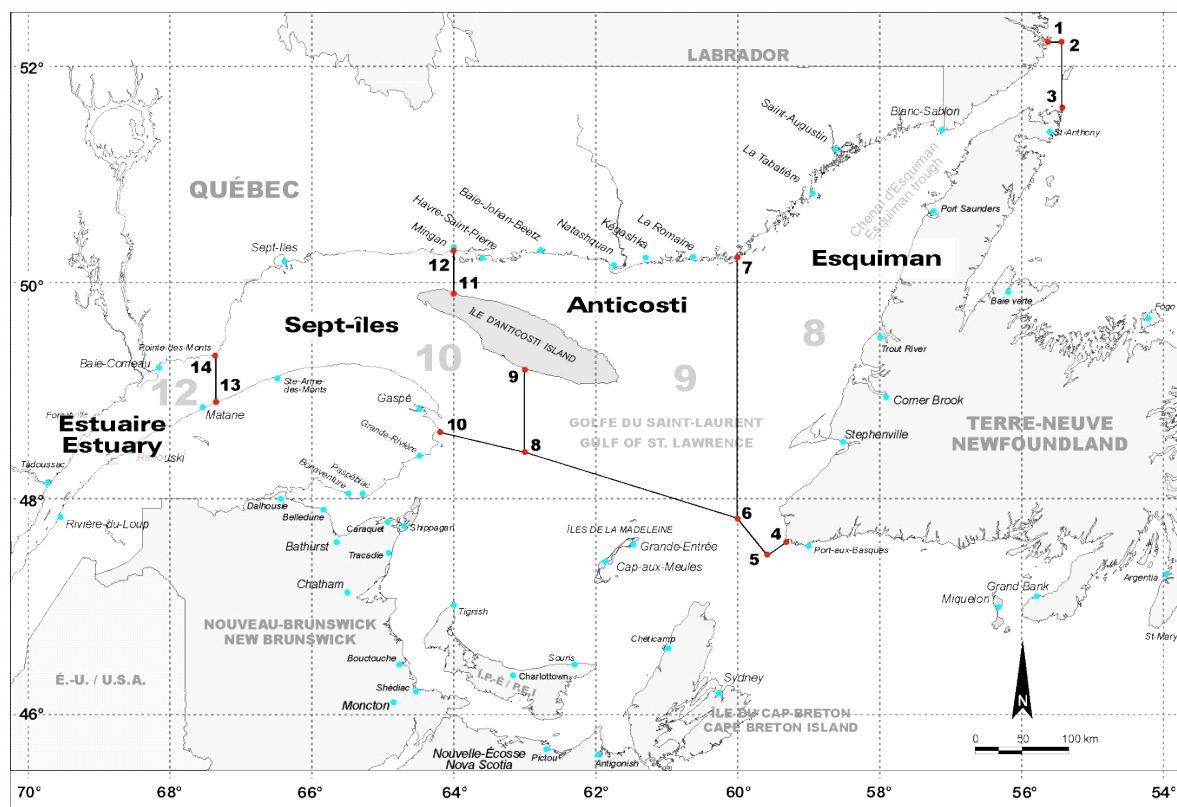


Figure 1: Shrimp fishing areas in the Gulf of St. Lawrence (DFO).

Canadian Atlantic Fisheries Regulations prohibit otter trawlers greater than 19.8 m from fishing within 12 nautical miles of the coast. A study conducted in 1980 indicated that shrimp in the northern Gulf (SFAs 9, 10 and 12) were concentrated primarily within 12 nautical miles of the coastline. An exception to the regulation was granted to Gulf shrimp vessels over 19.8 m, in a sector stretching from Pointe à Michel (near Baie-Comeau) to Kegaska (about 61° 20' W) and encompassing Anticosti Island (Figure 1).

Northern shrimp (*Pandalus borealis* Kröyer 1838) have a discontinuous, circumboreal distribution and occur in the Northwest Atlantic from Davis Strait to the Gulf of Maine. They are usually found in areas with soft, muddy sediment and where temperature ranges from about 1-6 °C. Northern shrimp are protandrous hermaphrodites - they mature as males about age 2, mate for two or three years before changing sex and spending the rest of their lives (8 years or more) as females. They spawn in autumn and females carry eggs until April-May when the larvae are hatched. The pelagic larvae go through several stages over a period of months before settling to the ocean floor. During day time, shrimp feed on or near the bottom whereas, at night, they can migrate vertically and feed on zooplankton. Shrimp are important prey for several species such as cod, Greenland halibut, skates and wolffish as well as harp seals (from MML, 2008).

The draft IFMP (DFO, in revision) is an update of the 2007 IFMP and describes the biology and life history of northern shrimp in the Estuary and Gulf of St. Lawrence, a summary of which is given below.

Shrimp larvae hatch in April or May, and are pelagic for several months. At the end of the summer, the larvae more resemble adults and settle near the ocean floor. Juveniles attain male sexual maturity during their second year. Mating occurs in the fall and the males can reproduce for two or three years before changing sex. Sex change occurs in winter at age 4 or 5 at a size of about 21 mm (carapace length). Newly transformed females (primiparous) and older, multiple spawners (multiparous) reproduce in the following fall (September or October). Females incubate their fertilized eggs beneath the abdomen for about 8 months, after which larvae hatch the following spring. Females reproduce at least twice and the lifespan of shrimp in the Estuary and the Gulf is estimated to be about seven years.

Annual migrations are related to reproduction. In late fall and early winter, the egg-bearing females move to shallower areas. In spring, they concentrate in areas favourable for release of the larvae while the males remain distributed throughout the range. Females moult after the larvae hatch and redistribute into deeper areas (120-160 fathoms). The distribution of shrimp differs according to age. Generally, young shrimp are found in shallower areas, while the older/larger individuals are found in deeper waters. Concentrations of young shrimp in shallower waters tend to be more dense than those of large shrimp found in deep water.

Shrimp also migrate vertically into the water column at night to feed on plankton, then return to the bottom during the day. The extent of vertical migration varies and depends on the stage of development of the individual and local conditions. Small shrimp leave the bottom earlier than the females and rise higher in the water column.

Laboratory experiments have related temperature to physiological condition. Cold temperatures appear optimal for maturation and reproduction while warmer temperatures seem to favour survival and growth of larvae and juveniles. Generally, an increase in temperature accelerates development of eggs but decreases their survival. Fecundity was estimated from samples obtained from commercial fishing. The fecundity of an average-sized female was about 2,000 eggs. Mortality of eggs during incubation can be significant and vary from 0 to 86 % (14 % on average).

Studies on recruitment processes have shown that the length of spring bloom has a positive influence on larval survival. The feeding success of the first larval stages is critical for

survival of a cohort. Synchronisation of hatching with the spring bloom appears critical for successful recruitment. Furthermore, temperature conditions adequate for development and growth of larvae and the zooplankton community (their prey) also appear to be necessary to ensure successful recruitment.

Laboratory experiments showed that moulting frequency increases with temperature but decreases with age (or size) of shrimp. The juvenile stage is the most sensitive to temperature variations, suggesting that the growth of a cohort is largely influenced by the environmental conditions.

3.3.2 Stock Status

Reference Points

A "Fishery Decision-Making Framework Incorporating the Precautionary Approach" (<http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/precaution-eng.htm>) was adopted as part of DFO's Sustainable Fisheries Framework (SFF) initiative (<http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/overview-cadre-eng.htm>). The main components of the former include: reference points and stock status zones (Healthy, Cautious and Critical); harvest strategy and harvest decision rules; and the need to take into account uncertainty and risk when developing reference points and developing and implementing decision rules. Following is a summary of the decision framework.

The stock status zones are created by defining the Limit Reference Point (LRP) at the Critical:Cautious zone boundary, and an Upper Stock Reference Point (USR) at the Cautious:Healthy zone boundary and the Removal Reference for each of the three zones (Figure 2). The LRP, the stock status below which serious harm is occurring, is based on biological criteria and established by Science through a peer reviewed process. The USR is the stock size below which removals must be reduced to avoid reaching the LRP. The USR, is set at a safe distance above the LRP to facilitate effective management actions when the stock is in decline. Moreover, the USR can be a target reference point (TRP) determined by productivity objectives for the stock, broader biological considerations and social and economic objectives for the fishery.

The Removal Reference is the maximum acceptable removal rate, normally expressed in terms of fishing mortality (F) or harvest rate. The Removal Reference must be less than or equal to the removal rate associated with maximum sustainable yield. In the Cautious zone, the adjustment of the Removal Reference requires a progressive reduction in removal rate.

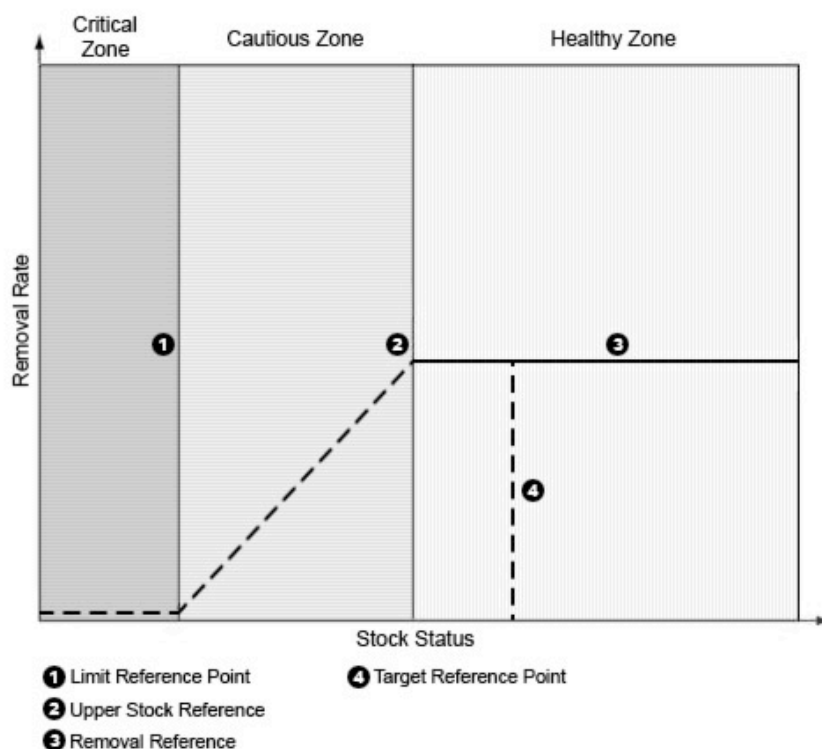


Figure 2: Stock status zones defined by a Limit Reference Point (LRP) at the Critical:Cautious zone boundary, and an Upper Stock Reference Point (USR) at the Cautious:Healthy zone boundary and the Removal Reference for each of the three zones (Source: DFO, available at: <http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/precaution-eng.htm>).

Precautionary reference points for the Gulf of St. Lawrence shrimp fishery were developed in accordance with the DFO framework. Savard (2012) provided the rationale for the development of the LRP and USR.

Main stock indicators incorporate both male and female abundance. The main indicator for each stock in a given year is calculated from the male and female abundance indices obtained from the summer fishery (number per unit effort (NPUE) for June, July and August) and the annual research survey male and female abundance estimates. The indicator represents the mean of the integrated indices by sex.

The LRP relies on biological considerations aimed at insuring conservation of the resource. The four shrimp stocks increased over the history of the fishery, from low levels observed during the mid 1980s and 1990s. Increases were associated with the production of abundant year classes. The abundance of the predators was high during the 1980s but decreased substantially during the 1990s. Even at these low abundances and different levels of predation pressure, reproductive capacity was not impaired and the spawning stock was sufficient to produce strong cohorts that subsequently led to a prolonged period of abundance increase. The stock status indicators corresponding to these levels of low abundance form the basis for the LRP. The LRP is equal to the average of the minimal indicator of the two periods of the beginning of 1980s and 1990. LRPs for the four stocks are: SFA 8 - 0.45, SFA 9 - 0.60, SFA 10 - 0.53 and SFA 12 - 0.65.

Because the assessment of the shrimp stocks is descriptive and based on the examination of a relative indicator of abundance, it is not possible to obtain a reliable estimation of the biomass which can support maximal sustainable yield (B_{MSY}). Furthermore, it is not possible

to estimate reference points based on B_{MSY} and fishing mortality (F_{MSY}). Alternatively, an analogous approach based on the main indicator of the stock status was adopted, allowing the detection of conditions which favour healthy stocks or cause a serious harm.

The USR, in principle, is determined by the fishery managers who must consider consultations with industry stakeholders as well as advice from scientists. In accordance with DFO's decision framework, the USR should be set at a level that is high enough so that the cautious zone has sufficient range to allow the detection of the decline of a stock, thus providing time to adopt effective management measures.

The last two increases in the Gulf shrimp stocks occurred during a period of low predator abundance. These increases were due to the recruitment of very abundant yearclasses. However, since about 2007, some shrimp stocks have gradually decreased and exploitation rate indices have increased (DFO, 2011) and it is uncertain whether the abundance levels observed since 2003 can be maintained. Therefore, 1996 to 2002 was considered a stable period during which catches were sustainable. The average stock status from 1996 to 2002 represents an approximation of the biomass allowing maximum sustainable yield (MSY). (A TRP set at the average for this period was proposed but not implemented.) The USR is 80% of the average of stock status indicators for the 1996 to 2002 period, a level that provides a sufficiently large cautious zone to allow future declining stocks to respond to management measures. USR indicator values for the four socks are: SFA 8 - 1.34, SFA 9 - 1.18, SFA 10 - 1.33 and SFA 12 - 1.12.

However, the USR values correspond to stock abundances observed during a period of low predator biomass. If the biomass of the predator species were to return to the high values historically observed, a review of the USRs would be necessary.

No Removal References have been established for these stocks but the harvest control rules (below) provide for different exploitation strategies (through TAC adjustments) when stock status indicators are assessed within the Healthy, Cautious or Critical zones. The harvest control rules are intended to limit exploitation, ensuring a high probability of maintaining the stock within the healthy zone (Desgagnés and Savard, 2012).

Assessment Methods

The assessment of shrimp in the Gulf of St. Lawrence relies on both fishery dependent (the fleet) and fishery independent (research survey) data. Methods used to produce the commercial fishery statistics (catch, effort, catch rates, number at length) from 1982 to 2012 for each of the four shrimp fishing areas are described by Savard (2013). In brief, fishery statistics (from logbooks) and commercial catch sampling (for carapace length, sex and maturity) provide the basis for determining catch and effort, numbers caught at length, and the standardization of catch per unit effort.

The research survey, conducted with a shrimp trawl following a stratified random sampling design, has been conducted in the Estuary and the northern Gulf of St. Lawrence since 1990. The survey data are used to estimate the distribution and abundance of shrimp and some groundfish species (Savard and Bourdages, 2013). Details of the 2012 survey fishing and sampling protocols are given in Archambault *et al.*, 2013. Biomass and coefficients of variation for both males and females are estimated by kriging. Biomass is converted to abundance from weight-length relationships and length frequency distributions.

The main indicator of stock status is calculated for each SFA from the male and female indices obtained from the summer commercial fishery (number per unit effort for June, July and August) and the research survey (abundance). The main indicator corresponds to the

average of the indices by sex that were standardized with respect to the 1990–1999 period (DFO, 2013).

The assessment of the status of shrimp stocks in the Gulf of St. Lawrence, as described above, relies on information from both fisheries dependent and independent sources to estimate stock health indicators relative to precautionary reference points. Because shrimp are protandrous (i.e. change sex), it is important to protect both the male (recruitment to the female component) and the female stock components (spawning stock) (Savard, 2012).

The assessment also considers the role of predators as a source of natural mortality. The LRPs were calculated from the minimum level of abundance at which stocks were able to increase even in the presence of abundant predators. The USR values were calculated from a period of low predator abundance. If the biomass of predators were to increase to the values historically observed, a review of the USR would be necessary (Savard, 2012).

The main stock indicators in a given year have been shown to have correlated with the harvest (tons) in the following year over a period of time when TACs were not based on formal decision rules (Savard, 2012: see Figure 3. This relationship provides the basis for decision rules to control exploitation under the three stock status scenarios and is illustrated in tabular form provided in a presentation by Savard, pers. comm. (Proposed Precautionary Approach for the Gulf Shrimp Fishery in 2012 and 2013).

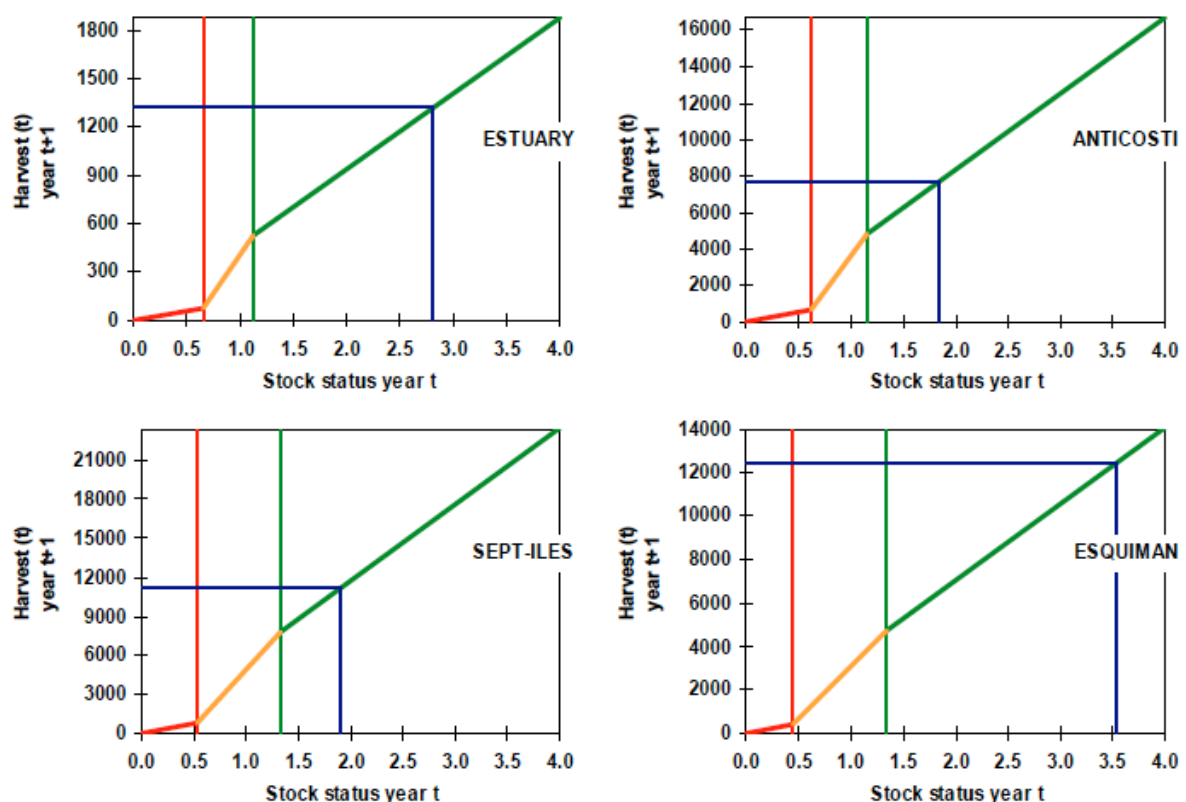


Figure 3: Harvest guidelines by fishing area. The projected harvest for 2012 is shown in view of the main stock indicator for 2011. The red vertical line defines the LRP (x - axis), the upper limit of the critical zone. The green vertical line defines the USR, the lower limit of the healthy zone. The blue vertical line gives the stock status in the current year and the blue horizontal line indicates the projected harvest for the following year (y - axis).

Within the healthy zone, the main stock indicator value is equal to or above the USR. The TAC is adjusted if the difference between the proposed harvest and the TAC that was implemented the preceding year is higher than 5%. The maximum adjustment is 15%, the best result obtained with a simulation model (Desgagnés and Savard, 2012) to maintain the stocks in the healthy zone and the female biomass. This rule was subsequently accepted and endorsed by industry. Industry asked that the rules would be reviewed after two years.

Stock (Healthy)	Guidelines
Estuary (SFA 12)	Harvest = 470.7 * indicator
Sept-Iles (SFS 10)	Harvest = 5868.9 * indicator
Anticosti (SFA 9)	Harvest = 4176.4 * indicator
Esquiman (SFA 8)	Harvest = 3524.0 * indicator

The proposed TACs are derived by multiplying the value for each SFA (slope of the relationship between the harvest in year t+1 and stock status in year t; Figure 3) by the main stock indicator to obtain the harvest guidelines. These values were compared to the previous year's TACs and the differences (%) were calculated. TACs for SFAs with positive differences are increased but capped at 15%. TACs for SFAs with negative differences are decreased but also capped at 15%.

Within the cautious zone, the main stock indicator result is between the LRP and USR. The TACs are derived by applying the relationship (slope and intercept) between the harvest in year t+1 and stock status in year t (Figure 3) to the main stock indicator result to obtain the harvest guidelines. The TAC is adjusted if the difference between the proposed harvest and the TAC that was implemented the preceding year is higher than 5%.

Stock (Cautious)	Guidelines
Estuary	Harvest = (962.4 * indicator) – 551.8
Sept-Iles	Harvest = (8819.4 * indicator) – 3910.5
Anticosti	Harvest = (7819.1 * indicator) – 4197.5
Esquiman	Harvest = (4871.1 * indicator) – 1808.8

Within the critical zone, the main stock indicator is equal to, or less than; the LRP. The TAC adjustment is made as for the cautious zone, following the 5% rule.

Stock (Critical)	Guidelines
Estuary	Harvest = 117.7 * indicator
Sept-Iles	Harvest = 1469.7 * indicator
Anticosti	Harvest = 1044.1 * indicator
Esquiman	Harvest = 881.0 * indicator

Current Status

The following is based on information presented in DFO (2013) Science Response 2013/001 - Update of Stock Status Indicators for Northern Shrimp in the Estuary and Gulf of St. Lawrence. The assessment was conducted in January 2013, using 2012 research survey and fishery data (Savard, 2012, 2013; Savard and Bourdages, 2013).

The assessment of overall status of the Gulf of St. Lawrence shrimp stocks, relative to limit (LRP) and upper stock reference (USR) points, estimates the most recent stock status indicators in a historical context (i.e. since 1982).

The four shrimp stocks in the Estuary and the Gulf of St. Lawrence have remained in the healthy zone since the early 2000s (Figure 4). The main stock status indicator for Estuary (SFA 12) increased in 2012 for the third consecutive year, reaching the highest value in the series. The decreasing trend observed in Sept-Îles (SFA 10) since 2007 ended in 2012 with the main indicator increasing to a value similar to those observed in 2008, 2009 and 2010. In 2012, the main indicator for Anticosti (SFA 9) was slightly lower than in 2011. The Esquiman (SFA 8) indicator decreased in 2012, reaching a value similar to those observed between 2006 and 2009 (DFO, 2013).

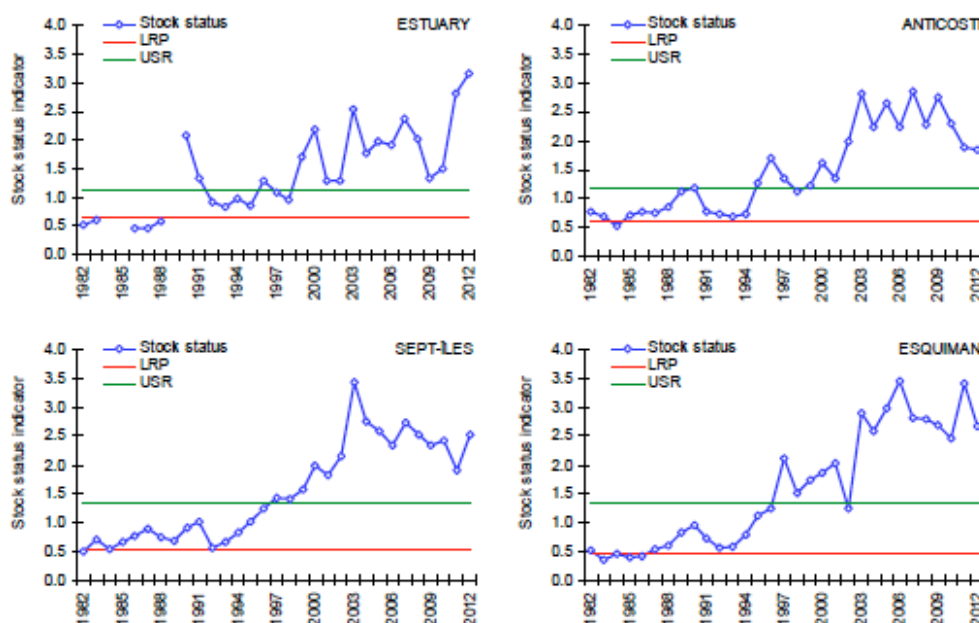


Figure 4: Main stock status indicator by fishing area and year, and limit (LRP) and upper (USR) stock reference points for each fishing area. (Source: DFO, 2013)

The current stock abundances remain well above the LRPs in all SFAs. Continued and historically high abundance within the last decade indicates a low probability of recruitment overfishing. The history of the fishery has shown that recruitment has not been impaired. Even at low abundance levels during the early to mid 1980s and 1990s, the spawning stock was sufficient to produce abundant cohorts which had a detectable, positive impact on the condition of the stocks.

The main stock status indicators also showed that all four stocks were well above the USR in 2012. The 2012 main indicators were 1.99, 1.56, 1.91 and 2.83 times the USRs for SFAs 8, 9, 10 and 12, respectively. The stocks remain highly productive and main indicators have been above the USRs for a prolonged period.

Advised TACs for 2013 were calculated according to the method described above for stocks in the healthy zone and are tabulated below.

Stock	2012 Indicator	Stock status	Harvest guidelines	TAC 2012	Difference harvest / 2012 TAC	Adjustment for 2013	TAC 2013
Estuary	3.165	Healthy	1490 t	1053 t	+ 42 %	TAC 2012+ 15 %	1211 t
Sept-Iles	2.534	Healthy	14872 t	12896 t	+ 15 %	TAC 2012+ 15 %	14830 t
Anticosti	1.838	Healthy	7676 t	8447 t	- 9 %	TAC 2012- 9 %	7687 t
Esquiman	2.666	Healthy	9395 t	10452 t	- 10 %	TAC 2012- 10 %	9407 t

Note: Actual 2013 TACs for Anticosti and Esquiman were set at the harvest guideline, even though the difference between the harvest guideline and 2012 TAC was greater than 5%.

3.3.3 History of Fishery and Management

The history of the trawl fishery for shrimp in the Estuary and Gulf of St. Lawrence is described in detail within the most recent draft IFMP (DFO, in revision) and a summary is given below.

The fishery began in 1965 when the first commercial catches were made in the western Gulf. Catches increased from about 1,000 to 7,500 tons during the 1970s, reaching 15,000 tonnes by the end of the 1980s. Since 2000, catches have averaged about 35,000 tons.

During the 1960s, intensive exploratory fishing identified concentrations of shrimp in the Gulf of St. Lawrence and the Saguenay Fjord. The small fishery in the Saguenay Fjord was not continued but additional exploration during the 1970s discovered new sites in the Estuary and the Gulf of St. Lawrence. Subsequently, intensified shrimp fishing and the use of higher performance vessels and gear contributed to the rapid increase in landings. The collapse of cod and redfish stocks in the mid-1970s led to increased demand for shrimp fishing licences and the number increased to 111. The number of shrimp licences was limited to avoid an increase in fishing capacity on groundfish species, since all the shrimp fishing licence holders were also harvesting groundfish. The Gulf Shrimp Advisory Committee (GSAC) was created in 1980 and measures for catch control, such as Total Allowable Catch (TAC) in 1982, were imposed.

A symposium on the Gulf shrimp fishery was held in March 1985 to discuss the suitability of issuing new fishing licences, distributing quotas between harvesters and measures to reduce incidental catch of groundfish. Subsequently, the number of licences increased between 1985 and 1990 to 134.

There are two groups of shrimp harvesters: Group A from Western Newfoundland and Labrador and Quebec; and Group B from First Nations, Quebec and New Brunswick. Also, allocations were granted to Prince Edward Island and Nova Scotia. An individual quota program was established for Group B in 1991 and for Group A in 1996.

A second symposium, held in 1993 to plan for medium term management, brought together industry stakeholders to discuss management plans in an open setting. A three year management plan (1993-1995) was subsequently adopted and several management

measures were changed or strengthened. The management strategy was also aimed at socio-economic objectives such as maximizing profits, avoiding over-capitalization and ensuring equitable sharing.

Beginning in 1997, temporary shrimp allocations were provided to harvesters (mainly groundfishers from Quebec and New Brunswick) who did not hold regular shrimp fishing licences. Temporary allocations were also provided to harvesters from Prince Edward Island and Nova Scotia in 1998. Temporary allocation quotas were dependant on the TAC and, therefore, varied based on shrimp stock abundance. In 2009, DFO stabilized access for the various fleets involved in the shrimp fishery.

In January 2000, in response to the Marshall decision which affirmed the aboriginal right to hunt, fish and gather in pursuit of a “moderate livelihood,” DFO developed the Marshall Response Initiative to negotiate interim fisheries agreements, giving First Nations increased and IFCediate access to the commercial fishery. This initiative was largely inspired by the Aboriginal Fisheries Strategy, a program implemented by DFO in 1992, to provide a framework for Aboriginal fishing for food, social and ceremonial purposes. The Marshall Response Initiative remained in effect until 2007.

As a result of acquisitions from the buying back of several Quebec and New Brunswick licences in 2000, five First Nations from Quebec and two from New Brunswick participated in the shrimp fishery with fishing licences issued under the Aboriginal Communal Fishing Licences Regulations.

In 2008, Gulf based shrimp harvesters of the Association des Crevettiers Acadiens du Golfe (ACAG) began work on a restructuring plan to improve the viability of their fishing enterprises. By 2011, this initiative resulted in 4 Gulf based fishing enterprises being purchased by 10 traditional Gulf based shrimp harvesters from the ACAG. These remaining 10 Gulf and Scotian Shelf shrimp fishing enterprises now have increased economic viability potential with the additional quotas acquired through restructuring. Furthermore, DFO implemented enterprise combining within the Newfoundland and Labrador Region, a voluntary fleet self-rationalization policy allowing fish harvesters to acquire individual quotas from existing enterprises.

In 2011, 140 fishing licences, including First Nations peoples, were issued for this limited entry fishery.

The shrimp fishery in the Estuary and Gulf of St. Lawrence is carried out by trawlers varying from 16.7 m (55 feet) to 27.4 m (90 feet) in length. Minimum mesh size of 40 mm has been enforced since 1986 to minimize the catches of small shrimp and to target the size of shrimp that meets market specifications. Sorting of shrimp on board is not permitted to prevent discards of small shrimp. In 1993, the use a separator grate to significantly reduce the incidental catch of groundfish became mandatory. TAC's have been implemented, enforced and largely respected since 1982.

The northern shrimp is a species subject to abundance variations related to variable recruitment. Management measures have been in place to limit the exploitation and protect the spawning potential of the population. Catch limits ensure that a proportion of shrimp, particularly females, will not be fished and will remain available for reproduction.

3.4 Principle Two: Ecosystem Background

3.4.1 The marine ecosystem

The Gulf of St. Lawrence (GSL) is a semi-enclosed sea that opens to the Atlantic Ocean through the Cabot Strait (140 km wide and 480m deep at its deepest) and the Strait of Belle Isle (17 km wide and 60 m deep at its sill) (Dufour *et al.*, 2010) (Figure 5). In addition to exchanging flows through these two openings, the GSL receives the runoff from the St. Lawrence River system, the 14th largest drainage basin in the world, via the St. Lawrence estuary. The Gulf of St. Lawrence shrimp fishery operates in the northern GSL, to the north of the Laurentian Channel, which divides the GSL into southern and northern sections (Figure 5).

The northern GSL is characterised by the presence of relatively deep channels, the Esquiman and Anticosti channels, branching northward from the Laurentian Channel. Average depth of the Laurentian Channel along its length is 290m, while depths in the Esquiman and Anticosti Channels are greater than 200 m (Dufour *et al.*, 2010).

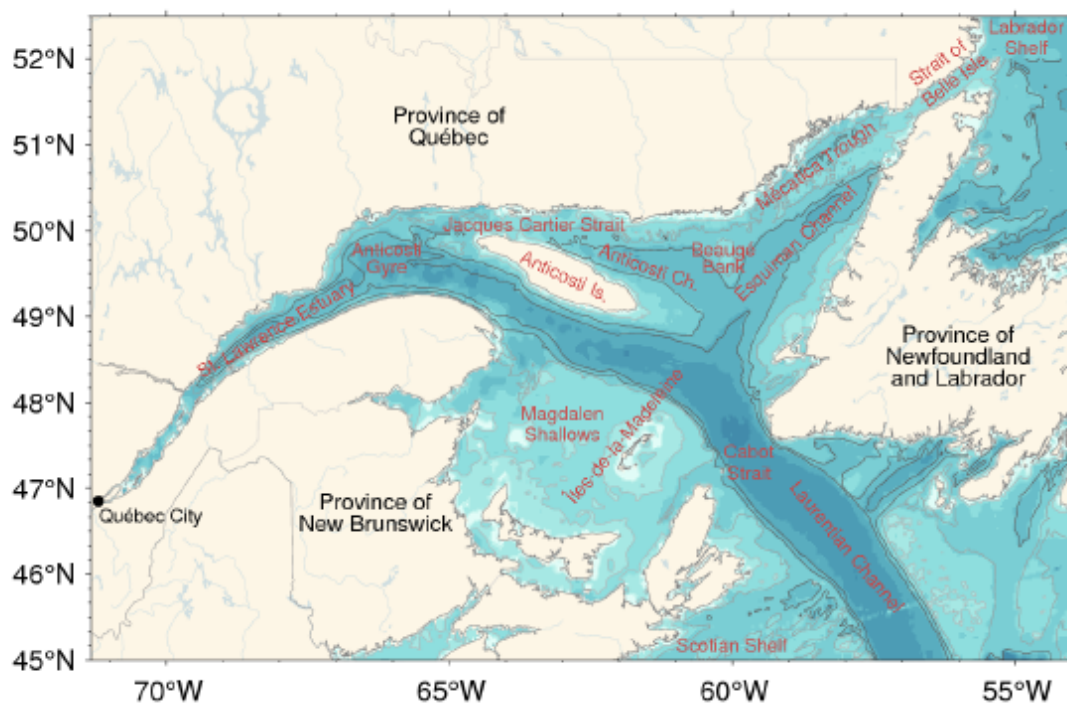


Figure 5: The Gulf of St. Lawrence (Source: Dufour et al 2010).

Bottom sediments throughout much of the northern GSL are soft, characterised as “pelite” in available sediment maps (Loring and Nota 1973; Dutil *et al.*, 2011) (Figure 6); these are primarily mud and mud mixed with sand, with the bottom of the channels and basins mainly mud, and a mixture of sand and mud on slopes (Dutil *et al.*, 2011).

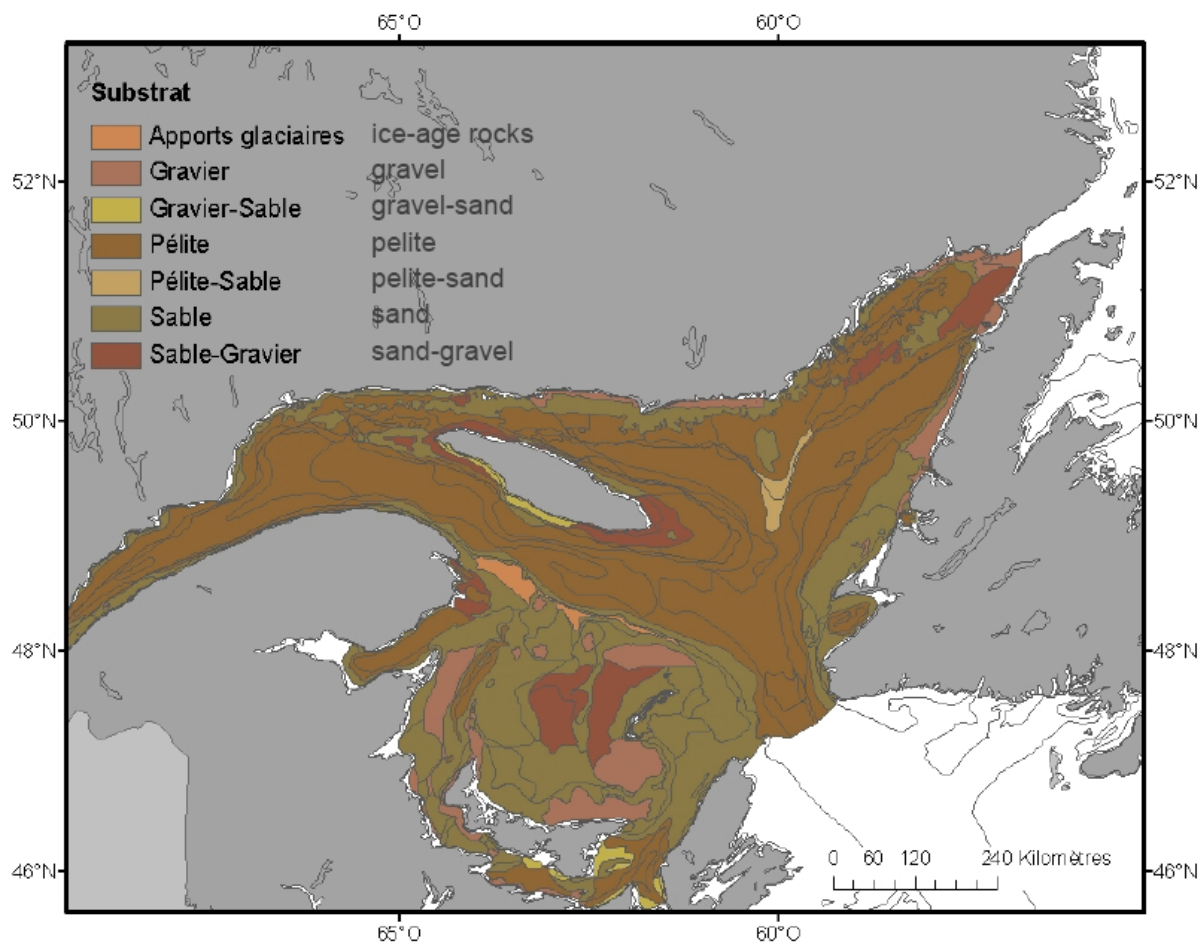


Figure 6: Sediments in the Gulf of St. Lawrence (Source: Loring and Nota 1973 in Lévesque et al., 2012).

Northern shrimp of commercial sizes are generally taken at depths of 200-300 m in the fishery area (DFO 2012a) - in the deeper basins and channels, and along the slopes above these. Northern shrimp prefer soft mud or mud-sand habitats with high organic content.

Water temperatures show a “3-layer” vertical pattern in this as in other Atlantic Canadian ocean areas, with seasonably variable surface temperatures (ice covers the surface in winter, warm surface temperatures in summer), a cold intermediate layer (CIL) of temperature $\leq 2^{\circ}\text{C}$ which persists through the year at depths of 50-125m, and a warmer, more saline deep layer at depth $>150\text{m}$ and temperatures $2\text{-}6^{\circ}\text{C}$ (Dufour *et al.*, 2010). Shrimp are found below the CIL in the warmer deep waters. The CIL is principally formed by winter cooling, although inflow of cold Labrador Current water from the Strait of Belle Isle may contribute, while the deep warmer layer is formed from deep inflow from the Atlantic via Cabot Strait (Dufour *et al.*, 2010).

Accordingly the physical habitat of northern shrimp of commercial sizes in this fishery area can be generally characterised as follows: mud or mud-sand sediments, depths of 200-300m, in temperatures generally between 2 and 6°C .

An estimate of the total habitat suitable for fishable concentrations of shrimp is based on figures from DFO (2012a) and Savard (2012). The Gulf of St. Lawrence has been divided into grid squares 10 minutes of latitude by 10 minutes of longitude, and logbooks show that

479 of these squares have been visited by shrimp fishing vessels over the history of the fishery (Savard et al 2012). Average area of the squares is 223 km², so the estimated total area of habitat suitable for fishable concentrations of shrimp is 223 x 479 or about 107,000 km². Depending on the year, shrimp trawling is estimated to impact 4,000 to 8,000 km² of bottom habitat per year (DFO 2012a), which is 4%-8% of the total "shrimp" habitat.

Benthic species and communities of the fishery area are generally known, although there has been relatively little directed study of benthic communities in the northern GSL. Moritz *et al.*, (2012) described 6 benthic communities, each associated with specific environmental variables, in the northern Gulf of St. Lawrence, based on bycatch of megafauna in shrimp trawl surveys from 2006 to 2009. Three of the six communities were in deeper channels where concentrations of northern shrimp would be found (*P. borealis* was the most frequently taken invertebrate in these communities). Common species in these communities were sea pens (Pennatulacea) (among the top 5 species in all 3 communities), pink glass shrimp (*Pasiphaea multidentata*) (all 3 communities), sea anemones (Actinaria) (all 3 communities), a sea urchin (*Brisaster fragilis*) (2 of 3), sponges (Porifera) (2 of 3), a sea star (*Ctenodiscus crispatus*) (1 community) and soft corals (Alcyonacea) (1 community). Desrosiers *et al.*, (2000) characterised benthic megafauna from corer samples from 2 stations in the northern Gulf, in a study of trophic guilds in these areas - among the more abundant species in their samples were a variety of polychaete worms (mobile and tube-dwelling), a bivalve (*Nucula* sp.), nemertean and sipunculid worms, and an amphipod, each of which they categorised as a subsurface deposit feeder, surface deposit feeder, carnivore, or filter feeders. Major invertebrate groups of the northern Gulf have been identified and divided into trophic groups for a series of studies of trophic relationships (for example Savenkoff *et al.*, 2007); descriptions of the invertebrate groups and species, and of trophic relationships in 4 periods from the 1980s to recent times are available on CDEENA (n.d.). Other available studies on benthic communities in the northern Gulf listed by Moritz *et al.* (2012) are mainly of specific groups or subareas of the northern GSL. Of note from the cited studies is the widespread presence of a range of sessile, "rooted" species in the megafauna sampled by the shrimp trawl, in particular sea pens, anemones, and sponges (Moritz *et al.*, 2012), species one might ordinarily associate with harder bottom substrates, and the wide range of infauna one would expect from these soft substrates (Desrosiers *et al.*, 2000). The wide distribution of sponges, sea pens and soft corals noted by Moritz *et al.*, (2012) is consistent with findings in other studies; Colpron *et al.*, (2010) found sea pens and soft corals to be widely distributed in the northern GSL, with some fishermen associating higher catches of shrimp with higher catches of sea pens, while DFO (2012a) noted the wide distribution of sea pens and sponges in this fishery area.

Sensitive benthic habitats have been identified and mapped by DFO (2012a), in an assessment of impacts of shrimp trawling on benthic habitats in the fishery area. This assessment concluded that some sensitive habitats were not affected by the fishery - highly complex habitats, mainly in coastal areas, and areas of concentrations of sea pens, mainly in waters deeper than those affected by the fishery, beyond 300 m depth, in the Laurentian Channel. Areas of concentration of sponges were widespread in the fishery area and could potentially be affected, but information on distribution of fishing effort showed that there was little overlap between fishing and sponge concentration areas in recent years. Sponge areas had probably been impacted by this fishery prior to recent years. This assessment noted that in any given year, shrimp fishing is restricted to a relatively small proportion of the potential habitat of northern shrimp and associated species, such that much of this habitat would be unimpacted.

The DFO (2012a) assessment built on an initiative to identify sensitive marine habitats Canada-wide (DFO 2010), as part of implementation of an overall policy on protection of benthic habitats from impacts of fishing (DFO 2009). Consistent with this policy, and

following the DFO (2012a) identification of sensitive areas, an assessment of risks to sensitive benthic habitats from shrimp trawling will be undertaken and mitigation measures, including closed areas, will be implemented if necessary (DFO Fisheries Management personnel, pers. comm.). At present no areas have been closed to shrimp fishing to protect sensitive habitats.

Trophic relationships in the northern Gulf of St. Lawrence have been studied in some detail, including changes since the mid 1980s coincident with major changes in the ecosystem. Savenkoff *et al.*, (2007) summarised the changes in trophic patterns as deduced using inverse modelling (a mass balance approach based on Ecopath), comparing the situation during three time periods: the mid 1980s, mid 1990s and early 2000s. Thirty species groups were used to create the trophic webs; northern shrimp are part of a “shrimp” group which also includes striped shrimp (*Pandalus montagui*) and pink glass shrimp (*Pasiphaea multidentata*). In all three periods, the major prey species in the northern GSL was capelin, accounting for 57% of all prey in the 1980s, 63% in the 1990s, and 43% in the 2000s, while shrimp increased from 7-8% of all prey in the earlier periods to 22% in the early 2000s. The other main prey species were planktivorous small pelagics. Shrimp were consumed by all 20 predator groups examined in all three time periods, but most interactions were weak in all three periods (that is, a relatively small part of the predator diet was made up of shrimp); the most important predators of shrimp were redfish, large and small cod, and Greenland halibut in all three periods, with the relative importance of these predators changing from the mid-1980s to the early 2000s (Savenkoff *et al.*, 2007, Fig. 7). Fishing was a smaller source of mortality than predation for shrimp in all three periods, 6% and 12% of the total mortality in the mid 1980s and early 2000s, 27% in the mid 1990s. Further details of the models and composition of the various species groups is available at CDEENA (n.d.).

The northern Gulf of St. Lawrence ecosystem has undergone substantial changes since the mid 1980s, moving from a trophic system dominated by large-bodied predatory groundfish (Atlantic cod, redfishes) and small-bodied forage species (capelin, mackerel, herring, shrimps) in the 1980s to a system dominated by the latter group alone in the early 2000s (Savenkoff *et al.*, 2007; Dufour *et al.*, 2010). This change was apparently caused by the removal of a functional group, the large groundfishes, by fishing; predator release was associated with changes in the predator-prey relationships, replacement of groundfishes by marine mammals as primary predators, and increases in abundance of prey species. Long-term trends have been observed in air temperatures (correlated with surface water temperatures), which have been increasing since the 1880s, oxygen concentration in the deeper waters of the Laurentian Channel (decreasing since the 1930s, some areas are essentially hypoxic in recent years), and pH (decreasing since the 1930s) (Dufour *et al.*, 2010). During the 1990s an episode of cold conditions occurred, with an approximate 10-year period of higher than normal winter ice volume and cold intermediate layer volume (Dufour *et al.*, 2010); CIL volume influences the proportion of the continental shelf covered by cold water and as such has a significant influence on the ecosystem.

3.4.2 Retained, discarded, ETP species

Estimates of bycatch amounts by species (or species group) are available, based on observations by on-board observers. Target for observer coverage is 5% of sets, distributed among the various fishing areas. This target is usually met or approached closely, with the exception of Newfoundland vessels fishing in the Esquiman Channel area, where coverage in recent years has been around 2%. Despite the low coverage in this area, the overall consistency of results from year to year for the entire fishery area suggests that the observer-based estimates are an accurate reflection of overall bycatch amounts in the fishery. In a study of the representivity of observer coverage in several Gulf of St. Lawrence

fisheries, Benoît and Allard (2009) concluded that observer coverage in the northern shrimp fishery was essentially randomly distributed in the fishery, that is, that this should represent the overall fishery well. A 5% coverage level in the Esquiman area, as in other areas, is considered by managers to be necessary to support ongoing fishery management measures (such as area closures to protect small fish) and is a target of the fishery management plan.

A range of measures is taken in this fishery to limit bycatch, which amount to a bycatch management strategy. Regulatory measures include mandatory use of the Nordmore grate, with a spacing of 19-25 mm (25 mm is used by most fishermen) and a “small fish protocol” which requires that grid squares with excessive bycatch as recorded by observers be closed to fishing (this measure is rarely implemented, as fishermen seek to minimise bycatch). Fishermen also take measures to ensure that bycatch is minimized, since there is an economic cost to excessive bycatch, either via reduced value of catch at landing (plants deduct weight of bycatch from the weight for which landings are paid), or by increased sorting time at sea to ensure clean catches. Measures taken by fishermen include targeting of areas with low risk of bycatch, and use of 30cm toggle chains to keep nets off the bottom, thereby reducing catch of demersal and benthic species.

Estimates of annual bycatch amounts based on observations of 14,185 sets over the 12 years from 2000 to 2011 are available (DFO 2012b). Amounts were estimated in tons per year based on ratios with catch of the target species in the observed sets.

Total bycatch in this fishery is low (Table 2). From 2000-2011 total bycatch of all species combined varied from 1.0% to 2.3% of the catch of the target species (DFO 2012b). For the most abundant species in the bycatch, capelin, bycatch was generally less than 1% of the target species catch for each year during the period sampled (L. Savard, pers. comm.).

Bycatch species are identified to the lowest possible level by observers, typically to species for the more important or abundant species, or to species group for species which are rarer or taxonomically difficult. A total of 97 species or species groups was identified in the bycatch in the period sampled, 77 groups of fishes and 20 groups of invertebrates (DFO 2012b). Sixteen of these groups were observed in 10% or more of sets, while 59 were observed in less than 1% of sets.

Retained Species

Striped shrimp, *Pandalus montagui*, is the only retained species in this fishery. This species is very similar to the target species and is thus difficult to sort from catches. Striped shrimp has lower commercial value than northern shrimp, and presence of this species in catches can reduce the price paid at the plant, so fishermen take measures to avoid it. Striped shrimp is distributed in shallower, colder waters than northern shrimp (Savard et Nozères 2012) so fishermen are able to target areas where the risk of taking this species is lower. Striped shrimp bycatch varied from 0 to 41 t/yr in 2000-2011, with an average catch over the last 5 years in the data series of 12 t/yr (Table 2).

Occasional catches of large halibut (Greenland or Atlantic) may be retained by fishermen who have groundfish licences; it is estimated that 13% of the bycatch of these species is retained (DFO 2012bc). This would amount to, on average, about 10 t/yr for Greenland halibut (turbot) (13% of the recent 5-year average of 85 t/yr), and much less for Atlantic halibut, and based on these very small catch amounts these are not considered retained species.

Bycatch Species (Discards)

All other species in the bycatch, except ETP species, are considered discard species. Although retention of groundfish is authorized for vessels holding groundfish licences, most of the bycatch is very small individuals which have passed through the Nordmore grate, with no commercial value. Payments for landed catches are reduced for excessive bycatch in the catch, and sorting at sea represents a cost to fishermen, so fishermen are motivated to avoid taking excessive bycatch.

Estimated annual catches of the 10 most abundant discard species in the most recent 5-year period (Table 2) range from a maximum of 174 t/yr for capelin down to 3 t/yr for hagfishes. Commercial pelagic (capelin, Atlantic herring) and demersal fishes (Greenland halibut, American plaice, redfishes and others) are among the most abundant species in the bycatch.

Pink glass shrimp (*Pasiphaea multidentata*) is the fourth most abundant bycatch species by weight, based on the 2007-2011 average of 25.7 t/yr (Table 2). Presence of this species in the catch reduces catch value, as it is not marketable and must be sorted from the catch at plants when landed, so it is avoided by fishermen. *P. multidentata* is widely distributed in the northern GSL; based on survey results it is distributed deeper than *P. borealis*, in warmer, more saline water (Savard and Nozères, 2012).

None of the bycatch species comes close to meeting the MSC weight guideline for a “main” bycatch species (5% of target species weight), and none are commercially valuable because of their small size.

Several of the bycatch species are depleted and as such are considered “main” bycatch species - American plaice, redfishes, and Atlantic cod. The basis for considering these depleted, and recent management history, is as follows:

- Atlantic cod – Laurentian North population assessed by Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as Endangered; stock is in the critical zone, well below its limit reference point (DFO, 2012c). The fishery remains open in the northern GSL, with a low TAC (2,000 t in 2011) (DFO, 2012c).
- American plaice – Maritimes population assessed by COSEWIC as Threatened. This species is caught as part of a small fishery on mixed flatfishes in the northern GSL, with total catches of the order of 100 t/yr, and this level of catch is not projected to jeopardise survival or recovery (DFO, 2011a).
- Redfishes – two species are not separated in catches; Gulf of St. Lawrence/Laurentian Channel population of deepwater redfish has been assessed as Endangered by COSEWIC, Atlantic population of Acadian redfish assessed as Threatened. Deepwater redfish would be the species most likely to be taken in the northern GSL - an index fishery with a TAC of 2000 t/yr is open in the northern GSL, although catches have been below this value in recent years; this level of catch is not expected to jeopardise recovery (DFO, 2011b).

Species assessed by COSEWIC as Special Concern are not included in the depleted/vulnerable category; these include Atlantic wolffish, thorny skate (Atlantic-wide) and smooth skate (Laurentian-Scotian Shelf population). Special Concern species require management plans rather than recovery strategies, under the *Species at Risk Act*.

For other relatively common fish species in the bycatch, population assessments are available which permit assessing the impact of bycatch in the shrimp fishery against other sources of mortality and overall population abundance: capelin (DFO, 2011c), Greenland halibut (DFO, 2011d), Atlantic herring (DFO, 2011e, DFO, 2012d), witch flounder (DFO, 2012e). These species are harvested under DFO management plans and are subject to TAC restrictions.

A comparison of bycatch in the shrimp fishery with trawl survey estimates of total abundance (for species for which the annual trawl surveys can provide reasonable estimates) shows that the bycatch is very small in relation to total population size (DFO, 2012b). Estimated numbers (or biomass, when data were not available to estimate numbers) of species in the bycatch were compared with estimated numbers (or biomass) of the same size fraction in the population from the trawl surveys. For five species for which numbers could be estimated - Greenland halibut, redfishes, American plaice, witch flounder, and Atlantic cod - numbers in the bycatch were less than 0.9% of the trawl survey estimates of numbers of the same sizes in the population. For these species, weight of bycatch was less than 0.6% of the estimated biomass in the population of the same sizes. For 9 species for which numbers could not be estimated - thorny skate, smooth skate, white hake, fourbeard rockling, Atlantic halibut, hagfishes, grenadiers, lumpfish and Atlantic soft pout - bycatch represented less than 1% of population biomass as estimated from the trawl surveys. Trawl survey estimates of pelagic species are not possible, but bycatch of capelin was from 1-10% of the annual landings in the fishery area in 2000-2011, while bycatch of herring was less than 0.5% of annual landings in the same period. All other species occurred in relatively few tows and in very low amounts (DFO, 2012b).

Table 2: Bycatch and target species catch in the northern shrimp fishery - maximum and minimum 2000-2011, average 2007-2011, in tonnes. (Sources: northern shrimp catch, Savard, 2012; bycatch amounts, DFO, 2012b).

	2000-2011 (tonnes)							Ave
Species	Minimum	Maximum	2007	2008	2009	2010	2011	2007-11
Northern shrimp	26236	36055	36055	35734	35983	36302	34280	35670.8
Striped shrimp	0.00	40.59	0.22	0.07	16.91	0.09	40.59	11.58
Pink glass shrimp	0.37	56.30	56.30	1.80	22.00	41.00	7.50	25.72
Capelin	77.25	321.70	87.20	92.70	321.70	156.00	210.60	173.64
Greenland halibut	60.68	121.30	86.30	121.30	64.60	70.80	82.90	85.18
Atlantic herring	23.80	76.32	23.80	25.10	56.70	31.70	66.00	40.66
American plaice	11.00	43.00	19.10	23.10	17.50	39.20	26.20	25.02
Witch flounder	7.30	31.89	13.24	19.17	17.05	19.29	20.20	17.79
Redfishes	9.80	45.82	23.60	26.00	9.80	11.60	10.00	16.20
Atlantic cod	3.10	45.20	4.90	45.20	11.40	3.10	9.00	14.72
Barracudinas	0.72	20.00	4.00	20.00	17.60	10.50	8.50	12.12
Thorny skate	5.00	19.60	7.80	12.00	5.00	19.60	8.30	10.54
Hagfishes	1.42	4.10	2.80	2.80	4.10	3.50	3.70	3.38
Atlantic wolffish	0.01	0.50	0.50	0.06	0.04	0.07	0.10	0.15
Northern wolffish	0.00	0.17	0.17	0.00	0.00	0.02	0.00	0.04
Spotted wolffish	0.00	0.35	0.12	0.00	0.00	0.02	0.08	0.04

Endangered, threatened, protected species

Two ETP species are present in the bycatch: spotted wolffish and northern wolffish, both listed on Schedule 1 of the *Species at Risk Act* (SARA) as Threatened. COSEWIC reassessed these species in November 2012 and confirmed the Threatened designation, while noting that abundance of both species had been increasing over the past decade (COSEWIC, 2013a in press; COSEWIC, 2013b in press; COSEWIC, 2012a). These species are taken in very small amounts in the bycatch, 0.04 t/yr (40 kg) on average for the past 5 years (Table 2). Both are covered by a recovery strategy developed under the *Species at Risk Act* (SARA) (Kulka *et al.*, 2007). As a condition of licence, fishermen are required to return any individuals taken to the water unharmed. Mortality of these species from bycatch in Canadian Atlantic fisheries was assessed not to be such as to jeopardise their survival or recovery (DFO, 2004), and as such permits were issued to all fishermen who might take them as bycatch allowing them to cause this “incidental harm”.

3.4.3 Specific constraints

No specific constraints have been identified with respect to bycatch or other environmental impacts of the fishery. Bycatch is extremely low, thanks to a bycatch management strategy (see previous section), and catches of each species taken are low relative to other sources of mortality and to overall population abundance (see details in scoring table sections 2.1 and 2.2). Amounts of ETP species taken are extremely low and are not hindering recovery of these species (see details in scoring table section 2.3).

3.4.4 Critical environments.

Sensitive habitats in the fishery area have been identified as part of an assessment of impacts of the shrimp trawl fishery on the benthic environment (DFO, 2012a). This assessment concluded that it was unlikely that this fishery was currently impacting identified sensitive areas, although there could be some continuing impact on areas of sponge concentration. DFO's Fisheries Management section will be leading an assessment of risks posed by the trawl fishery to benthic habitats, consistent with the DFO Policy on protection of benthic habitats from the impacts of fishing (DFO, 2009), and will implement additional measures to protect these habitats if necessary.

Sessile, sensitive benthic species (sea pens, soft corals, sponges) are apparently widespread in the fishery area (DFO, 2012a; Colpron *et al.*, 2010) and may be impacted by the fishery. However this fishery impacts a small proportion of the total area potentially suitable for northern shrimp and its associated species and communities (of the order of 5%) every year, and as such leaves a large portion of the habitat essentially unimpacted or impacted to a small degree.

3.5 Principle Three: Management System Background

3.5.1 Area of operation of the fishery, and the jurisdiction under which it falls

Northern shrimp in Eastern Canada

Shrimp in the waters off eastern Canada are widely distributed and abundant over a large area from southern Nova Scotia (44°N) to Baffin Island (75°N), principally over soft muddy bottoms in water temperatures ranging from -1.5 to +6°C, and depths from 150 to 600 m all along the edge of the continental shelf. These waters are described by two different sets of geographical zones, a) the Divisions of the inter-governmental body known as the North Atlantic Fisheries Organisation (NAFO) that originated for assessing and managing groundfish stocks, and b) Canadian Shrimp Fishing Areas 0-16 that were established by the Department of Fisheries and Oceans. The latter are wholly within the Canadian 200 mile limit that marks their seaward boundary, and that runs across the western divisions of NAFO.

As the shrimp fisheries occur predominantly within the 200 limit, most can be described using the SFAs alone.

Gulf of St. Lawrence Shrimp Fishery

The Gulf fishery being recertified in this report occupies SFAs 8 (Esquiman), 9 (Anticosti), 10 (Sept-Îles) and 12 (The Estuary). The fishery began off Sept-Îles in 1965, subsequently expanding to the Esquiman Channel (SFA 8), the north and south of Anticosti Island, and to the Estuary (SFA12) of the Gulf of St. Lawrence by 1980. When TACs were first introduced in 1982 these five areas were managed separately, but in 1993 an adjustment of boundaries reduced the number of management areas to four.

As these SFAs are wholly within the Canadian 200 mile limit they fall under the sole jurisdiction of the Department of Fisheries and Oceans, Canada, which acts in collaboration with Provincial Governments. Management is based on Canadian national and regional legislation, and on Regional management policies and practices. Scientific advice is provided by DFO regional scientists principally based at the Institute Maurice-Lamontagne, Mont Joli. Oversight and active management of the fishery and the environment are carried out by the Fisheries and Aquaculture Management Branch of DFO Québec Region, in collaboration with DFO Newfoundland and Labrador Region, and the Gulf Region. The fishery operates under the framework of the evergreen Integrated Fisheries Management Plan for Northern Shrimp in the Estuary and Gulf of St Lawrence, the latest version being an incomplete draft dated 6 December 2012 (DFO, 2012a). Managers follow advice based on consultations and recommendations from the Gulf of St Lawrence Shrimp Advisory Committee (GSAC), which dates back to 1980. Stock surveys show that the overall distribution of northern shrimp in the Gulf is highest between 200-300 m depth in areas with a bottom temperature of 4-6°C (Savard and Nozères, 2012) and therefore is generally associated with the deep channels, where the bottom is of fine sediment (pelite, sandy pelite) and the sides of the channels are of coarser sediment (gravelly-sandy pelite). The species rarely occurs in the southern Gulf. The fishery usually opens on April 1, and generally continues into the fall, but the highest catches and the best price occur in spring when large mature females aggregate inshore to release larvae.

3.5.2 Recognised groups with interests in the fishery

The main interest groups are the client for this certification, and the numerous stakeholder groups and organisations that are members of the Gulf Shrimp Advisory Committee (GSAC):-

- The Client
- Federal Government officials and scientists from Atlantic Regions
- Fishers' Associations
- First Nations
- Processors' Associations
- Provincial Governments of New Brunswick, Newfoundland and Labrador, Nova Scotia, Prince-Edward Island, and Québec.

A full listing of members within the different groups is shown in Section 3.5.4.

The GSAC is chaired by the Regional Director, Fisheries & Aquaculture Management Branch, DFO Québec Region. GSAC meetings are open to the public, and to observers including NGOs and ENGOs.

3.5.3 The management system

This section lists the following components of the legal and customary framework applicable to the shrimp fishery: Acts, Frameworks, Policies, Plans, DFO roles and responsibilities, and structure.

Principal Acts and Regulations specifying responsibilities and enabling powers:

- *Department of Fisheries and Oceans Act*, 1985 (R.S.C., 1985, c. F-15) (establishes DFO mandate) <http://laws-lois.justice.gc.ca/eng/acts/F-15/index.html>
- *Fisheries Act* 1985 (gives the Minister responsibility for the management of fisheries, habitat, and aquaculture. This Act was amended June 29, 2012. <http://laws-lois.justice.gc.ca/eng/acts/F-14/index.html>.
- *Oceans Act* 1996 (S.C. 1996, c. 31) (entrusts the Minister to lead integrated oceans management) <http://laws-lois.justice.gc.ca/eng/acts/O-2.4/index.html>
- *Species at Risk Act* 2002 (S.C. 2002, c. 29) (gives the Minister responsibilities associated with the management of aquatic species at risk). <http://laws-lois.justice.gc.ca/eng/acts/S-15.3/index.html>
- *Atlantic Fishery Regulations* , 1985 (SOR/86-21) <http://laws-lois.justice.gc.ca/eng/regulations/SOR-86-21/index.html>
- *Fishery (General) Regulations* 1993 (SOR/93-53) <http://lawslois.justice.gc.ca/eng/regulations/SOR-93-53/index.html>
- *Atlantic Fisheries Restructuring Act*, 1985 (R.S.C., 1985, c. A-14) <http://laws-lois.justice.gc.ca/eng/acts/A-14/index.html>
- *Quebec Fishery Regulations*, 1990 (SOR/90-214) <http://laws-lois.justice.gc.ca/eng/regulations/SOR-90-214/index.html>

Frameworks, Policies and Plans:

To fulfil obligations to the United Nations Convention on the Law of the Sea, the Convention on Biological Diversity, and the United Nations Fisheries Agreement, Canada is committed to developing National and Regional Frameworks, Policies and Plans for delivering sustainable fisheries and sustainable use of the environment. This is the aim of an ecosystem approach to management being implemented by an integrated management planning process specified under the *Oceans Act*.

Frameworks and Policies relevant to Principles 1 and 2:

- DFO, 2002. Canada's oceans strategy: Our oceans, our future. Policy and Operational Framework for Integrated Management of Estuarine, Coastal and Marine Environments in Canada. Fisheries and Oceans Canada, Oceans Directorate, Ottawa, Ontario. (Principles 1 & 2, and integrated ocean management)
www.dfompo.gc.ca/oceans/publications/cos-soc/pdf/cos-soc-eng.pdf
- Atlantic Fisheries Policy Review: A policy framework for the management of fisheries on Canada's Atlantic Coast (DFO, 2004-64) www.dfo-mpo.gc.ca/afpr-rppa/Doc_Doc/.../Policy_Framework_e.pdf
- An Integrated Aboriginal Policy Framework (Principle1)
www.dfo-mpo.gc.ca/fm-gp/aboriginal-autochtones/iapf-cipa-eng.htm
- Sustainable Fisheries Framework (Principles1and 2)
www.dfo-mpo.gc.ca/fm-gp/peche-fisheries/fish-ren-peche/sff-cpd/overview-cadre-eng.htm
- A fishery decision-making framework incorporating the Precautionary Approach. October 2011 version. (Principle 1) <http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sffcpd/precaution-eng.htm>
- Commercial Fisheries Licensing Policy for Eastern Canada, 1996 (under revision) (Principle1) <http://www.dfo-mpo.gc.ca/fm-gp/policies-politiques/licences-permis/index-eng.htm>
- Commercial fisheries licensing policy for the Gulf Region (DFO, 2010) (Principle 1) www.glf.dfo-mpo.gc.ca/Gulf/Licenses-Delivery/Commercial-Fisheries-Licensing-Policy
- National Framework for Marine Protected Areas (Principle 2)
www.dfo-mpo.gc.ca/oceans/publications/dmpaf-eczpm/framework-cadre2011-eng.asp
- Policy for Managing the Impact of Fishing on Sensitive Benthic Areas (Principle 2)
www.dfo-mpo.gc.ca/fm-gp/peche-fisheries/fish-ren-peche/sff-cpd/benthi-eng.htm

Examples of relevant codes of practice, plans, programmes and regulations :-

- Canadian Code of Conduct for Responsible Fishing Operations
www.dfo-mpo.gc.ca/fm-gp/policies-politiques/cccrfo-cccpr-eng.htm
- Canada's Oceans Action Plan. DFO/2005-348, Ottawa.
<http://www.dfo-mpo.gc.ca/oceans/publications/oap-pao/pdf/oap-eng.pdf>
- Integrated Fishery Management Plan for Northern Shrimp in the Estuary and Gulf of St. Lawrence (Zones 8,9,10 and 12). Draft December 6, 2012 (DFO, 2012a)
- Aboriginal Communal Fishing Licences Regulations, 1993 (SOR/93-332)
<http://laws-lois.justice.gc.ca/eng/regulations/SOR-93-332/index.html>
- Aboriginal Aquatic Resource and Oceans Management Program
www.dfo-mpo.gc.ca/fm-gp/aboriginal-autochtones/aarom-pagrao/index-eng.htm

DFO Roles and Responsibilities

The Oceans Act (1996) gives DFO the overarching responsibility for sustainable management of fisheries and ecosystems nationally and regionally, and this responsibility is cited at the head of all major framework, policy and plan documents. At the regional level the comprehensive role of DFO in the decision making process is communicated to stakeholders and the public by the following list of roles and responsibilities excerpted from Annex E of the 2003-2007 version of the Gulf IFMP (DFO, 2005b):

Resource Management and Aboriginal Fisheries

Assumes the role of resource manager by relying on recommendations from the main stakeholders and implementing various management measures; carries out consultations with the industry and provincial governments and updates the annual management plan.

Provides advice regarding DFO's relationship with aboriginal peoples; food, social and ceremonial fishing; consultation; DFO's policies and programmes relative to Aboriginals.

Science

Provides regular stock status reports and science responses on the shrimp resource in the Gulf; indicates any potential problems that could jeopardize conservation of stocks; provides advice on the appropriateness of management measures relative to conservation of stocks; identifies any data required to facilitate assessments after the fishing season is over.

Conservation and Protection

Ensures that fishing activities are conducted in accordance with the existing legislation; identifies problems in enforcing the regulations when the management plan is being drawn up, and proposes specific measures for solving the problems.

Policies and Economics

Provides information, advice and analyses on the policies, programs and obligations of DFO, and on economic and commercial aspects of the fisheries and aquaculture.

Statistical Services

Produces useful information and statistics for understanding and managing the marine fishing industry in Canada.

Communications

Provide advice on appropriate strategies for informing people about the annual management plan; maintaining media relations; liaising between the media and fishery managers; and providing the public with information on the situation of Canadian fisheries.

DFO structure

Management of the Gulf Shrimp Fishery is administered and supported by the following regional DFO staff and work streams (sourced from Appendix 2 of DFO, 2012a, which also lists contact details).

DFO contact - Québec region

Name	Branch
Patrick Vincent	Fishery Management
Marcel Boudreau	Resource Management and Aboriginal Affairs
Daniel Boisvert	Resource Management
Kevin Wilkins	Aboriginal Affairs
Bernard Morin	Resource Management
John Chouinard	Conservation & Protection
Hugo Bourdages	Sciences
Martial Ménard	Policy and Economics
Edith Lachance	Statistics
Caroline Hilt	Communications
David Courtemanche	Gaspé Area
Jean Morisset	North shore area

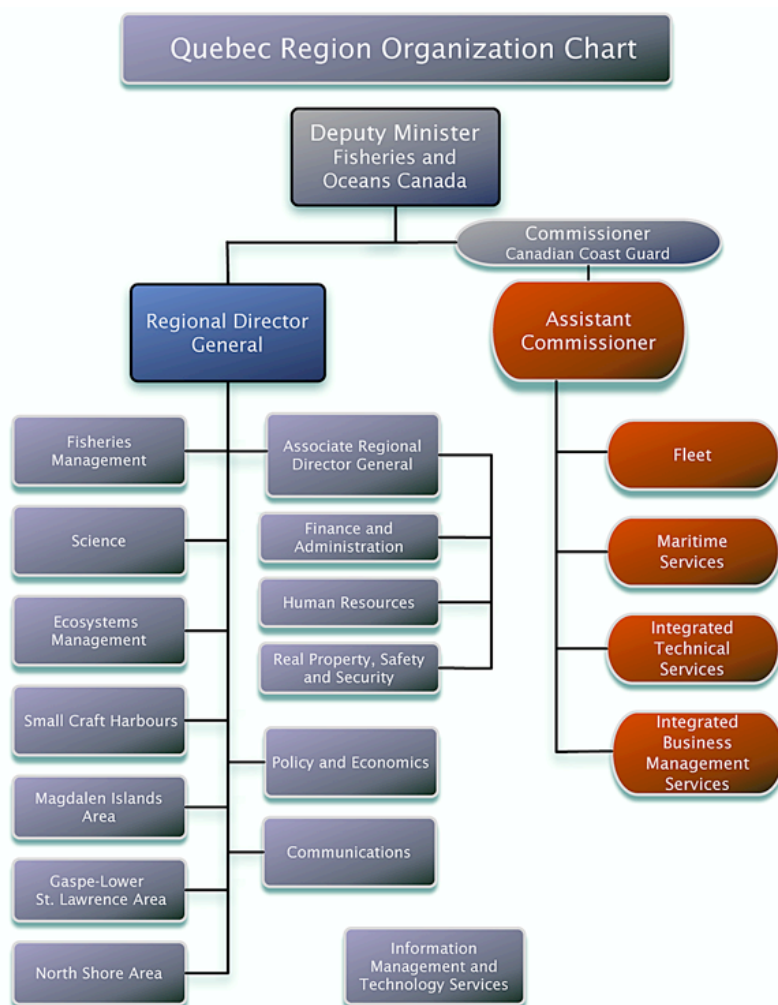
DFO contacts – Gulf-Region

Name	Branch
Matthew Hardy	Resource Management
Réjean Hébert	Resource Management
Alain Hébert	Resource Management
Ron Belliveau	Conservation & protection
Marc Lecouffe	Aboriginal Affairs
Manon Mallet	Policy and Economics
Jennifer Smith	Statistics
Steve Hachey	Communications
Michel Albert	Tracadie Area

DFO contacts – Newfoundland and Labrador region

Name	Branch
Patricia Williams	Resource Management
Tony Blanchard	Resource Management
Ron Burton	Conservation & protection
Judy Guest	Aboriginal Affairs
Frank Corbett	Policy and Economics
Anne Russell	Statistiques
Bob Fagan	Communications
Donald Ball	West coast of Newfoundland Area

The organisation within Québec Region is as follows:



Higher level responsibility

The Regional Director General for each DFO region is ultimately responsible for the system of fisheries and ecosystem management, and the management decisions that it takes. Higher persons of last resort are the Sector Heads at DFO Federal level, Ottawa, including the Assistant Deputy Minister for Ecosystems and Fisheries Management, and ultimately the Fisheries Minister. Legally speaking, the Minister is ultimately responsible for all policies and decisions about the management of fisheries, including decisions about the TAC and the issue of licences and quota allocations.

3.5.4 Consultation

At all levels, DFO practices an open and consultative approach to management, decision making, the implementation of existing policies, and the development of new ones, as mandated by most frameworks, policies and plans.

Operationally, the principal vehicle for consulting stakeholders on management of the Gulf shrimp fishery, including setting the total allowable catch, is the Gulf Shrimp Advisory Committee, which is chaired by the DFO Regional Director of Fisheries and Aquaculture Management, Québec Region.

The Gulf Shrimp Advisory Committee

Section 1.5 of the Gulf Shrimp IFMP (DFO, 2012a) states:

“The GSAC is the main mechanism for consultation with the fishing industry in the Gulf of St. Lawrence including the First Nations and stakeholders in developing management recommendations and TACs intended for the Minister for the annual shrimp Management Plan for the Estuary and the Gulf of St. Lawrence. The committee consists of representatives of shrimp harvesters associations, First Nations, processors, provincial governments and resource managers from DFO. The Department also offers to the Committee the support of resource persons (an economist, a DFO biologist and an adviser from Conservation and Protection Program).

The GSAC advises the Minister of Fisheries and Oceans on issues affecting exploitation of shrimp, including distribution of the resource, methods of exploitation, needs in respect of scientific research and regulatory application, licensing policy and economic analysis of harvesting enterprises.

Beyond the GSAC, working groups may be formed with specific duties as needed. Currently, a working group is responsible for monitoring and development of administrative rules related to the Individual Transferable Quota Program for Group B in place since 1993.

With the implementation of the multi-year management cycle, the governance and the structure of the advisory committee are been reviewed”

The mandate of the GSAC , taken from Appendix 1 of the Gulf Shrimp IFMP (DFO, 2012a) is as follows:

Purpose:

To provide advice to the Minister of Fisheries and Oceans on the management and development of the shrimp fishery in the Gulf of St. Lawrence.

Scope:

The Committee will provide input on annual or multi-year management plans, which may include, but is not restricted to, advice on quota allocations, regulatory amendments, enforcement efforts, licensing policies, seasons, fishing areas, gear restrictions, conservation plans for groundfish and developmental activities.

The Committee will take into consideration biological, marketing, financial and other relevant information when formulating advice.

Subcommittees:

Ad hoc subcommittees and/or working groups can be established to review and assess specific policy options and management measures.

Attendance:

The proceedings of the Advisory Committee meetings will be open to the public and media representatives unless a majority of Committee members decide otherwise before a meeting starts. Observers will sit away from the table and not take part in discussions unless asked to do so by the Chairman. The number of observers can be restricted, at the discretion of the Chairman, where space is limited in the meeting premises.

Administration:

No formal voting procedures will be established for the Committee, but rather it will seek to operate on a consensus basis. A summary of each meeting will be prepared and distributed by the Department of Fisheries.

The Advisory Committee is therefore the forum for:

- Presentation and explanation of scientific advice on the status of the shrimp stock and the ecosystem.
- Consultation on the TAC and related aspects of the annual management plan.
- Review of the in-year performance of the fishery, including reports on monitoring, quota uptake, surveillance, compliance, markets and prices.
- Review and resolution of licensing and quota allocation and disputes.
- Consultation with the industry on revisions to the evergreen IFMP, which is rewritten every five years. Upon agreement with their association, any representative can advance amendments to the plan at any time. If consensus is reached, the appropriate amendment to the IFMP is made.
- Consultation with the industry on proposed new national and regional frameworks, policies, plans, and regulations. DFO seeks opinions and local knowledge in advance of new legislation or changes to existing regulations and measures, in order to pre-empt problems, disputes or legal disputes.
- Explanations by managers of whether or why the advice of the Committee was used or not.

The following groups are represented on the Committee (copied from Appendix 1 of DFO. 2012a):

Fishers' Associations

- Fish, Food and Allied Workers Union (FFAWU)
- Association des capitaines propriétaires de la Gaspésie (ACPG)
- Association des crevettiers acadiens du Golfe (ACAG)
- Association des pêcheurs de crevette de Matane (APCM)
- Lower North Shore Fisher's Associations Regroupment (LNSFAR)
- Fédération régionale acadienne des pêcheurs professionnels (FRAPP) – crew members

First Nations

- Red Bank First Nation
- Eel River Bar First Nation
- Innu Takuaikan Uashat Mak Mani-Utenam
- Listuguj Mi'gmaq First Nation
- Micmacs of Gesgapegiag Band
- Nation Micmac de Gespeg
- Première Nation Malécite de Viger

Processors' Associations

- Québec Fish Processors Association (QFPA)
- New-Brunswick Processors
- Association of Seafood Producers (Newfoundland) (ASP)

Provincial Governments

- New Brunswick
- Newfoundland and Labrador
- Nova Scotia
- Prince-Edward Island
- Québec

Federal Government

- Chairman, Fisheries Management Regional Director, Québec Region
- Secretary, Advisor, Resource Management Branch, Québec Region

Other

Non-voting observers by invitation.

NGO's and ENGO's

These are not formal members of the GSAC, but they are invited to send a representative to each meeting as an observer. At the site visit the assessors were advised that this option is not always taken up because problems with the groundfish fisheries often take precedence.

Fishery officers and stakeholders

At the site visit the assessors were advised that Fishery Officers are keen to use day to day personal contact to discuss directly with stakeholders the implementation and enforcement of current and new regulations, and to educate them on compliance issues.

Producer Associations and the Union

There are routine meetings between Producer Associations and the Fish, Food and Allied Workers Union to discuss practical protocols, prices, and day to day operational matters.

Symposia, workshops and Regional Advisory Process (RAP) meetings

To engineer in-depth consultation on management and scientific issues, managers and scientists organise and contribute to periodic symposia, workshops and RAP meetings on the Gulf shrimp fishery. For example, during the early development of the fishery DFO organised two fishers Symposia in 1985 and 1993, which discussed the status of the fishery and gave industry the chance to consider new directions, leading in both cases to significant steps in management (see Section 3.5.7). A third Symposium was held recently on December 11 and 12, 2012.

Workshops and Regional Advisory Process meetings have also been held in order to review and discuss new or critical technical issues. For Principle 1, the most important recent issue has been the development of precautionary reference points to assist in determining shrimp stock status, and the implementation of decision rules to assist in managing the harvest rate. The science was discussed and peer reviewed at a Regional Assessment Process (RAP) meeting in 2011 (DFO, 2012b) and was subsequently presented to stakeholders at a Gulf shrimp industry workshop held in Québec City on November 29-30, 2011. Stakeholders agreed to adopt the proposed reference points derived from the long term trend in a main stock indicator, and to accept the application of harvesting rules to each precautionary zone (maintain the harvest rate in the healthy zone, or reduce the harvest rate at an increasing

rate in the cautious and critical zones). A first formal application of these protocols to the shrimp stock assessment was peer reviewed at a RAP meeting in 2012 (DFO, 2012c). For Principle 2, the most recent main issue has been to assess the impact of shrimp trawling on habitat and sensitive benthic areas. A detailed assessment of the impact of shrimp trawling on habitat and benthic communities in the Gulf (DFO, 2012f) was peer reviewed at a RAP meeting in 2012 (DFO, 2012d). The implications for management will be discussed with the shrimp industry during 2013.

3.5.5 Details of non-fishery users or activities which could affect the fishery, and arrangements for liaison and cooperation.

None are known at this time.

3.5.6 Details of the decision making process or processes, including the recognised participants

The Gulf Shrimp Advisory Committee

Section 1.5 of the Gulf Shrimp IFMP (DFO, 2012a) states:-

“To make decisions, the Minister takes into account various recommendations including those of the Gulf of St. Lawrence Shrimp Advisory Committee (GSAC).Coordination of GSAC consultation and management is the responsibility of the Fisheries and Aquaculture Management Branch for the Québec Region, in collaboration with the two other DFO administrative regions involved in the fishery, the Newfoundland and Labrador Region and the Gulf Region, which includes Prince Edward Island, New Brunswick and part of Nova Scotia”.

The core of the decision making process is participation by DFO regional managers, scientists, Conservation & Protection personnel, industry and Provincial Government representatives, at meetings of the Gulf Shrimp Advisory Committee, chaired by the Regional Director for Fisheries and Aquaculture Management for Québec Region. Section 3.5.3 described in full the functions and membership of the Committee, and also identified the senior regional DFO managers and staff assigned to the various Branches and work streams that contribute to this co-management and decision making forum. To assist in scoring the fishery, the following list of core decision making activities of the GSAC have been adapted from Section 3.5.3:

- Review of the performance of the fishery, including reports on monitoring, quota uptake, surveillance, compliance, markets and prices.
- Review and discussion of the most recent assessment and scientific advice on shrimp stock status and the ecosystem.
- Review of stakeholder views on the upcoming TAC and related aspects of the annual management plan taking into account the implications of the reference points, decision rules, fishery economics, and whether or not a TAC constraint is required under the adjustment rules.
- Consensus decisions about the next TAC and annual management plan, and the need for any further management measures, or changes to the priorities for monitoring and surveillance.

- Review and resolution of licensing and quota-allocation requirements or disputes, including any quota reconciliation required as a result of quota over-runs in the previous year.
- Presentation and discussion of new policies and measures for managing the impact of the shrimp fishery on habitat, sensitive benthic areas, groundfish and species at risk
- Periodic discussion and decisions on amendment or revision of the evergreen IFMP, and the longer term action plan for the shrimp fishery.
- Consultation with the industry on any new national and regional frameworks, policies, plans, and regulations. DFO seeks opinions and local knowledge in advance of new legislation or changes to existing regulations and measures, in order to pre-empt problems, disputes or legal disputes.
- Explanation of how or why any previous advice from the Committee was used or not.

Decisions taken by the GSAC are achieved by consensus after fully taking into account the views of scientists, managers, the stakeholder representatives attending the meetings, and comments from observers, but final responsibility rests with DFO managers, and ultimately with the Minister.

Frequency of GSAC meetings

Before 2012, the GSAC met annually, but management has now moved to a two year cycle, and the next meeting of the GSAC will not take place until 2014. If required, however, sub-committees and working groups of the Advisory Committee can still meet in the interim year so that continuity is maintained, and fishers' workshops and symposia can be organised as policy or scientific developments dictate.

Emergency decisions

Contingencies or emergencies requiring action will cause fishers and other stakeholders to meet with their Association, or with DFO Fishery Officers, regional officials, or scientists, to discuss immediate points arising, or to request an emergency meeting of the GSAC, after which further action could be taken within existing procedures.

The scientific basis for decisions

Whilst the decisions taken by the GSAC fully take into account the experiences, perceptions, needs and views of fishery stakeholders, they are fundamentally based on the scientific knowledge and criteria required to achieve sustainable use of the shrimp stock and the ecosystem. The scientific advice originates through a process that is well established under DFO in all regions. For the Gulf shrimp fishery, the process comprises an assessment of stock status based on applying precautionary reference points to the results of ongoing stock surveys, followed by the use of decision rules and simulations to recommend TAC options for controlling the harvest rate. Scientific results and their implications are presented by scientists at the Advisory Committee meetings. DFO Research Documents on the supporting scientific studies, DFO Science Advisory Reports and Science Responses on the most recent assessment and advice, are peer reviewed and then posted on the website of the DFO Canadian Science Advisory Secretariat, where they are accessible to the public (<http://www.meds-sdmm.dfo-mpo.gc.ca/csas-sccs/applications/publications/index-eng.asp>). Research studies, assessments and science advisory reports are subject to external peer review at large meetings organised periodically under the DFO Regional Advisory Process, the results of which are also posted on the Science Advisory Secretariat website as Proceedings documents. The scientific process is therefore transparent and documented,

and it has to meet the time scales determined by the GSAC decision meetings that are in turn timed to meet the TAC year. For the Gulf shrimp fishery, the provision of scientific advice to the GSAC is the responsibility of the Institute Maurice-Lamontagne, Mont Joli, Québec.

The science is covered in detail elsewhere in this Report, but to support the scoring of Principle 3 the following texts provide a brief summary of the scientific rationales and data that underpin the decision process:-

Principle 1: Stock Assessment and TAC

This section is based on the following references:

DFO. 2011b; DFO. 2012b; DFO. 2012c; DFO. 2012e; DFO. 2013; Savard. 2012b.

Measuring shrimp stock status

- The indicators are trend-based. The main stock indicator (MSI) is an integration of two abundance indicators - stock numbers for males and females from the autumn survey and numbers caught per unit effort for female and large male shrimp from the summer fishery. The MSI for each SFA is standardised against the geometric mean for a 1990-99 reference period.
- For each SFA, the lower reference point (LRP) is an average of the MSI for two periods of low abundance in the 1980s and 1990s that were stable and generated a stock increase when groundfish predation later declined. The upper reference point (URP) or upper stock reference (USR) is 80% of the average of the MSI for 1996-2002, a stable period that generated good year-classes and higher abundance after groundfish predation was reduced

Decisions on stock status

- For the assessment year the decision process compares the MSI to the lower (LRP) and upper (URP) reference points to determine if the stock is in the healthy (above the URP), cautious (between the URP and LRP), or critical zones (below the LRP).

Harvesting decisions based on the precautionary approach

- In the healthy zone managers can allow socio economic factors to be considered, or even prevail, but to be consistent with the precautionary approach it is advised that the TAC should correspond to a stable exploitation rate (the mean rate observed from 1990 to 2010 as prescribed in section 7.8 of the current Gulf shrimp IFMP (DFO, 2012). On this basis the TAC will reduce or increase in proportion to any decline or increase in stock above the URP.
- In the cautious zone, managers can balance socio economic and biological considerations, but to be consistent with the precautionary approach it is advised that in order to evade the critical zone and to recover the stock towards the healthy zone the harvest rate should decline so that the TAC falls faster than the decline in stock.
- In the critical zone, biological considerations should be paramount, and to be consistent with the precautionary approach it is advised that the exploitation rate and TAC should be reduced even more rapidly, or cease, in order to promote rapid recovery into the cautious zone.
- To assist decision making, scientists have developed a length-based 25-year projection model (Desgagné & Savard, 2012) to explore the utility of different harvest rules taking into account different assumptions about how recruitment might respond to stock changes.
- So far, experience of the critical and cautious zones has not yet materialised.

The TAC threshold and cap.

- The shrimp industry has adopted the proposal that in all three precautionary zones the TAC change should be subject to a 5% threshold (i.e. no change in TAC if the recommended change is less than 5%), and that in the healthy and cautious zones the TAC change should be capped at 15%.

Principle 2: Impact of shrimp trawling on habitat and sensitive benthic areas

In compliance with the Policy for Managing the Impact of Fishing on Sensitive Benthic Areas (www.dfo-mpo.gc.ca/fm-gp/peche-fisheries/fish-ren-peche/sff-cpd/benthi-eng.htm) the impact of northern shrimp trawling on benthic habitat communities in the Estuary and Northern Gulf of St Lawrence has recently been assessed, and results will be discussed by managers and stakeholders during 2013 to determine what management action is required.

As described in DFO (2012f), DFO (2012d), and Lévesque *et al.*, (2012), the impact assessment has taken into account:-

- The distribution and habitat of northern shrimp in the Gulf, based on shrimp catch data;
- The distribution of fishing effort by decade since 1982, based on log-book and observer-at-sea data;
- The distribution of benthic communities based on DFO surveys between 2006 and 2009;
- Studies on the distribution of corals and sponges in the Gulf based on DFO research surveys, in order to determine biomass thresholds for sensitive areas;
- Assessment of the trawling impact on sensitive or vulnerable benthic communities in the Gulf.

Key findings (DFO, 2012f, page 2) are:

“The cumulative impact of shrimp trawling has likely been low on sea pen fields and highly diverse benthic communities since the depths targeted for fishing (200 – 300 m) are not optimal depths for the establishment of sea pen fields (>300 m) or highly diverse benthic communities (<200 m).

Because sponge aggregations are found in a large range of depths, regular fishing activity may have affected their distribution. Moreover, important concentrations of sponges are observed in areas that were intensively fished in the 1980s but where little fishing activity has since been documented. Therefore, some recovery potential seems to be possible after a period of intensive trawling.

The likelihood that shrimp fishing activities cause harm to vulnerable or fragile marine ecosystems is low to moderate. High concentrations of sea pens and sponges and habitats suitable for the establishment of highly diverse benthic communities are found on the periphery of traditional fishing grounds. The overlap between trawling activities and these vulnerable or fragile habitats could occur occasionally, as has been the case in the past”.

These studies and findings demonstrate that a coherent evidence-based approach has been taken in preparation for decisions about Principle 1 (the TAC) and Principle 2 (the impact of shrimp trawling on habitat in the Gulf).

3.5.7 Objectives for the fishery

Strategic objectives

The overarching vision for the management of fisheries in Canada is that they are a common property resource to be managed for the benefit of all Canadians, consistent with conservation objectives, the constitutional protection afforded Aboriginal and treaty rights, and the relative contributions that various uses of the resource make to Canadian society, including socio-economic benefits to communities (taken from the Policy for Managing Impacts of Fishing on Sensitive Benthic Areas). The frameworks, policies and plans listed in Section 3.5.3 all refer to the high level objective of managing fisheries and ecosystems sustainably, as illustrated in Annex 1 using selected excerpts from the following documents:

- A Policy Framework for the Management of Fisheries on Canada's Atlantic Coast
- A Sustainable Fisheries Framework
- Policy for Managing the Impact of Fishing on Sensitive Benthic Areas

The Policy Framework for the Management of Fisheries on Canada's Atlantic Coast cites the following strategic objectives, as noted by Section 4.1 of the previous certification report (Tavel, 2008) :-

- Developing and adopting a comprehensive risk management framework that incorporates precaution
- Developing and adopting ecosystem-based management
- Conducting fisheries within an enforceable regulatory framework
- Promoting a conservation ethic and responsible harvesting operations

These high level objectives shape the fishery-specific objectives cited below.

Current fishery-specific long and short term objectives

The following operational management objectives for the Gulf shrimp fishery are taken from Section 5 of the Gulf Shrimp IFMP (DFO, 2012a). The headings equate to long term objectives, the bullets equate to shorter term (sometimes recurrent) objectives, and the 'tasks' equate to practices or measures that are either already in place or are being developed, and that have been paraphrased here from the more detailed text in the IFMP. Regulatory measures aimed at achieving the objectives are described in Section 3.5.9.

Protect the Productivity of Shrimp Stocks

- Maintain the abundance of shrimp stocks in the healthy zone
Tasks: Assess stock status every second year and compare to the reference points
Identify if the stock is in the healthy, cautious or critical zones
Use decision rules to advise an appropriate TAC annually.
The current assessment is survey based: an assessment model is required.

Minimize the impact of the fishery on the ecosystem

- Assess the risk that shrimp trawls cause serious damage to habitat and benthic communities
Tasks: Carry out the risk analysis and identify any mitigation measures required
- Assess the risk of the shrimp fishery causing serious harm to the stocks of non-target species
Tasks: Assess the risk of harm to non-target species and identify any management measures needed.
- Monitor the interactions of the fishery with species at risk

Tasks: Species at risk have been identified (Spotted and Northern Wolffish, Striped bass, and Leatherback turtle). Catches must be logged on board, and all such fish returned to the sea at the point of capture.

- Modernise the tools for monitoring fishing operations
Tasks: Implement VMS and electronic logbooks to facilitate geo-referenced management measures.

Modernize the governance of the fishery

- Review the mandate and structure of the GSAC
Tasks: Adapt to the evolving state of the fishery, and to the new multi-year planning, assessment and advisory cycle
- Review administrative rules
Tasks: Develop or modernise the ITQ structure to support economic viability. Harvesters are calling for a reduction in the licence fee.
- Reduce gear conflicts
Tasks: Monitor conflicts between shrimp, snow crab and Greenland halibut fisheries, and resolve them using appropriate spatial management measures.

Support economic prosperity

- Facilitate fleet restructuring
Tasks: Hold industry workshops that explore the scope and measures to maintain or improve economic viability by reducing costs and or restructuring fleets.
- Collaborate on eco-certification work
Tasks: Work with stakeholders to meet commitments aimed at maintaining Marine Stewardship Council certification.

Performance evaluation

A table in Section 9 of the Gulf Shrimp IFMP (DFO, 2012a) summarises the above objectives, their expected results, and a measurable performance indicator. The table, and comments about measurability, are reproduced later in this Report under PI 3.2 1.

Developing objectives for emerging policies

In addition to the objectives that govern current management at the fishery-specific level, conservation objectives are being developed for Ecologically and Biologically Significant Areas (DFO, 2006a; DFO, 2007a; DFO, 2009c), the management of Large Ocean Management Areas (DFO, 2007c), and Integrated Management (DFO, 2007b; Dufour and Ouellet, 2007.)

3.5.8 Development of the fishery, fleets, access rights and resource sharing

This section is sourced from Sections 1 and 6 of the Gulf Shrimp IFMP (DFO, 2012a).

Development of the shrimp fishery

The trawl fishery for northern shrimp in eastern Canada developed in the 1960s, and the fishery in the Gulf of St Lawrence dates from 1965, with the earliest landings occurring in the northwestern Gulf and the St Lawrence estuary. The fishery is conducted exclusively using bottom otter trawlers ranging in length from 16.7 m (55 feet) to 27.4 m (90 feet).

Shrimp catches in the Gulf fishery increased progressively from around 1000t in the early 1970's to about 36 000t in 2004 before becoming stabilised around that level (Figure 7). The

fishery has long been regulated by the issue of licences (initially to those who already held a groundfish licence) so that the rate of development could be controlled. The collapse of cod and redfish stocks in the mid-1970s and the low prices paid for these species led to increased demand for fishing licences for northern shrimp. TACs were introduced in 1982 and were gradually increased in line with the increases in shrimp stock abundance. Fishing effort and landings by traditional licence holders therefore increased, and new allocations could be made to new temporary licence holders, as long as the TAC remained above a threshold level. Over the years, various rationalisations and consolidation of the fleets have taken place, including the negotiation of licences for First Nations, and the adoption of new access frameworks including resource sharing agreements.

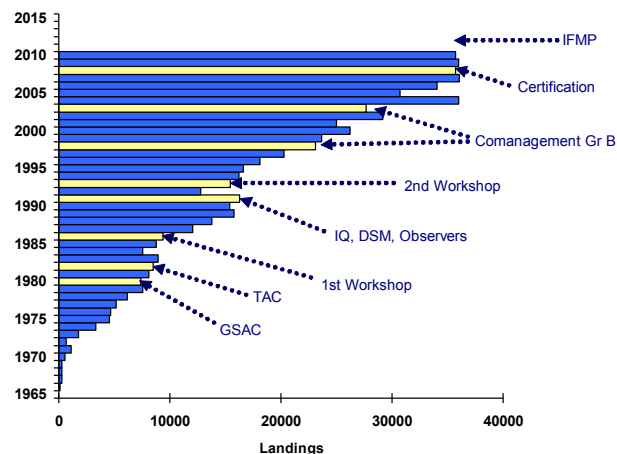


Figure 7: Historical landings (mt) of the shrimp fishery in the estuary and the north of the Gulf of St. Lawrence and highlights of management measures since the start of the fishery (Source: Figure 8 of current Gulf Shrimp IFMP (DFO, 2012a))

The following key events are culled from Section 1.1 of the IFMP (DFO, 2012a):

- 1980: formation of Gulf Shrimp Advisory Committee.
- 1982: total allowable catch introduced.
- 1985: first fishers Symposium.
- 1986: introduction of minimum mesh size of 40mm.
- 1991: introduction of dockside monitoring and seagoing observer programmes.
- 1991: introduction of individual quotas for fishers in Group B (harvesters and First Nations from Québec and New Brunswick).
- 1993: second Symposium, leading to a 3 year management plan, and socio-economic as well as conservation objectives.
- 1993: introduction of the Nordmore grate to reduce the by-catch of groundfish.
- 1996: introduction of individual quotas in Group A (western Newfoundland and Labrador and Québec traditional and temporary fleets).
- 1997: a higher TAC led to new temporary licences and allocations (mainly to groundfish fishers from Québec and New Brunswick)
- 1998: temporary allocations to harvesters from Prince Edward Island and Nova Scotia
- 1998-2002: co-management agreement between DFO and traditional harvesters of Group B*
- 2000-2007: Marshall Response Initiative: negotiation of First Nations rights in line with the Aboriginal Fisheries Strategy of 1992.
- 2000: buy-back of Québec licences for redistribution to 4 First Nations.

- 2003-2007: 2nd co-management agreement between DFO and traditional Group B harvesters*
- 2003 and 2008: issue of 2 additional First Nation community licences.
- 2004: 2 First Nations licences issued in New Brunswick.
- 2008: traditional harvesters of '*Association des crevettiers acadiens du Golfe*' begin voluntary restructuring leading to redistribution of 4 Gulf based quota allocations by 2011.
- 2008: DFO allows voluntary enterprise combination in Newfoundland and Labrador region (Licences are renamed licence shares, which can be redistributed, and hence the total shares stay constant as licences are liquidated).
- 2011: DFO Regional Advisory Process reviews proposed Gulf shrimp reference points and harvest rules (DFO, 2012)
- 2012: 3rd Industry Symposium on future directions for the fishery.

*The co-management agreement between DFO and Group B fishermen gives the industry a role in stewardship of the resource. Provisions include multi-year catch sharing arrangements and industry financial contributions for supplemental research activities. Under the joint project agreement between 2004 and 2007, regular shrimpers in Group B contributed \$140,000 annually to fund activities complementing the Department's existing fisheries surveillance and scientific research efforts.

Access rights, fleet allocations, and resource sharing

Legal Rights

The fishery is a limited entry fishery, with fishing licenses issued in accordance with section 7 of the *Fisheries Act*. <http://laws-lois.justice.gc.ca/eng/acts/F-14/index.html>. The general policy governing licence issue, licence renewal and re-assignment, vessel replacement, and registration of boats and harvesters, is described in the Commercial Fisheries Licensing Policy for Eastern Canada, 1996 (<http://www.dfo-mpo.gc.ca/fm-gp/policies-politiques/licences-permis/index-eng.htm>). In 2002, a New Access Framework was instituted (Annex C of the 2003-2007 Gulf Shrimp IFMP, DFO, 2005b) specifying three conditional principles that must be met, namely, sustainable use of stocks and the ecosystem; recognition of Aboriginal and Treaty Rights, and equity. The latter specifies that the determining process shall be fair, consistent and transparent, and take into account adjacency, historical dependence, and economic viability.

As a result of expansion, new access arrangements and licence rationalisations, there is now a mix of permanent and temporary licences, the latter being issued only if the TAC exceeds a designated historical threshold corresponding to the needs of the permanent licence holders, who will have pre-emptive rights to the resource once the TAC falls below the threshold.

The IFMP indicates that the number of licences issued to the Estuary and Gulf fishery by DFO in 2011 was 140, distributed across Québec and the Atlantic provinces and First Nations.

Allocations between fleets and individuals

A TAC is determined for each SFA, formerly annually, but from 2012 onward, every two years. The TACs for each SFA are shared between fleets (see Resource Sharing, below), and then allocated as individual boat quotas. Initial quota allocations were based on shares determined between and within fleets when competitive fishing was first replaced by individual quotas in the 1990s, but they have since undergone numerous adjustments including

- the granting of licences to First Nations,
- mechanisms to adjust for differential changes to the TACs in each fishing area,
- changes to the resource sharing arrangements between fleets and areas,
- rationalisation within fleets, including voluntary transfers or newly permitted enterprise combination aimed at maintaining or improving economic viability,

The following summary of the main features of the fleets and their allocations is based on Section 6 of the IFMP (DFO, 2012a). It illustrates the effort made by DFO and the Gulf Shrimp Advisory Committee to account for differing historical rights and evolving needs of regional shrimp fishing fleets based on coasts adjacent to the Gulf.

- Harvester Group A

Newfoundland & Labrador, and Québec traditional and temporary fleets

In 1996 this group agreed to divide the Group A quota into equal shares, 56 for Newfoundland and 7 for Québec. Newfoundland shares have remained non-transferrable, but the Québec harvesters agreed to temporary in-season transfers.

- Harvester Group B.

Québec and New Brunswick, plus First Nation fishers of both provinces.

An individual transferable quota program was agreed in 1991, and since 1993 this program has permitted the permanent transfer of individual allocations for fleet rationalization. The original ITQ was based on historical averages for 1987-1989, with small adjustments for holders of a snow crab licence, and the redistribution of a small TAC surplus from the Anticosti area.

Before 2003 the proportional change in TAC year on year was the same in each fishing area, but this is no longer the case, necessitating adjustments so that each fleet maintains its global share of the overall TAC year on year. The adjustment is described in Section 6.1.2.1 of the IFMP (DFO, 2012a).

Resource Sharing

In 2009 DFO negotiated new long term resource sharing entitlements under the New Access Framework (Section 6.2 of the Gulf Shrimp IFMP (DFO, 2012a):

- Core harvesters from Prince Edward Island and Nova Scotia receive a 2.36% global share of the TACs in SFA 9 (Anticosti), 10 (Sept-Îles) and also 8 (Esquiman).
- Group A: receives 73.23% of the TAC in SFA 8, of which 88.9% to Newfoundland and Labrador, and 11.1% to Québec.
- Group B: The global total for this Group is 24.41% of the TAC in SFA 8 plus 97.64% of the TACs in SFA 9 and 10, and 100% of the TAC in SFA 12 (Estuary). Of this total, 13.5% is assigned to Group B harvesters dependent on groundfish, and there is a stable division between the Newfoundland and Québec fleets (but it is not specified in the IFMP text). First Nations are not required to share with harvesters dependent on groundfish.

Once these components are summed and allocated to the fleets, they are further allocated as individual quotas based on the percentage licence share currently available to each remaining licence holder following the various transfers and consolidations of licence shares over the years. From 2012, DFO will also apply a quota reconciliation procedure, where any quota over-run by an individual or fleet in one year is automatically docked from the quota available for the following year.

As an example, the following tonnages applied for the 2012 season:

- TAC for Estuary (SFA 12) = 1053t
- TAC for Sept-Îles (SFA 10) = 12 896t
- TAC for Anticosti (SFA 9) = 8 447t
- TAC for Esquiman (SFA 8) = 10 452t
- Total TAC = 32 848t

After applying resource sharing and individual quotas the aggregated fleet allocations were:-

- Group A: 5753t for Newfoundland and Labrador traditional shrimp fishers
1050t for other fish harvesters
774t for Québec traditional shrimp fishers
76t for groundfish harvesters on the Québec lower north shore.
- Group B: 21716t for traditional New Brunswick, Québec and First Nation shrimp harvesters
2726t for groundfish dependent harvesters
Group B will administer its own rules for managing temporary in season transfers.
- Core fish harvesters. 376t to the core group in each of Prince Edward Island and Nova Scotia

This section shows that the fishery is fully committed to the legal and customary rights of those dependent on fishing, and that these rights are reflected in the systems for allocating licences, sharing access to the resources in each SFA, and allocating individual quota shares.

3.5.9 Regulatory Measures

The shrimp fishery is subject to the following framework and measures for regulating the fishery. In many cases compliance with these measures can be quantified, hence providing a basis for measuring the outcome and performance of the management system.

Regulatory Framework

Harvesters are notified of their regulatory obligations via licence conditions, and by the annual (now biennial) management plan in the form of a Notice to fish harvesters, which specifies:

- the start date for the season (usually 1 April)
- the regulatory measures that apply for shrimp fishing and the catch of species at risk
- the TACs agreed for each SFA that year
- the resulting global (all area) tonnage distributed to each fleet, prior to any quota reconciliation, and prior to allocation among individuals according to their licence share.

Regulatory Measures

Regulation of fishing effort (Principle 1)

- Entry is restricted to the licence holders of each fleet, taking into account the effects of fleet rationalisations in recent years.

Regulation of the harvest rate (Principle 1)

- Fishing season begins April 1 in each SFA.
- An annual total allowable catch (TAC) is set for each SFA in conformity with:

- scientific advice on stock status (determined by the integrated stock status indicator relative to reference points;
- the application of the harvest rule, taking into account industry advice on economic considerations;
- the application of a TAC adjustment recommended by the industry: the TAC is only changed if the recommendation exceeds + or - 5%, whilst large changes are capped at + or – 15% (DFO, 2012b).

Regulation of individual transferable quotas (Principle 1)

- The TAC for each SFA is distributed to fleets in proportion to the sharing agreement, followed by allocation of the individual quota shares of the fleet TAC (as described in Section 3.5.8);
- There is mandatory hailing out at the start of a trip, and mandatory operation of VMS;
- Licence holders must review landings and transfers to ensure that when they sail they have enough residual quota for the expected landings from their trip;
- It is mandatory to complete a log book at sea;
- There is a mandatory single area condition (unless observer on board);
- There is mandatory hailing in, and completion of trip log before landing;
- All landings must be verified by the Dockside Monitoring Programme (DMP)
- There are individual quota reconciliation and transfer rules;
- In-season transfers are managed by the relevant harvester association;
- First Nation licence holders can only transfer to another First Nation holder;
- Licence holders must cease fishing when their ITQ is taken up;
- Fishers seeking rationalisation by enterprise combination must apply to DFO.

Regulation of exploitation pattern, species at risk, groundfish by-catch (Principle

2)

- Prescribed minimum trawl mesh size of 40 mm;
- Mandatory use of the Nordmore Grate with specified bar spacing (minimum 19mm, maximum 25 mm) and attachment rules. Use of a double liner over the Grate is forbidden during the season;
- Mandatory prohibition on the use of an on-board shrimp sorting machine;
- Northern wolffish, spotted wolffish and leatherback turtle must be returned IFCedately to the sea in such a way as to minimise injury;
- Groundfish caught incidentally at sea may be returned to the sea, but Greenland halibut less than 85mm must be returned to the water IFCedately and carefully;
- Closing protocol for undersized Greenland halibut (triggered by an average catch rate of 75kg of undersized halibut from three trawl hits);

Regulation of the impact of shrimp trawling on sensitive benthic areas. (Principle

2)

- The impact of shrimp trawling on habitat and sensitive benthic areas in the Gulf of St Lawrence has been assessed (DFO, 2012f) and peer reviewed (DFO, 2012d). The risks and any required mitigation measures will be discussed by managers and stakeholders during 2013, with a view to implementation from 2014.

3.5.10 Conservation and Protection

Conservation and Protection (C&P) activities for the Gulf shrimp fishery are carried out by the C&P branches of DFO Québec, supported by DFO Gulf and Newfoundland-Labrador regions, based on the details described in Section 8 of the current IFMP:

The principles adopted

- Promoting compliance with laws and regulations through education and shared stewardship
- Inspection, monitoring and surveillance
- Special surveys, or individual investigations of serious or complex violations
- The effort deployed on individual fisheries is reviewed annually and depends on departmental priorities and a risk analysis for each fishery. Shrimp fishing is generally perceived to present a low risk.

The rules to be enforced

- Fishers must hold a valid licence and a valid individual quota
- Mandatory hailing out before sailing, and must have enough quota for the trip
- Mandatory compliance with mesh size, gear and grid specifications when at sea
- Mandatory use of VMS, and compliance with single-fishing-area condition (unless observer on board and quota available in the second area)
- Mandatory log book recording of catch and by-catch data
- Mandatory hailing-in before landing, and submission of completed log books

Monitoring and surveillance tools and measures

- Vessel logs complete at end of trip, verified against the recorded landings by 100% coverage of all mobile gear landings by a Dockside Monitoring Programme carried out by independent contractors (DMP) at industry expense, following hailing in.
- Observer monitoring at sea of gear, species, catch, by-catch and discards for 5% of average sea-days of each fleet with a quota in each fishing area, at industry expense
- Ongoing audit of VMS data for compliance with single area rule
- Cumulative audit of log book and landings data for quota uptake purposes**
- Audit of observer reports for compliance with by-catch and species at risk rules**

**Logbook data including area fished is entered on a data base, and automated programmes check for conformity between the fishing area and the area licensed, backed up by aerial surveillance. Illegalities are also noted in observer reports. At-sea monitoring and surveillance may lead to charges of illegal activity when evidence is found. Aerial surveillance provides evidence of conformity with licence conditions and closed areas.

Verifications

On shore,

- Fishery Officers monitor hail-outs and hail-ins as an aid in planning enforcement activities;
- Fishery Officers conduct licence and landings checks, monitor weigh-outs, verify completed log books, and assess the integrity of the dockside monitoring programme;

At sea,

- Fishery Officers inspect shrimp vessels to check licences, mesh size and rigging of gear and grate, log book records of catches and by-catches, area restrictions, and to assess observer performance;

Audit of vessel position using VMS and Aerial surveillance

- Ensures compliance with area entitlement, seasonal and area closures;

Intelligence:

- Used for investigating reports of large scale fraud and collusion.

Management of Conservation & Protection

- C&P Branch authorizes VMS service providers, monitors the accuracy of reporting systems, and uses the data for planning surveillance patrols and other investigations;

- C&P is the contract authority for at-sea observer services and quality assures the delivery of accurate data and reports as per specification;
- C&P designates both at-sea and dockside observers (third parties). Designation is subject to an individual meeting background checks and eligibility criteria, and requires the successful completion of exams;
- C&P monitors the performance of at-sea and dockside observers and may initiate action to revoke the designations of observers found to be deficient in performance.

Education and Shared Stewardship

- Informal interactions are ongoing, but effort of this kind is not recorded on a day to day basis for individual fisheries;
- Periodic meetings occur with DFO and industry as required to track the annual performance of the fisheries and the C&P programme; to discuss expectations, problems and solutions; and to modify plans and priorities;
- The advent of a new or amended regulation will trigger increased contact with industry in order to explain what is required, and how it will be enforced;
- The "Report a Poacher" programme contributes to the enforcement regime.

Compliance and violations

Key aspects, such as hailing out and hailing in, use of VMS, the completion of on-board log books, and dockside monitoring of landings, are all mandatory and require 100% compliance. The level of effort on other aspects of surveillance, such as the number of observer-at-sea trips, boarding at sea by the two available patrol boats, and aerial surveillance, are more modest because a previous history of low violations allows Fishery Officers to designate the shrimp fishery as presenting a low risk of non-compliance.

The following tables, presenting non compliance reports from the DFO Protection and Conservation Branch for 2002-2007, and boarding-at-sea data for 2002-2006, were first shown in the previous certification report (Tavel, 2008).

Violations and irregularities reported	2002	2003	2004	2005	2006	2007
Illegal gear (especially related to the Nordmore grate)	1	2	1			
Quota overtaken ¹	5	13	11			
Shrimp discards	1		3			
Conflicts with other fishing gears	1	1		1		
Irregular landing ²		6	6			
Illegal landing ³		2				1
Irregularities related to observers or reported by them ⁴	2		7	3		1
Hail in/out and at sea calling ⁵	1	1	31		3	3
Others*	1	9	6	11	4	2
Total :	12	34	65	15	7	7

*Others : Mainly inadequate logbook completed, non authorized captain replacement, few misreporting.

1. Related to catch higher than personal quota in one area. Possibility to buy parts of quota from another fisher increases the difficulty to manage ITQ. However total catch do not exceed significantly the TAC for the region.

2 Related mostly to landing interruption

3 Related to shrimp landing out of the PVQ process

4 Related to problems encountered in observer deployment on board or irregularities reported by observers

5 The surveillance and protection system oblige the fisher to notify departure and wharf return, and to give catch estimates by radio telephone

Two patrol boats (E.P. le Québécois, Louisbourg) monitor shrimp fishing in the Gulf. The table below represents direct at-sea-boardings of shrimp trawlers. On board verifications are often made by fishery officers to inspect compliance with regulations.

Surveillance at sea (2002-2006)

	2002	2003	2004	2005	2006
Shrimp trawlers fishing observations	16	9	12	30	30
Verifications on board	2	2	2	15	20

Observers-at-sea

The At-Sea observer program is considered to be essential for monitoring catch activities in the Gulf shrimp fishery (Section 8.1.1. of the IFMP; DFO, 2012a) but in practice the proportion of fishing trips that is inspected in this way is sometimes below the 5% target, as shown by the following data for 2011 and 2012 for the different fleets fishing in the SFA 8 (Esquiman).

	Fleet			
	Quebec	Gulf	Newfoundland	Average
2011				
No. of trips	4/37	2/63	7/336	13/466
% coverage	10.8	3.1	2.1	2.8
2012				
No of trips	2/30	6/50	9/411	17/491
% coverage	6.6	12.0	2.1	3.4

Sanctions

Sanctions to deal with breaches of licence conditions and fishery regulations range from a warning coupled with guidance for a first or low level offence, through on the spot fines, up to major cases that would require the institution of court proceedings. At the site visit it was stressed that costly and time-consuming court action is viewed as a blunt tool and a last resort, and that C&P objectives are best secured by informal interactions with industry at wharves, plants, or at sea during day to day monitoring, surveillance and enforcement patrols. Assessors were assured that few sanctions have been applied in the shrimp fishery, not because of a lack of will or capacity, but because violations are generally rare, mainly involving hailing in or hailing out, and technical issues with VMS equipment. Where infractions have occurred, and warnings or sanctions have been applied, repeat offences are rare. The "Report a Poacher" programme was stated to be a significant contributor to the effectiveness of the enforcement regime.

National Audits and Evaluations

DFO recently published the following reports of a national Evaluation and national Audit of the effectiveness of Conservation and Protection activities. These are summarised briefly to provide evidence that reviews have taken place external to the regions. The findings relate predominantly to efficiencies and deficiencies at the national level, rather than identifying weaknesses in the conservation of any particular fishery.

- DFO. 2011. Evaluation of the Conservation and Protection Program. Project Number 6B142, February 2011. <http://www.dfo-mpo.gc.ca/ae-ve/evaluations/10-11/6b142-eng.htm>

Mandate

“C&P promotes and maintains compliance with legislation, regulations and fishery management measures to achieve the conservation and sustainable use of Canada’s aquatic resources, and the protection of species at risk, fish habitat and oceans.”

“The main objective of this evaluation is to determine to what extent the Conservation and Protection Program (C&P) is relevant, is managed effectively and efficiently, and whether it has achieved its stated objectives.This evaluation, a first for C&P, covered the period from 2005/06 to 2009/10 and was undertaken between June 2010 and December 2010. The evaluation was conducted with C&P staff and others from National Headquarters (NHQ) and in Fisheries and Oceans Canada’s (DFO) six regions.”

“The report confirmed the relevance of C& P activities nationally and in the regions, and found that it was generally effective, but it nevertheless identified a number of strategic and operational concerns and recommendations that require attention, including the provision of national guidance on how better to achieve goals in the context of Education and Shared Stewardship, Integrated Fisheries Management Plans, ‘intelligence led’ enforcement, and major case management and special investigations. Finally C&P should find options for addressing significant concerns about whether budgets and manpower are sufficient overall for the tasks at hand,”

- DFO 2012. Audit of Commercial and Aboriginal Fisheries - Conservation & Protection. Project Number 6B236, Internal Audit Report, March 2012. <http://www.dfo-mpo.gc.ca/ae-ve/audits-verifications/11-12/6B236-eng.htm>

The audit found that the C&P governance framework and control activities for Commercial and Aboriginal Fisheries are well established, and that operational plans are linked to Fisheries and Oceans Canada’s strategic outcome for sustainable fisheries, but there is scope for improvement in several areas:

- Improved collaboration is needed with Resource Management over initiatives within Ecosystems and Fisheries Management.
- Improved alignment is needed between allocation of resources and the enforcement strategy
- Intelligence gathering systems and processes do not permit sharing across regions
- Performance measures and indicators have been identified, but need to be more effectively and strategically focused to permit operational adjustments
- There is adequate monitoring of budgets, forecasts, and resource allocations, but the needs of Major Case Management and special investigations are not adequately met, and these sectors lack a national training program.
- Recruitment strategies in place do not consider the needs of the intelligence program.

3.5.11 Education and training

So far as we are aware, education for stakeholders is mainly achieved through day to day contact with Fishery Officers and monitoring officers, and during the operation of the GSAC, where scientific and technical presentations are made regularly in support of the provision of

scientific advice. Compliance & Protection officers and dockside monitoring staff receive formal training for their duties, however.

There is a considerable emphasis on educational outreach for policy, management and science throughout the DFO domain. This is partly facilitated by the very comprehensive and user friendly DFO website pages devoted to all aspects of DFO activities and regions, but other educational activities do occur including the use of workshops and symposia to inform fishery stakeholders on scientific and technical issues.

4. Evaluation Procedure

4.1 Harmonised Fishery Assessment

This is the only certification assessment for these fisheries. There is no need for any harmonization.

4.2 Previous assessments

Initial certification for SFA 9, 10, 12 occurred in September 2008, and for SFA 8 in March 2009. The fisheries were initially certified with conditions using a pre-FAM assessment tree. During those certifications, three conditions were raised in relation to three performance indicators. Over the course of the ensuing certification validity period, the client, with the assistance of the scientific/ management agency, successfully closed out those conditions. There are no conditions which remained open after the fourth surveillance audit for these fisheries.

4.3 Assessment Methodologies

The Gulf of St. Lawrence shrimp trawl fisheries (SFA 8 and SFA 9, 10, 12) were reassessed against the MSC Principles and Criteria using the MSC Certification Requirements, version 1.2 (10 January 2012), and associated MSC Guidance to MSC Certification Requirements, version 1.1 (10 January 2012).

This reassessment was conducted using the default assessment tree, without modification, contained within MSC Certification Requirements v.1.2. There were no stakeholder comments received regarding the use of the default assessment tree during the consultation period. The Risk-based Framework was not used in this reassessment.

4.4 Evaluation Processes and Techniques

4.4.1 Site Visits

The fishery site visit for the Gulf of St. Lawrence northern shrimp recertification was combined with the fourth annual surveillance audit. The site visit was conducted during the period of 7 - 9 November 2012, with all meetings held in Québec, (See Table 3). Site visit meetings were conducted with members of the client group and DFO personnel including stock biologists, resource management staff, conservation and protection personnel. General topics discussed with each group are outlined in Table 3.

Table 3: Site visit participants and issues discussed for the Gulf of St. Lawrence Northern Shrimp Fishery Recertification November 2012.

Individual	Organization/ Position	Issues Discussed
Cédric Arseneau	DFO Ecolabelling Co-ordinator	DFO ecolabelling coordinator responsibilities.
Bernard Morin	DFO Resource Management	Resource management, IFMP updating, PA policy, fishery performance checklist, Advisory process.
Daniel Boisvert	DFO Resource Management	Resource management, IFMP updating, fishery performance checklist, Advisory process.
Louise Savard	DFO Science	Biology of shrimp, assessment of target (P1) species, development of reference points, assessment data sources, catch composition, survey program, research plan, retained, bycatch and ETP species.
Clément Beaudoin (Telecon, 12 December 2012)	DFO Conservation and Protection	Monitoring, control and surveillance system, compliance in the fishery, enforcement tools, sanctions, at-sea and dockside monitoring programs.
Serge Haché	L'association Coopérative Des Pêcheurs De L'île Ltee (Client)	Unit of certification, current issues/ concerns within the fishery, involvement within the fishery management and advisory process, update on remaining conditions from first certification period.
Sylvain Samuel	Executive Director, Association des capitaines propriétaires de la Gaspésie	Management development of the fishery, concerns and issues in the fishery, gear development projects.

There were no written submissions or requests for meetings with the assessment team received from Environmental Non-Governmental Organizations (ENGOS) or any other stakeholders.

With the exception of follow up questions and responses between the assessment team and DFO personnel, all other meetings were conducted in person at the Hotel Plaza Québec, Québec.

All members of the assessment team, Don Parsons, Howard Powles, Colin Bannister and Steve Devitt, attended each of the site visit meetings.

4.4.2 Consultations

See Table 3, above, with respect to details of the individuals interviewed during the site visit, and summary of topics discussed. Summaries of all meetings conducted over the course of the site visit are included in Appendix 3.

4.4.3 Evaluation Techniques

IFC published the notification of the fishery proceeding to recertification in the Navigator, an industry paper in Atlantic Canada, the MSC website and via email to known interested

stakeholders. In discussion with the client, it was decided that the magazine selected was most appropriate due to wide spread distribution and substantive reader base. Notification of the site visit as well as any announcements regarding team and peer reviewer selection, and publication of assessment report were circulated to stakeholders via email and posted on the MSC website.

Several sources of information provided the basis of assessment conclusions, including a review of information and references provided by the client prior to the site visit, site visit meetings held with stakeholders involved with the fishery (see Table 3), and review of literature and information provided following site visit meetings. Inspection of the fishery focused on the practicalities of fishing operations, the mechanisms and effectiveness of the management agency and assessment of the fishery and its impact on non-target species, habitats and ecosystems.

The MSC Principles and Criteria set out the requirements for sustainable fishing. These Principles and Criteria have subsequently been used to develop a standardized, default assessment tree (within the MSC Certification Requirements, version 1.2), including Performance Indicators (PI) and Scoring Guideposts (SG), by the MSC and its advisory boards, which have been used in the recertification of this fishery.

Proposed use of the default assessment tree was announced on the MSC website. In order to make the assessment process as clear and transparent as possible, each PI has three associated scoring guideposts (SGs) which define the level of performance necessary to achieve 100, 80 (a pass score), and 60 scores for each PI; 100 represents a theoretically ideal level of performance and 60 a measurable shortfall, below which the candidate fishery fails.

For each PI, the performance of the fishery is evaluated, and a score issued. In order for the fishery to achieve certification, an overall weighted average score of 80 is necessary for each of the three Principles and no PI should score less than 60. Scores are issued using a minimum increment of five. Average scores for each Principle are rounded to one decimal place.

Following the review and synthesis of information available, the assessment team discussed each individual scoring issue under each scoring guidepost to determine if evidence is present to demonstrate which scoring issues are met. Justification of issues that were met is provided in the scoring table presented in Appendix 1.1. Scores for each PI were determined based on guidance outlines in Section 27.10 of the Certification Requirements. Scores were agreed upon by each team member, with the principle lead responsible for writing the rationales.

Scores allocated for each PI were entered into the MSC Fishery Assessment Scoring Worksheet in order to attain the overall Principle scores.

5. Traceability

There are two client groups for this fishery. The first is a group of processors based in Québec and New Brunswick. Their interest is in SFAs 8, 9, 10 & 12. The second is a group based in Newfoundland. Their interest is in SFA 8 only.

SFAs 9, 10, & 12 were initially certified to the MSC sustainable fishery standard by TAVEL Certification Inc in September 2008 for the Québec and New Brunswick client group. TAVEL Certification certified SFA 8 as a separate UoC in March 2009 for the same client group. As part of the first harmonised MSC assessment, SFA 8 was also certified on the same date by Moody Marine Ltd for a client group of processors based in Newfoundland.

Prior to commencing the re-certification assessments for these UoCs, the two client groups agreed to consolidate the re-certification assessments of all the SFAs into a single UoC evaluation exercise. A certificate sharing agreement has been agreed that maintains the interests in SFA 8, 9, 10 & 12 for the Québec and New Brunswick based client group and the interest in SFA 8 only for the Newfoundland based client group. As a result of this agreement, there will be one fishery certificate issued, which will cover all four units of certification and identify the eligibility for each client group.

5.1 Eligibility Date

This is the first re-certification of these fisheries. The certification validity period for SFA 8 is from 30 March 2009 to 30 March 2014. The initial certification validity period for SFAs 9, 10, 12 was from 18 September 2008 to 22 September 2013. This certificate validity was extended to 31 January 2014 by Variation Request to the MSC in August 2013.

The Target Eligibility Date, i.e. the date from which product from a certified fishery may be permitted to bear the MSC Ecolabel, is 1st February 2014.

This date has been set owing to a combination of: a) the delayed re-certification which resulted in a variation that enabled the original certification of SFAs 9, 10, & 12 to be extended to 31st January 2014 and, b) CR 27.6.1.2, which allows the eligibility date to extend as far back as 6 months from the date of publication of the Public Comment Draft Report (PCDR). The PCDR was published in December 2013 and the FCR is expected to be published in early February, 2014.

Therefore, any shrimp caught on or after the 1st February 2014 (i.e. the end of the extended certificate date) will be eligible to display the MSC logo if the fishery is re-certified but client group members and businesses within the chain of custody for this fishery would need to comply with MSC certification requirements for Under MSC Assessment fishery (UMAF) product traceability.

5.2 Traceability within the Fishery

The Gulf of St. Lawrence northern shrimp trawl fishery is managed through a limited entry and licence based management system. As noted previously, there are currently 140 active licenses permitted to operate in the candidate fishery. Harvesters operating in the fishery are required to renew permits annually, report catch and comply with conditions of license

related to regulation of the fishery, thereby, allowing DFO to track the number of permit holders in total as well as the number active permit holders in the fishery.

Through requirements associated with dockside monitoring, landings reporting, and VMS, those involved in the management and enforcement of regulations have the ability to identify the quantity of product caught, as well as the SFA from which it was harvested.

The possibility of eligible vessels permitted fishing illegally outside the UoCs is minimal, as this would be detected via VMS. Each vessel must have a SFA quota in order to be permitted to fish in that SFA. Some vessels also have quota to fish in other certified SFA (e.g. East Scotian Shelf). All vessels are required to either offload product prior to changing shrimp fishing zones or are required to have an at-sea observer on board who can verify catch quantities prior to moving to new fishing zones. These permitted vessels are controlled through ITQ quotas, hence it is not a concern that these vessels would commingle product from outside these units of certification.

Likewise, the risk of substitution of certified product with non-certified product prior to landing is negligible, as vessels must have quota in order to fish in each SFA. Therefore, although harvesters may be permitted to fish in other SFAs, that product would be landed, validated and recorded against ITQs in those SFAs.

There is no at-sea processing of shrimp harvested in the Gulf of St. Lawrence northern shrimp trawl fishery under assessment. All harvested product is landed for processing as fresh (iced), whole shell-on product. The raw material must be cooked and peeled prior to being sold. Members of the client group (processing companies) would be required to have a valid chain of custody in effect in order to be able to sell the certified product further into the distribution chain. As such, these member companies would all be knowledgeable and in compliance with MSC segregation requirements for certified and non-certified raw materials.

There is no transshipping in these fisheries. All vessels must hail out to fish in one SFA and return to offload the raw material prior to fishing in another SFA. The only time this practice varies is when there is an at-sea observer on board the vessel. Then, captains can notify DFO that they are moving to another SFA and the request is permitted as there is an observer to verify harvest and bycatch information in each area.

5.3 Eligibility to Enter Further Chains of Custody

The fishery assessment covers all northern shrimp, *P. borealis*, landed from vessels operating in the Unit of Certification until the point of landing, therefore the scope of certification ends at the point of landing. Downstream certification of the product would require the appropriate chain of custody certification.

As noted above, the fishery certificate is applicable to all permitted trawl vessels that hold valid ITQ licences for the SFAs. Any product landed by vessels operating within the UoC is considered within scope, and MSC certified provided that the product is purchased by members of the client group, currently as follows (at the time of recertification).

Client Group members for SFA 8, 9, 10, 12 include:

- L'Association Cooperative des Pêcheurs de L'Ile Ltée
- Produits Belle-Baie Ltée
- L'Association québécoise de l'industrie de la pêche

- Pêcheries Marinard Ltée
- Crevelle du Nord Atlantique Inc.
- Fruits de Mer de L'est du Québec Ltée
- Crustacés des Mont Inc.
- Tabatière Seafood

The client group for SFA 8 includes all the above companies, plus the following Association of Seafood Producers (ASP) members (see below). A certificate sharing agreement between the client groups means that the ASP companies only have access to SFA 8. As such, ASP companies are not eligible to directly purchase raw material from permitted harvesters in SFAs 9, 10 & 12 for purposes of selling the product as MSC certified. In order to do this they must purchase raw or processed product only from the client group member companies that have access to SFA 9, 10 & 12 .

- Association of Seafood Producer (ASP) members:
 - Barry Group Inc.
 - Ocean Choice International L.P.
 - Notre Dame Seafoods Inc.
 - Nu Sea Products Inc. (BGI)
 - Northern Shrimp Ltd (OCI)
 - St. Anthony Seafoods Limited Partnership (Clearwater).

Traceability of product from the fishery by legally licenced SFA 8, 9, 10, 12 shrimp fishing vessels is covered by the fishery certificate up to the first point of landing to client group member companies. In order for subsequent links in the distribution chain to be able to use the MSC logo, companies and/or individuals must enter into a separate chain of custody certification, and be able to track product to the client group member companies.

Product from the fishery under assessment is landed in any port authorized by DFO where certified dockside monitoring companies can verify weight and species composition of offloaded product. A list by province, of Core Fishing Harbours which support commercial fishing operations is available at the following DFO website; <http://dfo-mpo.gc.ca/sch-pbp/list-liste/harb-port-eng.asp?c=fc> .

5.4 Eligibility of Inseparable or Practically Inseparable (IPI) stock(s) to Enter Further Chains of Custody

The distribution of *P. montagui* can overlap with that of *P. borealis* in the Gulf of St. Lawrence and, as a result, is liable to be caught in the fishery. Owing to their physical similarities and appearance they are inseparable during the normal fishing operation and practically inseparable during processing (CR 27.4.9.1 a & b).

Observer information for the most recent years available (2000-2011) indicates that “striped shrimp” (i.e. shrimp other than *P. borealis*) made up 0.12% of the target species catch in this period (DFO 2012bc) (Table 2, above). As such, catches of *P. montagui* in the fishery are < 0.12% of the total combined weight of target and IPI species (CR 27.9.4.1 c).

The *P. borealis* fishery is the only fishery that uses small enough mesh size to catch *P. montagui* and so it is not subject to any other fishing mortality (CR 27.4.9.1 c). There are no other fisheries (e.g. trap) targeting shrimp in the Gulf of St. Lawrence.

P. montagui is not an ETP species (CR 27.4.9.1 d) (SARA Public Registry).

The *P. montagui* stock in the Gulf of St. Lawrence has not been MSC certified (CR 27.4.9.1 e).

Because of the inseparability and low quantities of *P. montagui* that may be retained in the *P. borealis* fishery, a variation request was submitted to and granted by the MSC to: 1. Recognise the IPI status of *P. montagui* and, 2. Exempt it from MSC requirements as set out in Annex CH of the MSC CR v1.3. This was accepted by MSC, see Annex 2 showing variation request and response.

As long as the proportion of *P. montagui* does not exceed 2% then product will be eligible to carry the MSC logo.

6. Evaluation Results

6.1 Principle Level Scores

Table 4: Final Principle Scores

Final Principle Scores	
Principle	Score
Principle 1 – Target Species	95.0
Principle 2 – Ecosystem	88.3
Principle 3 – Management System	92.5

6.2 Summary of Scores

Table 5: Individual scores awarded for each performance indicator.

Prin- ciple	Wt (L1)	PI No.	Performance Indicator (PI)	Score
One	1	1.1.1	Stock status	100
		1.1.2	Reference points	90
		1.1.3	Stock rebuilding	
		1.2.1	Harvest strategy	95
		1.2.2	Harvest control rules & tools	90
		1.2.3	Information & monitoring	100
		1.2.4	Assessment of stock status	95
Two	1	2.1.1	Outcome	100
		2.1.2	Management	100
		2.1.3	Information	100
		2.2.1	Outcome	80
		2.2.2	Management	100
		2.2.3	Information	100
		2.3.1	Outcome	100
		2.3.2	Management	95
		2.3.3	Information	95
		2.4.1	Outcome	80
		2.4.2	Management	60
		2.4.3	Information	85
		2.5.1	Outcome	80
		2.5.2	Management	60
		2.5.3	Information	90
Three	1	3.1.1	Legal & customary framework	100
		3.1.2	Consultation, roles & responsibilities	100
		3.1.3	Long term objectives	100
		3.1.4	Incentives for sustainable fishing	80
		3.2.1	Fishery specific objectives	100
		3.2.2	Decision making processes	90
		3.2.3	Compliance & enforcement	100
		3.2.4	Research plan	70
		3.2.5	Management performance evaluation	90

6.3 Summary of Conditions

A summary of the conditions raised during this reassessment can be seen in Table 6. Full detail of each condition, including scoring rationales, conditions, milestones, client action plan and client deliverables can be seen in Appendix 1.2.

Table 6: Summary of Conditions

Condition number	Condition	Performance Indicator	Related to previously raised condition? (Y/N/A)
1	<p>By the 3rd surveillance audit, the client must provide evidence that a partial strategy has been developed and implemented and is expected to achieve the Habitat Outcome 80 level of performance, i.e. the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.</p> <p>In addition, by the 4th surveillance audit, the client must provide evidence to demonstrate that there is some objective basis for confidence that the partial strategy will work, based on information directly about the fishery and/or habitats involved.</p>	2.4.2	No
2	<p>By the 4th surveillance audit, the client must provide evidence that a partial strategy has been developed and successfully implemented which takes into account available information and is expected to restrain impacts of the fishery on the the benthic biodiversity and communities elements of the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.</p> <p>The client must provide evidence to demonstrate that the partial strategy, if necessary, is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).</p>	2.5.2	No
3	<p>By the 2nd surveillance audit the client must provide evidence that a documented and approved research plan has been completed to provide the management system with a strategic approach to research, and reliable and timely information sufficient to achieve the objectives consistent with both MSC Principle 1 and Principle 2.</p>	3.2.4	No

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Appendices

Appendix 1: Scoring and Rationales

Appendix 1.1: Performance Indicator Scores and Rationale

Evaluation Table PI 1.1.1

PI 1.1.1		The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing	
SG	Issue	Met? (Y/N)	Justification/Rationale
60	a	Yes	It is likely that the stock is above the point where recruitment would be impaired.
			See SG 100a.
80	a	Yes	It is highly likely that the stock is above the point where recruitment would be impaired.
			See SG 100a.
	b	Yes	The stock is at or fluctuating around its target reference point.
			See SG 100b.
100	a	Yes	There is a high degree of certainty that the stock is above the point where recruitment would be impaired.
			<p>The following, pertaining to both SG 100a and SG 100b, is based on information presented in DFO (2013) Science Response 2013/001 - Update of Stock Status Indicators for Northern Shrimp in the Estuary and Gulf of St. Lawrence . The assessment was conducted in January 2013, using 2012 research survey and fishery data (Savard, 2012, 2013; Savard and Bourdages, 2013).</p> <p>The assessment of overall status of the Gulf of St. Lawrence shrimp stocks, relative to limit (LRP) and upper stock reference (USR) points (see Section 3.3b above and PIs 1.1.2 and 1.2.4 below), estimates the most recent stock status indicators in a historical context (i.e since 1982). The main indicator for each stock is calculated from the male and female abundance indices obtained from the summer fishery (NPUE for June, July and August) and the annual research survey male and female abundance estimates. The indicator represents the mean of the integrated indices by sex.</p>

PI 1.1.1		The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing	
			<p>The four shrimp stocks in the Estuary and the Gulf of St. Lawrence have remained in the healthy zone since the early 2000s (Figure 4, Section 3.2.2, p.21 above). The main stock status indicator for Estuary (SFA 12) increased in 2012 for the third consecutive year, reaching the highest value in the series. The decreasing trend observed in Sept-Îles (SFA 10) since 2007 ended in 2012 with the main indicator increasing to a value similar to those observed in 2008, 2009 and 2010. In 2012, the main indicator for Anticosti (SFA 9) was slightly lower than in 2011. The Esquiman (SFA 8) indicator decreased in 2012, reaching a value similar to those observed between 2006 and 2009 (DFO, 2013).</p> <p>The current stock abundances remain well above the LRPs in all SFAs. Continued and historically high abundance within the last decade indicates a low probability of recruitment overfishing. The history of the fishery has shown that recruitment has not been impaired. Even at low abundance levels during the early to mid 1980s and 1990s, the spawning stock was sufficient to produce abundant cohorts which had a detectable, positive impact on the condition of the stocks. Therefore, there is a high degree of certainty that the stocks are above the point where recruitment would be impaired.</p>
	b	Yes	<p>There is a high degree of certainty that the stock has been fluctuating around its target reference point, or has been above its target reference point, over recent years.</p>
			<p>Rationale for the use of the Upper Stock Reference (USR) as a proxy for a target reference point (TRP) is given above in Section 3 and below in PI 1.1.2.</p> <p>The main stock status indicators also showed that all four stocks were well above the USR in 2012 (Section3.3b, Figure 4). The 2012 main indicators were 1.99, 1.56, 1.91 and 2.83 times the USRs for SFAs 8, 9, 10 and 12, respectively. The stocks remain highly productive and main indicators have been above the USRs for a prolonged period.</p> <p>The stocks remain within a high productivity period. Based on stock abundance estimates for the past decade, there is a high degree of certainty that the stocks have been above the USR for a prolonged period (CB 2.2.2.2).</p>
References		DFO, 2013 (SR 2013/001); Savard, 2012 (Res. Doc. 2012/006); Savard, 2013 (Res. Doc. 20123/003); Savard and Bourdages, 2013 (Res. Doc. 2013/002).	
Stock Status relative to Reference Points			
	Type of reference point	Value of reference point	Current stock status relative to reference point
Target reference point	USR: 80% of stock indicators for the productive and stable period, 1996 - 2002 (B_{MSY} proxy).	SFA 8 1.34 SFA 9 1.18 SFA 10 1.33 SFA 12 1.12	SFA 8 2.67/1.34 = 1.99 SFA 9 1.84/1.18 = 1.56 SFA 10 2.53/1.33 = 1.91 SFA 12 3.17/1.12 = 2.83

PI 1.1.1	The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Limit reference point	LRP: Average of minimal stock indicators for the two periods of low abundance (early 1980s & 1990s).	SFA 8 0.45 SFA 9 0.60 SFA 10 0.53 SFA 12 0.65	SFA 8 $2.67/0.45 = 5.92$ SFA 9 $1.84/0.60 = 3.06$ SFA 10 $2.53/0.53 = 4.78$ SFA 12 $3.17/0.65 = 4.87$
OVERALL PERFORMANCE INDICATOR SCORE:			100
CONDITION NUMBER (if relevant):			

Evaluation Table: PI 1.1.2

PI 1.1.2		Limit and target reference points are appropriate for the stock	
SG	Issue	Met? (Y/N)	Justification/Rationale
60	a	Yes	Generic limit and target reference points are based on justifiable and reasonable practice appropriate for the species category.
			See SG 80a.
80	a	Yes	Reference points are appropriate for the stock and can be estimated.
			<p>A "Fishery Decision-Making Framework Incorporating the Precautionary Approach" (http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/precaution-eng.htm) was adopted as part of DFO's Sustainable Fisheries Framework (SFF) initiative (http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/overview-cadre-eng.htm). The main components of the former include: reference points and stock status zones (Healthy, Cautious and Critical); harvest strategy and harvest decision rules; and the need to take into account uncertainty and risk when developing reference points and developing and implementing decision rules. The following is abridged from the documentation describing the decision-making framework.</p> <p>The stock status zones are created by defining the Limit Reference Point (LRP) at the Critical:Cautious zone boundary, and an Upper Stock Reference Point (USR) at the Cautious:Healthy zone boundary and the Removal Reference for each of the three zones (see Figure 2 in Section 3.3.2 above). The LRP, the stock status below which serious harm is occurring, is based on biological criteria and established by Science through a peer reviewed process. The USR is the stock size below which removals must be reduced to avoid reaching the LRP. The USR, is set at a safe distance above the LRP to facilitate effective management actions when the stock is in decline. Moreover, the USR can be a target reference point (TRP) determined by productivity objectives for the stock, broader biological considerations and social and economic objectives for the fishery.</p> <p>The Removal Reference is the maximum acceptable removal rate, normally expressed in terms of fishing mortality (F) or harvest rate. The Removal Reference must be less than or equal to the removal rate associated with maximum sustainable yield. In the Cautious zone, the adjustment of the Removal Reference requires a progressive reduction in removal rate.</p> <p>Precautionary reference points for the Gulf of St. Lawrence shrimp fishery were developed in accordance with the DFO framework and are described below (SG 80c and SG 100b).</p>
			The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity.
			See SG 100b.
	c	Yes	The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome.

PI 1.1.2		Limit and target reference points are appropriate for the stock	
SG	Issue	Met? (Y/N)	Justification/Rationale
			<p>Savard (2012) described how the USR was selected, ensuring the stocks are maintained at a level consistent with B_{MSY} (summarized below).</p> <p>The assessment of the shrimp stocks is descriptive and is based on the examination of a relative indicator of abundance. Therefore, it is not possible to obtain a reliable estimation of the biomass which can support maximal sustainable yield (B_{MSY}). Furthermore, it is not possible to estimate reference points based on B_{MSY} and fishing mortality (F_{MSY}). Alternatively, an analogous approach based on the main indicator of the stock status was adopted, allowing the detection of conditions which favour healthy stocks or cause a serious harm.</p> <p>The USR, in principle, is determined the fishery managers who must consider consultations with industry stakeholders as well as advice from scientists. In accordance with DFO's decision framework (Section 3.3b and SG 80a above), the USR should be set at a level that is high enough so that the cautious zone is large enough to allow detection of the decline of a stock and to adopt effective management measures.</p> <p>The last two increases in the shrimp stocks occurred during a period of low predator abundance. These increases were due to the recruitment of very abundant yearclasses. However, since about 2007, some stocks have gradually decreased and exploitation rate indices have increased (DFO, 2011) and it is uncertain whether the abundance levels observed since 2003 can be maintained. Therefore, 1996 to 2002 was considered a stable period during which catches were sustainable. The average stock status from 1996 to 2002 represents an approximation of the biomass allowing maximum sustainable yield (MSY). (A TRP set at the average for this period was proposed but has not been implemented.) The USR is 80% of the average of stock status indicators for this period, a level that provides a sufficiently large cautious zone to allow declining stocks to respond to management measures. USR indicator values for the four socks are: SFA 8 - 1.34, SFA 9 - 1.18, SFA 10 - 1.33 and SFA 12 - 1.12.</p> <p>However, the USR values correspond to stock abundances observed during a period of low predator biomass. If the biomass of the predator species were to return to the high values historically observed, a review of the USRs would be necessary.</p> <p>The USR is consistent with and demonstrates similar intent or outcome as B_{MSY} and ensures that the stock is maintained at a high level.</p> <p>No Removal References have been established for these stocks but the harvest control rules (see PI 1.2.2) provide for different exploitation strategies (through TAC adjustments) when stocks are assessed within the Healthy, Cautious or Critical zones.</p>
	d	NA	Key low trophic level species, the target reference point takes into account the ecological role of the stock.

PI 1.1.2		Limit and target reference points are appropriate for the stock	
SG	Issue	Met? (Y/N)	Justification/Rationale
			Although <i>Pandalus borealis</i> is a low trophic level species, it is not considered "key" for this assessment (CB 2.3.13). It is not one of the species types listed in Box CB1 and does not fully meet the criteria in Box CB3 (i.e. feeds predominantly on plankton, >10,000 eggs/spawning).
100	b	Yes	The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity following consideration of precautionary issues .
			<p>Savard (2012) described how the LRP was selected and set above the level at which there is an appreciable risk of impairing reproductive capacity (summarized below).</p> <p>The LRP relies on biological considerations aimed at insuring conservation of the resource. The four shrimp stocks increased over the history of the fishery, from low levels during the mid 1980s and 1990s. Increases were associated with the production of abundant year classes. The abundance of the predators was high during the 1980s but decreased substantially during the 1990s. Even at these low abundances and different levels of predation pressure, reproductive capacity was not impaired and the spawning stock was sufficient to produce strong cohorts that subsequently led to a prolonged period of abundance increase. The stock status indicators corresponding to these levels of low abundance form the basis for the LRP. The LRP is equal to the average of the minimal indicator of the two periods of the beginning of 1980s and 1990. LRPs for the four stocks are: SFA 8 - 0.45, SFA 9 - 0.60, SFA 10 - 0.53 and SFA 12 - 0.65.</p> <p>Reproductive capacity has not been impaired at any level of abundance observed since the early 1980s. Therefore, the LRPs have been set higher than the point at which there is an appreciable risk that recruitment is impaired. As this results in more precautionary management, the SG100 statement about "following consideration of relevant precautionary issues" applies (GCB 2.3.5).</p>
	c	No	<p>The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome, or a higher level, and takes into account relevant precautionary issues such as the ecological role of the stock with a high degree of certainty.</p> <p>In determining the USR, there was no consideration given to setting a level higher than B_{MSY} to account for precautionary issues such as the ecological role of the stock.</p>
References			DFO, 2011 (SAR 2011/006); Savard, 2012 (Res. Doc. 2012/006); See URL: http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/overview-cadre-eng.htm (decision framework); http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/precaution-eng.htm (SFF).
OVERALL PERFORMANCE INDICATOR SCORE:			90
CONDITION NUMBER (if relevant):			

Evaluation Table: PI 1.1.3

PI 1.1.3		Where the stock is depleted, there is evidence of stock rebuilding	
SG	Issue	Met? (Y/N)	Justification/Rationale
60	a	NA	Where stocks are depleted rebuilding strategies which have a reasonable expectation of success are in place.
			The main stock status indicators given in the most recent assessment (DFO, 2012a) showed that all four stocks remained within the Healthy Zone in 2011. The 2011 main indicator values were 7.84, 3.08, 3.58 and 4.32 times the LRP for SFAs 8, 9, 10 and 12, respectively and 2.63, 1.57, 1.43 and 2.54 times the USR, respectively (PI 1.1.1).
			The stock is not considered depleted; therefore this indicator is not applicable and not scored (CB2.4.1).
	b	NA	A rebuilding timeframe is specified for the depleted stock that is the shorter of 30 years or 3 times its generation time. For cases where 3 generations is less than 5 years, the rebuilding timeframe is up to 5 years.
	c	NA	Monitoring is in place to determine whether they are effective in rebuilding the stock within a specified timeframe.
80	a	NA	Where stocks are depleted rebuilding strategies are in place.
	b	NA	A rebuilding timeframe is specified for the depleted stock that is the shorter of 20 years or 2 times its generation time . For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years.
	c	NA	There is evidence that they are rebuilding stocks, or it is highly likely based on simulation modelling or previous performance that they will be able to rebuild the stock within a specified timeframe.
100	a	NA	Where stocks are depleted, strategies are demonstrated to be rebuilding stocks continuously and there is strong evidence that rebuilding will be complete within the specified timeframe .
	b	NA	The shortest practicable rebuilding timeframe is specified which does not exceed one generation time for the depleted stock.
References		DFO, 2012a (SAR 2012/006).	
OVERALL PERFORMANCE INDICATOR SCORE:			NA
CONDITION NUMBER (if relevant):			

Evaluation Table: PI 1.2.1

PI 1.2.1		There is a robust and precautionary harvest strategy in place	
SG	Issue	Met? (Y/N)	Justification/Rationale
60	a	Yes	The harvest strategy is expected to achieve stock management objectives reflected in the target and limit reference points.
			See SG 100a.
	b	Yes	The harvest strategy is likely to work based on prior experience or plausible argument.
			See SG 80b.
	c	Yes	Monitoring is in place that is expected to determine whether the harvest strategy is working.
			<p>The current IFMP for this fishery (DFO, 2005) provides the details for monitoring to confirm that the harvest strategy is working. This plan was in effect from 2003 to 2007 but has since been reviewed and modified annually (i.e. through Management Decisions, harvesting plans and conditions of licence), prior to the implementation of a new IFMP proposed for 2013. The annual review ensures that the objectives, strategies, and tactics remain appropriate and up-to-date.</p> <p>Licence conditions for shrimp harvesters specify:</p> <ul style="list-style-type: none"> i) the quantity of shrimp and/or groundfish permitted to be taken; ii) the waters in which fishing is permitted; iii) the period during which fishing is permitted; iv) the vessel that is permitted to be used and the operators; v) the type, size and quantity of fishing gear and equipment that is permitted and the manner in which it is to be used; vi) the protocols for reporting information and the details of fishing activity that the master of the vessel must record and report to DFO; vii) the location and times at which landing of shrimp is permitted; viii) the observer verification of the weight of any species caught and retained; ix) the required method for landing of shrimp from the vessel and the method by which the weight is to be determined; <p>There are also dockside monitoring (DMP) and at-sea observer programs in support of the harvest strategy. The DMP, funded by the industry, has been in operation since 1991. All shrimp must be landed at ports where DMP is available. Landings are recorded by independent dockside observers to ensure control and monitoring of catches. The at-sea Observer Program, also funded by industry, has been in operation since 1997. The level of observer coverage is established by DFO, taking into account recommendations from the industry. There is also a mandatory Vessel monitoring System (VMS).</p>

PI 1.2.1		There is a robust and precautionary harvest strategy in place	
SG	Issue	Met? (Y/N)	Justification/Rationale
			<p>The draft IFMP (DFO, in revision) specifies 100% dockside verification of all landings, a target of 5% observer coverage and a mandatory logbook system which is timely and accurate. Furthermore, quota reconciliation ensures that overruns in a given year will be deducted from the quota (individual or fleet) for the next season.</p> <p>The draft IFMP also includes a compliance plan implemented through the The Conservation and Protection (C&P) Program. The program <i>"follows a balanced approach of management and enforcement, including: promoting compliance with laws and regulations through education and shared stewardship, activities of inspection, monitoring and surveillance, management of special surveys or investigations of serious violations in connection with complex compliance issues"</i>.</p> <p>Monitoring activities for the shrimp fishery focus on catch, effort and landings, facilitated by the at-sea observer program, the aerial surveillance program of C&P, fishery officers, DMP and VMS.</p> <p>Performance review will be updated annually under the new IFMP.</p>
80	a	Yes	<p>The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving management objectives reflected in the target and limit reference points.</p> <p>See SG 100a.</p>
	b	Yes	<p>The harvest strategy may not have been fully tested but monitoring is in place and evidence exists that it is achieving its objectives.</p> <p>Although there is no formal Management Strategy Evaluation (MSE) for this fishery, a simulation model has been developed for comparing the performance of adjustment rules for the exploitation of shrimp in the northern Gulf of St. Lawrence (Desgagnés and Savard, 2012). The model simulated the observed stock dynamics and projected the stock trajectory over 25 years. The model is considered an effective tool for the selection of harvest adjustment rules and was used to demonstrate the benefits of the new, Precautionary Approach to harvesters.</p> <p>The combination of monitoring (SG 60c), stock assessment (PI 1.2.4), harvest control rules/tools and management actions (PI 1.2.2), explicit within both the existing and proposed IFMPs as well as annual FMP updates, comprises an effective, cohesive harvest strategy, as evidenced by the stocks remaining within the Healthy Zone for an extended period (DFO, 2013). TAC's have not been exceeded and there was no evidence of systematic fishery rules violations.</p>
100	a	Yes	<p>The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in the target and limit reference points.</p>

PI 1.2.1		There is a robust and precautionary harvest strategy in place	
SG	Issue	Met? (Y/N)	Justification/Rationale
			<p>DFO's Sustainable Fisheries Framework (http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/overview-cadre-eng.htm) ensures that fisheries are supportive of conservation and sustainability. The framework includes tools to monitor and assess initiatives for an environmentally sustainable fishery and identifies areas for improvement. The SFF "provides the foundation of an ecosystem-based and precautionary approach to fisheries management in Canada." The framework includes the implementation of IFMPs that identify goals related to conservation, management, enforcement, and science and require a regular review of the fishery against the plan's objectives.</p> <p>Past management, prior to the implementation of formal PA reference points, has made TAC adjustments (in both directions) based on the scientific assessment of the status of the stocks. The 2012 management plan (annual supplement to the 2003 - 2007 IFMP) contained objectives relevant to reference points and general management measures (DFO, 2012a). The 2012 total allowable catches (TAC) in each fishing area were determined with the decision rule of the Gulf shrimp precautionary approach (see PI 1.2.2). Although the decision rule resulted in a 15% decrease in TAC for two SFAs, the reductions were accepted and respected by industry, providing evidence that the current harvest strategy is also responsive to the status of the stocks. The PA framework was also used to set the 2013 TACs.</p> <p>The first management objective of the new IFMP (DFO, in revision) is aimed at protecting the productivity of shrimp stocks by maintaining abundance in the Healthy Zone. "The Precautionary Approach (PA) applied to a fishery lets management decisions be made based on an assessment of previously developed stock condition indicators. This assessment looks at the condition of stock and classifies it into one of three zones (i.e., critical, caution and healthy), which are delimited by reference levels (upper and lower) and a consequent predetermined rate of exploitation. The PA framework also includes TAC adjustment rules (or decisions) as a function of stock condition indicators. The decisions rules in place aim to maintain the stocks in the healthy zone and if the abundance should become lower to the limit of the healthy zone, the exploitation rate should be adjusted in order to bring back the stock indicators in the healthy as soon as possible". Therefore, the proposed harvest strategy will also be responsive to the state of the stock and is designed to achieve stock management objectives reflected in the target and limit reference points.</p>
	b	No	<p>The performance of the harvest strategy has been fully evaluated and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.</p> <p>There is no formal Management Strategy Evaluation (MSE) for this fishery.</p>
	d	Yes	The harvest strategy is periodically reviewed and improved as necessary.

PI 1.2.1		There is a robust and precautionary harvest strategy in place	
SG	Issue	Met? (Y/N)	Justification/Rationale
			The harvest strategy under the 2003 - 2007 IFMP has been reviewed and improved annually through through Management Decisions, harvesting plans and conditions of licence. The current harvest strategy, in place for 2012-13, will be reviewed and improved as necessary. The new IFMP contains a section on performance review that will enable assessment of progress towards achieving management objectives on an annual basis.
References		Desgagnés and Savard, 2012 (Res. Doc. 2012/001); DFO, 2005 (old IFMP); DFO, 2013 (SR 2013/001); DFO, 2012b (2012 FMP); DFO, in revision. (new IFMP); http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/overview-cadre-eng.htm (SFF);	
OVERALL PERFORMANCE INDICATOR SCORE:			95
CONDITION NUMBER (if relevant):			

Evaluation Table: PI 1.2.2

PI 1.2.2		There are well defined and effective harvest control rules in place	
SG	Issue	Met? (Y/N)	Justification/Rationale
60	a	Yes	Generally understood harvest rules are in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached.
			See SG 80a.
	c	Yes	There is some evidence that tools used to implement harvest control rules are appropriate and effective in controlling exploitation.
			See SG 100c.
80	a	Yes	Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.
			<p>Harvest control rules are based on the precautionary, reference point approach for the Gulf of St. Lawrence shrimp fishery (see PI 1.1.2 above). Harvest rules stipulate how TACs are established, depending on the observed stock status (i.e. Healthy, Cautious or Critical zone).</p> <p>The main stock indicators in a given year have been shown to correlate with the harvest (tons) in the following year (Savard, 2012a). This relationship provides the basis for decision rules to control exploitation under the three stock status scenarios. This is illustrated in tabular form provided in a presentation by L. Savard, (pers. comm., Nov 2012). (Proposed Precautionary Approach for the Gulf Shrimp Fishery in 2012 and 2013).</p> <p>The TAC decision rule relates harvest levels to the ability to maintain a stock in the healthy zone. The rule uses a constant exploitation rate for a stock in the healthy zone; exploitation rate declines in the cautious zone until in the critical zone the exploitation rate is 1/4 of that in the healthy zone.</p> <p>Within the healthy zone, the main stock indicator (based on pooled information on males and females from the fishery and the survey) is equal to or above the USR. The TAC is adjusted if the difference between the proposed TAC and the TAC that was implemented the preceding year is higher than 5%. The maximum adjustment is 15%, the best result obtained with the simulation model (Desgagnés and Savard, 2012) to maintain the stocks in the healthy zone. This rule was subsequently accepted and endorsed by industry. Although an exploitation rate is not formally stated, the constants in the following equations are intended to maintain constant exploitation rates more or less equivalent to those which applied during the period of stock increase.</p>

PI 1.2.2		There are well defined and effective harvest control rules in place																															
SG	Issue	Met? (Y/N)	Justification/Rationale																														
			<table><tr><th>Stock (Healthy)</th><th>Guidelines</th></tr><tr><td>Estuary (SFA 12)</td><td>Harvest = 470.7 * indicator</td></tr><tr><td>Sept-Iles (SFS 10)</td><td>Harvest = 5868.9 * indicator</td></tr><tr><td>Anticosti (SFA 9)</td><td>Harvest = 4176.4 * indicator</td></tr><tr><td>Esquiman (SFA 8)</td><td>Harvest = 3524.0 * indicator</td></tr></table> <p>The proposed TACs for 2013 were derived by multiplying the value for each SFA (slope of the relationship between the harvest in year t+1 and stock status in year t; Fig. 5 of SR 2013/001) by the main stock indicator to obtain the harvest guidelines. These values were compared to the 2012 TACs and the differences (%) were calculated. TACs for SFAs with positive differences (i.e. 10 and 12) were increased but the increases were capped at 15%. TACs for SFAs 8 and 9 (negative differences) were set at the harvest guideline values.</p> <p>Within the cautious zone, the main stock indicator is between the LRP and USR. The TACs are derived by applying the relationship (slope and intercept) between the harvest in year t+1 and stock status in year t (Fig. 5 of SR 2013/001) to the main stock indicator to obtain the harvest guidelines. The TAC is adjusted if the difference between the harvest and the TAC that was implemented the preceding year is higher than 5%.</p> <table><tr><th>Stock (Cautious)</th><th>Guidelines</th></tr><tr><td>Estuary :</td><td>Harvest = (962.4 * indicator) – 551.8</td></tr><tr><td>Sept-Iles</td><td>Harvest = (8819.4 * indicator) – 3910.5</td></tr><tr><td>Anticosti</td><td>Harvest = (7819.1 * indicator) – 4197.5</td></tr><tr><td>Esquiman</td><td>Harvest = (4871.1 * indicator) – 1808.8</td></tr></table> <p>Within the critical zone, the indicator is equal to or less than the LRP. The TAC adjustment is made as for the cautious zone, following the 5% rule.</p> <table><tr><th>Stock (Critical)</th><th>Guidelines</th></tr><tr><td>Estuary</td><td>Harvest = 117.7 * indicator</td></tr><tr><td>Sept-Iles</td><td>Harvest = 1469.7 * indicator</td></tr><tr><td>Anticosti</td><td>Harvest = 1044.1 * indicator</td></tr><tr><td>Esquiman</td><td>Harvest = 881.0 * indicator</td></tr></table>	Stock (Healthy)	Guidelines	Estuary (SFA 12)	Harvest = 470.7 * indicator	Sept-Iles (SFS 10)	Harvest = 5868.9 * indicator	Anticosti (SFA 9)	Harvest = 4176.4 * indicator	Esquiman (SFA 8)	Harvest = 3524.0 * indicator	Stock (Cautious)	Guidelines	Estuary :	Harvest = (962.4 * indicator) – 551.8	Sept-Iles	Harvest = (8819.4 * indicator) – 3910.5	Anticosti	Harvest = (7819.1 * indicator) – 4197.5	Esquiman	Harvest = (4871.1 * indicator) – 1808.8	Stock (Critical)	Guidelines	Estuary	Harvest = 117.7 * indicator	Sept-Iles	Harvest = 1469.7 * indicator	Anticosti	Harvest = 1044.1 * indicator	Esquiman	Harvest = 881.0 * indicator
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b	Yes	The selection of the harvest control rules takes into account the main uncertainties.																															

PI 1.2.2		There are well defined and effective harvest control rules in place	
SG	Issue	Met? (Y/N)	Justification/Rationale
			<p>In the development of the LRP (DFO, in revision), it was recognized that stock behaviour in the critical zone is uncertain because this level of abundance has not been observed during the period used to determine the reference points. When setting the USR, it was recognized that the value corresponded to stock abundances observed in the absence of predators. Should predator abundance return to historical high levels, a review of the USR would be necessary since it is not certain whether the shrimp stocks could maintain high abundance levels under maximum predation conditions.</p> <p>The selection of harvest control rules (SG 80a above) accounts for main uncertainties. The precautionary, reference point framework addresses uncertainty within the calculation of confidence limits for the stock abundance indices. The CPUE/NPUE series from the fishery is standardized to account for variation due to changes in fishing power and seasonality (Savard, 2013). Mean annual values are presented with 95% confidence intervals. Uncertainty, represented by 95% confidence intervals, is addressed within biomass and abundance estimates for male and female shrimp from research surveys (Savard and Bourdages, 2013).</p> <p>The 5% - 15% TAC adjustment rule within the Healthy zone and the 5% rule for the Cautious and Critical zones account for uncertainty related to annual variability in estimation of abundance indicators (i.e. fishery NPUE, research survey). The simulation model (Desgagnés and Savard, 2012), that projected stock trajectory over 25 years, is an effective tool for addressing uncertainty related to the selection of harvest control rules.</p> <p>The Science Advisory Reports on stock status provide a separate section on sources of uncertainty. Recent reports (DFO, 2012a; DFO, 2011) described the uncertainty related to trends in stock abundance in the Estuary (SFA 12). Extended survey coverage in the last four years indicated that abundance is much greater than previously estimated but the new survey series is insufficient to identify trends with certainty. The 2010 report (DFO, 2010) noted that the abundance indices of all components of the stocks (juveniles, males and females) increased simultaneously in the 2003 survey. It was believed that environmental factors could have had an impact on the availability of shrimp to the trawl which affected their catchability during that survey.</p>
	c	Yes	<p>Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules.</p>
			See SG 100c.
100	b	No	The design of the harvest control rules takes into account a wide range of uncertainties.

PI 1.2.2		There are well defined and effective harvest control rules in place	
SG	Issue	Met? (Y/N)	Justification/Rationale
			Although the selection and design of the harvest control rules addresses main uncertainties (SG 80b), no risk analysis has been performed and, therefore, it cannot be said that a wide range of uncertainties is taken into account. A stock assessment model currently under development (Drouineau <i>et al.</i> , 2012), coupled with the simulation model for selection harvest rules (Desgagnés and Savard, 2012), will be capable of addressing a wider range of uncertainty.
	c	Yes	<p>Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the harvest control rules.</p> <p>Harvest control tools currently in place are described under management measures of the new IFMP (DFO, in revision) and include annual TACs; fishing season (begins April 1); fishing gear (otter trawl with mesh size not less than 40 mm.); single area condition (one area per trip); surveillance monitoring (100% dockside, 5% observer coverage, mandatory logbook and VMS); and quota reconciliation (quota excess deducted in subsequent year).</p> <p>With the introduction of the precautionary framework for 2012 and 2013, TAC decreases were imposed for some SFAs while SFAs others were permitted increases. These decisions were based on the harvest control rules that adjust TACs annually in response to observed changes in stock abundance reflected in the main stock indicators. They were endorsed and accepted by industry and demonstrate that tools are effective in achieving the exploitation levels required under the harvest control rules.</p> <p>Additional evidence can be found in past management actions (prior to the reference point framework), which made annual adjustments to the TACs (+/-) in response to increases or decreases in multiple stock health indicators (Savard, 2013).</p> <p>Over the longer term, the history of a successful fishery and a healthy resource provides evidence for the efficacy of harvest control tools. TAC's are respected and the stocks remain within a high productivity period. There are no indications of growth or recruitment overfishing.</p>
References		Desgagnés and Savard, 2012 (Res. Doc. 2012/001); DFO, 2012a (SAR 2012/006); DFO, 2013 (SR 2013/001); DFO, in revision. (new IFMP); Drouineau <i>et al.</i> , 2012 (SPAM); Savard, 2012a (Res. Doc. 2012/006); Savard, 2013 (Res. Doc. 2013/003); Savard and Bourdages, 2013 (Res. Doc. 2013/002).	
OVERALL PERFORMANCE INDICATOR SCORE:			90
CONDITION NUMBER (if relevant):			

Evaluation Table: PI 1.2.3

PI 1.2.3		Relevant information is collected to support the harvest strategy	
SG	Issue	Met? (Y/N)	Justification/Rationale
60	a	Yes	Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.
			See SG 100a.
	b	Yes	Stock abundance and fishery removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.
			See SG 80b.
80	a	Yes	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.
			See SG 100a.
	b	Yes	Stock abundance and fishery removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule , and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule.
			<p>Stock abundances are monitored annually through the DFO research survey which covers the stock areas, especially in recent years when the Estuary has been sampled more extensively. Catches are well-estimated and numbers per unit effort (NPUE) are calculated from commercial sampling and logbook data. Both sources are integrated to produce the main status indicators for each stock which are evaluated relative to the LRP and the USR within the precautionary reference point framework (PI 1.1.2 above).</p> <p>Fishery removals are monitored and well estimated through a combination of vessel logbooks, daily hails and 100% dockside monitoring as required by the IFMP (DFO, 2005; DFO, in revision), thereby providing timely information for quota monitoring and accurate estimates of fishery removals. The integrity of the dockside monitoring program is routinely assessed by Fisheries Officers who also conduct inspections of shrimp vessels to check licences, gear, catches, assess at-sea observer performance and ensure compliance within boundary areas.</p> <p>In addition to precautionary reference points, the research survey catch sampling facilitates an evaluation of relative year-class strength, thereby providing an outlook for the stocks in the context of future recruitment. For example, the 2011 survey showed that the 2007 year class was more abundant than the mean in Estuary and Esquiman stocks and less abundant in Sept-Îles and Anticosti. The 2008 and the 2009 year classes were average to low abundance in all areas except Esquiman where the 2010 year class was also abundant (DFO, 2012a).</p>
	c	Yes	There is good information on all other fishery removals from the stock.

PI 1.2.3		Relevant information is collected to support the harvest strategy	
SG	Issue	Met? (Y/N)	Justification/Rationale
			There was no evidence of removals due to illegal, unreported, unregulated, recreational, customary or incidental fishing; therefore other sources of shrimp mortality are considered insignificant.
100	a	Yes	A comprehensive range of information (on stock structure, stock productivity, fleet composition, stock abundance, fishery removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
			<p>Stock abundance: The efficacy of the PA reference point framework depends on annual estimates of stock abundance. These are produced annually from the commercial fishery and the research survey. Indices of NPUE (males and females) from the summer fishery are integrated with abundance indices (males and females) from research surveys to produce the main stock indicators (Savard, 2012a; DFO, 2013). Furthermore, stock trajectories are facilitated through the identification and tracking of age cohorts in length frequency distributions, thereby provided outlooks for the stocks beyond the coming year.</p> <p>Stock structure: The geographical range of the stocks has been long established from the annual reserch surveys (e.g. Archambault <i>et al.</i>, 2011) and from commercial fishery data (e.g. Savard, 2013). Details of the age composition, size and sex stages are determined each year and represent an integral part of the asesment process (Savard, 2012a). Sevigny <i>et al.</i>, (2000) conducted a genetic study of <i>Pandalus borealis</i> and concluded that, with a few local exceptions, shrimp in Atlantic Canada form a single population.</p> <p>Stock productivity: The annual research surveys also provide the basis for determining the maturity stages of northern shrimp (a protandrous hermaphrodite) and growth. These data are used to estimate natural mortality (Desgagnés and Savard, 2012; Drouineau <i>et al.</i>, 2012) and forecast recruitment events (DFO, 2013). Stock recruitment relationships are poorly know but recent simulation attempts (Desgagnés and Savard, 2012) posed some plausible models. On the other hand, the stock assessment model (Drouineau <i>et al.</i>, 2012) observed no relationship, stating: " <i>The strong year classes are not explained by a high abundance of females and are more likely due to favourable environmental conditions improving larval survival (Ouellet et al., 2011).</i>" Fecundity estimates were obtained from the catch sampling program conducted at spring from 2001 to 2005 (L. Savard, unpublished data). An average sized female produces approximately 2000 eggs per clutch and egg mortality during incubation can range from 0 to 86% (DFO, in revision.).</p>

PI 1.2.3		Relevant information is collected to support the harvest strategy	
SG	Issue	Met? (Y/N)	Justification/Rationale
			<p>Fleet composition: The IFMPs for this fishery (both the 2003 - 2007 version and the new draft version) provide information on fleet composition. As of 2011, Quebec and Newfoundland held 38 licences each and New Brunswick - 21. New access was also specified for Quebec (22), New Brunswick (13), Newfoundland (8), Prince Edward Island (1), Nova Scotia (1). The total licences for 2011 (traditional, aboriginal and new access) was 140. Fishing is carried out by vessels between 55 and 90 feet in length, using otter trawls with mesh size not less than 40 mm (DFO, in revision). The 2003 - 2007 (DFO, 2005) plan contains a complete listing of enterprises and individual quotas. Each licence holder must agree to conditions of licence (DFO, 2012b) each year. These conditions specify fishing area, authorized gear, haul requirements, as well as provisions for observer coverage, DMP and VMS.</p> <p>Fishery removals: As noted above (SG 80b), fishery removals are monitored and well estimated through a combination of vessel logbooks, daily hauls and dockside monitoring as required by the IFMP (DFO, 2005; DFO, in revision). The history of the fishery regarding removals and TACs is presented above in Section 3.2 (Table 1). The fishery targets larger shrimp which are mostly female. However, male shrimp also comprise a substantial portion of the catch. Removals due to illegal, unreported, unregulated, recreational, customary or incidental fishing are considered insignificant.</p> <p>Other data: The environment (e.g. temperature, competition, predation) is believed to play an important role in controlling shrimp populations. Time series of sea-surface temperature (SST), thermally mixed layer depth, and the SST warming rate in spring at the time of larval emergence were correlated with time series of indices of shrimp recruitment between 1994 and 2003 in the northwest Gulf (Ouellet <i>et al.</i>, 2007). The observed relationships supported the hypothesis that oceanographic conditions in the upper layer of the water column, which initiate and sustain high levels of biological production at the time of larval emergence and early development, are favourable for northern shrimp recruitment success. Comprehensive collection of environmental information in the Gulf of St. Lawrence continues such that the information can be used in shrimp stock management (e.g. Galbraith <i>et al.</i>, 2012).</p> <p>A mass-balance model investigated changes in the structure and function of the northern Gulf ecosystem for the mid-1980s, the mid-1990s, and the early 2000s (Savenkoff <i>et al.</i>, 2006). The results identified prey and predators of shrimp and estimated the effects of fishing and predation for each period. Increases in shrimp abundance since the early 1990s was linked to the concomitant major decrease in predators. The role of shrimp as prey has is an important consideration, for both the development of precautionary reference points and the annual stock assessments.</p> <p>The above represents a comprehensive range of information relevant to the harvest strategy.</p>
	b	Yes	<p>All information required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent uncertainties in the information [data] and the robustness of assessment and management to this uncertainty.</p>

PI 1.2.3		Relevant information is collected to support the harvest strategy	
SG	Issue	Met? (Y/N)	Justification/Rationale
			<p>Main stock indicators are essential for assessing status relative to precautionary reference points. These indicators rely on data from the fishery (NPUE) and the annual research survey (Savard, 2013; Savard and Bourdages, 2013). Data from the summer fishery are collected systematically and are considered representative of the commercial catch and effort. The survey, in place for many years, follows strict sampling protocols to produce statistically valid results (i.e. biomass/abundance by sex with confidence limits).</p> <p>The simulation model (Desgagnés and Savard, 2012) was used in the selection of decision rules and provided a test of the robustness of assessment and management to uncertainty. The model describes and assesses a wide range of uncertainties underlying its performance.</p>
References			<p>Archambault <i>et al.</i>, 2011 (Res. Doc. 2011/112); Desgagnés and Savard, 2012 (Res. Doc. 2012/001); DFO, 2005 (2003 - 2007 IFMP); DFO, 2013 (SR 2013/001); DFO, 2012b (FMP); DFO, in revision (new IFMP); Drouineau <i>et al.</i>, 2012 (SPAM); Galbraith <i>et al.</i>, 2012; Ouellet <i>et al.</i>, 2007; Savard, 2012a (Res. Doc. 2012/006); Savard, 2013 (Res. Doc. 2013/003); Savard and Bourdages, 2013 (Res. Doc. 2013/002); Savenkoff <i>et al.</i>, 2006; Sevigny <i>et al.</i>, 2000.</p>
OVERALL PERFORMANCE INDICATOR SCORE:			100
CONDITION NUMBER (if relevant):			

Evaluation Table: PI 1.2.4

PI 1.2.4		There is an adequate assessment of the stock status	
SG	Issue	Met? (Y/N)	Justification/Rationale
60	b	Yes	The assessment estimates stock status relative to reference points.
			Rationale presented in PI 1.1.1 and PI 1.1.2 above clearly demonstrates that the assessment estimates stock status relative to reference points (LRP and USR). The research survey estimates of abundance and the summer fishery NPUE are critical to the reference point framework. Estimation of future recruitment from survey samples facilitates outlook for the stocks, beyond the scope of the PA framework.
	c	Yes	The assessment identifies major sources of uncertainty.
			See SG 80c.
80	a	Yes	The assessment is appropriate for the stock and for the harvest control rule.
			See SG 100a.
	c	Yes	The assessment takes uncertainty into account .
			<p>The CPUE/NPUE series from the fishery is standardized to account for variation due to changes in fishing power and seasonality (Savard, 2013). Mean annual values are presented with 95% confidence intervals. Uncertainty, represented by 95% confidence intervals, is addressed within biomass and abundance estimates for male and female shrimp from research surveys (Savard and Bourdages, 2013).</p> <p>The Science Advisory Reports on stock status, based on the assessment, provide a separate section on sources of uncertainty. Recent reports (DFO, 2012a; DFO, 2011) described the uncertainty related to trends in stock abundance in the Estuary (SFA 12). Extended survey coverage in the last four years indicated that abundance was much greater than previously estimated but the new survey series was insufficient to identify trends with certainty. The 2010 report (DFO, 2010) noted that the abundance indices of all components of the stocks (juveniles, males and females) increased simultaneously in the 2003 survey. It was believed that environmental factors could have had an impact on the availability of shrimp to the trawl which affected their catchability during that survey.</p>
	e	Yes	The assessment of stock status is subject to peer review.
			See SG 100e.
100	a	Yes	The assessment is appropriate for the stock and for the harvest control rule and takes into account the major features relevant to the biology of the species and the nature of the fishery.

PI 1.2.4		There is an adequate assessment of the stock status	
SG	Issue	Met? (Y/N)	Justification/Rationale
			<p>The assessment of the status of shrimp stocks in the Gulf of St. Lawrence relies on information from both fisheries dependent and independent sources to estimate stock health indicators relative to precautionary reference points (PI 1.1.2) which were developed in accordance with the DFO decision-making framework (http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/precaution-eng.htm).</p> <p>The main stock indicators include both male and female abundance. Because shrimp are protandrous (i.e. change sex), it is important to protect both the male (recruitment to the female component) and the female stock components (spawning stock) (Savard, 2012a).</p> <p>The assessment also considers the role of predators as a source of natural mortality. The LRP's were calculated from the minimum observed level of abundance at which stocks were able to increase even in the presence of predators. The USR values were calculated from a period of low predator abundance. If the biomass of predators were to increase to the values historically observed, a review of the USR would be necessary (Savard, 2012a).</p>
	c	No	<p>The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way.</p> <p>The current assessment is empirical, not model-based. Therefore, stock status relative to reference points is not evaluated in a probabilistic way. However, the stock assessment model currently under development (Drouineau, <i>et al.</i>, 2012), coupled with the simulation model for selection harvest rules (Desgagnés and Savard, 2012), should provide capability for probabilistic evaluation of stock status.</p>
	d	Yes	<p>The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.</p> <p>The assessment of stock status is not currently model based and, therefore, is not greatly influenced by errors in assumptions.</p> <p>Prior to the implementation of precautionary reference points for the assessment of stock status in 2012 (DFO, 2012a), a multiple indicator method was used to evaluate stock status as the basis for TAC adjustments. This long-standing method was shown to be consistent with the new precautionary framework with respect to generating advice on stock status and catch control (DFO, 2013; DFO, 2012a; Savard, 2012a). The history of a successful fishery and a healthy resource provides evidence for the efficacy and robustness of the assessment methodologies. TAC's are respected, the stocks remain healthy and there are no indications of growth or recruitment overfishing.</p> <p>Other assessment approaches (e.g. VPA, general production, Y/R) have been attempted for <i>P. borealis</i> in Atlantic Canada but with limited success (IFC, 2013; SCS, 2011). Recent modelling exercises for stock assessment (Drouineau <i>et al.</i>, 2012) and management strategy evaluation (Desgagnés and Savard, 2012) appear promising.</p>

PI 1.2.4		There is an adequate assessment of the stock status	
SG	Issue	Met? (Y/N)	Justification/Rationale
	e	Yes	<p>The assessment has been internally and externally peer reviewed.</p> <p>Assessments had been annual up to 2012 and were subjected to internal peer review. However, in future, peer-reviewed assessments will be conducted every two years. Annual updates will still be performed to monitor the status the resource, facilitating timely management action, if required.</p> <p>A workshop to review and approve PA reference points and TAC adjustment rules for Gulf shrimp stocks was held in November, 2011 (DFO, 2012c). Participants included DFO scientists, one DFO manager and two external reviewers.</p>
References		<p>Desgagnés and Savard, 2012 (Res. Doc. 2012/001); DFO, 2013 (SR 2013/001); DFO, 2012a (SAR 2012/006); DFO, 2012c (Proc. Ser. 2011/59); DFO, 2011 (SAR 2011/006); DFO, 2010 (SAR 2010/008); Drouineau, <i>et al.</i>, 2012 (SPAM); http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/precaution-eng.htm (decision framework); IFC, 2013; Savard, 2012a (Res. Doc. 2012/006); Savard, 2013 (Res. Doc. 2013/003); Savard and Bourdages, 2013 (Res. Doc. 2013/002); SCS, 2011.</p>	
OVERALL PERFORMANCE INDICATOR SCORE:			95
CONDITION NUMBER (if relevant):			

Evaluation Table: PI 2.1.1

PI 2.1.1		The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species	
SG	Issue	Met? (Y/N)	Justification/Rationale
60	a	Yes	Main retained species are likely to be within biologically based limits (if not, go to scoring issue d below).
			<p><i>Pandalus montagui</i> (striped shrimp or “crevette ésope”) is the only retained species in this fishery. Retention of groundfish species is authorised on those vessels which hold groundfish licences as well as shrimp licences, but individuals taken as bycatch are typically very small (having passed through the Nordmore grate) and are thus discarded. Occasionally large individuals may be taken and retained, but this is a rare occurrence and all groundfish are considered discard species.</p> <p>Bycatch of striped shrimp is well below the 5% weight guideline for “main” bycatch species – an average of 6 t/yr were taken over a 12-year period, compared to catches of the target species of the order of 30,000 t/yr, and the species was taken in 0.36% of observed tows in this period (DFO, 2012b). The species is of no commercial value (indeed it may decrease the value of mixed catches) and there is no indication that it is vulnerable. Thus it is not considered a “main” retained species.</p> <p>As such, a minimum default score of 80 is assigned.</p>
	c	Yes	If main retained species are outside the limits there are measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding of the depleted species.
			As there are no main retained species, a minimum default score of 80 is assigned.
	d	Yes	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery.
			As there are no main retained species, a minimum default score of 80 is assigned.
80	a	Yes	Main retained species are highly likely to be within biologically based limits (if not, go to scoring issue c below).
			As there are no main retained species (see 60a), a default score of 80 is assigned.
	c	NA	If main retained species are outside the limits there is a partial strategy of demonstrably effective management measures in place such that the fishery does not hinder recovery and rebuilding.
			As there are no main retained species, a default score of 80 is assigned.
100	a	Yes	There is a high degree of certainty that retained species are within biologically based limits and fluctuating around their target reference points.

PI 2.1.1		The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species	
SG	Issue	Met? (Y/N)	Justification/Rationale
			<p>Average catches of 6 t/yr (in a fishery taking of the order of 30,000 t/yr of the target species) on a rough minimal biomass estimate of the order of 15,000t, and in 0.36% of observed tows (see PI 2.1.3) are considered exceptionally rare and negligible in their impact.</p> <p>As such (MSC GCB 3.5.3), a default score of 100 is assigned. Although no reference points have been determined for striped shrimp, it can be stated with a high degree of certainty, based on the available information, that this species is within biologically based limits and well above its B_{MSY}.</p>
	b	Yes	<p>Target reference points are defined for retained species.</p> <p>As bycatch is exceptionally rare and negligible in its impact, a default score of 100 is assigned (MSC GCB 3.5.3).</p>
References		DFO, 2012b.	
OVERALL PERFORMANCE INDICATOR SCORE:			100
CONDITION NUMBER (if relevant):			

Evaluation Table: PI 2.1.2

PI 2.1.2		There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species	
SG	Issue	Met? (Y/N)	Justification/Rationale
60	a	Yes	There are measures in place, if necessary, that are expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.
			See SG 100a.
	b	Yes	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).
			See SG 100b.
80	a	Yes	There is a partial strategy in place, if necessary that is expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.
			See SG 100a.
	b	Yes	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.
			See SG 100b.
	c	Yes	There is some evidence that the partial strategy is being implemented successfully .
			See 100c.
100	a	Yes	There is a strategy in place for managing retained species. Bycatch of the only retained species is exceptionally rare and negligible in its impact (see PI 2.1.3). This is a result of the fishermen's ability to avoid taking this species, which is of low commercial value such that significant bycatches can reduce the value of landed catches. Their strategy is primarily based on avoiding areas where high bycatches of striped shrimp may be taken. The fishermen's strategy for avoiding this species meets the definition of a strategy in that it is a cohesive and strategic arrangement comprising measures (primarily based on geographical targeting), an understanding of how the measures work to achieve an outcome, and designed to manage impact on this component; fishermen are aware of the need to modify fishing practices in light of unacceptable outcomes.
	b	Yes	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.

PI 2.1.2		There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species	
SG	Issue	Met? (Y/N)	Justification/Rationale
			Fishermen have subjected their strategy to testing over a period of decades, motivated by the need to maximise value of catches, based on their knowledge of the fishery and the distribution of the species involved.
	c	Yes	There is clear evidence that the strategy is being implemented successfully .
			Clear evidence is available from the observer program that catches of the only retained are extremely low (DFO, 2012b).
	d	Yes	There is some evidence that the strategy is achieving its overall objective .
			In addition to the observer evidence on low catches, information on general distribution and abundance of <i>P. montagui</i> (Savard and Nozères, 2012) is such as to confirm that this species is widespread and abundant, thus that recorded bycatches are exceptionally small and negligible in their impact on the population.
References		DFO, 2012b; Savard and Nozères, 2012.	
OVERALL PERFORMANCE INDICATOR SCORE:			100
CONDITION NUMBER (if relevant):			

Evaluation Table: PI 2.1.3

PI 2.1.3		Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species	
SG	Issue	Met? (Y/N)	Justification/Rationale
60	a	Yes	Qualitative information is available on the amount of main retained species taken by the fishery.
			Quantitative information is available – see SG 80a.
	b	Yes	Information is adequate to qualitatively assess outcome status with respect to biologically based limits.
			See SG 80b.
	c	Yes	Information is adequate to support measures to manage main retained species.
			See SG 80c.
80	a	Yes	Qualitative information and some quantitative information are available on the amount of main retained species taken by the fishery.
			<p>Quantitative information on bycatch is available from the observer program; a total of 14,185 tows was observed over a 12-year period (2000-2011) and results have been published (DFO, 2012b). For this period, total bycatch weight (all species combined) was 1.7% of the weight of the target species, varying from 1.0% to 2.3% depending on the year.</p> <p>The only retained species in this fishery is <i>Pandalus montagui</i> (striped shrimp or “crevette ésope”). Although retention of groundfish species is authorised on some vessels holding groundfish licences as well as shrimp licences, individuals taken as bycatch are typically very small (having passed through the Nordmore grate) and are thus discarded. Occasional catches of large individuals (Greenland halibut or Atlantic halibut) may be retained but these would be extremely rare, given the low bycatch of these species overall (see PI 2.2.3), and these are thus considered discard species.</p> <p>Amounts of <i>P. montagui</i> taken are very small, averaging 6 t/yr over the period sampled (a total of 69 t over the 12 yr) (DFO, 2012b). Amounts taken have varied from 0 to 40 t/yr over the period sampled. <i>P. montagui</i> were present in 0.36% of sets over the 12-yr period (DFO, 2012b) (see also Introduction Table 2).</p> <p>Although retention of this species is authorised, it is a lower value species and high proportions of this species in landed catches reduce the value of the catch. Accordingly fishermen do their best to avoid <i>P. montagui</i> and based on the observer data, are quite adept at doing this.</p> <p>Since total catch of all bycatch species is less than 2%, the catch of <i>P. montagui</i> is well below the 5% guideline for identifying a “main” bycatch species. The species is not of commercial interest and there is no indication that it is vulnerable (see 80b), thus, <i>P. montagui</i> is not considered a “main” bycatch species.</p>

PI 2.1.3		Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species	
SG	Issue	Met? (Y/N)	Justification/Rationale
	b	Yes	Information is sufficient to estimate outcome status with respect to biologically based limits.
			<p>Biomass estimates for <i>P. montagui</i> have not been published, however this species made up about 10% of the weight of <i>P. borealis</i> in survey tows covering the fishery area over a 20-year period (1990-2011) (Savard et Nozères, 2012). As such, a very rough biomass estimate for this species would be 10% of that of <i>P. borealis</i> for the same period (this would be a minimal estimate as the survey is designed for <i>P. borealis</i> and does not cover <i>P. montagui</i> habitat optimally). In recent years, total survey biomass for <i>P. borealis</i> for all fishing areas combined has been of the order of 150,000 t (DFO, 2012f), so that a very rough minimal estimate of <i>P. montagui</i> biomass would be around 15,000 t.</p> <p>Accordingly, in light of the information on estimated bycatch and a rough biomass estimate, information is sufficient to estimate outcome status for the only retained species. Catches are extremely low (69 t over 12 years) relative to the biomass.</p>
	c	Yes	Information is adequate to support a partial strategy to manage main retained species.
			See SG 100c.
	d	Yes	Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator score or the operation of the fishery or the effectiveness of the strategy)
			The observer program continues to collect information on bycatch, with a target observer coverage of 5% of tows, and the survey continues to collect information on catch and distribution of <i>P. montagui</i> .
100	a	Yes	Accurate and verifiable information is available on the catch of all retained species and the consequences for the status of affected populations.
			<p>The only retained species is <i>P. montagui</i>.</p> <p>Accurate information on bycatch amounts of this species are available from the observer program. Although proportion of sets observed varies by shrimp fishing area, the overall target is 5% of tows, and something over 1,000 sets/yr have been observed over a 12 year period in the total fishery area (DFO, 2012b). The information has been reviewed through the CSAS process so is considered verifiable.</p> <p>Observer coverage in this fishery was determined to be essentially random with respect to fishery characteristics (Benoît and Allard, 2009), indicating that the sampling results represent the fishery well. Available evidence indicates that presence of observers on board does not affect fishing practices (DFO, 2012b).</p>

PI 2.1.3		Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species	
SG	Issue	Met? (Y/N)	Justification/Rationale
			At an average of 6 t/yr, and occurring in 0.36% of observed tows, the catches of the only retained species are considered exceptionally rare and negligible in their ecological impact. A rough minimal biomass estimate of 15,000 t can be developed by comparison of survey results for <i>P. borealis</i> and <i>P. montagui</i> (Savard and Nozères, 2012 - see above). Considering a catch of 6 t/yr on a biomass of 15,000 t/yr, status for the affected population can be estimated.
	b	Yes	Information is sufficient to quantitatively estimate outcome status with a high degree of certainty . Information from the observer program is collected in sufficient detail and with sufficient rigour to show that catches of the only retained species are exceptionally rare and negligible in their impact. Although observer coverage in one area (Esquiman Channel) has been less than the 5% coverage target in recent years, the consistency of results over the 12-year period indicates that the information is suitable to estimate outcome status with a high degree of certainty. Information from trawl surveys is sufficient to show that <i>P. montagui</i> is widely distributed, and to infer a minimal biomass estimate, indicating that the very small bycatches would have no impact on the population.
	c	Yes	Information is adequate to support a comprehensive strategy to manage retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective. Given that available information indicates that bycatch of the only retained species is exceptionally rare and negligible in its impact, a default score of 100 is assigned.
	d	Yes	Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species. Observer program coverage with a target coverage level of 5% will continue, as will the shrimp trawl surveys on which information on <i>P. montagui</i> distribution and abundance is based.
References		Benoît and Allard, 2009; DFO, 2012 b; Savard and Nozères, 2012.	
OVERALL PERFORMANCE INDICATOR SCORE:			100
CONDITION NUMBER (if relevant):			

Evaluation Table: PI 2.2.1

PI 2.2.1		The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups	
SG	Issue	Met? (Y/N)	Justification/Rationale
60	a	Yes	Main bycatch species are likely to be within biologically based limits (if not, go to scoring issue b below).
			See SG 80a.
	b	Yes	If main bycatch species are outside biologically based limits there are mitigation measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding.
			See SG 80b.
	c	Yes	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the bycatch species to be outside biologically based limits or hindering recovery.
			<p>Bycatch of all species, including better-known and lesser-known species, is very low. For the fish species most abundant in the bycatches over a 12-year period, capelin, annual estimated catches are 172 t; for the second most abundant species, turbot, annual catches are 85 t/yr; for all other species, catches are below 50 t/yr, usually far below.</p> <p>Better-known species are those for which population assessments are available: Greenland halibut (DFO, 2011d), American plaice (DFO, 2011a), Atlantic cod (DFO, 2012c), Atlantic herring (DFO, 2011e, 2012d), capelin (DFO, 2011c), redfishes (DFO, 2011b), witch flounder (DFO, 2012e), thorny skate (COSEWIC, 2012b). It is clear from these assessments that bycatch is not having a significant impact on populations (see PI 2.2.3).</p> <p>For species which are biologically poorly known but for which biomass estimates can be made from the annual groundfish trawl surveys, bycatch represents less than 1% of estimated population biomass (see PI 2.2.3). Again, although these species are lesser-known, it is clear that bycatch is not having a significant impact on populations.</p> <p>For pink glass shrimp (<i>Pasiphaea multidentata</i>) estimated average bycatch is 25.7 t/yr. This species is widely distributed in the northern Gulf of St. Lawrence but is found in deeper, warmer waters than the target species (Savard and Nozères, 2012). Although no abundance estimate is available, the catches are extremely low and probably insignificant relative to overall population abundance, since a substantial proportion of the population is distributed in waters not targeted by the fishery.</p>

PI 2.2.1		The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups	
SG	Issue	Met? (Y/N)	Justification/Rationale
			For the remainder of the poorly-known species, for which population assessments or trawl survey biomass estimates are not available, annual bycatches are 12 t or less – the annual catch of the most abundant poorly-known species in the bycatch (“lussions”, barracudinas) is 12 t/yr (DFO, 2012b). Species taken in the bycatch are generally widely distributed (Scott and Scott, 1988), such that catches at this low level can be considered to be insignificant in population terms. As such, there is no reason to believe that these species are outside biologically based limits, or that the shrimp fishery would hinder their recovery if necessary. Species which are outside biologically based limits in this area are species which have been intensively targeted by fisheries for decades, and no such species are in the lesser-known category.
80	a	No (see 80b.)	<p>Main bycatch species are highly likely to be within biologically based limits (if not, go to scoring issue b below).</p> <p>Total weight of all discarded (and retained) species has varied from 1.0 to 2.3% of the catch of the target species over a 12 year period (DFO, 2012b). Therefore, no individual species meets the weight guideline (5% of the target species weight) for a “main” bycatch species.</p> <p>No discard species have commercial value, as only small individuals of commercial species (for example Greenland halibut, Atlantic herring) are taken (large individuals of large species such as halibuts are occasionally taken and may be retained but this is very rare and considered insignificant). As such, no discard species are characterised as “main” by commercial value.</p> <p>Several depleted species occur in the bycatch, and these are considered the only “main” bycatch species: Atlantic cod, American plaice, redfishes (see PI 2.2.3). As these are outside safe limits, scoring is via SG 80b.</p>
	b	Yes	<p>If main bycatch species are outside biologically based limits there is a partial strategy of demonstrably effective mitigation measures in place such that the fishery does not hinder recovery and rebuilding.</p> <p>There is a strategy in place to minimise bycatch, consisting of regulatory measures (mandatory use of the Nordmore grate, “small fish” protocol to close areas if bycatch levels are excessive) and fishermen-implemented measures (toggle chains, geographical targeting) (see PI 2.2.2). As a result of this strategy, bycatch of all discard species is very low (see PI 2.2.3).</p> <p>Information on amounts of bycatch relative to other sources of mortality, or in the context of overall population abundance, indicates that the strategy is effective in maintaining bycatch at levels which would not significantly impact populations or hinder recovery or rebuilding if this was necessary (see PI 2.2.3).</p>
100	a	No	There is a high degree of certainty that bycatch species are within biologically based limits.

PI 2.2.1		The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups	
SG	Issue	Met? (Y/N)	Justification/Rationale
			Some bycatch species are depleted, outside biologically safe limits, so this SG is not met (see SG 80a).
References		DFO, 2012b; DFO, 2011b; DFO, 2011a; DFO, 2012c; DFO, 2011d; DFO, 2011e, 2012d; DFO, 2011c; DFO, 2012e; COSEWIC, 2012b; Savard and Nozères, 2012; Scott and Scott, 1988.	
OVERALL PERFORMANCE INDICATOR SCORE:			80
CONDITION NUMBER (if relevant):			

Evaluation Table: PI 2.2.2

PI 2.2.2		There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations	
SG	Issue	Met? (Y/N)	Justification/Rationale
60	a	Yes	There are measures in place, if necessary, which are expected to maintain main bycatch species at levels which are highly likely to be within biologically based limits or to ensure that the fishery does not hinder their recovery.
			See SG 100a.
	b	Yes	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/species).
			See SG 100b.
80	a	Yes	There is a partial strategy in place, if necessary, for managing bycatch species at levels which are highly likely to be within biologically based limits or to ensure that the fishery does not hinder their recovery.
			See SG 100a.
	b	Yes	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or the species involved.
			See SG 100b.
	c	Yes	There is some evidence that the partial strategy is being implemented successfully.
			See SG 100c.
100	a	Yes	There is a strategy in place for managing and minimising bycatch.
			<p>There is a strategy in place, based on regulatory measures and on fishermen's actions, to minimise bycatch. Fishermen take measures to minimise bycatch because of the cost of excessive bycatch levels in the catch – either time lost at sea to sort catches, or lower values paid for catches which contain excessive levels of bycatch.</p> <p>The principal regulatory measure is a requirement to use the Nordmore grate with a grid spacing of 19-25 mm (fishermen primarily use 25 mm). There is also a "small fish protocol" under which grid areas will be closed to fishing if bycatch levels are above a threshold amount, but this measure has rarely had to be applied in the past. Measures used by fishermen include use of toggle chains (ca 30 cm in length) to keep gear from fishing close to the bottom, and geographical targeting to avoid bycatch species. Taken</p>

PI 2.2.2		There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations	
SG	Issue	Met? (Y/N)	Justification/Rationale
			together, this suite of measures constitutes a strategy since it is a cohesive and strategic arrangement comprising several measures, an understanding of how the measures work to achieve an outcome, and designed to manage impact on this component; there is an awareness of the need to modify fishing practices in light of unacceptable outcomes (and a strong economic motivation to minimise bycatch).
	b	Yes	<p>Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.</p> <p>The Nordmore grate has been tested and shown to be effective in reducing bycatch to very low levels in many <i>Pandalus</i> fisheries using similar gear (for example Newfoundland, Hickey <i>et al.</i>, 1993; Alaska, Jackson and Irving, 2007; Oregon, Hannah <i>et al.</i>, 1996; Gulf of Maine, GMRI, 2009).</p> <p>Application of the current bycatch reduction strategy, based on the Nordmore grate and other measures described above, has been shown to keep bycatch levels extremely low over a period of 12 years in this fishery (see PI 2.2.3) (DFO, 2012b).</p>
	c	Yes	<p>There is clear evidence that the strategy is being implemented successfully.</p> <p>Use of the Nordmore grate is monitored by the protection and surveillance system and there are few infractions involving non-use (DFO C+P staff, pers. comm.). Penalties for improper use of the Nordmore grate are quite high, including loss of gear and catch. Fishermen suffer economic losses if bycatch is excessive so are motivated to minimise this.</p>
	d	Yes	<p>There is some evidence that the strategy is achieving its objective.</p> <p>The information from the observer program (DFO, 2012b) shows that bycatches in this fishery are very low, and, taken with information from the annual groundfish trawl surveys and from assessments of the more abundant bycatch species, negligible in their impact on populations of bycatch species (see PI 2.2.3).</p>
References		References in 2.2.3. DFO, 2012b; GMRI, 2009; Hannah <i>et al.</i> , 1996; Hickey <i>et al.</i> , 1993; Jackson and Irving, 2007.	
OVERALL PERFORMANCE INDICATOR SCORE:			100
CONDITION NUMBER (if relevant):			

Evaluation Table: PI 2.2.3

PI 2.2.3		Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch	
SG	Issue	Met? (Y/N)	Justification/Rationale
60	a	Yes	Qualitative information is available on the main bycatch species affected by the fishery.
			See SG 80a.
	b	Yes	Information is adequate to broadly understand outcome status with respect to biologically based limits
			See SG 80b.
	c	Yes	Information is adequate to support measures to manage bycatch.
			See SG 80c.
80	a	Yes	Qualitative information and some quantitative information are available on the amount of main bycatch species affected by the fishery.
			<p>Quantitative information is available on all species taken as bycatch, from the observer program. Target for observer coverage is 5% of tows and this is generally achieved; the exception is the “Esquiman” fishing area, where coverage is generally lower (2.1% and 2.1% of tows in 2011 and 2012 respectively). A total of 14,185 tows over 12 years has been observed, species have been identified to the lowest taxonomic level possible, and results have been published (DFO, 2012b). Despite the relatively lower coverage in Esquiman, the results overall are considered to represent the bycatch composition and amount accurately.</p> <p>Although retention of groundfish is permitted on vessels which hold groundfish licences in addition to shrimp licences, individuals in the bycatch are typically small, having passed through the Nordmore grate, and of no commercial value, so are discarded. The only exception is the occasional large halibut (Atlantic or Greenland) which does not pass through the Nordmore net opening; retention of these individuals is very rare (DFO pers. comm., Cedric Arsenault, November 8, 2012.).</p> <p>Accordingly all bycatch species other than <i>P. montagui</i> (striped shrimp or “crevette ésope”) are considered to be discard species.</p> <p>Total weight of all discarded and retained species has varied from 1.0 to 2.3% of the target species catch over a 12 year period (DFO, 2012b). Therefore no individual species meets the 5% guideline for a “main” bycatch species. The most abundant species in the bycatch, Greenland halibut, made up, on average, around 0.2% of the target species catch over the years 2007-2011. No discard species has commercial value as only small individuals of commercial species (Greenland halibut, Atlantic herring, capelin etc) are taken in the bycatch, and pink glass shrimp is not marketable and is sorted out from the catch (pers. comm., C. Arsenault, November 8, 2012). As such, no species meets the definition of a “main” bycatch species based on proportion in the catch or commercial value.</p>

PI 2.2.3		Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch	
SG	Issue	Met? (Y/N)	Justification/Rationale
			<p>Several species considered vulnerable are taken in bycatch and these thus qualify as main bycatch species. They are qualified as vulnerable based on COSEWIC assessments that they are at risk:</p> <ul style="list-style-type: none"> • Atlantic cod – the Laurentian North population has been assessed by COSEWIC as Endangered • American plaice – the Maritimes population has been assessed by COSEWIC as Threatened • Redfishes – the two species are not separated in catches; the Gulf of St. Lawrence/Laurentian Channel population of deepwater redfish has been assessed as Endangered by COSEWIC, and some individuals of the Atlantic population of Acadian redfish assessed as Threatened may also be present <p>These species are not covered under ETP species since they are not listed on Schedule 1 of SARA.</p> <p>Species assessed as “Special Concern” by COSEWIC are not considered vulnerable species for this assessment – these include Atlantic wolffish (also listed on SARA Schedule 1 as Special Concern), thorny skate Atlantic-wide, and the Laurentian/Scotian Shelf population of smooth skate.</p> <p>Species listed as Threatened or Endangered on SARA Schedule 1 are considered in ETP species (Section 2.3).</p> <p>For these 3 main discard species, estimated catch amounts are as follows (from DFO, 2012b):</p> <ul style="list-style-type: none"> • Atlantic cod, from 2000-2011 a maximum of 45 t was taken in one yr, in other years catch ranged from 2-11 t/yr • American plaice, catches ranged from 11-43 t/yr in the same period • Redfishes, catches ranged from 10-46 t/yr
	b	Yes	<p>Information is sufficient to estimate outcome status with respect to biologically based limits.</p> <p>For the three main bycatch species noted above, average annual catches over the most recent 5 years for which data is available (2007-2011) are as follows (DFO, 2012b):</p> <ul style="list-style-type: none"> • Atlantic cod 14.7 t • American plaice 25.0 t • Redfishes 16.2 t <p>For each of these species, the bycatch in the shrimp fishery represents less than 0.9% in number, and less than 0.6% by weight, of trawl survey estimates of abundance of the sizes taken in the shrimp fishery (that is, relatively small individuals). The level of mortality is thus considered negligible.</p>

PI 2.2.3		Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch	
SG	Issue	Met? (Y/N)	Justification/Rationale
			<p>For the same species, bycatch amounts can be put in a context of other sources of mortality and of population status</p> <ul style="list-style-type: none"> For Atlantic cod, recent catches from the northern Gulf stock have been 3,600 t in 2010 and 1,700 t in 2011, substantially higher than bycatch in the shrimp fishery (DFO, 2012c). For American plaice, recent population trends have been increasing; recent catches have been low, averaging around 100 t/yr since 2006 in a directed fishery and as bycatch in other fisheries (DFO, 2011a) For redfishes (DFO, 2011b), deepwater redfish biomass in Unit 1+2, the Gulf of St. Lawrence/Laurentian Channel population, was estimated at 19,000 t in 2010, with recent catches under 1,000 t/yr; and catches at this level were projected to allow the population to increase; for Acadian redfish in Unit 1+2+3LNO, estimated biomass in 2012 was 1.9 m t, and under catch levels of 9,000 t/yr (slightly above recent catches) the stock had a 99% chance of staying above B_{MSY} for decades to come <p>Based on this information, outcome status can be reliably assessed, and the shrimp fishery bycatch would pose no problem to the populations.</p>
	c	Yes	Information is adequate to support a partial strategy to manage main bycatch species.
			Information on bycatches from the observer program, and on population status from regular assessments, is adequate to support a partial strategy to manage the main bycatch species.
	d	Yes	Sufficient data continue to be collected to detect any increase in risk to main bycatch species (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).
			Regular population assessments of the main bycatch species are undertaken, and collection of data on bycatch via the observer program continues, with a target of 5% of tows sampled.
100	a	Yes	Accurate and verifiable information is available on the amount of all bycatch and the consequences for the status of affected populations.
			The information on bycatch amounts (DFO, 2012b) is considered accurate, given the rigour of the identifications and the coverage level (approaching the target of 5% in all regions except for the Esquiman Channel where coverage has been around 2% of tows in recent years; a total of 14,185 sets observed). The consistency of results over a 12-year period indicates that the information is accurate. This information, and the information on impact of the bycatches on populations (DFO, 2012b), is considered verifiable as it has been through the CSAS peer review process.

PI 2.2.3		Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch	
SG	Issue	Met? (Y/N)	Justification/Rationale
			<p>DFO (2012b) lists bycatch amounts over a 12-year period (2000-2011) for 97 species groups into which all bycatch has been classified. Estimated bycatch amounts are low. For species other than the “main” bycatch species covered above, the species with the highest annual average bycatch over the 5 years from 2007-2011 was capelin, with an average annual catch of 173.6 t; the second most abundant in this period was Greenland halibut at 85.2 t/yr on average. All other species were below 50 t/yr, generally well below.</p> <p>DFO (2012b) compares these catches to survey biomass estimates of those species which can be estimated from the annual trawl surveys. For Greenland halibut and witch flounder, shrimp fishery bycatches are less than 0.9% by number of the survey biomass estimates for the sizes taken in the bycatch. For 9 additional species for which sizes are not available, shrimp fishery bycatch estimates are less than 1% of survey biomass estimates. All other species are generally widely distributed (Scott and Scott, 1988) and probably abundant, and the estimated bycatches are extremely small in relation to their probable abundance.</p> <p>For the two most abundant pelagic species in the bycatch, capelin bycatch represents from 1-10% of the total annual landed catches, while herring bycatches represent 0.5% of total annual landed catches over the period surveyed. All other species occur in less than 1% of tows sampled.</p> <p>Bycatches of invertebrates are also very small – for pink glass shrimp (<i>Pasiphaea multidentata</i>) average annual catches are 26 t, while all other species are at less than 1 t/yr. Pink glass shrimp is widely distributed in the northern Gulf of St. Lawrence although at depths greater than those where most of the target species is concentrated (Savard and Nozères, 2012), thus there is a substantial proportion of the population which is not affected by the fishery</p>
	b	Yes	<p>Information is sufficient to quantitatively estimate outcome status with respect to biologically based limits with a high degree of certainty.</p> <p>Information on the relation of bycatch amounts to trawl survey biomass (see 100a) is sufficient to quantitatively indicate that catches are very low in relation to population abundance. For “main” bycatch species (80 SG part b), information is sufficient to quantitatively estimate outcome status.</p> <p>For the only invertebrate taken at over 1 t/yr, <i>P. multidentata</i>, information on distribution is available which is sufficient to quantitatively estimate outcome status (Savard and Nozères, 2012).</p> <p>For several other species taken in the bycatch, detailed population assessments are available to support estimation of outcome status:</p> <ul style="list-style-type: none"> Greenland halibut, (DFO, 2011d)

PI 2.2.3		Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch	
SG	Issue	Met? (Y/N)	Justification/Rationale
			<ul style="list-style-type: none">• Atlantic herring, (DFO, 2011e, 2012d)• Capelin, (DFO, 2011c)• Witch flounder, (DFO, 2012e)• Thorny skate, (COSEWIC, 2012b) <p>For other species, bycatches are so small as to be biologically negligible, generally less than 1 t/yr. The fish species taken as bycatch are generally widespread in distribution (Scott and Scott, 1988) such that these small bycatches would have no impact on population status.</p>
	c	Yese	Information is adequate to support a comprehensive strategy to manage bycatch, and evaluate with a high degree of certainty whether a strategy is achieving its objective .
			<p>Information on bycatch amounts is available at a high level of detail, such that the strategy for bycatch management can be evaluated on an ongoing basis; the information indicates that bycatches are extremely low and in most cases essentially negligible ecologically.</p> <p>Assessments of vulnerable species (the “main” bycatch species covered in 80SG) and of species which are most abundant in bycatch (those covered in 100 SG b) are undertaken on an ongoing basis, typically every year or 2 years.</p> <p>Information cited in this section is peer-reviewed through the CSAS process.</p>
	d	Yes	Monitoring of bycatch data is conducted in sufficient detail to assess ongoing mortalities to all bycatch species.
The observer program continues to assess bycatch with a target coverage level of 5% per year, and with species identification to the lowest level possible.			
References		Cedric Arsenault, pers. comm. November 8, 2012 DFO, 2012b; DFO, 2011b; DFO, 2011a; DFO, 2012c; DFO, 2011d; DFO, 2011e, 2012d; DFO, 2011c; DFO, 2012e; COSEWIC, 2012b; COSEWIC, 2012a; Savard and Nozères, 2012; Scott and Scott, 1988.	
OVERALL PERFORMANCE INDICATOR SCORE:			100
CONDITION NUMBER (if relevant):			

Evaluation Table: PI 2.3.1

PI 2.3.1		The fishery meets national and international requirements for the protection of ETP species. The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species	
SG	Issue	Met? (Y/N)	Justification/Rationale
60	a	Yes	Known effects of the fishery are likely to be within limits of national and international requirements for protection of ETP species.
			See SG 100a.
	b	Yes	Known direct effects are unlikely to create unacceptable impacts to ETP species.
			See SG 100b.
80	a	Yes	The effects of the fishery are known and are highly likely to be within limits of national and international requirements for protection of ETP species.
			See SG 100a.
	b	Yes	Direct effects are highly unlikely to create unacceptable impacts to ETP species.
			See SG 100b.
	c	Yes	Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.
			See SG 100c.
100	a	Yes	There is a high degree of certainty that the effects of the fishery are within limits of national and international requirements for protection of ETP species.

		<p>Two ETP species are impacted by this fishery – “loup tacheté” or spotted wolffish, and “loup à tête large” or northern wolffish. Both are listed as Threatened on SARA Schedule 1. A single individual of striped bass (“bar rayé”) (for which the St. Lawrence river population is listed as Endangered on SARA Schedule 1) was taken in 2002, but this is considered an outlier. No interactions of this fishery with ETP species of marine mammals, sharks or leatherback turtles have been recorded (DFO, 2012b).</p> <p>National and international requirements would be that survival and recovery of the ETP species not be jeopardised.</p> <p>Recent assessments of population status of northern wolffish (COSEWIC, 2013b in press) and spotted wolffish (COSEWIC, 2013a in press) show that abundance and distribution indices of these species have been increasing since the mid-1990s for spotted wolffish, and since the early 2000s for northern wolffish. These assessments were based on all available information, on peer review of the information held by DFO on population indices, and on peer review by COSEWIC of the overall assessment.</p> <p>Observer information on amounts of bycatch (DFO, 2012b) are based on over 14,000 observed sets over 12 years, and show very low amounts of bycatch of these species (see PI 2.3.3 and Table 2 in Introduction). Spotted wolffish have been recorded in 52 tows in 10 of the 12 years for which data are available, with a total catch over the 12 years of 909 kg. Northern wolffish have been recorded in 6 tows in 3 of the 12 years, with a total estimated catch over the period of 234 kg (DFO, 2012b). This information has been peer reviewed through the CSAS process.</p> <p>A high degree of certainty requires no more than a 10% chance that real effects be outside those shown by the information (MSC CB 3.11.4.1). This would mean (a) that there is a 10% chance that real bycatch is greater than observed and (b) that there is a 10% chance that the observed population increases are wrong. Given the time series involved and the peer review processes for the information, it is considered that there is a less than 10% chance that the information is erroneous.</p>
b	Yes	There is a high degree of confidence that there are no significant detrimental direct effects of the fishery on ETP species.

		<p>Bycatches of ETP species are extremely low, essentially negligible in terms of population impact (see SG100 part a). To meet the standard of a high degree of confidence, there should be no more than a 10% chance that the available information is erroneous (MSC CB 3.11.4.1). Given the long time series over which the observer information was collected (12 yr), the number of sets sampled (over 14,000), the low taxonomic level to which species were identified by observers, and the extremely low prevalence of the two ETP species in the observed bycatches (DFO, 2012b), it is considered highly unlikely that the true situation would be substantially different from that presented by the available information, less than 10% likely.</p> <p>This conclusion is supported by an assessment of allowable harm (DFO, 2004), indicating that the overall level of threat from fisheries would not jeopardise survival or recovery of the two wolffish species; threat level has decreased since that assessment was done, since there is now a recovery strategy (Kulka <i>et al.</i>, 2007) and a requirement to release any individuals taken unharmed. The conclusion is further supported by the conclusion of recent population assessments that abundance and distribution indices of these species have been increasing (COSEWIC 2013, 2013b in press).</p>
c	Yes	<p>There is a high degree of confidence that there are no significant detrimental indirect effects of the fishery on ETP species.</p> <p>Possible indirect effects of the fishery on the two ETP species are (a) removal of prey items for the ETP species and (b) impacts on habitat of ETP species.</p> <p>(a) Trophic impacts. Wolffishes feed on a variety of organisms; spotted wolffishes on echinoderms, fishes and benthic crustaceans (COSEWIC, 2013a in press), northern wolffish on pelagic fishes and benthic invertebrates (COSEWIC, 2013b in press). Given the very low level of bycatch in this fishery, including of benthic invertebrates (DFO, 2012b) and the fact that northern shrimp reference points are intended to allow for the needs of predators (DFO, 2011f), it is highly unlikely that the fishery is removing enough prey to negatively impact wolffish populations.</p> <p>(b) Habitat impacts. The shrimp fishery operates on soft-bottom habitats where northern shrimp concentrate, not on the harder-bottom habitats preferred by wolffishes (Kulka <i>et al.</i>, 2007). The fishery is unlikely to be causing serious or irreversible harm to benthic habitats (see PI 2.4.1 – 3). As such, it is highly unlikely that the fishery is causing harm to wolffish habitats, to the extent that there would be negative impacts on populations.</p> <p>The conclusion that indirect effects are not negatively impacting populations of these two species is supported by the observation that population indices have been increasing in recent years (COSEWIC, 2013a, 2013b in press).</p>
References		COSEWIC, 2013a in press; COSEWIC, 2013b in press; DFO, 2004; DFO, 2012b; Kulka <i>et al.</i> , 2007.
OVERALL PERFORMANCE INDICATOR SCORE:		100
CONDITION NUMBER (if relevant):		

Evaluation Table: PI 2.3.2

PI 2.3.2		<p>The fishery has in place precautionary management strategies designed to:</p> <ul style="list-style-type: none"> • Meet national and international requirements; • Ensure the fishery does not pose a risk of serious harm to ETP species; • Ensure the fishery does not hinder recovery of ETP species; and • Minimise mortality of ETP species. 	
SG	Issue	Met? (Y/N)	Justification/Rationale
60	a	Yes	There are measures in place that minimise mortality, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.
			See SG 100a.
	b	Yes	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).
			See SG 100b.
80	a	Yes	There is a strategy in place for managing the fishery's impact on ETP species, including measures to minimise mortality, that is designed to be highly likely to achieve national and international requirements for the protection of ETP species.
			See SG 100a.
	b	Yes	There is an objective basis for confidence that the strategy will work, based on information directly about the fishery and/or the species involved.
			See SG 100b.
	c	Yes	There is evidence that the strategy is being implemented successfully.
			See SG 100c.
100	a	Yes	There is a comprehensive strategy in place for managing the fishery's impact on ETP species, including measures to minimise mortality that is designed to achieve above national and international requirements for the protection of ETP species.
			A comprehensive strategy is in place, consisting (a) of the strategy to minimise bycatch and (b) a recovery strategy for the two ETP species and associated mandatory measures.

PI 2.3.2		<p>The fishery has in place precautionary management strategies designed to:</p> <ul style="list-style-type: none"> • Meet national and international requirements; • Ensure the fishery does not pose a risk of serious harm to ETP species; • Ensure the fishery does not hinder recovery of ETP species; and • Minimise mortality of ETP species. 	
SG	Issue	Met? (Y/N)	Justification/Rationale
			<p>The bycatch strategy, as it would apply to ETP species, consists of mandatory measures (use of the Nordmore grate) and measures taken by fishermen (use of toggle chains to ensure that the gear fishes off bottom (wolffishes are strongly bottom-associated). An additional measure taken by fishermen that minimises wolffish bycatch is targeting of fishing on soft-bottom habitats where shrimp are abundant; wolffishes concentrate on hard bottom habitats with shelters (Kulka <i>et al.</i>, 2007), not on the habitats where shrimp are concentrated. The recovery strategy for the two wolffish species (Kulka <i>et al.</i>, 2007) outlines a number of measures to foster recovery of this species; based on this, as a condition of licence in the shrimp fishery (and others), fishermen are required to return any northern or spotted wolffishes taken in bycatch to the water unharmed. Wolffishes are relatively robust and survival if returned unharmed to the water is considered to be reasonably high (Kulka <i>et al.</i>, 2007).</p> <p>Overall, the strategy is designed to achieve as close to zero mortality as possible on these two species, and as such, is considered to be designed to achieve above national and international requirements.</p>
	b	Yes	<p>The strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis supports high confidence that the strategy will work.</p> <p>The bycatch minimisation strategy is based on information about the fishery and on groundfish species in general. The recovery strategy (Kulka <i>et al.</i>, 2007) is based on a detailed assessment of the biology of the two ETP species and on a consideration of the range of fisheries which can impact them.</p> <p>An assessment of “allowable harm” for northern and spotted wolffish (DFO, 2004) concluded that existing sources of mortality for these species, including bycatch in the shrimp fishery and other fisheries, were not jeopardising survival or recovery of these species. Further, mortality was expected to decrease as mandatory measures to return wolffishes unharmed to the water came into effect. Based on this assessment, and conditional on the new measures to protect the species, shrimp fishermen (and those in other fisheries) were given permits to harm the two wolffish species, as provided for in the <i>Species at Risk Act</i>. As such, a quantitative analysis has been conducted indicating that the strategy would work.</p> <p>Recent population assessments of these species indicate that both have been increasing in abundance (COSEWIC, 2013a, 2013b in press). As such, there is a high degree of confidence that the strategy has been successful.</p>
	c	No	There is clear evidence that the strategy is being implemented successfully.

PI 2.3.2		The fishery has in place precautionary management strategies designed to: <ul style="list-style-type: none"> • Meet national and international requirements; • Ensure the fishery does not pose a risk of serious harm to ETP species; • Ensure the fishery does not hinder recovery of ETP species; and • Minimise mortality of ETP species. 	
SG	Issue	Met? (Y/N)	Justification/Rationale
			<p>The observer program provides clear evidence that the bycatch minimisation strategy is being implemented successfully; bycatch is extremely low (see PI 2.3.3).</p> <p>There is no evidence as to the effectiveness of the strategy requirement to return wolffishes to the water unharmed, as this depends on actions of fishermen on vessels.</p>
	d	Yes	There is evidence that the strategy is achieving its objective.
			<p>The evidence from population assessments (COSEWIC, 2013a, 2013b, in press) that abundance indices of the two wolffish species have been increasing (over a 15+-year for spotted wolffish, over a 10-year period for northern wolffish) shows that the strategy is achieving its objective of ensuring protection and recovery of these species.</p>
References		COSEWIC, 2013a in press; COSEWIC, 2013b in press; DFO, 2004; Kulka <i>et al.</i> , 2007.	
OVERALL PERFORMANCE INDICATOR SCORE:			95
CONDITION NUMBER (if relevant):			

Evaluation Table: PI 2.3.3

PI 2.3.3		<p>Relevant information is collected to support the management of fishery impacts on ETP species including:</p> <ul style="list-style-type: none"> • Information for the development of the management strategy; • Information to assess the effectiveness of the management strategy; and • Information to determine the outcome status of ETP species. 	
SG	Issue	Met? (Y/N)	Justification/Rationale
60	a	Yes	Information is sufficient to qualitatively estimate the fishery related mortality of ETP species.
			See SG 80a.
	b	Yes	Information is adequate to broadly understand the impact of the fishery on ETP species.
			See SG 80b.
	c	Yes	Information is adequate to support measures to manage the impacts on ETP species.
			See SG 80c.
80	a	Yes	<p>Sufficient data are available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species.</p> <p>Two ETP species are impacted by this fishery – “loup tacheté” or spotted wolffish, and “loup à tête large” or northern wolffish. Both are listed as Threatened on SARA Schedule 1, and this status was recently confirmed by COSEWIC (2013a, b) for both. A single individual of striped bass (“bar rayé”) (for which the St. Lawrence river population is listed as Endangered on SARA Schedule 1) was taken in 2002, but this is considered an outlier. No interactions of this fishery with ETP species of marine mammals, sharks or leatherback turtles have been recorded (DFO, 2012b).</p> <p>Quantitative estimates of the bycatch amounts of the two ETP species over a 12-year period, based on observer reports, are available (DFO, 2012b). Spotted wolffish have been recorded in 52 tows in 10 of the 12 years for which data are available, with a total catch over the 12 years of 909 kg. Northern wolffish have been recorded in 6 tows in 3 of the 12 years, with a total estimated catch over the period of 234 kg (DFO, 2012b).</p>
	b	Yes	Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species.

PI 2.3.3		Relevant information is collected to support the management of fishery impacts on ETP species including: <ul style="list-style-type: none"> • Information for the development of the management strategy; • Information to assess the effectiveness of the management strategy; and • Information to determine the outcome status of ETP species. 	
SG	Issue	Met? (Y/N)	Justification/Rationale
			<p>Spotted wolffish is considered to exist in a single population in Atlantic Canadian waters (COSEWIC, 2012a; COSEWIC, 2013a in press). Abundance indices in the areas in which the species is abundant (Newfoundland Grand Banks) have been increasing since the mid 1990s. In the northern Gulf of St. Lawrence, occurrence (%) in survey tows in has been increasing since the mid-1990s, returning to values similar to those of the 1980s prior to the substantial decline in abundance, and area occupied has also been increasing (COSEWIC, 2012a; COSEWIC, 2013ain press). Estimated bycatch in the shrimp fishery was less than 0.3% of survey biomass estimates for this species in 2006-2011 (DFO, 2012b). This information indicates that the very small catches in the shrimp fishery over the past decade have not had a detrimental impact on protection and recovery of this species.</p> <p>Northern wolffish is also considered to be a single population in Canadian Atlantic waters (COSEWIC, 2012a; COSEWIC, 2013b in press). Abundance and distribution indices of this species have been increasing in its major centres of distribution, for example on the Newfoundland and Labrador shelves, since about 2002 (COSEWIC, 2012a; COSEWIC, 2013b). The species has always been relatively uncommon in the northern Gulf of St. Lawrence, typically occurring in around 0.5% of groundfish trawl survey tows in the 1980s (with maximums of 0.9% in two years). Since 2000 relative occurrence has declined to less than 0.1% of tows in some years, 0 in others. Although the species is uncommon, the extremely low recorded catches in the shrimp fishery (234 kg over 12 year), taken with the increasing trend for the whole population, indicate that this fishery is not a threat to protection or recovery of the species.</p>
	c	Yes	<p>Information is sufficient to measure trends and support a full strategy to manage impacts on ETP species.</p> <p>As noted above (SG 80b), trend information is available for spotted wolffish and northern wolffish populations, indicating that abundance has been increasing despite the very small bycatch in the shrimp fishery.</p> <p>Information on bycatch and on species abundance is sufficient to support a full strategy. Abundance and relative occurrence in sets are assessed on annual groundfish trawl surveys in the northern Gulf of St. Lawrence and in other areas occupied by the populations, such that a full strategy can be supported.</p>
	a	No	Information is sufficient to quantitatively estimate outcome status of ETP species with a high degree of certainty.

PI 2.3.3		Relevant information is collected to support the management of fishery impacts on ETP species including: <ul style="list-style-type: none"> • Information for the development of the management strategy; • Information to assess the effectiveness of the management strategy; and • Information to determine the outcome status of ETP species. 	
SG	Issue	Met? (Y/N)	Justification/Rationale
			<p>The information on bycatch of these species provides a high degree of certainty that bycatches are very low. Information has been consistent over a 12-year period during which over 14,000 trawl sets were observed.</p> <p>Information on population status of these two species has recently been reviewed (COSEWIC, 2013a in press, COSEWIC, 2013b in press), based on all available information and in particular on trawl survey indices of abundance and area of occurrence. Although the Threatened designation was maintained by COSEWIC in 2012 for these two species, both are showing increases in the abundance and distribution indices in the areas where they are most abundant, spotted wolffish since the mid-1990s, northern wolffish since the early 2000s. Spotted wolffish is increasing in the fishery area; northern wolffish is not showing an increase in the fishery area but the species is uncommon in this area.</p> <p>The increase in abundance over a 15-year period for spotted wolffish indicates with a high degree of certainty that the small bycatches in the shrimp fishery are not having a detrimental impact on populations. For northern wolffish, the observed increases have been over a shorter period, and are not as strong as for northern wolffish; as such, despite the extremely low catches observed in this fishery, it cannot be stated that there is a high degree of certainty about outcome status.</p>
	b	Yes	<p>Accurate and verifiable information is available on the magnitude of all impacts, mortalities and injuries and the consequences for the status of ETP species.</p> <p>The information from the observer program (DFO, 2012b) is considered accurate, given the large number of trawl sets which has been sampled over a 12-year period. It is considered verifiable because it has been through the CSAS peer review process.</p> <p>Even assuming 100% mortality of individuals taken in bycatch, bycatches are so low that the consequences for these species can be considered insignificant. Mortality may be less than 100% since fishermen are required to return wolffishes unharmed to the water; however individuals taken would be small and probably relatively vulnerable to discard mortality.</p> <p>The recent increases in population indices for these two species confirm that the bycatch mortality in the shrimp fishery is not having a detrimental effect on populations.</p>
	c	Yes	Information is adequate to support a comprehensive strategy to manage impacts, minimise mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives.

PI 2.3.3		Relevant information is collected to support the management of fishery impacts on ETP species including: <ul style="list-style-type: none"> • Information for the development of the management strategy; • Information to assess the effectiveness of the management strategy; and • Information to determine the outcome status of ETP species. 	
SG	Issue	Met? (Y/N)	Justification/Rationale
			<p>Information is adequate to support the strategy in place to minimise bycatch, and the recovery strategy for wolffishes, a key requirement of which is that individuals be returned unharmed to the water.</p> <p>The effectiveness of the strategy can be evaluated with a high degree of certainty over a period of 5-10 years, since trawl survey indices are noisy and some time is required to assess trends. Since this would be true of most marine species, it is considered that the fishery meets this SG.</p>
References		COSEWIC, 2013a in press; COSEWIC, 2013b in press; COSEWIC, 2012a; DFO, 2012b.	
OVERALL PERFORMANCE INDICATOR SCORE:			95
CONDITION NUMBER (if relevant):			

Evaluation Table: PI 2.4.1

PI 2.4.1		The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis and function	
SG	Issue	Met? (Y/P/N)	Justification/Rationale
60	a	Yes	The fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.
			See SG 80a.
80	a	Yes	The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.
			<p>To analyse impacts of this fishery on bottom habitats, DFO (2012ti) divided the northern GSL into grid squares of 10 minutes latitude x 10 minutes longitude. Over the history of the fishery trawlers have fished in 479 of these squares, the average area of which is 223 km² (Savard et al 2012), so an estimate of total habitat suitable for shrimp concentrations is 107,000 km². Depending on the year, shrimp trawling impacts 4,000 – 8,000 km² of bottom habitat (DFO 2012a) which is 4-8% of the estimated total “shrimp habitat”. (see 2.4.3). Trawl doors and footgear would affect benthic habitats, both the geological structure of the bottom (mounds, burrows and the surface layer of the soft sediment on which the fishery operates) and the organisms which would contribute to maintaining habitat quality.</p> <p>The following alternative hypotheses were considered to support scoring this PI (following MSC CB3.14.6.1):</p> <ul style="list-style-type: none"> a) the fishery causes serious or irreversible harm, that is, gross harm which is essentially irreversible, and significant disruption of habitat structure and function; b) the fishery causes substantial changes in habitat structure and function, only reversible in 10 years or more; and c) the fishery causes changes in habitat structure and function which are reversible in 1-2 yr. <p>Information to assess these hypotheses comes from a range of sources including reviews of bottom-fishing gears on mud habitats (e.g. Rice, 2006, NEFMC, 2011), studies of impacts of shrimp or other trawls on mud bottom habitats (e.g. Hixon and Tissot, 2007; Simpson and Watling, 2006) and information on habitats and the distribution of fishing in the fishery area (DFO, 2012a, Lévesque <i>et al.</i>, 2012).</p>

PI 2.4.1		The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis and function	
SG	Issue	Met? (Y/P/N)	Justification/Rationale
			<p>Mud bottoms are rapidly affected by trawling, with the bottom showing furrows IFCedately after trawling. Organisms which contribute to habitat structure on mud bottoms would have recovery times from 1-2 yr to ca 5 yr (NEFMC, 2011, p 79). Hard bottoms, with longer-lived vertically-developed fauna may be contacted occasionally by this fishery, but are not the preferred habitat for the fishery. Highly complex habitats and areas of high concentration of sea pens are not fished by this fishery, although sea pens and soft corals are relatively widely distributed in the fishery area; sponge areas may be affected (see PI 2.4.3). Sponges were not considered to be characteristic of high and low energy mud bottom habitats by NEFMC (2011 - pp 40-41) but because of their wide distribution in the fishery area, they are probably affected. Some areas of concentration of sponges are not in areas covered by the fishery (DFO, 2012a).</p> <p>Because a relatively small proportion of the relevant habitat is trawled in any given year, substantial parts of the habitat are unaffected by the fishery over time. The distribution of the fishery has changed over time, allowing formerly affected areas time to recover (DFO, 2012a). There has been no indication of decreased productivity of fished species or habitats because of habitat damage in this fishery area (or in any other areas where Pandalid fisheries operate); this may not be considered strong evidence as benthic habitats are generally not well known, but one would expect some signal if there had been serious or irreversible harm to habitats, since the fishery has operated in this area for several decades.</p> <p>Taking into account the sensitivity of mud habitats, the mode of operation of the fishery, and in particular the existence of large areas of unimpacted habitats over time, hypotheses (a) and (b) above are not supported. There is no reason to believe, based on available information, that the fishery is causing serious or irreversible harm to habitats.</p> <p>The MSC requires that there be no more than a 30% probability that there be serious or irreversible harm, to meet the SG 80 on this PI. Given the existence of wide areas of unimpacted habitat, this guideline is met.</p>
100	a	No	<p>There is evidence that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.</p> <p>No evidence is available from the fishery area to support this SG.</p>
References		DFO, 2012a; Hixon and Tissot, 2007; Lévesque <i>et al.</i> , 2012; NEFMC, 2011; Rice, 2006; Simpson and Watling, 2006.	
OVERALL PERFORMANCE INDICATOR SCORE:			80
CONDITION NUMBER (if relevant):			

Evaluation Table: PI 2.4.2

PI 2.4.2		There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types	
SG	Issue	Met? (Y/N)	Justification/Rationale
60	a	Yes	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.
			Measures are in place which would ensure that the fishery does not cause serious or irreversible harm to habitats. Fishing gear is rigged such that doors and footgear (rollers and/or bobbins) are the only parts of the gear in contact with the bottom; netting flies off the bottom. The fishery impacts 4,000-8,000 km ² per year, approximately 4-8% of the available habitat for northern shrimp and associated species (see PI 2.4.3), leaving much of the habitat potentially suitable for the target species unimpacted. The fishery does not operate in areas of high habitat complexity (primarily coastal areas) or in areas where sea pens are concentrated (deeper than the fishery depth); sponges concentration areas may have been impacted by the fishery in the past, but are widely distributed in the northern Gulf of St. Lawrence including in areas not impacted by the fishery (DFO, 2012a).
	b	Yes	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/habitats).
			The depth distribution of the fishery ensures that areas of complex habitats and of concentration of sea pens are not impacted, while the geographical distribution of the fishery (4-8% of total habitat suitable for shrimp concentrations impacted in any given year) ensure that much of the habitat remains unimpacted. Leaving areas unimpacted by fisheries is the measure most likely to work, in terms of protecting habitat (NEFMC, 2011).
80	a	No	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.
			<p>A partial strategy to ensure habitat outcome 80, is not in place in this fishery; in particular there has not been analysis to develop an understanding of how the existing measures work to achieve an outcome and no analysis of potential requirements to change measures should this become necessary has been conducted (MSC CR, 2013).</p> <p>As part of its Sustainable Fisheries Framework, DFO has developed a policy on Managing Impacts of Fishing on Sensitive Benthic Areas (DFO, 2009). The policy outlines approaches for assessing risks to sensitive benthic areas from fishing, and for putting protective measures in place where necessary.</p> <p>Although substantial work has been done to map habitats, including sensitive habitats, and the distribution of fishing effort in the fishery area (DFO, 2012a), a partial strategy to manage impacts of the fishery on benthic habitats has not been developed, nor has an assessment of the need for such a strategy been conducted. There is a recognition that such a strategy may be required, consistent with the national policy on benthic impacts, and a timeline has been established for conducting a risk assessment and implementing protection measures if necessary (DFO Fisheries Management, pers. comm.).</p>

PI 2.4.2		There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types	
SG	Issue	Met? (Y/N)	Justification/Rationale
	b	No	There is some objective basis for confidence that the partial strategy will work, based on information directly about the fishery and/or habitats involved.
			As no partial strategy is in place, this SG is not met.
	c	No	There is some evidence that the partial strategy is being implemented successfully.
			As no partial strategy is in place, this SG is not met.
100	a	No	There is a strategy in place for managing the impact of the fishery on habitat types.
			These is no evidence to demonstrate that this scoring issue is met.
	b	No	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or habitats involved.
			These is no evidence to demonstrate that this scoring issue is met.
	c	No	There is clear evidence that that strategy is being implemented successfully.
			These is no evidence to demonstrate that this scoring issue is met.
	d	No	There is some evidence that the strategy is achieving its objective.
			These is no evidence to demonstrate that this scoring issue is met.
References		DFO, 2009; DFO, 2012a; See URL: http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/benthi-eng.htm .	
OVERALL PERFORMANCE INDICATOR SCORE:			60
CONDITION NUMBER (if relevant):			1

Evaluation Table: PI 2.4.3

PI 2.4.3		Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types	
SG	Issue	Met? (Y/N)	Justification/Rationale
60	a	Yes	There is basic understanding of the types and distribution of main habitats in the area of the fishery.
			See SG 80a.
	b	Yes	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear.
			See SG 80b.
80	a	Yes	The nature, distribution and vulnerability of all main habitat types in the fishery are known at a level of detail relevant to the scale and intensity of the fishery.
			<p>The fishery operates primarily on soft-sediment bottoms ("pelite" - basically mud, mixed at times with sand), which are the sediments on which northern shrimp concentrations are found, although harder bottom (gravel and boulder) areas may be occasionally contacted (DFO, 2012a). Depths fished are mainly between 200 and 300 m (DFO, 2012a, Lévesque <i>et al.</i>, 2012).</p> <p>Sediments throughout the Gulf of St. Lawrence have been mapped in some detail, certainly at a level of detail relevant to the scale and intensity of the fishery (Loring and Nota, 1973). These maps have served to support more detailed analyses of habitats in the fishery area (e.g. Dutil <i>et al.</i>, 2011) and studies of the potential impacts of shrimp trawling on the habitats (DFO, 2012a, Lévesque <i>et al.</i>, 2012).</p> <p>Vulnerability of soft-bottom habitats to trawling impacts has not been studied in the fishery area but is generally known from studies elsewhere (e.g. those summarised by Rice (2006) and NEFMC (2011); and relevant studies by Hixon and Tissot (2007) and Simpson and Watling (2006)). Generally mud bottom habitats are not subject to much natural disturbance, although bioturbation may provide a background level of disturbance which may mask the impacts of human activities (Simpson and Watling, 2006). Mud habitats are generally rapidly affected by trawling, but may also recover relatively rapidly from trawl impacts (NEFMC, 2011). Organisms which contribute to quality of mud bottom habitats (tube-dwelling worms, sea pens, molluscs) may be damaged by trawling impacts; some of these can recover relatively rapidly (tube-dwelling amphipods), while others (sea pens, molluscs) make take several years (NEFMC, 2011).</p>
	b	Yes	Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent of interaction, and the timing and location of use of the fishing gear.

			<p>The nature of the impacts of the shrimp trawls used in this fishery is generally known although no studies have been conducted in this area. Bottom impacts are from trawl doors and foot gear (the foot rope is typically rigged with rollers and/or bobbins) (DFO, 2012a). The gear would be expected to cause furrows in the bottom sediment, and to uproot sessile and burrowing fauna; some benthic species could be crushed although one would expect the doors to create a furrow rather than to run over organisms, and the footrope is rigged to roll over organisms. Predation may be increased on organisms uprooted or damaged by the trawl (Hixon and Tissot, 2007).</p> <p>Based on estimates of the gear footprint and fishing effort data, it is estimated that 4,000-8,000 km² of the seabed is trawled annually, between 4% and 8% of the total area which has been historically fished (DFO, 2012a). Shrimp trawlers have fished in 479 grid squares of 10 min latitude by 10 min longitude and an average area of 223 km² over the history of the fishery (Savard et al, 2012); based on these figures, a total of 107,000 km² of benthic habitat is suitable for shrimp concentrations in the fishery area. As such, it is estimated that shrimp trawling impacts 4-8% of habitat supporting shrimp concentrations in any given year.</p> <p>Generally, recurrent trawling on mud bottoms has been shown to reduce species diversity and to impact productivity either positively or negatively (Hixon and Tissot, 2007).</p> <p>Information on the distribution of fishing effort is collected on an ongoing basis, via VMS, logbooks and observers. Information on distribution of effort from 1982-2011 was compiled and published as part of an assessment of potential impact of trawling on benthic habitats and species (DFO, 2012a). There was good agreement between the information from logbooks and from observers (DFO, 2012a).</p>
	c	Yes	<p>Sufficient data continue to be collected to detect any increase in risk to habitat (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).</p> <p>Distribution of fishing continues to be monitored by VMS, logbooks and observers. Trends in fishing gear are such as to make the gear lighter rather than heavier (e.g. by using pelagic trawl doors), both to reduce fuel costs and to reduce impacts on bottom habitats (DFO, 2012g).</p>
100	a	Yes	<p>The distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types.</p> <p>Distribution of sediment types and of habitat types has been published for the Gulf of St. Lawrence as a whole (Dutil <i>et al.</i>, 2011). Vulnerable habitat types for this area, as for Atlantic Canada as a whole, have been mapped based on threshold values for concentrations of sponges and corals in survey and commercial trawl samples (Kenchington <i>et al.</i>, 2010), while an analysis aimed at modelling habitat complexity and benthic biodiversity has outlined areas of complex habitats (Lévesque <i>et al.</i>, 2010). These analyses have been used to support an assessment of the potential impacts of shrimp trawling on sensitive habitats in the fishery area (DFO, 2012a, Lévesque <i>et al.</i>, 2012).</p>
	b	No	The physical impacts of the gear on the habitat types have been quantified fully.

			No directed analyses of the impacts of the gear on habitat types have been conducted in this fishery area.
	c	No	Changes in habitat distributions over time are measured.
			This has not been done in the past, and is unlikely to receive adequate research resources in future.
References			DFO, 2012a; DFO 2012g; Dutil <i>et al.</i> , 2011; Hixon and Tissot, 2007; Kenchington <i>et al.</i> , 2010; Lévesque <i>et al.</i> , 2010; Lévesque <i>et al.</i> , 2012; Loring and Nota, 1973; NEFMC, 2011; Rice, 2006; Simpson and Watling, 2006.
OVERALL PERFORMANCE INDICATOR SCORE:			85
CONDITION NUMBER (if relevant):			

Evaluation Table: PI 2.5.1

PI 2.5.1		The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function	
SG	Issue	Met? (Y/P/N)	Justification/Rationale
60	a	Yes	The fishery is unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
			<p>Impacts on bycatch species (retained, discarded, ETP) and habitats have been covered in specific performance indicators. Bycatch amounts are so low as to be negligible in ecological terms, thus would not impact ecosystem structure or function. The fishery is highly unlikely to cause serious or irreversible harm to habitats.</p> <p>Two additional potential impacts of the fishery on ecosystem structure and function have been identified: (a) impact on trophic relationships of removing northern shrimp, a prey species for a range of predators, from the ecosystem and (b) non-catch impacts of the gear on benthic biodiversity and communities.</p> <p>See SG 100 for scoring justification for (a - impact on trophic relationships of removing northern shrimp, a prey species for a range of predators, from the ecosystem), SG 80 for scoring justification for (b - non-catch impacts of the gear on benthic biodiversity and communities).</p>
80	a	Yes	The fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
			<p>(a) see SG100a.</p> <p>(b) With respect to non-catch impacts of fishing on benthic biodiversity and community structure, in light of the spatial and temporal distribution of fishing, it can be inferred that it is highly unlikely that the fishery would be causing serious or irreversible harm to these ecosystem elements. In particular:</p> <ul style="list-style-type: none"> - the fishery operates on soft bottom communities, where the target species concentrates, which are considered to be more resilient to damage than the complex, bottom-rooted, vertically-developed species and communities - the fishery concentrates on subareas of the total area of soft-bottom communities of the northern Gulf of St. Lawrence within relevant depth and temperature ranges, at places where the target species concentrates, leaving a substantial portion of the relevant benthic communities unimpacted in any given year. An area between 4-8% of the total potential bottom habitat for shrimp is fished in any given year (see basis for estimate in 2.4.3). - the fishery does not operate on known areas of vulnerable benthic habitat where particularly sensitive species or communities may be found; in particular, it does not operate on highly complex habitats or on areas of concentration of sea pens (references in PI 2.5.3) - recovery time of organisms typical of mud bottom habitats is typically 5 years or less (NEFMC, 2011)

PI 2.5.1		The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function	
SG	Issue	Met? (Y/P/N)	Justification/Rationale
			The observations above are considered adequate to state that there is no more than a 30% probability that the true status of benthic biodiversity and community structure would be within the range where there would be serious (gross change and disruption of habitat function) or irreversible (regime-type change from which recovery would not occur) harm. There has been no indication of changes in productivity in northern Gulf of St. Lawrence ecosystems due to impacts of this fishery, other factors having been considered more important in driving recent ecosystem changes in this area (Dufour <i>et al.</i> , 2010).
100	a	No	There is evidence that the fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
			<p>(a) Throughout the history of the fishery, from the 1980s to the present, removals by the fishery have been much smaller than amounts of shrimp consumed by predators (CDEENA, n.d.; Savenkoff <i>et al.</i>, 2007). The limit reference point (LRP) for the fishery has been set at a level which allowed predators adequate access to northern shrimp as prey at a time when predators were abundant (DFO, 2011f).</p> <p>As such, there is evidence that the fishing strategy in place (see PI 2.5.2) is highly likely to maintain shrimp abundance at levels which will allow the species to play its ecological role, and thus to prevent serious or irreversible harm to the ecosystem. The catch monitoring system is almost 100% likely to keep catches at or below TACs, and the limit reference point is at least 80% likely to maintain shrimp at a level where predator requirements will not be compromised, based on information from the fishery area and other similar fisheries.</p> <p>(b) With respect to non-catch impacts on benthic biodiversity and community structure, although it appears quite unlikely that impacts from this fishery would be such as to cause serious or irreversible harm, this cannot be stated at the relevant probability level (80%). Although the fishery does not operate in areas of concentration of sea pens (DFO, 2012a, Lévesque <i>et al.</i>, 2012), it does overlap with widely distributed sponges (DFO, 2012a, Lévesque <i>et al.</i>, 2012), and with widely distributed soft corals and sea pens (Colpron <i>et al.</i>, 2010), and fishermen have observed that shrimp catches tend to be better in areas where sea pens are abundant (Colpron <i>et al.</i>, 2010). Information on biology and recovery times of sponges and soft corals in this area is not available.</p>
References		CDEENA, n.d.; Colpron <i>et al.</i> , 2010; DFO, 2011f; Dufour <i>et al.</i> , 2010; Lévesque <i>et al.</i> , 2012; NEFMC, 2011; Savenkoff <i>et al.</i> , 2007.	
OVERALL PERFORMANCE INDICATOR SCORE:			80
CONDITION NUMBER (if relevant):			

Evaluation Table: PI 2.5.2

PI 2.5.2		There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function	
SG	Issue	Met? (Y/N)	Justification/Rationale
60	a	Yes	There are measures in place, if necessary.
			<p>(a) For impact of removal of the target species on trophic relationships, see SG 80.</p> <p>(b) For non-catch impacts of the fishery on benthic biodiversity and communities, the main measure in place is geographic limitation of the fishery to between 4-8% of the potential area where the benthic communities associated with northern shrimp concentrations would occur (see basis for estimate in 2.4.3). Leaving most of the area occupied by these benthic communities unimpacted would ensure that the fishery does not cause serious or irreversible harm to this ecosystem element. This measure is not regulatory but is a function of the mode of operation of the fishery.</p>
	b	Yes	The measures take into account potential impacts of the fishery on key elements of the ecosystem.
			<p>(a) For impact of removal of the target species on trophic relationships, see SG 80.</p> <p>(b) By leaving most of the potential benthic area unimpacted in any given year, the measure takes into account the potential impacts of the fishery on the benthic biodiversity and communities.</p>
	c	Yes	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).
			<p>(a) The measures to protect trophic relationships are based on experience with pandalid fisheries in other parts of North America, and on past experience in the fishery area, and thus are considered likely to work. There has been no indication from the extensive work on ecosystem changes in the northern Gulf of St. Lawrence over the past 2+ decades that fishery removals of shrimp are a significant factor in ecosystem changes (see references in PI 2.5.3).</p> <p>(b) The measures in place to protect benthic biodiversity and community structure are considered likely to work based on knowledge of the distribution of the fishery and of benthic communities in the fishery area (see references in PI 2.5.3). Given the likely recovery time of benthic organisms which are impacted by fisheries on mud bottoms, generally of 5 years or less (e.g. NEFMC, 2011), and the fact that most of the potential bottom area is unimpacted in any given year, it appears plausible that the geographic limitation of fishing effort in effect would be successful in ensuring that the fishery does not cause serious or irreversible harm to benthic biodiversity or communities. Leaving portions of benthic communities unimpacted by fishing, and allowing time for recovery between fishing periods, are generally considered to be appropriate means of reducing trawl non-catch impacts on bottom communities (NEFMC ,2011).</p>

PI 2.5.2		There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function	
SG	Issue	Met? (Y/N)	Justification/Rationale
80	a	No	There is a partial strategy in place, if necessary.
			<p>A partial strategy, if necessary, would include an analysis of existing measures in order to develop an understanding of how those measures work to achieve an outcome and an awareness of the need to change measures should they cease to be effective.</p> <p>(a) The potential impact of removal of the target species on availability of prey for predators was considered in setting the limit reference point (LRP) for this fishery (DFO, 2011f). The LRP was set at a level which allowed abundance of the shrimp population to increase at a time when predators were abundant, ensuring that the fishery will be closed or severely limited when abundance declines to a low level, which historically had allowed for predators to have adequate prey. Managing this fishery based on this LRP is a partial strategy for managing the impact of the fishery on prey abundance.</p> <p>(b) For non-catch impacts on benthic biodiversity and communities, there has not been an assessment of whether a strategy is necessary, and no strategy is in place.</p>
	b	No	<p>The partial strategy takes into account available information and is expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.</p> <p>(a) The strategy to ensure that removals of the target species do not prejudice trophic relationships is based on information from the fishery area (LRP set at a level at which shrimp were playing a role in trophic relationships) and from pandalid fisheries in other areas. The strategy is expected to maintain shrimp at abundance levels which will allow the species to continue to play its trophic role, and thus to ensure that serious or irreversible harm is not caused to the ecosystem.</p> <p>(b) For non-catch impacts on benthic biodiversity and communities, no strategy is in place.</p>
			<p>(a) The strategy to ensure that removals of the target species do not prejudice trophic relationships is based on information from the fishery area (LRP set at a level at which shrimp were playing a role in trophic relationships) and from pandalid fisheries in other areas. The strategy is expected to maintain shrimp at abundance levels which will allow the species to continue to play its trophic role, and thus to ensure that serious or irreversible harm is not caused to the ecosystem.</p> <p>(b) For non-catch impacts on benthic biodiversity and communities, no strategy is in place.</p>
	c	No	<p>The partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).</p> <p>As noted (SG 60c) the measures in place work but there is no partial strategy in place.</p>
			<p>As noted (SG 60c) the measures in place work but there is no partial strategy in place.</p>
	d	No	<p>There is some evidence that the measures comprising the partial strategy are being implemented successfully.</p> <p>(a) TACs (the principal measure for implementing the strategy to protect trophic relationships) are closely adhered to in this fishery, based on a comprehensive catch monitoring and surveillance and protection system (DFO, 2012f).</p> <p>(b) For non-catch impacts on benthic biodiversity and communities, no strategy is in place.</p>
			<p>(a) TACs (the principal measure for implementing the strategy to protect trophic relationships) are closely adhered to in this fishery, based on a comprehensive catch monitoring and surveillance and protection system (DFO, 2012f).</p> <p>(b) For non-catch impacts on benthic biodiversity and communities, no strategy is in place.</p>

PI 2.5.2		There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function	
SG	Issue	Met? (Y/N)	Justification/Rationale
100	a	No	There is a strategy that consists of a plan , in place.
			(a). The partial strategy to protect trophic relationships does not meet the definition of a “strategy” (MSC GCB 3.3.1b) as no mechanisms to modify fishing practices are included should unacceptable impacts be identified (that is, there is no provision to modify the LRP if it appears that trophic relationships are compromised). (b) For non-catch impacts on benthic biodiversity and communities, no strategy is in place.
	b	No	The strategy , which consists of a plan , contains measures to address all main impacts of the fishery on the ecosystem, and at least some of these measures are in place. The plan and measures are based on well-understood functional relationships between the fishery and the Components and elements of the ecosystem. This plan provides for development of a full strategy that restrains impacts on the ecosystem to ensure the fishery does not cause serious or irreversible harm.
			As noted (SG 100 a) there is no full strategy in place for either ecosystem issue.
	c	No	The measures are considered likely to work based on prior experience , plausible argument or information directly from the fishery/ecosystems involved.
			As noted (SG 100 a) there is no full strategy in place for either ecosystem issue.
	d	No	There is evidence that the measures are being implemented successfully .
			As noted (SG 100 a) there is no full strategy in place for either ecosystem issue.
References		References in 2.5.3. DFO, 2011f; DFO, 2012f; NEFMC, 2011.	
OVERALL PERFORMANCE INDICATOR SCORE:			60
CONDITION NUMBER (if relevant):			2

Evaluation Table: PI 2.5.3

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem	
SG	Issue	Met? (Y/N)	Justification/Rationale
60	a	Yes	Information is adequate to identify the key elements of the ecosystem (e.g., trophic structure and function, community composition, productivity pattern and biodiversity).
			See SG 80a.
	b	Yes	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, and have not been investigated in detail .
			See SG 80b.
80	a	Yes	Information is adequate to broadly understand the key elements of the ecosystem.
			<p>At least two comprehensive reviews of the marine ecosystem of the northern Gulf of St. Lawrence have recently been published, which support a broad understanding of the key elements of the ecosystem: Dufour and Ouellet (2007) and Dufour <i>et al.</i>, (2010 - a description of recent trends which includes a comprehensive background description of the ecosystem elements). These are supported by information on specific elements summarised below.</p> <p>Trophic structure and function in the northern Gulf ecosystem are relatively well known as a result of a series of studies, both specifically on shrimp (Savenkoff <i>et al.</i>, 2006) and more generally on the trophic system and changes over recent decades (Savenkoff <i>et al.</i>, 2007; CDEENA, n.d.). The studies have been based on modified Ecopath ("inverse") models of the trophic system and have described changes in trophic relationships accompanying broader ecosystem changes since the mid 1980s.</p> <p>Productivity patterns (primary, secondary, higher-level) in the northern Gulf have been well described in the general ecosystem descriptions cited (Dufour and Ouellet, 2007, Dufour <i>et al.</i>, 2010). Geographical, seasonal and interannual patterns are covered in these publications.</p> <p>Biodiversity of planktonic and benthic communities is generally known for the northern Gulf of St. Lawrence. For planktonic communities the Dufour reviews cited have detailed descriptions. For benthic communities, Moritz <i>et al</i> (2012) have described 6 communities of benthic invertebrates inhabiting different areas of the northern Gulf of St. Lawrence. Species composition is generally known for type areas in the northern Gulf (Desrosiers <i>et al.</i>, 2000; Savenkoff <i>et al.</i>, 2007) and general distribution of species has been documented in a comprehensive identification guide (Brunel <i>et al.</i>, 1998). Studies have added detail of specific areas and species in the northern Gulf and St. Lawrence estuary, for example for polychaetes (Massad and Brunel, 1979) and for epibenthic organisms in the St. Lawrence estuary (Bourget <i>et al.</i>, 1994, 2003).</p>

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem	
SG	Issue	Met? (Y/N)	Justification/Rationale
			<p>The ecosystem of the northern Gulf of St. Lawrence has undergone substantial changes since the mid-1980s which are documented in detail in the Dufour <i>et al.</i>, reviews cited (see also Savenkoff <i>et al.</i>, 2007). The system has changed from one dominated by large groundfish predators and smaller forage species, to a system dominated by forage species alone. Removal of groundfish by fishing is considered to be the main contributing factor (Savenkoff <i>et al.</i>, 2007), although the changes also took place coincident with a period of low temperatures in the late 1980s and early 1990s (Dufour <i>et al.</i>, 2010).</p>
	b	Yes	<p>Main impacts of the fishery on these key ecosystem elements can be inferred from existing information and some have been investigated in detail.</p> <p>The main potential impacts of the fishery on key ecosystem elements, in addition to those covered in earlier sections (retained, bycatch, ETP), are the following: (a) potential impact of removal of shrimp, a forage species for range of predators, on trophic structures and (b) potential impact of non-catch impacts of the gear on benthic biodiversity and communities.</p> <p>Impacts on trophic relationships can be inferred from existing comprehensive information on trophic relationships in the northern Gulf (Savenkoff <i>et al.</i>, 2007, CDEENA, n.d.) and on removals by the fishery (e.g. DFO, 2012f).</p> <p>Information on non-catch impacts on biodiversity and communities can be inferred from general information on non-catch impacts of bottom trawls on benthic fauna (Grant and Hiscock, 2010; NEFMC, 2011) and on the available information on benthic biodiversity in the fishery area (Desrosiers <i>et al.</i>, 2000; CDEENA, n.d.), and from assessments of potential harm to these communities from shrimp trawling (DFO, 2012a; Lévesque <i>et al.</i>, 2012).</p> <p>Detailed studies have been conducted on changes in trophic relationships since the mid-1980s in the fishery area, in relation to changes in oceanographic conditions and to fishery impacts (CDEENA, n.d.). The impact of the shrimp fishery on trophic relationships has been considered in these studies, by comparing mortality on shrimp due to the fishery with that due to predation (Savenkoff <i>et al.</i>, 2007; CDEENA, n.d.).</p>
	c	Yes	<p>The main functions of the Components (i.e., target, Bycatch, Retained and ETP species and Habitats) in the ecosystem are known.</p>

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem	
SG	Issue	Met? (Y/N)	Justification/Rationale
			<p>Functions of the various species taken in the fishery (target, bycatch, retained, ETP) in trophic relationships and production systems are well known from the studies of trophic systems and productivity patterns cited above (Savenkoff et al. 2007; CDEENA, n.d.; Dufour and Ouellet, 2007; Dufour et al., 2010). The target and retained species are preyed upon by a range of groundfish species and other predators (small pelagic fishes, seals). Discard and ETP species are mainly predators of shrimp and other invertebrates and fishes in the trophic system.</p> <p>The main functions of the habitat component is known from general studies of the relationships between species and their habitats.</p>
	d	Yes	<p>Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred.</p> <p>As noted in PIs 2.1.3 and 2.2.3, information on impacts on retained and discarded bycatch species is sufficient to indicate that these are very small, essentially negligible in terms of ecological impact.</p> <p>Similarly, for ETP species, PI 2.3.3 shows that information is sufficient to indicate that impacts are very small and are allowing the two ETP species to increase in abundance and distribution.</p> <p>For habitats (PI 2.4.3), available information is sufficient to show that impacts are confined to a small proportion of the total potential habitat area in any given year, and that impacts are not such as to cause serious or irreversible harm. Some impact on habitats is occurring, and additional assessment work is required to determine whether mitigating measures are required (a condition has been established).</p>
			<p>Sufficient data continue to be collected to detect any increase in risk level (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).</p> <p>Information continues to be collected on factors which could contribute to ecosystem impacts, such that any increase in risk level can be detected:</p> <ul style="list-style-type: none"> observer programs continue to collect information on bycatch levels, and trawl surveys and stock assessments monitor abundance of bycatch species good catch information is collected on the target species such that impact of removals on trophic relationships can be monitored information on distribution of fishing is collected by logbooks, observers and VMS systems, such that potential impacts on habitats can be monitored
	e	Yes	
100	b	No	<p>Main interactions between the fishery and these ecosystem elements can be inferred from existing information, and have been investigated.</p> <p>Non-catch impacts on benthic species and communities, have not been investigated in this fishery area, although assessments of potential for harm have been carried out (DFO, 2012a; Lévesque et al., 2012).</p>

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem	
SG	Issue	Met? (Y/N)	Justification/Rationale
	c	Yes	The impacts of the fishery on target, Bycatch and ETP species are identified and the main functions of these Components in the ecosystem are understood .
			The impacts of the fishery on these components are well described (see PIs 2.1.1, 2.2.1, 2.3.1). The functions of these components in trophic relationships and in the ecosystem in general are well understood (Savenkoff <i>et al.</i> , 2007; CDEENA, n.d.). The target and retained species are important prey items for a range of predators, although they are not as important as other prey items, notably capelin and other small pelagics. Bycatch species play a range of roles, including as both predators and prey. The two ETP species are predators on benthic invertebrates and on demersal and pelagic fishes.
	d	No	Sufficient information is available on the impacts of the fishery on the Components and elements to allow the main consequences for the ecosystem to be inferred.
			Most impacts on components and elements are relatively well understood. For habitats, an assessment of the need for additional mitigation strategies is required, and a condition has been established to account for this (see PI 2.4.2). The fishery may have an impact on soft corals and sea pens (Colpron <i>et al.</i> , 2010) which could be significant, although this is not considered to be likely to cause serious or irreversible harm.
	e	Yes	Information is sufficient to support the development of strategies to manage ecosystem impacts.
			Information is generally sufficient to support the development of such strategies, and in most cases has been used to develop strategies to manage ecosystem impacts (on bycatch in particular).
References		Bourget <i>et al.</i> , 1994; Bourget <i>et al.</i> , 2003; Brunel <i>et al.</i> , 1998; CDEENA, n.d.; See URL : http://slgo.ca/app-cdeena/en/nord_golfe/ecosystemes.jsp ; DFO, 2012f; DFO, 2012a; Desrosiers <i>et al.</i> , 2000; Dufour and Ouellet, 2007; Dufour <i>et al.</i> , 2010; Grant and Hiscock 2010; Lévesque <i>et al.</i> , 2012; Massad and Brunel 1979; Moritz <i>et al.</i> , 2012 (in press); NEFMC 2011; Savenkoff <i>et al.</i> , 2006; Savenkoff <i>et al.</i> , 2007;	
OVERALL PERFORMANCE INDICATOR SCORE:			90
CONDITION NUMBER (if relevant):			

Evaluation Table: PI 3.1.1

PI 3.1.1		<p>The management system exists within an appropriate legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> • Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; • Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and • Incorporates an appropriate dispute resolution framework. 	
SG	Issue	Met? (Y/N)	Justification/Rationale
60	a	Yes	<p>The management system is generally consistent with local, national or international laws or standards that are aimed at achieving sustainable fisheries in accordance with MSC Principles 1 and 2.</p> <p><i>The framework is comprehensive and well structured, and it provides effective rule-making capable of delivering sustainable use of the shrimp resource and the ecosystem, consistent with MSC principles 1 and 2. The legal and customary framework of the fishery therefore meets the criteria at the SG 60 standard.</i></p> <p>Evidence: <u>Legal and Policy framework</u> Canada has a public policy commitment to the sustainable management of ocean resources and ecosystems (DFO, 2002. Canada's oceans strategy: Our oceans, our future. Policy and Operational Framework for Integrated Management of Estuarine, Coastal and Marine Environments in Canada. Fisheries and Oceans Canada, Oceans Directorate, Ottawa, Ontario. www.dfompo.gc.ca/oceans/publications/cos-soc/pdf/cos-soc-eng.pdf).</p> <p>The legal and policy framework for achieving this at the national, regional and fishery level is a set of enabling Acts and Regulations, and a suite of Frameworks, Policies and Plans, listed in the first part of Section 3.5.3. This framework meets Canadian obligations to international laws and conventions on sustainable use in line with the precautionary and the ecosystem approach. It provides the drivers to manage the resource and ecosystem impacts of the shrimp fishery as one component of the long term aim of achieving integrated management of the Estuary and Gulf of St Lawrence (see for example the St Lawrence Action Plan 2011-2026 http://planstlaurent.gc.ca/en/home.html).</p> <p>With respect to guidance notes CB4.2.2.1 and 2.2.2, DFO Québec, Gulf and Newfoundland-Labrador regions have the following customary responsibilities, structure, practices and processes to deliver sustainable fishery and ecosystem objectives:-</p> <ul style="list-style-type: none"> • <u>Responsibilities:</u> DFO responsibilities are listed in Section 3.5.3 copied from Annex E of the 2002-07 Gulf Shrimp IFMP (DFO, 2005b). • <u>Structure:</u> Section 3.5.3 has a list of the staff and branches responsible for delivering Principles 1, 2 and 3 for the three DFO regions (Québec, Gulf, and Newfoundland-Labrador) relevant to managing the Gulf shrimp fishery. An organisation diagram for Québec Region is shown in Section 3.5.3.

PI 3.1.1		<p>The management system exists within an appropriate legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> • Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; • Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and • Incorporates an appropriate dispute resolution framework. 	
SG	Issue	Met? (Y/N)	Justification/Rationale
			<ul style="list-style-type: none"> • Practices and processes: DFO regional managers work through a consultative and participatory decision-making process based on scientific advice and the activities of the Gulf Shrimp Advisory Committee (GSAC), with fully-representative membership and work practices described in Sections 3.5.4 & 3.5.6 and in PI 3.1.2 The process results in the regulatory measures that are described in Section 3.5.9 and that are enforced by the Conservation & Protection activities described in Section 3.5.10. Individual fishing rights, including those for First Nation communities, are met by stable resource sharing agreements and the allocation of individual quota shares of the TAC, as described in Section 3.5.9 and in the Gulf Shrimp Fishery IFMP (DFO, 2012a). <p>What this system delivers:-</p> <ul style="list-style-type: none"> • Licensed access and fishing rights based on historical dependence, Aboriginal rights, resource sharing agreements, and individual quota shares; • A harvest rate managed by TAC to achieve sustainable fishing, based on scientific advice from stock surveys, assessments, precautionary reference points and harvest rules; • A contribution to the ecosystem approach by operating gear configurations that regulate the fishing pattern, by-catches, and contact with the seabed.
	b	Yes	<p>The management system incorporates or is subject by law to a mechanism for the resolution of legal disputes arising within the system.</p> <p>See SG 100b.</p>
	c	Yes	<p>Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability of the fishery.</p> <p>See SG 100c.</p>
	d	Yes	<p>The management system has a mechanism to generally respect the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.</p> <p>See SG 100d.</p>
80	b	Yes	<p>The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes which is considered to be effective in dealing with most issues and that is appropriate to the context of the fishery.</p> <p>See SG 100b.</p>

PI 3.1.1		<p>The management system exists within an appropriate legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> • Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; • Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and • Incorporates an appropriate dispute resolution framework. 	
SG	Issue	Met? (Y/N)	Justification/Rationale
	c	Yes	The management system or fishery is attempting to comply in a timely fashion within binding judicial decisions arising from any legal challenges.
			See SG 100c.
	d	Yes	The management system has a mechanism to observe the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.
			See SG 100d.
100	b	Yes	The management system incorporates or subject by law to a transparent mechanism for the resolution of legal disputes that is appropriate to the context of the fishery and has been tested and proven to be effective .
			<p><i>The shrimp fishery provides a transparent and effective mechanism for the informal resolution of management disputes within the shrimp fishery, and for formal legal disputes, the Courts provide a mechanism that has been tested and proven to be effective in at least three landmark cases. The regional and national systems meet the criteria at the SG100 standard.</i></p> <p>Evidence</p> <ul style="list-style-type: none"> • There is a customary and transparent process for dealing with disputes at a succession of levels. • As advised by DFO Québec at the site visit, operational or interpretational queries / concerns can be raised with the DFO personnel responsible for each Branch or work stream, whose contact details are readily available. An individual matter can be resolved informally by discussion or education, and where possible this is the preferred route. For compliance issues, Fishery Officers are empowered to operate through education and stewardship in preference to court action. • An issue or dispute with wider implications could be added to the agenda of the GSAC for plenary discussion, or, if necessary, for further exploration by a GSAC working group.

PI 3.1.1		<p>The management system exists within an appropriate legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> • Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; • Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and • Incorporates an appropriate dispute resolution framework. 	
SG	Issue	Met? (Y/N)	Justification/Rationale
			<ul style="list-style-type: none"> • Serious issues unresolved by this process, including those with high level implications, can be referred upwards to, in succession, the Regional Director General; an appropriate person in DFO Ottawa (e.g. Assistant Deputy Minister for Ecosystems and Fisheries Management); and in extreme cases to the highest level, the Fisheries Minister. The Minister may approve or change a decision, or could for example instruct officials to conduct a reconciliation process, as illustrated by the Workshop for Industry–DFO Reconciliation on Scientific Monitoring of the Southern Gulf of St. Lawrence Cod Stock (DFO, 2009a). • Where individuals make serious legal challenges to the management system, or the Federal agencies make serious challenges to an individual, the final step would be resolution by action in the Courts. <p><u>The efficacy of dispute resolution:-</u></p> <ul style="list-style-type: none"> • The effectiveness of <u>informal</u> resolution procedures in the shrimp fishery is inferred from the absence of significant, ongoing, or recurrent disputes on fishery management, allocation, or compliance issues. • The scope for <u>formal</u> resolution of individual disputes in favour of an appellant in the Supreme Court of Canada is illustrated by three landmark fisheries cases : <ul style="list-style-type: none"> ○ In 1990 the Supreme Court of Canada Sparrow Decision found that where an Aboriginal group has a right to fish for food, social, and ceremonial purposes, it takes priority, after conservation, over all other uses of the fishery. This decision is relevant to the allocation of licences and quotas in a fishery, and was a precursor of the development of the Aboriginal Fishing Strategy in 1992. ○ In 1999 the Supreme Court of Canada <i>Marshall</i> Decision affirmed a Treaty right to hunt, fish and gather in pursuit of a moderate livelihood, stemming from Peace and Friendship Treaties of 1760 and 1761. The Decision affected 34 Mi'kmaq and Maliseet First Nations in New Brunswick, Prince Edward Island, Nova Scotia, and the Gaspé region of Québec, and was the touchstone for the development of the Marshall Response Initiative motivating the allocation of fishing licences to First Nation communities. ○ In 2006 the Supreme Court of Canada Case of Larocque (snow crab licence holder) v Canada (Minister of Fisheries and Oceans) found for the appellant on grounds that the Minister did not have powers to finance scientific research activities by selling fishery resources managed by him.
	c	Yes	The management system or fishery acts proactively to avoid legal disputes or rapidly implements binding judicial decisions arising from legal challenges.

PI 3.1.1		<p>The management system exists within an appropriate legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> • Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; • Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and • Incorporates an appropriate dispute resolution framework. 	
SG	Issue	Met? (Y/N)	Justification/Rationale
			<p><i>The management system acts proactively to avoid legal disputes, and shows that it rapidly implements binding judicial decisions, thus meeting the criteria at the SG100 standard.</i></p> <p>Evidence:</p> <p>DFO Québec staff, who are the leading managers for this fishery assert that they and the Gulf Shrimp Advisory Committee are available for individuals who wish to raise problems questions or queries or to seek explanations, and that they consult widely in advance of new legislation or changes to existing regulations and measures, in order to seek local knowledge and to pre-empt problems, disputes or legal disputes.</p> <p>The general practice of Conservation and Protection staff is that unless compliance breaches are very serious the preferred route is to issue guidance, warnings, or fines, rather than to take costly legal action, which is regarded as the action of last resort.</p> <p>Regarding binding judicial decisions, the Sparrow case led DFO to develop the Aboriginal Fisheries Strategy in 1992, and the Marshall case led to the Marshall Response Initiative. As a result, DFO Canada undertook to negotiate fishery agreements giving First Nations the opportunity to succeed as commercial fishers, thereby showing the capacity of the system to respond to critical judicial decisions. By 2011, there were approximately 140 active licences in the Gulf shrimp fishery, of which 7 belonged to First Nations (see also Issue D).</p>
	d	Yes	<p>The management system has a mechanism to formally commit to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.</p> <p><i>Limited entry licensing, TAC-sharing agreements, and individual quota allocation systems implemented under the licensing regulations are formal commitments to the legal rights of dependent fishers including First Nations fishers. The fishery demonstrates a respect for rights consistent with MSC Principles, historical precedent, and new access rules, and meets the SG100 standard.</i></p> <p>Evidence:</p> <ul style="list-style-type: none"> • The Gulf shrimp fishery is managed by a limited entry licensing system that provides legal rights to those dependent on fishing, in the form of a licence and an individual transferable quota share (see Section 3.5.8 of this Report). Licences are conferred and regulated under the 1985 Fisheries Act (Section 7), and the 1996 Commercial Fisheries Licensing Policy for Eastern Canada, of which fishers can obtain a copy at any DFO Licensing Centre.

PI 3.1.1		The management system exists within an appropriate legal and/or customary framework which ensures that it: <ul style="list-style-type: none"> • Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; • Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and • Incorporates an appropriate dispute resolution framework. 	
SG	Issue	Met? (Y/N)	Justification/Rationale
			<ul style="list-style-type: none"> • Under the Aboriginal Fisheries Strategy, First Nation organisations can qualify as new entrants without having to meet criteria related to being full time fishers (2003-2007 Gulf shrimp IFMP: DFO, 2005b), but are, however, subject to the Aboriginal Communal Fishing Licences Regulations (SOR/93-332). • As described in Section 6 of the IFMP (DFO, 2012a), the Gulf Shrimp Advisory Committee has stabilised the proportion of the TAC in each SFA that is distributed to each fleet based on explicit resource sharing formulae agreed in 2009 and derived from a historical base period. The sum of these shares for each fleet is then allocated to individuals in the fleet as transferable quota shares that reflect historical rights but that incorporate modern adjustments. Restrictions governing the transfer of individual quotas within season or permanently are described in Section 3.5.9 of this Report. The TAC that is agreed for each shrimp area, and the quantities distributed to each fleet under the resource sharing agreement, are communicated to each fisherman via the annual Notice To Fish Harvesters, and can also be inspected on request to DFO.
References		DFO, 2002; DFO, 2005b; DFO, 2009a; DFO, 2012a.	
OVERALL PERFORMANCE INDICATOR SCORE:			100
CONDITION NUMBER (if relevant):			

Evaluation Table: PI 3.1.2

PI 3.1.2		<p>The management system has effective consultation processes that are open to interested and affected parties.</p> <p>The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties</p>	
SG	Issue	Met? (Y/N)	Justification/Rationale
60	a	Yes	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are generally understood .
			See SG 100a.
	b	Yes	The management system includes consultation processes that obtain relevant information from the main affected parties, including local knowledge, to inform the management system.
			See SG 100b.
80	a	Yes	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility and interaction.
			See SG 100a.
	b	Yes	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information obtained.
			See SG 100b.
	c	Yes	The consultation process provides opportunity for all interested and affected parties to be involved.
			See SG 100c.
100	a	Yes	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility and interaction.
			<p><i>Organisations and individuals have been identified, and their functions, roles and responsibilities in the Gulf shrimp fishery are explicitly defined and well understood for all areas of responsibility and interaction, and meet the criteria at the SG 100 level.</i></p> <p>Evidence: <u>At the policy level</u>, the Oceans Act 1985 gives DFO the overarching responsibility for sustainable management of fisheries and ecosystems both nationally and regionally. This responsibility is publicly elaborated by Canada's Ocean Strategy (DFO, 2002) and the Oceans Action Plan (DFO, 2005a), and it is usually either cited or implicit at the head of all major framework, policy and plan documents. The following examples are relevant to MSC Principle 1 and Principle 2:-</p>

PI 3.1.2		<p>The management system has effective consultation processes that are open to interested and affected parties.</p> <p>The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties</p>	
SG	Issue	Met? (Y/N)	Justification/Rationale
			<ul style="list-style-type: none"> Current Policy: The Sustainable Fisheries Framework “....., the Sustainable Fisheries Framework is a key instrument in developing environmentally sustainable fisheries that also support economic prosperity in the industry and fishing communities.. ”. Developing Policy: Policy for Managing the Impacts of Fishing on Sensitive Benthic Areas “Recognizing the ecological and biological value of benthic ecosystems and their role in supporting aquatic species that Canadians depend on, it is imperative that these ecosystems are considered when managing oceans activities, including the harvest of fisheries resources. This includes the consideration of target species, non-target species, the ecosystems of which they are a part and the impact of fishing on these ecosystems when making management decisions. <p>This is the basis of an ecosystem approach to fisheries management, which, along with a precautionary approach, is key to the emerging sustainable development framework of Fisheries and Oceans Canada (DFO). Consistent with the Food and Agricultural Organization Code of Conduct for Responsible Fishing, DFO will continue to promote responsible fishing that helps to reduce by-catch and mitigate impacts to habitat anywhere it's biologically justified and cost effective. Canada is also committed, under UN Resolution 61/105, to provide enhanced protection to marine habitats that are particularly sensitive. This policy is about managing fisheries in such sensitive benthic areas. It describes how these areas are identified and the nature of the protection that will be given to them”.</p> <p><u>At the governance level</u> in Canada the ultimate role and responsibility for the management of Fisheries and the Ecosystem rests with the Minister, Deputy Minister and the Sector Heads in Ottawa. Below that, the operational roles and responsibilities reside with DFO at the Regional level. Annex E of the 2002-2007 IFMP (DFO, 2005b) showed clearly-stated roles and responsibilities for DFO Québec Region, as listed in Section 3.5.3 of this Report. Section 3.5.3 showed the operating structure for Québec Region and the senior managers responsible for key work Branches in the Québec, Gulf and Newfoundland-Labrador regions adjacent to the shrimp fishery. The Senior Branch Managers in each region report to their Regional Director General.</p> <p><u>At the fishery-specific level</u>, DFO managers work with the Gulf Shrimp Advisory Committee, whose terms of reference, major functions, and membership groups are copied into Section 3.5.4 of this Report. The role of stakeholders at the Advisory Committee is to represent their interests; to hear and scrutinise proposals for management of the fishery based on scientific or other advice; and to advise DFO Regional Directors based on consensus decisions.</p>

PI 3.1.2		<p>The management system has effective consultation processes that are open to interested and affected parties.</p> <p>The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties</p>	
SG	Issue	Met? (Y/N)	Justification/Rationale
			<p>Day to day monitoring and surveillance of the fishery is supported by the Conservation & Protection Branch as described in Section 3.5.10 and PI 3.2.3. There are clear surveillance and enforcement roles and duties for Fishery Officers on land, at sea and in the air. The Branch is also responsible for specifying the dockside monitoring and observer-at- sea programmes that are contracted out, but whose performance is monitored by DFO.</p> <p><u>At the science level</u>, the Institute Maurice-Lamontagne, Mont Joli, is responsible for</p> <ul style="list-style-type: none"> • carrying out and analysing shrimp stock surveys and demographic sampling; • assessing stock status in SFAs 8,9, 10 and 12 by comparing the main stock indicator to recently agreed lower and upper limit reference points; • providing advice on the TAC based on decision rules, backed by simulation of its intended effect; • assessing the risk of serious or irreversible harm to habitat, by comparing the footprint of the shrimp fishery to the distribution of vulnerable habitat and sensitive benthic organisms and areas.
	b	Yes	<p>The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information and explains how it is used or not used.</p> <p><i>The management system includes consultations at the Gulf Shrimp Advisory Committee and at technical workshops that regularly seek and accept information and local knowledge for Principle 1 and Principle 2 issues, and explain how it is used or not used, so the fishery meets the SG 100 standard.</i></p> <p>Evidence: Formal consultations on the operational management of the Gulf Shrimp Fishery for Principle 1 and 2 issues occur at the Gulf Shrimp Advisory Committee (which has now shifted from an annual to a biennial schedule), periodic technical workshops, and peer review meetings under the DFO Regional Advisory Process. Informal consultations occur routinely between managers, scientists and stakeholders. Details are in Section 3.5.4 of this Report, but the following key points apply:-</p> <ul style="list-style-type: none"> • At the site visit DFO Québec staff emphasised that through the Advisory Committee and technical workshops they consult widely in order to seek opinions and local knowledge in advance of new legislation or changes to existing regulations and measures, thus pre-empting problems, disputes or legal disputes, and that they are readily available for individuals to raise problems questions or queries or to seek explanations. • Fishery Officers are keen to consult with the industry on compliance and enforcement issues, and to educate through day to day personal contact.

PI 3.1.2		<p>The management system has effective consultation processes that are open to interested and affected parties.</p> <p>The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties</p>	
SG	Issue	Met? (Y/N)	Justification/Rationale
			<p>The text for PI 3.1.1 Issue B fully described the customary role of DFO staff and the Advisory Committee in resolving or pre-empting disputes.</p> <ul style="list-style-type: none"> • The Advisory Committee is where scientific advice is presented on the status of the shrimp stock and the ecosystem, and it is where the industry is consulted directly on its views about the TAC and related aspects of the annual management plan, including economic issues, and on new management measures including those currently under development to protect habitat and sensitive benthic areas from the impact of shrimp trawling. • The basis for consensus decisions by the Committee on the advice it gives to DFO is explained, and at the site visit scientists explained that DFO managers will in return explain at subsequent meetings whether or why it was used, or not. The evidence is the assurance from scientists at the site visit but no examples were quoted. In addition, stakeholder Sylvain Samuel (Exec Dir. Association des Capitaines Propriétaires de la Gaspésie, and a regular participant in the Gulf Shrimp Advisory Committee) stated clearly that “There is a transparent adjustment process for the TAC, which allows everyone to understand how/ why the TACs change”. • The Advisory Committee is where DFO managers consult with the industry on revisions to the evergreen IFMP, which is amended progressively over time, and where they consult on the implementation of new national and regional frameworks, policies and plans. • Minutes of the Gulf Shrimp Advisory Committee meetings are available for scrutiny by the public. • There are routine meetings between Producer Associations and the Fish, Food and Allied Workers Union to discuss practical protocols, prices, and day to day operational matters. <p>Examples of relevant technical workshops and RAP meetings for the Gulf shrimp fishery are:-</p> <ul style="list-style-type: none"> • The development of precautionary reference points for the shrimp fishery, and their implementation in the stock assessment, were discussed and reviewed at a RAP meeting in 2011 (DFO, 2012b) and presented at a Gulf shrimp industry workshop held in Québec City on November 29-30 2011. • The development and implementation of an approach to the management of sensitive benthic areas were discussed at a zonal workshop in 2006 (DFO, 2006a) and a RAP peer review meeting in May 2012 (DFO, 2012d). • DFO consulted the industry on the current status and future management of the Gulf shrimp fishery at a two day industry Symposium held in December 2012 (http://www.2012northernshrimpsymposium.ca/?page=&english=1).
	c	Yes	<p>The consultation process provides opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement.</p>

PI 3.1.2		<p>The management system has effective consultation processes that are open to interested and affected parties.</p> <p>The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties</p>	
SG	Issue	Met? (Y/N)	Justification/Rationale
			<p><i>The consultation process provides opportunity and encouragement for all interested parties to be involved and facilitates their effective engagement. The fishery meets this issue at the SG 100 level.</i></p> <p>Evidence:</p> <p>At the Policy level in Canada and the regions, participation is a key theme of the preamble to all framework, policy and plan documents. This is evident from the following excerpt from the Sensitive Benthic Areas policy (the italics are the assessor's).</p> <ul style="list-style-type: none"> From the Policy for Managing Impacts of Fishing on Sensitive Benthic Areas “The fishery is a common property resource to be managed for the benefit of all Canadians, consistent with conservation objectives, the constitutional protection afforded Aboriginal and treaty rights, and the relative contributions that various uses of the resource make to Canadian society, including socio-economic benefits to communities. <i>Shared stewardship is an important part of managing Canada's fisheries resources. As such the Department will promote collaboration, participatory decision-making and shared responsibility with resource users and other stakeholders.</i> Integrated management is an essential aspect of ensuring commercial and non-commercial interests are considered in the planning and management of oceans activities, such as fishing”. <p>Many framework and policy documents contain an Appendix listing the stakeholders and groups that participated in consultations formulating the policy.</p> <p>At the operational level, membership of the GSAC (Section 3.5.4) is wide ranging and representative of all fishery stakeholders. Participation at the Advisory Committee is strong because decisions are taken by consensus rather than by vote. GSAC meetings are also open to the general public. NGOs and ENGOs are not formal members of the Committee but they are invited to attend plenary meetings, although assessors were told that their attendance is in practice irregular owing to the higher priority that ENGOs often assign to groundfish issues. Committee minutes illustrate how industry contributes to the management and co-management of the resource, particularly on decisions about the TAC, resource allocation, and on rationalisation of the fleets, topics that are both highly relevant to maintaining economic viability.</p>
References		DFO, 2002; DFO, 2005a; DFO, 2005b; DFO, 2006a; DFO, 2012b; DFO, 2012d.	
OVERALL PERFORMANCE INDICATOR SCORE:			100

PI 3.1.2		The management system has effective consultation processes that are open to interested and affected parties. The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties	
SG	Issue	Met? (Y/N)	Justification/Rationale
CONDITION NUMBER (if relevant):			

Evaluation Table: PI 3.1.3

PI 3.1.3		The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach	
SG	Issue	Met? (Y/P/N)	Justification/Rationale
60	a	Yes	Long-term objectives to guide decision-making, consistent with the MSC Principles and Criteria and the precautionary approach, are implicit within management policy
			See SG 100a.
80	a	Yes	Clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach are explicit within management policy.
			See SG100a.
100	a	Yes	Clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are explicit within and required by management policy.
			<p><i>There are explicit long term objectives that guide decision-making consistent with Principles 1 and 2 and the precautionary approach, and they are required by the high level national and regional policy documents to which the fishery specific objectives for the shrimp fishery should conform. Management policy meets the SG100 standard.</i></p> <p>Evidence: At the policy level, Canada has a public non-technical Oceans Strategy (DFO, 2002) and Oceans Action Plan (DFO, 2005a). There are numerous Acts and Regulations, and comprehensive and well-structured national and regional frameworks, policies and plans, that provide high level goals for decision making relevant to Principle 1 (fishers rights, including First Nations, and sustainable harvesting of stocks), Principle 2 (sustainable use of the ecosystem), and Integrated Ocean Management. The full list of these Acts, Regulations, Frameworks, Policies and Plans is shown in Section 3.5.3 of the Report.</p> <p>These all provide high level rationales and visions for what is to be achieved, and many of them contain high level objectives for sustainable use of the resource and the ecosystem. Several frameworks and policies contain overviews and lists that specify the need to develop objectives, strategies and methodologies consistent with the precautionary approach and the ecosystem approach to management. Annex 1 illustrates examples excerpted from:-</p> <ul style="list-style-type: none"> • A Policy Framework for the Management of Fisheries on Canada's Atlantic Coast (Principle 1); • The Sustainable Fisheries Framework (Principles 1 and 2); • The Policy for Managing the Impact of Fishing on Sensitive Benthic Areas (Principle 2);

PI 3.1.3		The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach	
SG	Issue	Met? (Y/P/N)	Justification/Rationale
			<p>The following strategic objectives are taken from the Policy Framework for the Management of Fisheries on Canada's Atlantic Coast, and were cited in Section 4.1 of the previous certification report for this fishery (Tavel, 2008):-</p> <ul style="list-style-type: none"> • Developing and adopting a comprehensive risk management framework that incorporates precaution • Developing and adopting ecosystem-based management • Conducting fisheries within an enforceable regulatory framework • Promoting a conservation ethic and responsible harvesting operations <p>The Sustainable Fisheries Framework makes clear the long-term nature of these policy commitments:- "The Framework and its policies will be implemented progressively over time. The phased-in approach will be done according to the priorities identified through fishery planning sessions held across DFO regions beginning in 2009".</p> <p><u>Emerging ecosystem and integrated management policies</u> There is substantial ongoing effort in Eastern Canada to define conservation objectives for Ecologically and Biologically Significant Areas in the Gulf of St. Lawrence (DFO, 2006a; DFO, 2007a; DFO, 2009c), the management of the Gulf of St. Lawrence Large Ocean Management Area (DFO, 2007c), and Integrated Management in the Gulf (Dufour and Ouellet, 2007.)</p> <p><u>Conclusions on Long Term Objectives</u> Summarising from above, management policy in Québec has the following long term goals or objectives, and are required by management policy:</p> <ul style="list-style-type: none"> • an ecosystem approach to managing the impacts of fishing on the resource and the ecosystem based on the precautionary approach and the best available science, • effective allocation of rights to regional fishing fleets, and to First Nations, • sustainable and economically viable harvesting, • management of the impact of fishing in order to avoid irreversible harm to habitat, • effective conservation of sensitive benthic areas, • development in the long term of a network of conservation zones and marine protected areas, • development of long term integrated ocean management for the Gulf of St Lawrence Large Ocean Management Area.
References		Annex 1; DFO, 2002; DFO, 2005a; DFO, 2006a; DFO, 2007a; DFO, 2007c; DFO, 2009c; Dufour and Oullet, 2007.	
OVERALL PERFORMANCE INDICATOR SCORE:			100
CONDITION NUMBER (if relevant):			

Evaluation Table: PI 3.1.4

PI 3.1.4		The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing	
SG	Issue	Met? (Y/P/N)	Justification/Rationale
60	a	Yes	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2.
			See SG 80a.
80	a	Yes	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and seeks to ensure that perverse incentives do not arise.
			<p><i>The management system has incentives that are consistent with achieving the outcomes for Principles 1 and 2, and it seeks to ensure that perverse incentives do not arise. The system meets the criteria at the SG80 standard for this PI.</i></p> <p>Evidence: The following processes and provisions for the Gulf shrimp fishery are conducive to achieving sustainable fishing:-</p> <ul style="list-style-type: none"> • A consultative and co-operative approach to management, including elements of co-management, through participation by all groups in the Gulf Shrimp Advisory Committee, and through the holding of technical workshops and Regional Advisory Process peer reviews, promotes knowledge about the benefits of regulating the fishery and protecting the ecosystem; • Restriction of access rights to those dependent on fishing, through limited entry licensing for the shrimp trawl fishery, including licences for First Nations, reduces competitive overfishing; • A TAC set annually by consultation, but in line with advice based on a stock assessment (formerly annual but now biennial) with precautionary reference points, contributes to economic viability by reducing the risk of overfishing; • A prescribed allocation of the TAC between the different fleets fishing in SFAs 8, 9,10 and 12 is based on a 2009 resource sharing agreement that reduces the risk of illegal fishing by competing sectors; • Allocation of transferable quota shares of the TAC to individual vessels in each fleet reduces the risk of competitive overfishing; • A regular review of the economic performance of the fishery vis a vis changes in stock status, markets and prices, promotes periodic rationalisation of enterprises in order to maintain economic viability; • Effective surveillance of fishing areas, trawl gear, catches and landings, based on VMS, log books, observers, patrols at sea and in the air, hailing in and hailing out, dockside monitoring promotes good compliance with the regulations; • A consultative and educational attitude by the Conservation & Protection Branch, and regular engagement by Fishery Officers on the dockside, promotes education and stewardship and encourages fishers to stay within the rules.

PI 3.1.4		The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing	
SG	Issue	Met? (Y/P/N)	Justification/Rationale
			<p>There are regular operational reviews of management policy at the Gulf Shrimp Advisory Committee and within DFO Branches, so that in general the above provisions are under regular review, but it is unclear whether or not the question of incentives is explicitly raised in these reviews, and hence whether they are explicitly sought.</p> <p>To our knowledge there are no subsidies that contribute to unsustainable fishing or ecosystem degradation, and officials stressed that, based on intelligence sources and Fishery Officers, there were no examples of perverse incentives.</p>
100	a	No	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and explicitly considers incentives in a regular review of management policy or procedures to ensure they not contribute to unsustainable fishing practices.
			There is no evidence the management system explicitly considers incentives during regular review of management policy or procedures.
References			
OVERALL PERFORMANCE INDICATOR SCORE:			80
CONDITION NUMBER (if relevant):			

Evaluation Table: PI 3.2.1

PI 3.2.1		The fishery has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2	
SG	Issue	Met? (Y/P/N)	Justification/Rationale
60	a	Yes	Objectives , which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are implicit within the fishery's management system.
			See SG 100a.
80	a	Yes	Short and long-term objectives , which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery's management system.
			See SG 100a.
100	a	Yes	Well defined and measurable short and long-term objectives , which are demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery's management system.
			<p><i>The Gulf Shrimp Fishery has explicit, well defined and measurable short and long term objectives that are consistent with achieving the outcomes expressed by Principle 1 and Principle 2 for the relevant threats posed by this fishery. The table of objectives contains performance indicators, and the regulatory measures that are used to implement the objectives lend themselves to quantitative measurement. Therefore the fishery meets the criteria at the SG 100 standard.</i></p> <p>Evidence: Long- and short-term management objectives specific to the Gulf shrimp fishery are described in Section 3.5.7 of the Report based on Section 5 of the Gulf Shrimp IFMP (DFO 2012a). Section 9 of the IFMP also contains summary tables, copied below, that show for each objective the expected results, and a performance indicator, thus providing evidence that the objectives are measurable (see also next paragraph). The serial numbers (5.1, 5.1.1, etc) used in the tables below relate to their original location in Section 5 of the IFMP.</p> <p>The fishery and ecosystem objectives shown in the table are put into effect by the comprehensive suite of regulatory measures listed in full in Section 3.5.9 of this Report, most of which are quantitatively measurable. The following category headings illustrate the scope of these measures:</p> <ul style="list-style-type: none"> • Regulation of fishing effort (Principle 1) • Regulation of the harvest rate (Principle 1) • Regulations and practices for individual transferable quotas (Principle 1) • Regulation of the exploitation pattern, species at risk, and groundfish by-catch (Principle 2) • Regulation of the impact of shrimp trawling on sensitive benthic areas. (Principle 2)

PI 3.2.1		The fishery has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2				
SG	Issue	Met? (Y/P N)	Justification/Rationale			
			Objectives		Expected results	Performance indicator
			5.1 Protect the productivity of the shrimp stocks	5.1.1 Maintain the abundance of the stocks in the healthy zone	The stock indicators should be maintained in the healthy zone	Status of the indicators
			Objectives		Expected results	Performance indicator
			5.2 Minimizing the fishery's impact on the ecosystem	5.2.1 Assessing the risks that shrimp trawls cause serious damage to habitat and sensitive benthic communities	The sensitive habitats and benthic species and disturbed areas by trawling are identified	Report and Advice to CSAS
					The risks are assessed (2013) and the mitigation measures are adopted if necessary (GSAC 2014)	Number of infractions
				5.2.2 Assessing the risk of the shrimp fishery causing serious harm to non-targeted species stocks	The importance (number and volume by fishing area and by year) of bycatches is determined by species =	Report and Advice to CSAS
					The risks are assessed (2013) and the mitigation measures are adopted if necessary (GSAC 2014)	Number of infractions
				5.2.3 Monitor the interactions of the fishery with species at risk	The interaction between the fishing activities and species at risk are reported,	Number of species at risk logbooks reported Number of report from observer at sea.

PI 3.2.1		The fishery has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2				
SG	Issue	Met? (Y/P N)	Justification/Rationale			
			Objectives		Expected results	Performance indicator
			5.2 Minimizing the fishery's impact on the ecosystem	5.2.4 Modernizing fishing operations monitoring tools	The electronic logbook is used by all participants in the fishery	Number of harvesters using the electronic logbook
					The vessel monitoring system is used by all participants in this fishery	Number of harvesters using the vessel monitoring
			5.3 Modernize the governance	5.3.1 Reviewing the GSAC's mandate and structure	A new structure will be develop for the GSAC and the mandate will be adjusted	Adoption of the new structure and the new mandate for the GSAC
				5.3.2 Reviewing administrative rules	Create a committee for the administrative rules	Adoption of new administrative rules
				5.3.3 Reducing gear conflicts	Document cases of Gear conflict	Create a new inter-fleet consultative structure and implement mitigation measure if necessary.
			5.4 Supporting economic prosperity	5.4.1 Facilitate the fleet restructuration	Create a new working group who will identify the requested fishery policies flexibility	Fleet is restructured
				5.4.2 Collaboration in the eco-certification works	Involvement in the reassessment process	Certification renewed for 5 years
References		DFO, 2012a.				
OVERALL PERFORMANCE INDICATOR SCORE:						100
CONDITION NUMBER (if relevant):						

Evaluation Table: PI 3.2.2

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives	
SG	Issue	Met? (Y/N)	Justification/Rationale
60	a	Yes	There are some decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives.
			See SG 80a.
	b	Yes	Decision-making processes respond to serious issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions.
			See SG 80b.
80	a	Yes	There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives	
SG	Issue	Met? (Y/N)	Justification/Rationale
			<p>There is a fully established consultative decision making process that results in measures and strategies to achieve the fishery specific objectives and that meets the SG 80 standard.</p> <p>Evidence:</p> <p><u>Policy level</u></p> <p>Most Canadian policy documents formally recommend an open and consultative approach to planning and decision making, and some include formal recommendations on what type of management and decision making process should be adopted (e.g. Section 7 of the Policy for Managing Impacts of Fishing on Sensitive Benthic Areas)</p> <p><u>Regional level</u></p> <p>Final responsibility for priorities and decisions for the shrimp fishery rests with senior regional DFO managers and staff assigned to the various Branches and work streams. Managers at the site visit attested that they follow an open and consultative approach, and work closely with stakeholders at the operational level especially through the Gulf Shrimp Advisory Committee.</p> <p><u>Operational decisions at the Gulf Shrimp Advisory Committee</u></p> <p>The core of the decision making process is the participation of DFO regional managers, scientists, Conservation & Protection personnel, industry and Provincial Government representatives, at meetings of the Gulf Shrimp Advisory Committee which is chaired by the Regional Director for Fisheries and Aquaculture Management for Québec Region. Senior regional DFO managers and staff from Québec, Gulf, and Newfoundland-Labrador regions assigned to the various Branches and work streams were identified in Section 3.5.3, which also described in detail the membership and mandate of the Committee.</p> <p>The aim of the GSAC is to make consensus decisions on what tactical and strategic advice should be given to regional DFO managers for the fishery and the ecosystem taking into account scientific advice based on the precautionary approach, and all available views. Final responsibility rests with DFO managers, and ultimately with the Minister, however.</p>

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives	
SG	Issue	Met? (Y/N)	Justification/Rationale
			<p>The core decision making activities of the GSAC are:</p> <ul style="list-style-type: none"> • Review the performance of the fishery, including reports on monitoring, quota uptake, surveillance, compliance, markets and prices. • Review and discuss with stakeholders the most recent assessment and scientific advice on shrimp stock status and the ecosystem. • Review stakeholder views on the upcoming TAC and related aspects of the annual management plan taking into account the implications of the reference points, harvest rules, fishery economics, and whether or not a TAC constraint is required under the adjustment rules. • Decide by consensus the next TAC and annual management plan, and the need for any further management measures, or changes to the priorities for monitoring and surveillance. • Review and resolve licensing and quota-allocation requirements or disputes, including any quota reconciliation carried over into the new TAC year. • Present and discuss new policies and measures for managing the impact of the shrimp fishery on habitat, sensitive benthic areas, groundfish and species at risk • Periodically discuss and decide on amendment or revision of the evergreen IFMP, and the long term action plan for the shrimp fishery. • Consult with the industry on any new national and regional frameworks, policies, plans, and regulations. DFO seeks opinions and local knowledge in advance of new legislation or changes to existing regulations and measures, in order to pre-empt problems, disputes or legal disputes. • Seek explanations from DFO managers on why or how Committee advice was used or not. <p><u>Frequency of GSAC meetings.</u> Before 2012, the GSAC met annually, but management has now moved to a two year cycle, and the next meeting of the GSAC will not take place until 2014. If required by events, sub-committees and working groups of the Advisory Committee can still meet in the interim year, and fishers workshops and symposia can be organised whenever policy developments dictate. The supporting scientific and advisory report meetings and documents will also move to a two-year cycle, but surveys and the assessment will continue to be carried out annually, and an interim scientific response can be requested if events require or justify it.</p> <p><u>Emergency decisions</u> Contingencies or emergencies requiring action will cause fishers and other stakeholders to meet with their Association, or with DFO Fishery Officers, regional officials, or scientists, to discuss IFCediate points arising, or to request an emergency meeting of the GSAC, after which further action could be taken within existing procedures.</p>

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives	
SG	Issue	Met? (Y/N)	Justification/Rationale
			<p><u>The scientific basis for decisions</u></p> <p>Principles 1. Decisions about management of the harvest rate by TAC</p> <p>Section 3.5.6, and the scoring justification for Issue C, describe in some detail the scientific basis and rationales for decisions about the TAC, using :-</p> <ul style="list-style-type: none"> the main shrimp stock indicator, based on survey abundance and female and male size distributions; precautionary reference points derived from the stock indicator for two reference periods; decision rules that stabilise exploitation rate in the healthy zone, or that reduce it at an increasing rate through the cautious and critical zones in order to promote stock recovery; simulation modelling that investigates the likely utility of the recommended TAC; TAC adjustments in the form of a threshold (no TAC change if the recommended TAC change is <5%) or cap (maximum TAC change to be capped at 15%). <p>Although descriptive, the decision framework is based on the best quantitative information available, and it was fully discussed and agreed by stakeholders following detailed presentations given at an industry workshop in November 2011 (DFO, 2012b).</p> <p>Principle 2 Decisions about managing the impact of shrimp trawling on habitat</p> <p>An assessment of the impact of shrimp trawling on habitat and on sensitive or vulnerable benthic communities in the Gulf has recently been completed (DFO, 2012d; DFO, 2012f; Lévesque <i>et al.</i>, 2012; Savard, 2012c). The impact assessment has taken into account:-</p> <ul style="list-style-type: none"> The distribution and habitat of northern shrimp in the Gulf, based on shrimp catch data; The footprint of fishing effort by decade since 1982, based on log-book and observer-at-sea data; The distribution of benthic communities based on DFO surveys between 2006 and 2009; Studies on the distribution of corals and sponges in the Gulf based on DFO research surveys, in order to determine biomass thresholds for sensitive areas; Assessment of the trawling impact on sensitive or vulnerable benthic communities in the Gulf. <p>Key findings (DFO, 2012f, page 2) are:</p> <p>“The cumulative impact of shrimp trawling has likely been low on sea pen fields and highly diverse benthic communities since the depths targeted for fishing (200 – 300 m) are not optimal depths for the establishment of sea pen fields (>300 m) or highly diverse benthic communities (<200 m).</p> <p>Because sponge aggregations are found in a large range of depths, regular fishing activity may have affected their distribution. Moreover, important concentrations of sponges are observed in</p>

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives	
SG	Issue	Met? (Y/N)	Justification/Rationale
			<p>areas that were intensively fished in the 1980s but where little fishing activity has since been documented. Therefore, some recovery potential seems to be possible after a period of intensive trawling.</p> <p>The likelihood that shrimp fishing activities cause harm to vulnerable or fragile marine ecosystems is low to moderate. High concentrations of sea pens and sponges and habitats suitable for the establishment of highly diverse benthic communities are found on the periphery of traditional fishing grounds. The overlap between trawling activities and these vulnerable or fragile habitats could occur occasionally, as has been the case in the past”.</p> <p>This demonstrates that a coherent evidence-based approach has been taken to prepare for decisions about the management of the shrimp resource (Principle 1) and the impact of shrimp trawling on habitat (Principle 2).</p> <p><u>Check lists</u> The site visit heard several times that DFO managers operate with a detailed fisheries check list that assists in decision making at that level. The assessors were not shown an example of such a list, however.</p>
	b	Yes	<p>Decision-making processes respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.</p> <p>The decision process responds to the serious and important issues in a timely and transparent manner, and it takes into account the wider implications. The decision process meets the criteria at the SG80 standard.</p> <p>Evidence: The Gulf Shrimp Advisory Committee topics highlighted under SG 80a qualify as being ‘serious and important issues’, and the scope of the Committee specifies that the advice must be consistent with established DFO policy, which clearly takes into account the wider implications of a decision. The main business is dealt with in a timely manner because the time scale is determined by the TAC cycle. The Committee is responsive because of the need to agree on the advice by consensus. The Committee is the preferred forum to receive and resolve disputes, which could arise at any time and in any number, and these could clearly be serious and important. The decision process requires that the advice is passed up to DFO Regional managers for decision taking, so that regional managers also deal with the serious and important issues by definition. Managers also work pro-actively to develop new DFO national and regional policies, or to instigate action on them, but it seems likely that these activities are prioritised taking into account either their relevance to the shrimp resource or to the risks posed to the ecosystem by the shrimp fishery.</p>
	c	Yes	Decision-making processes use the precautionary approach and are based on best available information.

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives	
SG	Issue	Met? (Y/N)	Justification/Rationale
			<p>The Shrimp fishery meets the criteria at the SG80 standard</p> <p>Evidence: <u>The policy level</u> At the National and Regional level it is well-established that DFO is committed to implementing resource and ecosystem management policies using the precautionary approach and the best available scientific information. This has been amply demonstrated by excerpts from various frameworks and policies cited earlier in this Report.</p> <p><u>Operational decisions for the Gulf shrimp fishery</u> For Principle 1, Section 3.5.6 of the Report describes the scientific basis for decisions about shrimp stock status based on the application of precautionary reference points to a time series of the main stock indicator, and the use of decision rules to recommend a TAC. A brief summary is:-</p> <ul style="list-style-type: none"> • The assessment (DFO, 2013 and 2012f) defines stock status by comparing a standardised main stock indicator to lower and upper stock reference points that are values of the indicator averaged for two historical periods in the fishery (before and after the decline in the abundance of groundfish predators). The indicator is based on a time series of the best available annual measurement of survey abundance and shrimp size distribution. • Decision rules that are consistent with the precautionary approach aim to maintain a stable exploitation rate (the average for 1990-2010) in the healthy zone, and to reduce it at an increasing rate as stock falls into the cautious or into the critical zone (DFO, 2012b and 2012c). <p>These applications are new, but they are based on a long run of data that are the best available information, and they are fully supported by scientific documentation that has been quality controlled by peer review as part of the Canadian Regional Advisory Process. The use of the precautionary approach reference points and decision rules was agreed by the shrimp industry at a workshop held in November 2011 (DFO, 2012b). The decision rules are based on simulations using a length-based projection model (Desgagné & Savard, 2012) whose results have also been peer reviewed. There is as yet no experience of the stock falling below the upper reference point, however, and hence no experience on how effectively the decision rules will achieve stock recovery should the stock fall into the cautious or the critical zones.</p> <p>For Principle 2, Section 3.5.6 of the Report describes an assessment of the impact of shrimp trawling on habitat and sensitive benthic species in the Gulf of St Lawrence. This is newly completed, and is based on peer-reviewed studies of the distribution of shrimp and shrimp fishing, habitat type, density of corals and sponges, and on the cumulative distribution and intensity of the shrimp fishing footprint (Lévesque et.al. 2012; Savard, 2012c; DFO, 2012d; DFO, 2012f).</p>

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives	
SG	Issue	Met? (Y/N)	Justification/Rationale
			This has been done using the best scientific information currently available, as well as taking fully into account local knowledge from the shrimp fishery. The findings will be discussed in 2013 by managers and stakeholders in order to decide what management actions are required. These decisions will take into account the precautionary concept of avoiding irreversible harm.
	d	Yes	Explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
			See SG 100d.
100	b	No	Decision-making processes respond to all issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
			Based on the documentary evidence from the Gulf Shrimp Advisory Committee, and verbal discussion with DFO officials at the site visit, the assessors are unable to verify that the decision process responds to <i>all</i> issues, and therefore this criterion is not met.
	d	Yes	Formal reporting to all interested stakeholders describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives	
SG	Issue	Met? (Y/N)	Justification/Rationale
			<p>DFO pursues a transparent approach that is very open to the provision of information and explanations about policy, the aims and operations of management, the nature and basis of the decisions taken, and the information and research on which it is based. This contributes to the effective operation of the management system, which is achieved by a suite of regulatory measures that is comprehensive and integrated. This meets the criteria at the SG 100 standard.</p> <p>Evidence:</p> <ul style="list-style-type: none"> DFO pursues effective public and stakeholder consultation on policy changes. The DFO website provides a comprehensive archive of Framework, Policy and Strategy documents that can be accessed by stakeholders wishing to determine whether decisions taken to manage the fishery and the ecosystem conform to Federal and Regional policies and recommended practice. The IFMP is published and provides a comprehensive summary of the management and ecosystem objectives, TAC and quota sharing principles and agreements, and of the fishery monitoring and surveillance systems, including mandatory reporting and recording. The Advisory Committee ensures a high degree of general transparency over decision making. It is a formal setting where DFO managers and scientists explain directly to stakeholders the content and basis for their advice and decisions about stock status, management of the resource, and the habitat. Conservation and Protection officers are present to report on monitoring and surveillance activities and to review enforcement priorities. The assessors understand that C&P Branch compiles a summary of its activities in the shrimp fishery, including any current violations, although the assessors have not yet seen a copy of the full report.
			<ul style="list-style-type: none"> Minutes of the GSAC meetings are recorded and can be consulted. As stated at the site visit, stakeholders are free to contact DFO Québec and other regional managers and divisional staff at any time to raise issues or to seek explanations of policy decisions. The regulatory measures to which the advisory and decision-making processes give rise are listed in detail in Section 3.5.9 of the Report, showing that they are comprehensive and integrated, as required by guidance note CB4.8.3. Fishing licence conditions describe the rules and regulations that fishers must follow, and they can seek guidance on these from Fishery Officers and managers. Science-based decisions are supported by explanations that are publicly available on the DFO website in the form of Research Documents, peer reviewed Scientific Advisory Reports, and Proceedings of formal peer review meetings organised by the Canadian Science Advisory Secretariat Regional Advisory Process. As an example of other forms of scientific communication, the assessors viewed a copy of the detailed Power Point presentation by scientist Louise Savard (Institute Maurice-Lamontagne, Mont Joli) which explained very clearly the use of the reference points and harvest rules in decision making, as well as the simulation testing of the decision rule scenarios.
References			DFO, 2012b; DFO, 2012c; DFO, 2012d; DFO, 2012e; DFO, 2012f; Lévesque et.al. 2012; Savard, 2012c.

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives	
SG	Issue	Met? (Y/N)	Justification/Rationale
OVERALL PERFORMANCE INDICATOR SCORE:			90
CONDITION NUMBER (if relevant):			

Evaluation Table: PI 3.2.3

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with	
SG	Issue	Met? (Y/N)	Justification/Rationale
60	a	Yes	Monitoring, control and surveillance mechanisms exist are implemented in the fishery under assessment and there is a reasonable expectation that they are effective.
			See SG 100a.
	b	Yes	Sanctions to deal with non-compliance exist and there is some evidence that they are applied.
			See SG 100b.
	c	Yes	Fishers are generally thought to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.
			See SG 100c.
80	a	Yes	A monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.
			See SG 100a.
	b	Yes	Sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence.
			See SG 100b.
	c	Yes	Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.
			See SG 100c.
	d	Yes	There is no evidence of systematic non-compliance.
			At the site visit managers stated clearly that the shrimp fishery presents a very low risk of non-compliance and that there is no evidence of <u>systematic</u> non-compliance, thus meeting this issue at the SG80 standard.
100	a	Yes	A comprehensive monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with	
SG	Issue	Met? (Y/N)	Justification/Rationale
			<p>A comprehensive monitoring, control and surveillance system has been implemented in the fishery to the degree that is required by the risk of non-compliance based on previous history. The system has demonstrated a consistent ability to undertake the required monitoring, control and surveillance activities, and to enforce the management measures and rules, thus meeting the criteria at the SG100 standard.</p> <p>Evidence: In Canada the Conservation and Protection Program is mandated to “promote and maintain compliance with legislation, regulations and fishery management measures to achieve the conservation and sustainable use of Canada’s aquatic resources, and the protection of species at risk, fish habitat and oceans” (DFO, 2011c).</p> <p>C&P Branch in Québec Region supported where necessary by the Gulf and Newfoundland-Labrador regions, is therefore responsible for monitoring, surveillance, enforcement, and sanctions related to the acts, regulations and management measures that apply to all the fisheries and fleets operating in the Gulf of St Lawrence area. The compliance principles and operations that apply to the Gulf shrimp fishery are described in Section 8 of the Gulf shrimp IFMP (DFO, 2012a), and in Section 3.5.10 of this report, from which the following list of features is taken:-</p> <p><u>The principles adopted</u></p> <ul style="list-style-type: none"> • Promoting compliance with laws and regulations through education and shared stewardship • Inspection, monitoring and surveillance • Special surveys, or individual investigations of serious or complex violations <p>The effort deployed on individual fisheries is reviewed annually and depends on departmental priorities and a risk analysis for each fishery. Shrimp fishing is generally perceived to present a low risk.</p> <p><u>The rules to be enforced</u></p> <ul style="list-style-type: none"> • Fishers must hold a valid licence and a valid individual quota • Mandatory hailing out before sailing, and must have enough quota for the trip

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with	
SG	Issue	Met? (Y/N)	Justification/Rationale
			<ul style="list-style-type: none"> • Mandatory compliance with mesh size, gear and grid specifications when at sea • Mandatory use of VMS, and compliance with single-fishing-area condition (unless observer on board and quota available in the second area) • Mandatory log book recording of catch and by-catch data • Mandatory hailing-in before landing, and submission of completed log books <p><u>Monitoring and surveillance tools and measures</u></p> <ul style="list-style-type: none"> • Vessel logs complete at end of trip, verified against the recorded landings by 100% coverage of all mobile gear landings by a Dockside Monitoring Programme (DMP) carried out by independent contractors at industry expense, following hailing in. • Observer monitoring at sea of gear, species, catch, by-catch and discards for 5% of average sea-days of each fleet with a quota in each fishing area, at industry expense • Ongoing audit of VMS data for compliance with single area rule • Cumulative audit of log book and landings data for quota uptake purposes** • Audit of observer reports for compliance with by-catch and species at risk rules** <p>**Logbook data including area fished is entered to a data base, and automated programmes check for conformity between the fishing area and the area licensed, backed up by aerial surveillance. Illegalities are also noted in observer reports. At-sea monitoring and surveillance may lead to charges of illegal activity when evidence is found. Aerial surveillance provides evidence of conformity with licence conditions and closed areas.</p> <p><u>Verifications</u></p> <p><u>On shore,</u></p> <ul style="list-style-type: none"> • Fishery Officers monitor hail-outs and hail-ins as an aid in planning enforcement activities; • Fishery Officers conduct licence and landing checks, monitor weigh-outs, verify completed log books, and assess the integrity of the dockside monitoring programme; <p><u>At sea,</u></p> <ul style="list-style-type: none"> • Fishery Officers inspect shrimp vessels to check licences, mesh size and rigging of gear and grate, log book records of catches and by-catches, area restrictions, and to assess observer performance; <p><u>Audit of vessel position using VMS and Aerial surveillance</u></p> <ul style="list-style-type: none"> • Ensures compliance with area entitlement, seasonal and area closures; <p><u>Intelligence:</u></p> <ul style="list-style-type: none"> • Used for investigating reports of large scale fraud and collusion. <p><u>Management of Conservation & Protection</u></p> <ul style="list-style-type: none"> • C&P Branch authorizes VMS service providers, monitors the accuracy of reporting systems, and uses the data for planning surveillance patrols and other investigations;

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with	
SG	Issue	Met? (Y/N)	Justification/Rationale
			<ul style="list-style-type: none"> C&P is the contract authority for at-sea observer services and quality assures the delivery of accurate data and reports as per specification; C&P designates both at-sea and dockside observers (third parties). Designation is subject to an individual meeting background checks and eligibility criteria, and requires the successful completion of exams; C&P monitors the performance of at-sea and dockside observers and may initiate action to revoke the designations of observers found to be deficient in performance. <p><u>Education and Shared Stewardship</u></p> <ul style="list-style-type: none"> Informal interactions are ongoing, but effort of this kind is not recorded on a day to day basis for individual fisheries; Periodic meetings occur with DFO and industry as required to track the annual performance of the fisheries and the C&P programme; to discuss expectations, problems and solutions; and to modify plans and priorities; The advent of a new or amended regulation will trigger increased contact with industry in order to explain what is required, and why, and how it will be enforced; The "Report a Poacher" programme contributes to the effectiveness of the enforcement regime.
	b	Yes	<p>Sanctions to deal with non-compliance exist, are consistently applied and demonstrably provide effective deterrence.</p> <p>Based on evidence discussed at the site visit, a range of sanction are available and have been consistently applied when required, such that few sanctions are now required for this fishery. The fishery meets the criteria at the SG 100 standard.</p> <p>Evidence: For breaches of licence conditions and fishery regulations, sanctions range from guidance and a warning for a first or low level offence, to on the spot fines, a penalty reduction on the length of fishing season available to the miscreant, and finally to possible court action for major cases. The site visit stressed that costly and time-consuming court action is viewed as a blunt tool and a last resort, and that C&P objectives are best secured by informal interactions with industry at wharves, plants, or at sea during day to day monitoring, surveillance and enforcement patrols. The Team was advised at the site visit that violations are publicised on the DFO website and in the newspapers, and that this publicity is an effective deterrent. DFO also stated that the "Report a Poacher" programme was a significant contributor to the effectiveness of the enforcement regime. Consequently the team was assured that few sanctions have been applied in the shrimp fishery, not because of a lack of will or capacity, but because violations are generally rare, mainly involving hailing in or hailing out, and technical issues with VMS equipment. Where infractions have occurred, and warnings or sanctions have been applied, repeat offences are rare.</p>
	c	Yes	There is a high degree of confidence that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with	
SG	Issue	Met? (Y/N)	Justification/Rationale
			<p>The co-management approach ensures that fishers provide the information required for management of the fishery. Despite the relatively low proportion of trips inspected by at-sea observers, the other mandatory aspects of monitoring and surveillance are carried out to target, and officials and enforcement officers are very confident that the shrimp fishery represents a low risk of non-compliance. On this basis the fishery meets the criteria at the SG100 standard.</p> <p>Evidence: Fishers are committed to the collection of ancillary information under co-management agreements, and they contribute financially to the costs of the monitoring programmes.</p> <p>It was asserted at the site visit that Fishery Officers have a high level of confidence that the fishery complies with the management system especially as key aspects such as hailing out and hailing in, use of VMS, the completion of on-board log books, and dockside monitoring of landings, are mandatory, and are comprehensively monitored electronically or on the dockside as part of the dockside monitoring program.</p> <p>As described in Section 3.5.10 of the Report the levels of effort on other aspects of surveillance, such as the number of observer-at-sea trips, boarding at sea by the two available patrol boats, and aerial surveillance, are modest, but this is the result of a risk assessment based on the previous history of low violations. Data from the previous Certification Report (Tavel, 2008) are included in Section 3.5.10.</p>
References		DFO 2011c; DFO 2012a; Tavel 2008.	
OVERALL PERFORMANCE INDICATOR SCORE:			100
CONDITION NUMBER (if relevant):			

Evaluation Table: PI 3.2.4

PI 3.2.4		The fishery has a research plan that addresses the information needs of management	
SG	Issue	Met? (Y/N)	Justification/Rationale
60	a	Yes	<p>Research is undertaken, as required, to achieve the objectives consistent with MSC's Principles 1 and 2.</p> <p>There has been significant research activity in support of current priorities for managing the Productivity and Biodiversity objectives of the Gulf shrimp fishery management system. This has been carried out in a coherent and focused way, mainly by scientists from the Institute Maurice-Lamontagne, Mont Joli. The research has been produced in a reliable and timely fashion and is of a quality that has fully met the needs of managers. The fishery therefore meets the SG 60 standard.</p> <p><u>Evidence:</u></p> <p><u>The Productivity objective</u> Supporting citations for research supporting this objective are listed under SG 100b .</p> <p>In recent years the principal requirement for Gulf shrimp research under this objective has been the designation of trend-based precautionary reference points to improve the assessment of stock status, coupled with the development of decision rules to inform the choice of TAC given to DFO managers by the Gulf Shrimp Advisory Committee. An empirical shrimp stock indicator derived from a long time series of stock abundance and length/sex distribution data has been used to define lower and upper <u>reference points</u> as the average of the stock indicator for stable periods in the shrimp fishery before and after the demise of the groundfish fisheries. The proposed <u>decision rules</u> specify setting a TAC to either maintain exploitation rate (in the healthy zone) or to reduce it at an increasing rate (in the cautious and critical zones). Testing these rules by simulation in order to demonstrate their potential efficacy to stakeholders has required the development of a length-based shrimp projection model. These reference points and decision rules were only implemented recently so they are still on trial and will require ongoing validation, taking into account whatever ecological and oceanographic factors are observed to influence future stock trends. It is not known if research plans have been made for this phase of the work.</p> <p><u>The Biodiversity objective</u> Supporting citations for research supporting the biodiversity objective are listed under SG 100b .</p> <p>The principal requirement for Gulf shrimp research under this objective has been to assess the likely impact of shrimp trawling on habitat and sensitive benthic areas in the Gulf of St Lawrence. This work has utilised specific studies of the distribution of habitat type, corals and sponges, shrimp, and the shrimp fishing effort footprint in the Gulf, but it also takes into account previous research on the impact of trawls and scallop dredges, and generic background documents and research on the identification of sensitive benthic areas and their conservation objectives.</p>

			<p>The utility of using at-sea observer surveys for making inferences about catch composition and discards has also been investigated.</p> <p>Outside of the shrimp fishery itself, researchers have investigated the conservation objectives required to achieve high level objectives for the management of Ecosystems, Large Ocean Management Areas, and for Integrated Management.</p> <p>It is not known what further research plans have been made for future studies under the Biodiversity objective.</p>
	b	Yes	<p>Research results are available to interested parties.</p> <p>See SG 100b.</p>
80	a	No	<p>A research plan provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.</p> <p>Considerable research has been carried out, but the assessors saw no documentary evidence that the Gulf shrimp fishery had or has a formal written strategic Research Plan that provided reliable or timely information for the past work, or any work that is being undertaken now, or is planned to be undertaken to meet future needs. The fishery does not meet the SG80 standard for this issue.</p>
	b	Yes	<p>Research results are disseminated to all interested parties in a timely fashion.</p> <p>See SG 100b.</p>
100	a	No	<p>A comprehensive research plan provides the management system with a coherent and strategic approach to research across P1, P2 and P3, and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.</p> <p>See SG 80a.</p>
	b	No	<p>Research plan and results are disseminated to all interested parties in a timely fashion and are widely and publicly available.</p> <p>Research results are widely disseminated in a timely fashion, and are widely and publicly available, but there is no research plan (see SG80a) and no evidence that a plan is or has been disseminated. The fishery does not meet the SG100 standard.</p> <p><u>Evidence</u></p> <p>There is no evidence that a research plan is disseminated, but the results of policies, research and technical investigations by DFO scientists from Québec and adjacent regions supporting or relevant to the management of the Gulf shrimp fishery have been widely disseminated in the form of the Research Documents, Science Advisory Reports, Regional Advisory Process Proceedings, and Technical Reports on listed below for both the productivity and the biodiversity objectives. Following peer review these become available quickly and publicly on the web pages of the Canadian Science Advisory Secretariat.</p>

			<p>Productivity objective (Principle 1): Reference points, stock assessment, and population modelling.</p> <p><u>Generic</u> DFO 2008. Proceedings of the Precautionary Approach Workshop on Shrimp and Prawn Canadian Stocks and Fisheries; November 26-27, 2008. DFO Can. Sci. Advis. Sec. Proceed. Ser. 2008/031.</p> <p>DFO. 2009a. Proceedings of the precautionary Approach Workshop on Shrimp and Prawn Stocks and Fisheries; November 26-27, 2008. DFO Can. Sci. Advis. Sec. Proceed. Ser. 2008/031.</p> <p><u>The Gulf Shrimp Fishery</u> DFO 2011. Reference points consistent with the precautionary approach for northern shrimp in the Estuary and Gulf of St. Lawrence. DFO Can. Sci. Advis. Sec., Sci. Advis. Rep. 2011/062.</p> <p>Savard, L. and Bourdages H. 2011. Update of the estimation of northern shrimp (<i>Pandalus borealis</i>) biomass and abundance from the trawl survey in the Estuary and the northern Gulf of St. Lawrence in 2010. DFO Can. Sci. Advis. Sec. Res. Doc. 2011/043. iv + 30 p.</p> <p>Savard, L. and Bourdages, H. 2012. Update of the estimation of northern shrimp <i>Pandalusborealis</i> biomass and abundance from the trawl survey in the Estuary and the northern Gulf of St. Lawrence in 2012. DFO Can. Sci. Advis. Sec. Res. Doc. 2012/004. ii + 33 p.</p> <p>Savard, L. 2012. Catches per unit of effort and numbers at length of the northern shrimp commercial fishery in the Estuary and the northern Gulf of St. Lawrence from 1982 to 2011. DFO Can. Sci. Advis. Sec. Res. Doc. 2012/005. ii + 70 p.</p> <p>DFO. 2012. Regional Science Advisory Process on the Precautionary approach reference points and Total Allowable Catch (TAC) adjustments rules for Northern Gulf of St. Lawrence shrimps (<i>Pandalus borealis</i>) Stocks; November 2, 2011. DFO Can. Sci. Advis. Sec. Proceed. Ser. 2011/059.</p> <p>Savard, L. 2012. Stock status indicators and reference points consistent with a precautionary approach for northern shrimp in the Gulf of St. Lawrence. DFO Can. Sci. Advis. Sec. Res. Doc. 2012/006. ii + 29 p.</p> <p>DFO. 2012. Assessment of Shrimp Stocks in the Estuary and Gulf of St. Lawrence in 2011. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2012/006.</p> <p>DFO. 2012. Proceedings of the regional peer review meeting on the Assessment of the Estuary and Gulf of St. Lawrence Shrimp Stocks; January 26, 2012. DFO Can. Sci. Advis. Sec. Proceed. Ser. 2012/015.</p>
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		<p>Savard L. 2012. Distribution of Northern shrimp fishing effort in the Estuary and Gulf of St. Lawrence. DFO Can. Sci. Advis. Sec. Res. Doc. 2012/092. ii+ 21 p.</p> <p>Savard L. and Nozères, C. 2012. Atlas of Shrimps of the Estuary and Northern Gulf of St. Lawrence. Can. Tech. Rep. Fish. Aquat. Sci. 3007: vi + 67 p.</p> <p>DFO 2012. Assessment of the impact of northern shrimp trawling on benthic habitats communities in the Estuary and northern Gulf of St. Lawrence. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2012/054.</p> <p>DFO. 2012. Proceedings of the regional peer review meeting on the assessment of the impact of northern shrimp trawling on habitat and benthic communities in the Estuary and northern Gulf of St. Lawrence; May 17, 2012. DFO Can. Sci. Advis. Sec. Proceed. Ser. 2012/032.</p> <p><u>By-catches</u> Benoit, H.P, and J. Allard, 2009. Can the data from at-sea observer surveys be used to make general inferences about catch composition and discards? Can. J. Fish. Aquat. Sci. 66: 2025–2039</p> <p><u>Ecosystem Management, Large Ocean Management Areas, and Integrated Management</u></p> <p>Dufour, R. and P. Ouellet. 2007. Estuary and Gulf of St. Lawrence Marine Ecosystem Overview and Assessment Report. Can. Tech. Rep. Fish. Aquat. Sci. 2744E : vii + 112 p.</p> <p>DFO 2007b. Guidance Document on Identifying Conservation Priorities and Phrasing Conservation Objectives for Large Ocean Management Areas. DFO Can. Sci. Advis. Sec., Sci. Advis. Rep. 2007/010.</p> <p>DFO. 2007c. Development of Conservation Objectives for Integrated Management in the Estuary and Gulf of St. Lawrence (GOSLIM); February 27 to March 1, 2007. DFO Can. Sci. Advis. Sec. Proceed. Ser. 2007/007.</p>
References		The references are cited in full in the text of this PI.
OVERALL PERFORMANCE INDICATOR SCORE:		70
CONDITION NUMBER (if relevant):		3

Evaluation Table: PI 3.2.5

PI 3.2.5		There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives There is effective and timely review of the fishery-specific management system	
SG	Issue	Met? (Y/N)	Justification/Rationale
60	a	Yes	The fishery has in place mechanisms to evaluate some parts of the management system.
			See SG 100a.
	b	Yes	The fishery-specific management system is subject to occasional internal review.
			See SG 80b.
80	a	Yes	The fishery has in place mechanisms to evaluate key parts of the management system
			See SG 100a.
	b	Yes	The fishery-specific management system is subject to regular internal and occasional external review.
			<p>The shrimp fishery has regular internal and periodic external reviews, and meets the criteria at the SG 80 standard.</p> <p>Evidence: Many of the reviews described under SG 100a are internal reviews by managers of the results of their own activities. The assessors are not aware of any formal mechanism to ensure that the Gulf shrimp fishery management system is reviewed by experts from outside Canada or the Québec region. Nevertheless, following guidance note GCB4. 11.1, it is clear that several of the review processes within Canada qualify as being external because they have components or members that work outside the responsible managing body e.g. the ongoing Advisory Committee (non-DFO stakeholders, and public observers); the RAP (national experts and academics from other regions and departments, plus occasional international experts), as well as reviews by scientific journals (international referees). The proceedings of the national Audit and national Evaluation of the Conservation and Protection Program are clearly external to the regional C&P branches.</p>
100	a	Yes	The fishery has in place mechanisms to evaluate all parts of the management system.
			<p>The fishery reviews all levels and parts of the management system, thus meeting the criteria at the SG100 standard.</p> <p>Evidence: <u>High level Federal Review</u></p>

		<p>Canadian government departments, agencies, and their scientific programmes are subject to periodic internal review and occasional external review of their organisation, core functions and effectiveness by an appropriate high level body or groups of experts. The highest level of external review for shellfisheries in general, by the Auditor General of Canada, took place in 1999 (Anon, 1999). As an example of the review of an individual function, the Conservation and Protection Program was recently reviewed nationally for fitness of purpose and effectiveness as described in two reports (DFO, 2011c; DFO, 2012g) quoted in Section 3.5.10 of this Report.</p> <p><u>Review by DFO Resource managers</u></p> <ul style="list-style-type: none"> • Relevant DFO regional managers periodically review how well the regions implement the wide range of Frameworks, Policies and Plans for managing fisheries and the ecosystem, in order to assess and amend existing and future operations and priorities. The site visit indicated that DFO resource managers use check-lists for progress chasing, gap analysis and priority setting, but an active check list was not available for view. • Specifically for the Gulf shrimp fishery, Section 9 of the IFMP (DFO, 2012a) illustrates a framework for the review of performance, showing objectives, sub-objectives, expected results, and performance indicators. This table was copied into the response for PI 3.2.1. It forms a template for performance evaluation by managers and stakeholders at the Gulf Shrimp Advisory Committee. • The direction and attainments of the management system are reviewed periodically in workshops and symposia held with the shrimp fishing industry, the most recent of which took place in December 2012. <p><u>Review by the Gulf Shrimp Advisory Committee</u></p> <p>The Advisory Committee is where the full range of stakeholders, DFO managers, officials of Provincial governments, and scientists review the short and long term performance of management of the shrimp fishery.</p> <p>e.g.</p> <p>Effectiveness of monitoring and management of the shrimp stock</p> <ul style="list-style-type: none"> • Uptake of quotas and the TAC based on log book and dockside monitoring records. • Performance against other regulatory requirements based on VMS records, log-books, observer reports, inspection at sea, and aerial surveillance. • Status of the shrimp stock measured by the main stock indicator and the precautionary reference points. <p>Review of licensing, resource sharing, and quota allocation issues and disputes</p> <p>Regular review and update of the IFMP, with renewal every five years.</p> <p>Under the guidance notes, the meetings of the Advisory Committee count as being both internal and external since meetings are attended by the public and by stakeholders who are Canadian but are external to DFO</p> <p><u>Review by DFO Compliance and Protection Branch</u></p>
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	b	<p>No</p> <p>The fishery-specific management system is subject to regular internal and external review.</p> <p>The shrimp fishery is regularly reviewed internally by managers, the Gulf Shrimp Advisory Committee, and the Regional Advisory Process. The Regional Advisory Process may include experts and academics from other regions and departments, plus occasional international experts. This qualifies as periodic, but not regular, external reviews (see GCB4.11.1), so that the issue is not met.</p>
References		Anon, 1999; DFO, 2011c; DFO, 2012a; DFO, 2012g; NAFO/ICES, 2012.
OVERALL PERFORMANCE INDICATOR SCORE:		90
CONDITION NUMBER (if relevant):		

Annex 1: Excerpts from Framework, Policy and Plan Documents

A Policy Framework for the Management of Fisheries on Canada's Atlantic Coast

Vision for the Management of the Atlantic Fisheries

The Vision

Objectives

Principles

Conservation and Sustainable Use

Policy Strategies

Developing & Adopting a Comprehensive Risk Management Framework that
Incorporates Precaution

Developing and Adopting Ecosystem-based Management

Conducting Fisheries within an Enforceable Regulatory Framework

Promoting a Conservation Ethic and Responsible Harvesting Operations

Self-reliance

Policy Strategies

Clarifying the Role of Fisheries and Oceans Canada in Supporting Viable Coastal
Communities

Providing Resource Users with a Greater Role in Shaping Social and Economic
Objectives

Stable and Transparent Access and Allocation Approach

Policy Strategies

Uses

Establishing Decision-making Guidelines for Commercial Access and Allocation

Stabilizing Sharing Arrangements in Established Commercial Fisheries

Shared Stewardship

Adopting a More Inclusive Approach to Policy Planning

Enabling Resource Users to Assume More of a Role in Operational Decisions

Facilitating Aboriginal Participation in Policy Planning and Decision Making

Building Capacity to Enable Resource Users to Take on New Responsibilities

Sustainable Fisheries Framework

“The Sustainable Fisheries Framework provides the bases for ensuring Canadian fisheries are conducted in a manner which supports conservation and sustainable use.... The Sustainable Fisheries Framework provides the foundation of an ecosystem-based and precautionary approach to fisheries management in Canada. The Framework comprises two main elements:

(1). **Conservation and Sustainable Use policies** incorporate precautionary and ecosystem approaches into fisheries management decisions to ensure continued health and productivity of Canada's fisheries and healthy fish stocks, while protecting biodiversity and fisheries habitat.

(2) The application of such policies will be implemented into the fisheries management process through various **Planning and Monitoring Tools**. Integrated Fisheries Management Plans identify goals related to conservation, management,

enforcement, and science for individual fisheries; and they describe access and allocations among various fish harvesters and fleet areas. The plans also incorporate biological and socio-economic considerations that are factored into harvest decisions.

The Framework and its policies will be implemented progressively over time. The phased-in approach will be done according to the priorities identified through fishery planning sessions held across DFO regions beginning in 2009. The implementation of the framework, including changes to harvest arrangements, will be the subject of engagement with Aboriginal groups. The Framework will also continue to evolve as new policies and tools are created. The Framework and its policies will be implemented progressively over time.

Policy for Managing the Impact of Fishing on Sensitive Benthic Areas

- Benthic ecosystems are essential components of Canada's oceans environments. They provide habitat, support food webs and are an important source of biodiversity. They also support many aquatic species that play an important social, cultural and economic role in the lives of many Canadians.
- Recognizing the ecological and biological value of benthic ecosystems and their role in supporting aquatic species that Canadians depend on, it is imperative that these ecosystems are considered when managing oceans activities, including the harvest of fisheries resources. This includes the consideration of target species, non-target species, the ecosystems of which they are a part and the impact of fishing on these ecosystems when making management decisions. This is the basis of an ecosystem approach to fisheries management, which, along with a precautionary approach, is key to the emerging sustainable development framework of Fisheries and Oceans Canada (DFO).
- Consistent with the Food and Agricultural Organization Code of Conduct for Responsible Fishing, DFO will continue to promote responsible fishing that helps to reduce by-catch and mitigate impacts to habitat anywhere it's biologically justified and cost effective.
- Canada is also committed, under UN Resolution 61/105, to provide enhanced protection to marine habitats that are particularly sensitive. This policy is about managing fisheries in such sensitive benthic areas. It describes how these areas are identified and the nature of that protection that will be given to them.
- This Policy is guided by the legal and policy framework designed to deliver the management of Canada's fisheries and oceans resources, including the *Fisheries Act*, the *Oceans Act*, and the *Species at Risk Act*, the Oceans Action Plan, and the New Emerging Fisheries Policy, as well as Canada's commitments under several international agreements governing the fisheries and oceans, including the *United Nations Convention on the Law of the Sea*, the *Convention on Biological Diversity*, and the *United Nations Fisheries Agreement*.

The policy is guided by the following principles:

- An ecosystem approach, which considers all of the components of an ecosystem, including benthic populations, communities and habitat, and their linkages, is fundamental to the conservation and sustainable use of Canada's fisheries.
- Conservation of fisheries resources and fish habitat – defined as sustainable use that safeguards ecological processes and genetic diversity for present and future generations – is a key priority of fisheries management decision making.
- The precautionary approach is a fundamental component of an effective risk management strategy. It recognizes that if there is both high scientific uncertainty and a risk of serious or irreversible harm, a lack of adequate scientific information will not be used as a reason for failing to take, or for postponing, cost effective

measures for the conservation or protection of fish or fish habitat that are considered proportional to the likely severity of the risk.

- Management decisions should be based on the best science available – where adequate scientific data are unavailable, efforts should be made to acquire such data;
- The fishery is a common property resource to be managed for the benefit of all Canadians, consistent with conservation objectives, the constitutional protection afforded Aboriginal and treaty rights, and the relative contributions that various uses of the resource make to Canadian society, including socio-economic benefits to communities.
- Benthic ecosystems support aquatic species that play an important social, cultural and economic role in the lives of Canadians and others. Not all benthic areas require equal levels of protection, as not all areas are equally ecologically or biologically significant or vulnerable to particular stressors.
- Shared stewardship is an important part of managing Canada's fisheries resources. As such the Department will promote collaboration, participatory decision-making and shared responsibility with resource users and other stakeholders.
- Management decisions should also take it into consideration, as may be available, Aboriginal traditional knowledge and other local and traditional knowledge.

Annex 2: MSC Variation Request and Response regarding IPI Application and Exemption

Marine Stewardship Council - Variation Request Form V1.3

Date submitted to MSC	12 December 2013
Conformity Assessment Body	Intertek Moody Marine
Fishery Name/CoC Certificate Number	Gulf of St. Lawrence Shrimp Trawl Fisheries
Lead Auditor/Programme Manager	Steve Devitt
Scheme requirement(s) to vary from	CR 27.4.10
Is this variation sought in order to undertake an expedited P1 assessment (CR annex CL)?	No.

1. Proposed variation

This is to request that the MSC consider a variation to the MSC CR v1.3, to approve *Pandalus montagui* as an IPI stock in accordance with CR 27.4.9.1, and an exemption to requirements for this IPI stock under CR 27.4.10.2.

2. Rationale/Justification

The *Gulf of St. Lawrence Shrimp Trawl Fishery* may capture *Pandalus montagui* concurrently in its fishery for *Pandalus borealis* within the area of the fishery in volumes up to 0.12% of the weight of the total catch. The attached analysis demonstrates that the fishery catches low amounts of this IPI species and that that *P. montagui* is relatively abundant and widespread throughout the Gulf of St. Lawrence area. The fishery is unlikely to create a significant impact on the IPI stock as a whole.

3. Implications for assessment (required for fisheries assessment variations only)

The Variation request and MSC response will be communicated in the forthcoming PCDR.

4. Have the stakeholders of this fishery assessment been informed of this request? (required for fisheries assessment variations only)

No.

5. Further Comments

Please see attached IPI analysis.

6. Confidential Information
NA.

EXPEDITED PRINCIPLE 1 ASSESSMENT FOR MAIN RETAINED PRINCIPLE 2 STOCKS

7. Main retained Principle 2 stock(s) for which an expedited Principle 1 assessment is sought	<i>Please list the stocks for which an expedited P1 assessment is sought. These must be stocks assessed in the existing certified fishery as 'main retained species'</i>
8. Evaluation of potential impact on Principle 2	
NA	
9. Evaluation of potential impact on Principle 3	
10. Based on the potential impacts identified in 8 and 9, please list any additions to the expedited assessment requirements given in Annex CL that will be necessary to ensure the fishery is accurately assessed against Principles 1, 2, and 3 with the proposed additional P1 stocks.	
NA	

Ref: 82502

Date: 12 December 2013

Dear Jodi,

Gulf of St. Lawrence Northern Shrimp (*Pandalus borealis*) Fishery Reassessment – IPI application

This is to request that you consider an application to approve *Pandalus montagui* as an IPI stock in accordance with CR 27.4.9.1, and an exemption to requirements for this IPI stock under CR 27.4.10.2.

CR 27.4.9.1

The distribution of *P. montagui* can overlap with that of *P. borealis* in the Gulf of St. Lawrence and may, as a result, be caught in the fishery. Owing to their physical similarities and appearance they are inseparable during the normal fishing operation and practically inseparable during processing (CR 27.4.9.1 a & b) (see figures 1 and 2).

Figure 1 - *Pandalus borealis*



Figure 2 - *Pandalus montagui*



Observer information for the most recent years available (2007-2011) indicates that *P. montagui* made up a maximum of 0.12% of the total catch in this period (DFO, 2012) (Table 1). As such, catches of *P. montagui* in the fishery are < 15% of the total combined weight of target and IPI species (CR 27.9.4.1 c).

Table 1: Bycatch and target species catch in the northern shrimp fishery - maximum and minimum 2000-2011, average 2007-2011, in tonnes. (Sources: northern shrimp catch, Savard, 2012; bycatch amounts, Savard et al., 2012).

	2000-2011 (tonnes)							Ave
Species	Minimum	Maximum	2007	2008	2009	2010	2011	2007-11
Northern shrimp	26236	36055	36055	35734	35983	36302	34280	35670.8
Striped shrimp	0.00	40.59	0.22	0.07	16.91	0.09	40.59	11.58
Pink glass shrimp	0.37	56.30	56.30	1.80	22.00	41.00	7.50	25.72
Capelin	77.25	321.70	87.20	92.70	321.70	156.00	210.60	173.64
Greenland halibut	60.68	121.30	86.30	121.30	64.60	70.80	82.90	85.18
Atlantic herring	23.80	76.32	23.80	25.10	56.70	31.70	66.00	40.66
American plaice	11.00	43.00	19.10	23.10	17.50	39.20	26.20	25.02
Witch flounder	7.30	31.89	13.24	19.17	17.05	19.29	20.20	17.79
Redfishes	9.80	45.82	23.60	26.00	9.80	11.60	10.00	16.20
Atlantic cod	3.10	45.20	4.90	45.20	11.40	3.10	9.00	14.72
Barracudinas	0.72	20.00	4.00	20.00	17.60	10.50	8.50	12.12
Thorny skate	5.00	19.60	7.80	12.00	5.00	19.60	8.30	10.54
Hagfishes	1.42	4.10	2.80	2.80	4.10	3.50	3.70	3.38
Atlantic wolffish	0.01	0.50	0.50	0.06	0.04	0.07	0.10	0.15
Northern wolffish	0.00	0.17	0.17	0.00	0.00	0.02	0.00	0.04
Spotted wolffish	0.00	0.35	0.12	0.00	0.00	0.02	0.08	0.04

The *P. borealis* fishery is the only fishery that uses small enough mesh size to catch *P. montagui* and so it is not subject to any other fishing mortality (CR 27.4.9.1 c).

P. montagui is not an ETP species (CR 27.4.9.1 d) (SARA Public Registry).

The *P. montagui* stock in the Gulf of St. Lawrence has not been MSC certified (CR 27.4.9.1 e).

27.10.4.2

As noted above, *P. montagui* has made up 0.12% of the total catch in highest of the five year period for which data are available, thus is less than 2% of the combined weight of target species and IPI species.

Based on percentages of bycatch species relative to target species weight above, and total weight of target species taken in the most recent years for which catch information is available (2007-2011) (35,670 t/yr), total annual catch of *P. montagui* was approximately 12 t/yr. Biomass estimates for this species are not available for the Gulf of St. Lawrence, but multispecies trawl surveys have shown that although *P. montagui* does not occur in large concentrations like those of *P. borealis*, it is relatively abundant and is distributed as widely as *P. borealis* in the Gulf of St. Lawrence (Savard and Nozères, 2012) (Figures 3, 4). In light of this evidence that the species is relatively abundant and widespread in the Gulf of St. Lawrence, the very small average annual catches of 12 t/yr are not considered to create a significant impact on the IPI stock as a whole.

Figure 3. Biomass (kg/km^2) of *Pandalus borealis* from the 1990-2011 Annual Shrimp Trawl Surveys (source: Savard and Nozères, 2012)

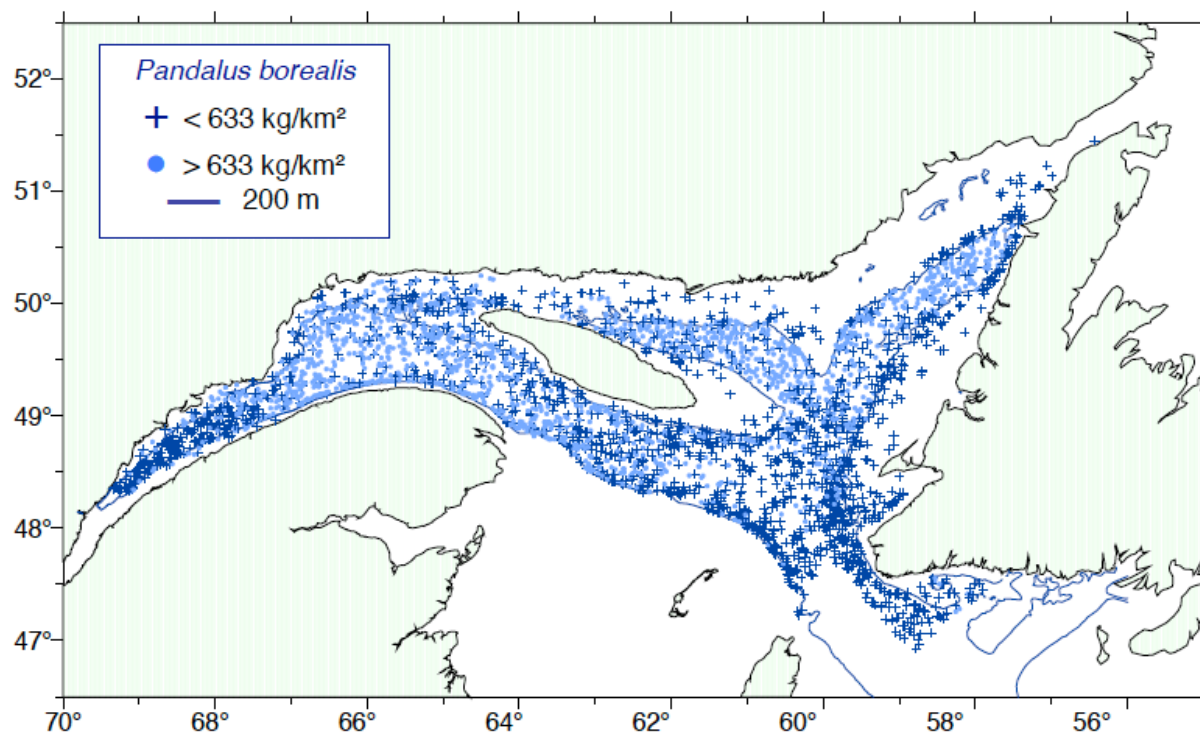
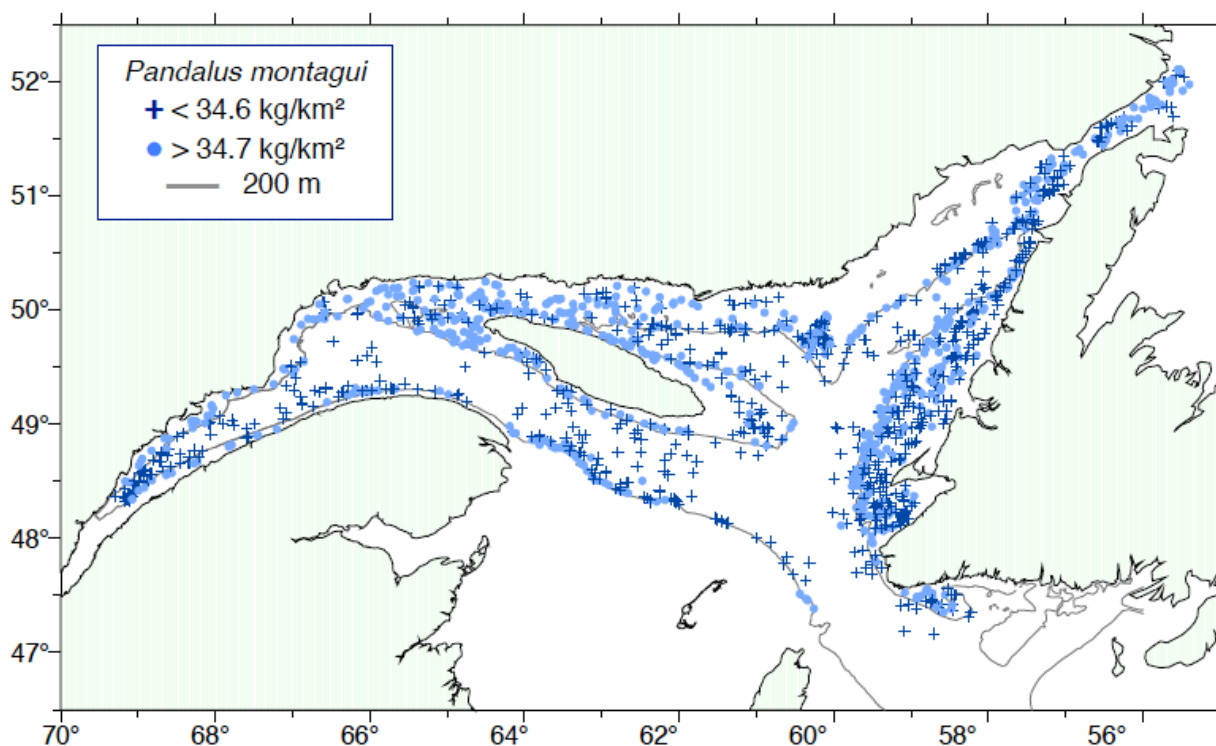


Figure 4. Biomass (kg/km^2) of *Pandalus montagui* from the 1990-2011 Annual Shrimp Trawl Surveys (Source: Savard and Nozères, 2012)



One reason for the low bycatches is the ability of fishermen to target areas where *P. montagui* is relatively uncommon. This species has low market value compared to that of the target species, and a mixture of *P. montagui* into landed catches can lower their value. Accordingly, it is expected that bycatch of *P. montagui* will continue to be low.

Yours sincerely,



Steve Devitt
IMM Lead Auditor

References cited

Savard, L. and Nozères, C. 2012. Atlas of shrimp species of the Estuary and northern Gulf of St. Lawrence. Can. Tech. Rep. Fish. Aquat. Sci. 3007: vi + 67 p.

Savard, L., Gauthier, J., Bourdages, H. and Desgagnés, M. 2013. Bycatch in the Estuary and Gulf of St. Lawrence Northern shrimp fishery. DFO Can. Sci. Advis. Sec. Res. Doc. 2012/151. ii+ 56 p.

SARA Public Registry. www.sararegistry.gc.ca



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Steve Devitt
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DERBY
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UK

Sent by email

Date: 13/12/2013

Subject: Request for variation to the MSC Certification Requirement 27.4.10

Dear Steve Devitt,

I write with reference to your submission on 12/12/2013 of a request for variation to the MSC Certification Requirement (CR) to allow consideration of *P. montagui* as an IPI stock and be exempt from requirements under CR 27.4.10.2 for the Gulf of St. Lawrence shrimp fishery and the Gulf of St. Lawrence Esquiman Channel shrimp fishery.

As you are aware, the CR procedures relating to annual surveillance audit schedule are integral to ensuring all MSC accredited Conformity Assessment Bodies (CABs) operate in a consistent and transparent manner. The MSC intends that these requirements be met across all fisheries and CoC certificate holders, except in exceptional, well-justified circumstances, as part of the MSC programme.

MSC notes the factors presented in your letter supporting your request, including:

- The fisheries may capture *P. montagui* while fishing for *P. borealis* within the area of the fisheries in volumes up to 0.12% of the weight of the total catch. Analysis demonstrates that the fisheries catch low amounts of this IPI species and that *P. montagui* is relatively abundant and widespread throughout the Gulf of St. Lawrence area. The fisheries are unlikely to create a significant impact on the IPI stock as a whole.

Given the rationale provided, the MSC is willing to grant a variation to the CR in this case.



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If you have any questions regarding this response, please do not hesitate to contact me.

Best regards,

A handwritten signature in black ink, which appears to read "David Hoyle". The signature is fluid and cursive, with the first name "David" and the last name "Hoyle" clearly distinguishable.

Fisheries Oversight Director
Marine Stewardship Council

cc: ASI

Appendix 1.2: Conditions

Three conditions, as described below, were raised in the reassessment. The fishery was previously certified based on an old style (pre-MSF FAM) assessment tree. These conditions do relate to similar conditions from the initial assessment however, the specific outcomes required for these performance indicators are different than those initially described in first MSF assessment tree.

Table A1.2: Condition 1

Performance Indicator	2.4.2: There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types
Score	60
SG 60a (met)	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.
Rationale	Measures are in place which would ensure that the fishery does not cause serious or irreversible harm to habitats. Fishing gear is rigged such that doors and footgear (rollers and/or bobbins) are the only parts of the gear in contact with the bottom; netting flies off the bottom. The fishery impacts 4,000-8,000 km ² per year, between 4-8% of the available habitat for northern shrimp concentrations and associated species (DFO, 2012a. Savard et al 2012; see basis for estimate in 2.4.3.), leaving much of the habitat potentially suitable for the target species unimpacted. The fishery does not operate in areas of high habitat complexity (primarily coastal areas) or in areas where sea pens are concentrated (deeper than the fishery depth); sponges concentration areas may have been impacted by the fishery in the past, but are widely distributed in the northern Gulf of St. Lawrence including in areas not impacted by the fishery (DFO, 2012a).
SG 60b (met)	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/habitats).
Rationale	The depth distribution of the fishery ensures that areas of complex habitats and of concentration of sea pens are not impacted, while the geographical distribution of the fishery (4- 8% of habitat suitable for shrimp concentrations impacted in any given year, see 2.4.3) ensure that much of the habitat remains unimpacted. Leaving areas unimpacted by fisheries is the measure most likely to work, in terms of protecting habitat (NEFMC, 2011).
SG 80a (not met)	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.
Rationale	<p>A partial strategy to ensure habitat outcome 80, is not in place in this fishery; in particular there has not been analysis to develop an understanding of how the existing measures work to achieve an outcome and no analysis of potential requirements to change measures should this become necessary has been conducted.</p> <p>As part of its Sustainable Fisheries Framework, DFO has developed a policy on Managing Impacts of Fishing on Sensitive Benthic Areas (DFO, 2009). The policy outlines approaches for assessing risks to sensitive benthic areas from fishing, and for putting protective measures in place where necessary.</p> <p>Although substantial work has been done to map habitats, including sensitive habitats, and the distribution of fishing effort in the fishery area (DFO, 2012a), a partial strategy to manage impacts of the fishery on benthic habitats has not been developed, nor has an assessment of the need for such a strategy been</p>

	conducted. There is a recognition that such a strategy may be required, consistent with the national policy on benthic impacts, and a timeline has been established for conducting a risk assessment and implementing protection measures if necessary (DFO Fisheries Management, pers. comm.).
SG 80b (not met)	There is some objective basis for confidence that the partial strategy will work, based on information directly about the fishery and/or habitats involved.
Rationale	As no partial strategy is in place, this SG is not met.
SG 80c (not met)	There is some evidence that the partial strategy is being implemented successfully.
Rationale	As no partial strategy is in place, this SG is not met.
Condition	<p>By the 3rd surveillance audit, the client must provide evidence that a partial strategy has been developed and implemented and is expected to achieve the Habitat Outcome 80 level of performance, i.e. the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.</p> <p>In addition, by the 4th surveillance audit, the client must provide evidence to demonstrate that there is some objective basis for confidence that the partial strategy will work, based on information directly about the fishery and/or habitats involved.</p>
Milestones	<ul style="list-style-type: none"> For the first annual surveillance audit, the client will have defined the terms of reference for the analysis of how existing measures achieve the Habitat Outcome 80 level of performance, i.e. the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm and contracted a suitable scientist/group for the analysis. The milestone associated with the first surveillance audit has been defined as a means to monitor progress. Meeting this milestone would likely not result in a change in score at this surveillance audit. For the second annual surveillance audit, the client will provide evidence that the analysis is underway, and provide a written report to update the Audit Team. The client will provide the identified measures and rationale supporting the agreement the partial strategy for ensuring that the shrimp fishery does not negatively impact habitats. The milestone associated with this surveillance audit has been defined as a means to monitor progress. Meeting this milestone would likely not result in a change in score at this surveillance audit. For the third annual audit, the client will provide the full analysis as well as confirm the implementation of the partial strategy, if necessary, for the fishery to achieve the Habitat Outcome (PI 2.4.1) SG80 level of performance. Meeting this milestone should demonstrate that SG 80a has been met and would likely result in a score of 70 for this performance indicator. By the fourth surveillance audit, the client will provide evidence to demonstrate that there is some objective basis for confidence that the partial strategy, if necessary, will work, based on information directly about the fishery and/or habitats involved. Meeting this milestone will demonstrate that all scoring issues of the SG 80 have been met and would result in a score of 80 for this performance indicator.
Client action plan	<p>The Client working in conjunction with DFO as the resource manager and other stakeholders will:</p> <ul style="list-style-type: none"> Provide an analysis of potential requirements to change measures

	<p>should this become necessary.</p> <p><u>Deliverables</u></p> <p>First Annual Audit – The client will provide the written terms of reference to the analysis of how existing measures achieve the Habitat Outcome SG 80 level of performance, i.e. the fishery is <u>highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm</u>; evidence that a suitable contractor has been engaged; and, a brief synopsis of work to date.</p> <p>Second Annual Audit – The client will provide evidence that the analysis is underway, and provide a written report to update the Audit Team. Also, the client will identify, if necessary, measures supporting the partial strategy.</p> <p>Third Annual Audit - The client will provide the full analysis indicated above, as well as confirm the implementation of the partial strategy, if necessary, for the fishery to achieve the Habitat Outcome (PI 2.4.1) SG80 level of performance.</p> <p>Fourth Annual Audit - The client will provide evidence to demonstrate that there is a partial strategy, if necessary, in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types and that there is some objective basis for confidence that the partial strategy will work, based on information directly about the fishery and/or habitats involved.</p>
Consultation on condition	IFC consulted and confirmed DFO's support for the Client Action Plan. The letter of support can be seen in Appendix 4.

Table A1.2: Condition 2

Performance Indicator	2.5.2: There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function.
Score	60
SG 60a (met)	There are measures in place, if necessary.
Rationale	<p>(a) For impact of removal of the target species on trophic relationships, see SG 80.</p> <p>(b) For non-catch impacts of the fishery on benthic biodiversity and communities, the main measure in place is geographic limitation of the fishery to between 4% and 8% of the potential area where the benthic communities associated with northern shrimp would occur. Leaving most of the area occupied by these benthic communities unimpacted would ensure that the fishery does not cause serious or irreversible harm to this ecosystem element. This measure is not regulatory but is a function of the mode of operation of the fishery.</p>
SG 60b (met)	The measures take into account potential impacts of the fishery on key elements of the ecosystem.
Rationale	<p>(a) For impact of removal of the target species on trophic relationships, see SG 80.</p> <p>(b) By leaving most of the potential benthic area unimpacted in any given year, the measure takes into account the potential impacts of the fishery on the benthic biodiversity and communities.</p>
SG 60c (met)	The measures are considered likely to work, based on plausible argument

	(e.g., general experience, theory or comparison with similar fisheries/ecosystems).
Rationale	<p>(a) The measures to protect trophic relationships are based on experience with pandalid fisheries in other parts of North America, and on past experience in the fishery area, and thus are considered likely to work. There has been no indication from the extensive work on ecosystem changes in the northern Gulf of St. Lawrence over the past 2+ decades that fishery removals of shrimp are a significant factor in ecosystem changes (see references in PI 2.5.3).</p> <p>(b) The measures in place to protect benthic biodiversity and community structure are considered likely to work based on knowledge of the distribution of the fishery and of benthic communities in the fishery area (see references in PI 2.5.3). Given the likely recovery time of benthic organisms which are impacted by fisheries on mud bottoms, generally of 5 years or less (e.g. NEFMC, 2011), and the fact that most of the potential bottom area is unimpacted in any given year, it appears plausible that the geographic limitation of fishing effort in effect would be successful in ensuring that the fishery does not cause serious or irreversible harm to benthic biodiversity or communities. Leaving portions of benthic communities unimpacted by fishing, and allowing time for recovery between fishing periods, are generally considered to be appropriate means of reducing trawl non-catch impacts on bottom communities (NEFMC, 2011).</p>
SG 80a (not met)	There is a partial strategy in place, if necessary.
Rationale	<p>A partial strategy, if necessary, would include an analysis of existing measures in order to develop an understanding of how those measures work to achieve an outcome and an awareness of the need to change measures should they cease to be effective.</p> <p>(a) The potential impact of removal of the target species on availability of prey for predators was considered in setting the limit reference point (LRP) for this fishery (DFO, 2011f). The LRP was set at a level which allowed abundance of the shrimp population to increase at a time when predators were abundant, ensuring that the fishery will be closed or severely limited when abundance declines to a low level, which historically had allowed for predators to have adequate prey. Managing this fishery based on this LRP is a partial strategy for managing the impact of the fishery on prey abundance.</p> <p>(b) For non-catch impacts on benthic biodiversity and communities, there has not been an assessment of whether a strategy is necessary, and no strategy is in place.</p>
SG 80b (not met)	The partial strategy takes into account available information and is expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.
Rationale	<p>(a) The strategy to ensure that removals of the target species do not prejudice trophic relationships is based on information from the fishery area (LRP set at a level at which shrimp were playing a role in trophic relationships) and from pandalid fisheries in other areas. The strategy is expected to maintain shrimp at abundance levels which will allow the species to continue to play its trophic role, and thus to ensure that serious or irreversible harm is not caused to the ecosystem.</p> <p>(b) For non-catch impacts on benthic biodiversity and communities, no strategy is in place.</p>
SG 80c (not met)	The partial strategy is considered likely to work, based on plausible argument

	(e.g., general experience, theory or comparison with similar fisheries/ecosystems).
Rationale	As noted (SG 60c) the measures in place work but there is not partial strategy in place.
SG 80d (not met)	There is some evidence that the measures comprising the partial strategy are being implemented successfully .
Rationale	<p>(a) TACs (the principal measure for implementing the strategy to protect trophic relationships) are closely adhered to in this fishery, based on a comprehensive catch monitoring and surveillance and protection system (DFO, 2012f).</p> <p>(b) For non-catch impacts on benthic biodiversity and communities, no strategy is in place.</p>
Condition	<p>By the 4th surveillance audit, the client must provide evidence that a partial strategy has been developed and successfully implemented which takes into account available information and is expected to restrain impacts of the fishery on the the benthic biodiversity and communities elements of the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.</p> <p>The client must provide evidence to demonstrate that the partial strategy, if necessary, is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).</p>
Milestones	<ul style="list-style-type: none"> By the first annual audit, the client must provide a written report of activities to identify whether measures in place are adequate such that the shrimp fishery does not negatively impact benthic biodiversity and communities. If it is concluded that a partial strategy is needed, the client will report on what additional measures are being considered . The milestone associated with the first surveillance audit has been defined as a means to monitor progress, meeting the milestone would likely not result in a change in score at this surveillance audit. By the second annual surveillance audit, the Client will provide evidence, if necessary, that measures have been identified and agreed that will comprise the partial strategy for ensuring that the shrimp fishery does not negatively impactbenthic biodiversity and communities. The milestone associated with the second surveillance audit has been defined as a means to monitor progress, meeting the milestone would likely not result in a change in score at this surveillance audit. By the third surveillance audit, the client will provide evidence that a partial strategy has been successfully implemented that takes into account available information and is expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem outcome defined in the SG80 of PI 2.5.1, i.e. The fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm. Meeting this milestone should demonstrate that SG 80b and 80d have been met and would likely result in a score of 70 for this performance indicator. By the fourth surveillance audit, the client will provide evidence to demonstrate that the partial strategy, if necessary, is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems). Meeting this milestone will demonstrate that all scoring issues of the SG 80 have been met and would result in a score of 80 for this performance indicator.
Client action plan	<p>The client, working in conjunction with DFO as the resource manager and other stakeholders, will:</p> <ul style="list-style-type: none"> Develop an appropriate partial strategy re. non-catch impacts on

	<p>benthic biodiversity and community structure. The potential impacts of the fishery on these ecosystem components will be considered and if necessary measures put in place to address potential impacts;</p> <ul style="list-style-type: none"> • Ensure a partial strategy based on available information is in place to ensure that impacts on benthic biodiversity and community structure are within acceptable limits; and • Ensure a partial strategy is in place to manage non-catch impacts on benthic biodiversity and community structure. <p><u>Deliverables</u></p> <p>First Annual Audit – The client will provide a written report of activities, by a suitable contractor, to identify whether measures in place are adequate such that the shrimp fishery does not negatively impact benthic biodiversity and communities. If it is concluded that a partial strategy is needed, the client will report on what additional measures are being considered.</p> <p>Second Annual Audit – If a partial strategy is found necessary, the client will develop an appropriate partial strategy re. non-catch impacts on benthic biodiversity and community structure. The potential impacts of the fishery on these ecosystem components will be considered and if necessary measures put in place to address potential impacts.</p> <p>Third Annual Audit - DFO will apply the <i>Ecological Risk Assessment Framework</i> identified within its <i>Policy for Managing the Impacts of Fishing on Sensitive Benthic Areas</i> and the client will provide written evidence to confirm a partial strategy, based on available information, is in place to ensure that impacts on benthic biodiversity and community structure are within acceptable limits.</p> <p>Fourth Surveillance Audit - The client will provide evidence to confirm a partial strategy is in place to manage non-catch impacts on benthic biodiversity and community structure; and that the partial strategy is considered likely to work, based on plausible argument.</p>
Consultation on condition	<p>IFC consulted and confirmed DFO's support for the Client Action Plan. The letter of support can be seen in Appendix 4.</p> <p>I</p>

Table A1.2: Condition 3

Performance Indicator	3.2.4: The fishery has a research plan that addresses the information needs of management.
Score	70
SG 60a (met)	Research is undertaken, as required, to achieve the objectives consistent with MSC's Principles 1 and 2.
Rationale	<p>There has been significant research activity in support of current priorities for managing the Productivity and Biodiversity objectives of the Gulf shrimp fishery management system. This has been carried out in a coherent and focused way, mainly by scientists from the Institute Maurice-Lamontagne, Mont Joli. The research has been produced in a reliable and timely fashion and is of a quality that has fully met the needs of managers. The fishery therefore meets the SG 60 standard.</p> <p><u>Evidence:</u></p> <p><u>The Productivity objective</u> Supporting citations for research supporting this objective are listed under SG 100b .</p>

	<p>In recent years the principal requirement for Gulf shrimp research under this objective has been the designation of trend-based precautionary reference points to improve the assessment of stock status, coupled with the development of decision rules to inform the choice of TAC given to DFO managers by the Gulf Shrimp Advisory Committee. An empirical shrimp stock indicator derived from a long time series of stock abundance and length/sex distribution data has been used to define lower and upper <u>reference points</u> as the average of the stock indicator for stable periods in the shrimp fishery before and after the demise of the groundfish fisheries. The proposed <u>decision rules</u> specify setting a TAC to either maintain exploitation rate (in the healthy zone) or to reduce it at an increasing rate (in the cautious and critical zones). Testing these rules by simulation in order to demonstrate their potential efficacy to stakeholders has required the development of a length-based shrimp projection model. These reference points and decision rules were only implemented recently so they are still on trial and will require ongoing validation, taking into account whatever ecological and oceanographic factors are observed to influence future stock trends. It is not known if research plans have been made for this phase of the work.</p> <p><u>The Biodiversity objective</u></p> <p>Supporting citations for research supporting the biodiversity objective are listed under SG 100b .</p> <p>The principal requirement for Gulf shrimp research under this objective has been to assess the likely impact of shrimp trawling on habitat and sensitive benthic areas in the Gulf of St Lawrence. This work has utilised specific studies of the distribution of habitat type, corals and sponges, shrimp, and the shrimp fishing effort footprint in the Gulf, but it also takes into account previous research on the impact of trawls and scallop dredges, and generic background documents and research on the identification of sensitive benthic areas and their conservation objectives.</p> <p>The utility of using at-sea observer surveys for making inferences about catch composition and discards has also been investigated.</p> <p>Outside of the shrimp fishery itself, researchers have investigated the conservation objectives required to achieve high level objectives for the management of Ecosystems, Large Ocean Management Areas, and for Integrated Management.</p> <p>It is not known what further research plans have been made for future studies under the Biodiversity objective.</p>
SG 60b (met)	Research results are available to interested parties.
Rationale	See SG 100b.
SG 80a (not met)	A research plan provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.
Rationale	Considerable research has been carried out, but the assessors saw no documentary evidence that the Gulf shrimp fishery had or has a formal written strategic Research Plan that provided reliable or timely information for the past work, or any work that is being undertaken now, or is planned to be undertaken to meet future needs. The fishery does not meet the SG80 standard for this issue.
SG 80b (met)	Research plan and results are disseminated to all interested parties in a

	timely fashion.
Rationale	See SG 100b.
Condition	By the 2 nd surveillance audit the client must provide evidence that a documented and approved research plan has been completed to provide the management system with a strategic approach to research, and reliable and timely information sufficient to achieve the objectives consistent with both MSC Principle 1 and Principle 2.
Milestones	<ul style="list-style-type: none"> By the first annual surveillance audit, the client will provide a draft strategic research plan that is required to achieve the objectives consistent with MSC Principles 1 and 2. The milestone associated with the first surveillance audit has been defined as a means to monitor progress, meeting the milestone would likely not result in a change in score at this surveillance audit. By the second annual surveillance audit, the client will provide evidence that the documented strategic research plan required to achieve the objectives consistent with MSC Principles 1 and 2 has been completed and adopted. Meeting this milestone will demonstrate that all scoring issues of the SG 80 have been met and would result in a score of 80 for this performance indicator.
Client action plan	<p>By the first annual surveillance audit, the client, working with DFO and other stakeholders(ex. Catch sector, research institutes, provinces) will prepare a draft strategic research plan to achieve the objectives consistent with MSC Principles 1 and 2.</p> <p>By the second annual surveillance audit, the research plan will be integrated in the Gulf shrimp IFMP.</p>
Consultation on condition	IFC consulted and confirmed DFO's support for the Client Action Plan. The letter of support can be seen in Appendix 4.

Appendix 2: Peer Review Reports

Peer Reviewer 1

Overall Opinion

<i>Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?</i>	Yes/No	Conformity Assessment Body Response
Yes		
<u>Justification:</u> The team's recommendation in the Executive Summary that the fishery be recertified against the MSC Standard is well supported by the assessment report.		

<i>Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe?</i>	Yes/No	Conformity Assessment Body Response
Yes		
<u>Justification:</u> <p>Wording of Condition 1 in Section 6.3 makes it clear enough what is expected, as per the evaluation table. However, guidance regarding what might constitute a "partial strategy" would be helpful. Something along the lines of what is included in the 100a rationale for PI 2.1.2, with a little elaboration in the context of this fishery, would serve the client well. A fair bit of "strategy" is already in place, the real challenge is the clear evidence part. However, the timeframe provided should be adequate. The 80a rationale for PI 2.4.2 indicates a risk assessment is to be conducted and protection measures implemented if necessary. This should provide the basis for satisfying SG 80 scoring issues.</p> <p>Wording of Condition 2 makes it clear enough what is expected. Guidance/elaboration as above for Condition 1 would be helpful. The risk assessment, etc referred to above will undoubtedly include the ecosystem element that is the focus of this condition and provide the basis for satisfying SG 80 scoring issues within the timeframe provided.</p> <p>Wording of Condition 3 makes it clear what is expected. Closing this condition presumably requires little more than formal documentation of the long-standing practice and including it in the IFMP.</p> <p>Section 6.3 should include reference to Appendix 1.2 where conditions are considered in much greater detail.</p>		<p><i><u>MSC guidance on setting conditions is that wording should refer to the PI and the expected outcomes whilst leaving the client sufficient independence to define their action to meet the condition. Accordingly, we have not provided more detailed guidance in the "Summary of Conditions" (Section 6.3). As noted by the reviewer (below), Appendix 1 provides more detail on generally what would be expected to meet the condition. Additional text has also been added to the scoring rationale (both in the scoring table and Appendix 1.2) of Condition 1 and 2 to clearly define the elements of a partial strategy.</u></i></p> <p><i><u>Again, guidance on how to meet the condition is not recommended by the MSC Certification Requirements, however, further elaboration on the condition is found in Appendix 1.</u></i></p> <p><i><u>No response required.</u></i></p> <p><i><u>This has been done.</u></i></p>

If included:

<i>Do you think the client action plan is sufficient to close the conditions raised?</i>	Yes/No	Conformity Assessment Body Response
<p><u>Justification:</u></p> <p>Condition 1: Deliverables of the client action plan are consistent with established milestones and should close the condition. Terms of reference for the analysis required at the 1st audit should provide sufficient details for the audit team to judge whether the plan is likely to be successful. In particular, clear indication should be provided regarding how the requirement of the 4th deliverable for “information directly about the fishery” is to be addressed. Some wording, however, is confusing. The 1st sentence of 4th milestone, repeated in 4th deliverable, reads “.....partial strategy, if necessary,.....”. SG 80 scoring issues make it clear that a partial strategy is necessary. What this condition is about is evaluation (i.e. the analysis) of impacts under existing measures to determine if additional measures are required, etc. This should be more clearly reflected in wording of the bullet preceding the deliverables.</p> <p>Condition 2: Deliverables are consistent with the established milestones and should close the condition. As above, confusion regarding necessity of a partial strategy and precisely what the condition is about, reflected in the wording of the 1st and 4th milestones and in the 1st and 2nd deliverables, should be eliminated.</p> <p>Condition 3: Achieving the deliverables and closing this condition should be fairly straightforward.</p>		<p><i>The client will be informed of the reviewer’s recommendations. The team’s perspective is that the TOR will be evaluated at the first surveillance audit and, if necessary, clarifications requested to ensure that the proposed work will meet the outcome expectations.</i></p> <p><i>Additional text has been added to the scoring rationale under both Appendix 1.1 (Scoring Table) and Appendix 1.2 (Conditions) for both Condition 1 and 2. The text essentially clarifies the elements of partial strategy.</i></p>

General Comments on the Assessment Report (optional)

In the Executive Summary and Section 3.3.2, as well as the client list, it is clear that SFA 8 is part of this recertification. However, in Section 3.5.1 it states that Esquiman Channel (SFA 8) is NOT part of this certification. Presumably this is an inadvertent carry over from the original certification report for the other SFAs done prior to SFA 8. The “not” in question is flagged.

IFC Response: SFA 8 is part of this recertification exercise. The last sentence of the second paragraph in Section 3.5.1 on page 32 has been deleted.

Sections 3.5.1 – 3.5.3 make it clear that 5 provincial governments are included among stakeholders in this fishery and that 3 DFO Regions are involved in its management, although Quebec Region has the lead. Principle 3 rationales in the evaluation table occasionally refer back to these sections, however, the distinct impression is left that Quebec (DFO Region and provincial government) has exclusive responsibility. DFO Gulf and NL Regions would necessarily be heavily involved in monitoring, surveillance and control activities in certain areas. It seems appropriate that this be better reflected.

IFC Response: In response to this regions issue, small wording changes have been made to the C&P section on page 52, and to PIs 3.1.1; 3.2.2; 3.2.3; and 3.2.5 to reflect that management of the fishery involves the three DFO regions, Quebec, Gulf and Newfoundland-Labrador.

Comments are minor. Places where some editing is required are flagged throughout the report and evaluation tables.

Overall, the report provides a solid basis for the team's recommendation to recertify the fishery.

Performance Indicator Review

Please complete the table below for each Performance Indicator which are listed in the Conformity Assessment Body's Public Certification Draft Report.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.1.1	Yes	Yes	NA	No further comment.	No response required.
1.1.2	Yes	Yes	NA	No further comment.	No response required.
1.1.3	NA	NA	NA	NA	Not scored, no response required.
1.2.1	Yes	Yes	NA	No further comment.	No response required.
1.2.2	Yes	Yes	NA	100b – While the TAC decision-making process seems quite robust, there is no risk analysis per se – a point worth noting. Can the simulation model be considered an alternative?	Clarification text has been added to SG100b - After "(SG 80b)", the following text was inserted "no risk analysis has been performed and, therefore, it cannot be said". The assessment team noted that it would not accept the simulation model as an alternative, given that the assessment model is under development. It is our understanding that both models would be used to address uncertainty and provide capability for probabilistic evaluation of stock status.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.2.3	Yes	Yes	NA	No further comment.	No response required.
1.2.4	Yes	Yes	NA	100c – the rationale provided here is relevant to the question posed in 1.2.2 above.	See response to 1.2.2 above.
2.1.1	Yes	Yes	NA	If there are no “main” retained species, as per the definition, the 60/80 issues do not apply. Only 100 issues are applicable.	No response required.
2.1.2	Yes	Yes	NA	The 80c rationale was not completed.	This should read “See SG 100c”, similar to the two previous SGs - this was left out by inadvertence. Text has been corrected.
2.1.3	Yes	Yes	NA	The 60a,c and 80a,c issues pertain to “main” retained species and not applicable.	The text in SG 60a, c and SG 80a, c is intended to support the case that the only retained species does not qualify as a “main” bycatch species.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.2.1	Yes	Yes	NA	60a and 80a are not applicable. Suggest NA under Met? for each and move 80a rationale to 80b.	No species meets the weight or value criteria for a "main" bycatch species, several are considered vulnerable (depleted) and are thus considered "main". We believe that the text is appropriate as written.
2.2.2	Yes	Yes	NA	No further comment.	No response required.
2.2.3	Yes	Yes	NA	80a – COSEWIC designations, which are terms broadly recognized as applying to species rather than populations/stocks, are misleading and unnecessarily confusing here. In the context of the MSC definition of "main" bycatch species, the DFO assessments of stock status, presumably in relation to reference points, for various groundfish species would be the appropriate references.	The team agrees that the DFO assessments (cited in 80b) are to be taken as the best assessments of current status of the specific stocks, however, these are not done in relation to reference points and thus do not indicate that the species are "vulnerable" in the MSC sense (depleted). The COSEWIC assessments are referred to here to indicate that the species are depleted and vulnerable, thus are to be considered "main" bycatch species. The team is satisfied that the scoring methodology has been met.
2.3.1	Yes	Yes	NA	No need for any rationale in 60a, suggest moving what's there to 100a.	Comment accepted, text revised accordingly.
2.3.2	Yes	Yes	NA	No further comment.	No response required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.3.3	Yes	Yes	NA	Rationale in 60a could be moved to 80a.	Comment accepted, text revised accordingly.
2.4.1	Yes	Yes	NA	No further comment.	No response required.
2.4.2	Yes	Yes	Yes	See comments regarding Condition 1 above.	See response to comment on Condition 1.
2.4.3	Yes	Yes	NA	See comment re sentence in 80b rationale in evaluation table.	The sentence in question, (penultimate sentence in first paragraph of scoring rationale 80b) has been verified. The team confirms it is written as appropriate - the results of studies on trawling impacts cited in this review are rather contradictory and so the sentence reads oddly.
2.5.1	Yes	Yes	NA	No further comment.	No response required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.5.2	Yes	Yes	Yes	80c rationale – reference back to 60c (measures) doesn't make it clear why this scoring issue (partial strategy) is not met. See further comment regarding Condition 2 above.	<p>We have clarified this by modifying the text in this SG. The new scoring rationale states: "As noted (SG 60c) the measures in place work but there is no partial strategy in place."</p> <p>Under 80a, we have also inserted a paragraph which states: "A partial strategy, if necessary, would include an analysis of existing measures in order to develop an understanding of how those measures work to achieve an outcome and an awareness of the need to change measures should they cease to be effective." This should clarify what the elements of a partial strategy are.</p>
2.5.3	Yes	Yes	NA	No further comment.	No response required.
3.1.1	Yes	Yes	NA	No further comment.	Small text changes on P141 & 145 regarding the regions issue
3.1.2	Yes	Yes	NA	No further comment.	No response required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.1.3	Yes	Yes	NA	No further comment.	No response required.
3.1.4	Yes	Yes	NA	No further comment.	No response required.
3.2.1	Yes	Yes	NA	No further comment.	No response required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.2.2	Yes	Yes	NA	If 80b deals with “serious and other important issues”, the “all” of 100b presumably pertains to or includes unimportant issues which would naturally be resolved informally and go undocumented. Regardless, evidence to satisfy this issue likely doesn't exist for any fishery. Rigid interpretation of this and a number of other scoring issues reflects a degree of hair-splitting that makes no sense and detracts from the overall process.	<p>For clarity, the team will rephrase the scoring comments for 100b on p 164 to: 'Based on the documentary evidence from the Gulf Shrimp Advisory Committee, and verbal discussion with DFO officials at the site visit, it is clear that the most serious and important issues are dealt with, but the assessors were unable to verify that the decision process responds to <i>all</i> issues, and therefore this criterion is not met'.</p> <p>On the reviewers specific comments, the team was not striving to be over rigid. It does not agree that the word 'all' necessarily means that the extra issues in 100b are of such lesser importance that they could go unrecorded, but be taken as read. The team genuinely felt that it had clear evidence that the most serious and important stock and habitat issues are addressed, justifying the 80 score, but it was not comfortable that it could cite evidence to go beyond that. It still feels that way; and that the score should stand as it is, albeit with the word changes proposed above. The overall final score of 90 for this PI is still a good score.</p>

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.2.3	Yes	Yes	NA	No further comment.	Small text changes on p167 regarding the regions issue
3.2.4	Yes	Yes	Yes	See comment re Condition 3 above.	
3.2.5	Yes	Yes	NA	No further comment.	Small text changes on p177 regarding the regions issue

Any Other Comments

Comments	Conformity Assessment Body Response

Peer Reviewer 2

Overall Opinion

Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?	Yes	Conformity Assessment Body Response
<p><u>Justification:</u></p> <p>This is a comprehensive assessment of the Gulf of St. Lawrence Northern Shrimp trawl fishery in SFAs 8, 9, 10 and 12 and I agree with the overall conclusion drawn by the assessment team that the fishery should be certified. A wealth of evidence has been presented by the assessment team to justify the scores for all of the Performance Indicators. I have a number of minor comments on the scores and underlying rationales, but overall I fully support the scores assigned by the assessment team, and agree that only three conditions need to be raised.</p> <p>P1</p> <p>I agree with the high scores allocated by the assessment team for the various performance indicators under P1. There is a wide-ranging Integrated Fishery Management Plan (IFMP) which is underpinned by the precautionary approach enshrined within the SFF, and which is continually updated. There is comprehensive information available for this fishery and explicitly defined harvest control rules. All evidence from the monitoring programmes and the assessment of stock status in relation to the well-defined reference points suggests that the IFMP is achieving its objectives of maintaining the stock within the healthy zone. My only comment relates to the status of the target reference points. DFO Science publications define target reference points for each of the 4 SFAs at a more precautionary level than the USRs, but it is not clear whether these target reference points are agreed by management and the fishing industry, and I note that the assessment team did not refer to these reference points in their scoring of PIs 1.1.1 and 1.1.2. Some clarification would be helpful.</p>		<p><u>Further clarification on the points raised pertaining to individual performance indicators is offered below.</u></p>
<p>P2</p> <p>The GOSL northern shrimp fishery is a relatively low impact fishery. There are no additional retained species other than <i>P. montagui</i>, and with a minimum mesh size of 40 mm and the mandatory use of the Nordmore grate, the fishery has minimal impact on bycatch species including ETP species. There is an effective observer programme, only 5% approximately of the total bottom habitat area for shrimp is fished in any one year, and any impacts of fishing on the habitat are unlikely to cause serious or irreversible harm. The two conditions raised against P2 performance indicators relate primarily to formalising strategies rather than significant deficiencies in the management of the fishery.</p>		<p><u>No response required.</u></p>
<p>P3</p> <p>There is a comprehensive management structure in place for the GOSL shrimp fishery. One particular strength is</p>		<p><u>No response required.</u></p>

the consultation process between the fishing industry and other stakeholders with DFO scientists and management through the Gulf Shrimp Advisory Committee. As with P2, the only condition raised against a P3 performance indicator relates to formalising a research plan to include the various strands of research which are already taking place.

<i>Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe?</i>	Yes	Conformity Assessment Body Response
<i>Justification:</i> Condition 1. I agree that this condition is appropriate and that it should be achievable by the fourth surveillance audit. There was a similar condition raised in the original assessment (but under a previous version of the assessment tree) for which significant progress had been made but which had not been met fully during the initial period of certification. The new condition raised under the re-assessment using the updated assessment tree should therefore be easily achievable within the specified timeframe. Condition 2. I agree that this condition is appropriate. The condition should be achieved within the specified timeframe. Condition 3. The condition is appropriate to ensure the production of a formal published research plan, and should be achievable within the required two year timeframe.		The condition was somewhat similar in the original assessment but not identical, due to a change in assessment trees and outcome requirement of the new performance indicator. This condition relates to the need for a strategy to ensure that habitat impacts are not serious or irreversible. No response required. No response required.

If included:

<i>Do you think the client action plan is sufficient to close the conditions raised?</i>	Yes	Conformity Assessment Body Response
<i>Justification:</i> Condition 1. The Client Action Plan should be sufficient to close the condition within the specified timeframe, but the Client will require the full support of DFO to meet the condition. Condition 2. The Client Action Plan should be sufficient to close the condition within the specified timeframe, but the Client will require the full support of DFO to meet the condition. Condition 3. The Client Action Plan will be sufficient to close the condition although it will require the support of DFO and other research institutes. I think it is a very good idea to incorporate the research plan within the IFMP, as it can then be easily updated on an annual basis along with other components of the IFMP, and be fully re-appraised every five years.		<i>No response required.</i> <i>No response required.</i> <i>No response required.</i>

General Comments on the Assessment Report (optional)

The assessment team's report provides an excellent, comprehensive summary of the Gulf of St Lawrence northern shrimp fishery in relation to MSC principles and criteria. Below I

outline a few areas where I think that the background information sections could be improved to clarify the evidence that underlies the scores and rationales.

The background information on P1 lacked detail, which meant that it was necessary to refer to the original documents to ascertain the nature of the data collected and how the data are used in the stock assessment. In particular it would be helpful to have a short summary of (a) the data and methods used to produce the commercial fishery statistics, (b) the methodology employed in the annual trawl research survey, and (c) how these two sets of data are combined to produce the main annual stock indicators, because these indicators are the basis for the setting of both limit reference points and upper stock reference points for the four SFAs, and for the harvest control rules. In addition, there needs to be a much fuller description in the legend for Figure 3 as this describes how the annual level of the main stock indicator is translated into a TAC for the following year in each SFA.

IFC Response: Additional detail has been provided in summary form to the text of Section 3.3.2, under the Assessment Methods subsection. Full detail of the data treatment and assessment methodology reside in the cited, publicly available, source document. The legend of Figure 3 has been expanded and includes a description of the stock status zones portioned in each figure.

On page 12, I do not understand the note below the table of calculations for the TACs in 2013. The note states that “Actual TACs for Anticosti and Esquiman were set at the harvest guideline, even though the difference between the harvest guideline and 2012 TAC was greater than 5%.” My understanding is that the TAC is not adjusted if the difference is less than 5%, but that there is an upper limit cap of 15% for the adjustment. In the case of these two SFAs, the differences between the harvest guidelines and the 2012 TACs are 9% and 10% (i.e. above 5% but below 15%), so the TAC for 2013 would be set at the harvest guideline. In addition, in the table on page 21, in the column headed “Adjustment for 2013”, the calculation should be $TAC_{2012} + x\%$.

IFC Response: Following the TAC adjustment rules, the negative differences for these two SFA's resulted in advised TAC's lower than those of the previous year but slightly higher than the harvest guidelines. However, in these instances, the lower harvest guideline values were used for the actual 2013 TAC's rather than the calculated adjustments as shown in the table.

In the background information for Principle 3, the text states (page 32) that “Esquiman Channel (SFA8) is not part of this certification...” which appears to contradict previous statements in the report.

IFC Response: This sentence has been deleted. This reassessment includes all four GSL shrimp fishing areas, 8, 9, 10 and 12.

Performance Indicator Review

Please complete the table below for each Performance Indicator which are listed in the Conformity Assessment Body's Public Certification Draft Report.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.1.1	No	Yes	N/A	I agree with a score of 100 for this PI. The assessment team used the USR as the target reference point even though a higher more precautionary target reference point has been set, and I am not sure why this additional information has not been included in the rationales for the scores in both PI 1.1.1 and 1.1.2.	The assessment team did not use the USR as the TRP. Rather, they accepted DFO's requirement that the USR is set at a level high enough so that the cautious zone has sufficient range to allow the detection of the decline of a stock, thus providing time to adopt effective management measures. Furthermore, higher and more precautionary TRP's have not been set for these stocks. TRP's based on the average stock status for the 1996 to 2002 period (approximation of B_{MSY}) were proposed during the development of reference points but were not accepted. It was not possible to obtain reliable estimations of the biomass which can support maximum sustainable yield. The rationale for the use of the USR rather than a TRP is stated on page 18, and under PI 1.1.2 SG80c.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.1.2	No	Yes	N/A	I agree with the rationale given for all the scoring issues. For scoring issue b, the limit reference point is set at a precautionary level, and for scoring issue c, the target reference point does not take into account fully the ecological role of the stock. For example, it does not take into account the possibility that predator biomass might increase to the high values observed historically. A score of 90 is appropriate therefore. However the rationale for the target reference point considers only the selection of the USRs for each SFA, and not the target reference points which are set at a higher level than the USR.	See response for PI 1.1.1 above.
1.1.3	N/A	N/A	N/A		

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.2.1	Yes	Yes	N/A	I agree with the rationale given for all the scoring issues. There is a comprehensive IFMP underpinned by the precautionary approach adopted within the SFF, and all evidence suggests that it is achieving its objectives. The IFMP is updated annually and is in the process of being fully revised. As there is no formal MSE, I agree that SG100b is not met and that the fishery therefore scores 95.	No response required.
1.2.2	Yes	Yes	N/A	I agree with a score of 90 for this PI. The further development of the simulation model for selection of harvest rules may enable the fishery to achieve a higher score in future.	No response required.
1.2.3	Yes	Yes	N/A	I agree with the rationale given for all the scoring issues.	No response required.
1.2.4	Yes	Yes	N/A		No response required.
2.1.1	Yes	Yes	N/A	I agree that <i>Pandalus montagui</i> should not be considered as a main retained species and with a score of 100 for this PI.	No response necessary.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.1.2	Yes	Yes	N/A		No response necessary.
2.1.3	Yes	Yes	N/A		No response necessary.
2.2.1	Yes	Yes	N/A	I agree with a score of 80 for this PI as some bycatch species are depleted. There is a strategy of mitigation measures in place which ensures that bycatch of all species is very low and has no impact on populations. There are some bycatch species (Atlantic cod, American plaice and redfishes) which are outside biologically based limits. However, the estimated bycatches in the shrimp fishery are extremely low in relation to landings of these species in other fisheries, and so it can be concluded that the bycatch in the shrimp fishery does not hinder recovery of these species.	No response necessary.
2.2.2	Yes	Yes	N/A		No response necessary.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.2.3	Yes	Yes	N/A	Accurate and verifiable information is available on all bycatch to estimate outcome status, and monitoring is set to continue at the current level of coverage.	No response necessary.
2.3.1	Yes	Yes	N/A	The very low level of bycatches of the two wolffish species as evidenced from a long-running and effective observer programme, the low level of bycatch of potential prey species and the increase in population indices in recent years for both wolffish species justifies a score of 100 for this PI.	No response necessary.
2.3.2	Yes	Yes	N/A	There is no verification that fishermen comply with the requirement to return wolffishes to the sea unharmed and therefore I agree that the fishery does not achieve the SG100 for this PI.	No response necessary.
2.3.3	Yes	Yes	N/A	The score of 95 seems harsh in that there has been an increase in abundance of both wolffish species in recent years across their main areas of distribution, but I accept that such an increase has not been seen for northern wolffish in the shrimp fishery area itself such that SG100a is not fully met.	No response necessary.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.4.1	Yes	Yes	N/A	I agree that it is highly unlikely that the habitat structure and function has been adversely impacted by the fishery, but there is no evidence available from this fishery, so the SG100 is not met.	No response necessary.
2.4.2	Yes	Yes	Yes	Whilst there are measures in place to achieve the Habitat Outcome 80 level of performance, I agree that they cannot be considered as either a partial or full strategy. A condition against this PI is therefore appropriate.	No response necessary.
2.4.3	Yes	Yes	N/A	Sufficient information on the nature and vulnerability of the main habitat types and on the distribution of fishing activity from VMS and log books is available to ensure that the SG80 is met, but the lack of a full analysis of the impact of the gear in this fishery and the lack of regular assessments of the change in habitat types over time precludes the SG 100 being met.	No response necessary.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.5.1	Yes	No	N/A	The assessment team identified two potential impacts of the fishery on ecosystem structure and function – the impact of removing shrimp on trophic relationships, and non-catch impacts of the gear on benthic biodiversity and communities. I agree with the team's assessment that the former meets the SG100, but the latter does not. On that basis, the score of 80 seems very harsh. Is there not scope to say that the SG100a is partially met and allocate a score of 90 for this PI?	The MSC scoring protocol requires that the assessment team score to the level of the lowest component when there are multiple components to be scored - so the score of this PI is required to be 80.
2.5.2	Yes	Yes	Yes	The main measure to ensure that the fishery does not impact on ecosystem structure and function is the geographical limitation of the fishery. Whilst this is likely to work, it is an indirect consequence of the current fishing practice, and could not be considered to be a partial or full strategy. I agree therefore that SG80 is not met in relation to this potential impact.	No response necessary.
2.5.3	Yes	Yes	N/A	I agree with the rationale given for all the scoring issues.	No response necessary.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.1.1	Yes	Yes	N/A	I agree with the rationale given for all the scoring issues.	No response required.
3.1.2	Yes	Yes	N/A	I agree with the rationale given for all the scoring issues. However I note with interest that under 100b, this fishery requires that DFO explains why it has <u>not</u> used the advice given to it by the Gulf Shrimp Advisory Committee. This is rare within most fisheries management structures, so it would be helpful to provide an example of where this has happened.	At the site visit no specific examples were cited, but scientists told the team that DFO managers explained whether and why the scientific advice was used or not. In addition, stakeholder S Samuel explained that TAC setting was completely transparent (See Stakeholder Interview Record). To reflect this, amendments have been made to the 3.1.2 text as below: 'The basis for consensus decisions by the Committee on the advice it gives to DFO is explained, and at the site visit scientists explained that DFO managers will in return explain at subsequent meetings whether or why it was used, or not.' ... the evidence is the assurance from scientists at the site visit but no examples were quoted. In addition, stakeholder Sylvain Samuel (Exec Dir. Association des Capitaines Propriétaires

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
					de la Gaspésie, and a regular participant in the Gulf Shrimp Advisory Committee) stated clearly that "There is a transparent adjustment process for the TAC, which allows everyone to understand how/ why the TACs change".'
3.1.3	Yes	Yes	N/A	There are clear long term objectives that are explicitly stated within and required by management policy which are consistent with both P1 and P2 and the SG100 is met therefore.	No response required.
3.1.4	Yes	Yes	N/A	I agree that the SG100 is not met as there is no evidence that incentives are considered in regular reviews of management policy.	No response required.
3.2.1	Yes	Yes	N/A	The Gulf Shrimp IFMP provides well defined and measurable short and long term objectives consistent with P1 and P2, so the fishery meets the SG100.	No response required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.2.2	Yes	Yes	N/A	I agree with the rationale given for all the scoring issues.	No response required.
3.2.3	Yes	No	N/A	I agree that there is a comprehensive monitoring, control and surveillance system in place, but under 100b no evidence is provided that sanctions <u>demonstrably</u> provide effective deterrence.	To correctly emphasise the deterrence effect of sanctions, the evidence under 100b has been rephrased as follows (amendment underlined):- “For breaches of licence conditions and fishery regulations, sanctions range from guidance and a warning for a first or low level offence, <u>to on-the-spot fines, a penalty reduction on the length of fishing season available to the miscreant,</u> and finally to possible court action for major cases. The site visit stressed that costly and time-consuming court action is viewed as a blunt tool and a last resort, and that C&P objectives are best secured by informal interactions with industry at wharves, plants, or at sea during day to day monitoring, surveillance and enforcement patrols. Assessors were advised at the site visit that <u>violations are publicised on the DFO website and in the newspapers, and that this publicity is an effective deterrent. DFO also stated that the “Report a Poacher” programme was a significant contributor to the effectiveness</u>

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
					of the enforcement regime. Consequently the team was assured that few sanctions have been applied in the shrimp fishery..... repeat offences are rare."
3.2.4	Yes	Yes	Yes	Whilst there has been substantial research in relation to both P1 and P2, I agree with the assessment team that there is no formal published research plan, and that SG80 is not met for this PI.	No response required.
3.2.5	Yes	Yes	N/a	I agree with the rationale given for all the scoring issues.	No response required.

Any Other Comments

Comments	Conformity Assessment Body Response

Appendix 3: Stakeholder submissions

Stakeholder Interview Record

Assessment Team	Names
Lead Assessor	Steve Devitt
P1 Team Member	Don Parsons
P2 Team Member	Howard Powles
P3 Team Member	Colin Bannister

Meeting Location	Hôtel Plaza Québec
Date	8 November 2012
Stakeholders Name	Affiliation
Cédric Arseneau	DFO Policy & Economics
Louise Savard	DFO Stock Assessment
Daniel Boisvert	DFO Resource Management
Bernard Morin	DFO Resource Management

Comments:

The lead assessor conducted introductions, explained MSC evaluation process for current stage of assessment and described the objectives of the day's meeting, which were:

- Update the team's understanding of the current status of the fishery
- Discuss and understand status of remaining conditions from the existing certification
- General discussion of current DFO approaches to stock assessment; fishery bycatch, habitat and ecosystem interactions research and fishery management.
- DFO responses to specific questions from team members about individual performance indicators.

2. Status

What is the nature of the organisations interest in the fishery (e.g. client / science / management / industry / eNGO etc)

Fisheries and Oceans Canada (DFO) is the unique fishery management and science agency for the candidate fishery.

3. Stakeholder Key Issues

What, if any, specific substantive issues or concerns are identified regarding the fishery? (P1 – P2 – P3) and what information is available to allow us to determine the status of the fishery in relation to each issue?

The meeting was conducted in a semi-formal manner, there were two meeting sessions conducted, one focused on science activities and the second focused on resource management.

Using the MSC performance indicators as a guide, the assessment team and the DFO representatives discussed the current status of each indicator. The team questioned specific aspects of the existing certification conditions, on-going stock and fishery monitoring, on-going research and future research plans.

Principle 1

Louise Savard (DFO Science), Cédric Arseneau (DFO Policy)

The team should review all the recent DFO science publications posted on the CSAS website.

PI 1.1.1 – Stock Status

Stock status is presented in the most recent Science Advisory Report (SAR), the next update is planned for January 2013. Stock assessments have been shifted to a biennial schedule, with the next full assessment planned for 2014. Updates in years without full assessments will be published in Science Response document, which will update the indicators based on the commercial fishery monitored indicators. Science response document should be available in early 2013.

Harvesters reported that 2012 Fishery indices were stable, CPUE indicators and prices were positive, based on feedback from harvesters. No change in shrimp abundance was evident from the 2011 and 2012 research surveys.

The 2012/ 2013 fishery is the first to apply reference points and the industry-agreed Precautionary Approach. A workshop was planned in November 2012 with industry to familiarize them with the approach and get industry acceptance of the PA tools. As well, a presentation was made to the Annual Advisory meeting in February 2012 to introduce the idea.

PI 1.1.2 - Reference points.

Description of reference points is described in the various published DFO documents. DFO policy on DFO website, including the definition of the Target Reference Point (TRP) which DFO has defined as the Upper Stock Reference (USR).

PI 1.1.3 - Rebuilding

Stock not considered to be depleted, this PI was not scored.

PI 1.2.1 – Harvest Strategy

The harvest strategy is laid out in the draft 2012 Integrated Fishery Management Plan (IFMP) update. The plan is currently in draft format and is still under discussion with industry. The plan is an “evergreen” plan (i.e. an update of the last version of the plan). There is ample discussion within the various (2011 – 2012) science publications.

PI 1.2.2 HCR and HC Tools.

The HCR is described in the IFMP. Shows how fishing mortality is reduced as the stock moves through the various stock status zones. Louise Savard presented the HCR at the last annual meeting with industry. The HCR was accepted by industry and is described in the 2012 SAR.

PI 1.2.3 - Information to support the Harvest Strategy

The interview confirmed no removals of *Pandalus borealis* from other fisheries.

PI 1.2.4 – Stock Assessment

Where was the SPAM model (Sex-structured Pandalus Assessment Model) used? The model was used to test various decision scenarios to demonstrate possible outcomes to industry. The model is not currently used as an ongoing predictive stock assessment model. See DFO 2012/101. This is not the same model as used in the MSE approach.

The assessment review process for recent assessments was attended by Jean-Jacques Maguire and Jean-Claude Brethes, as external reviewers.

Principle 2

Louise Savard, (DFO Science), Cédric Arseneau (DFO Policy)

PI 2.1.x Retained Species.

Retained and Discarded species - Is there any information on other retained species, (other than *P. borealis*)?

See tables in bycatch publication. *Pandalus montagui* is <5% of the catch, not a main retained species. It is taken in the surveys, information on distribution is available in the GSL atlas document. *P. montagui* is typically found in more shallow, colder water than *P. borealis* which occurs in deeper, warmer water. Harvesters try to avoid in the catch, as it can't be sorted in the processing plants.

There is also "Crevette blanche", (*Pasiphaea multidentata*) in the catch and this species must be sorted out in the plants as it is not palatable. There is an allowance of 2% for ice and white shrimp which is currently part of the TAC accounting process. There was a "move on" requirement in the last version of the IFMP, requiring harvesters to move on if high encounter rates of white shrimp occur.

Dockside monitoring program (DMP) verifies weights of all offloaded shrimp. Plants remove and do not pay for the very low levels of bycatch species and rocks which come ashore.

Should also state that harvesters with TAC for Atlantic halibut or groundfish can legally land these shrimp species as part of their catch. There are very few occurrences of this, most often, when fish are caught (pinned) in front of the separation Nordmore grates.

PI 2.2.x Discarded species.

Information is recorded by at-sea observers. There are no sorting machines allowed on-board, so other than larger fish and bycatch items, the rest of the bycatch is landed. Report on bycatch (DFO 2012/066) is available which includes estimates of bycatch in the fishery.

Use of the Nordmore grate is mandatory, spacing and placement within trawl is described in the conditions of licence and the IFMP. Toggle chains are used by most harvesters, and are not regulated. Footropes are off the ground.

In some years, there have been localized catches of turbot, capelin and redfish of >5% of catch. Typically, this results in greater effort for crews to sort the fish out at sea and the bycatch is deducted from quota. Processing plants who receive the higher bycatch typically notify DFO of the increased catch. DFO has small-fish protocol, which has been used in the past for turbot. Harvesters must move on to other areas or the fishing zone can be closed. This tool is not currently described in either the conditions of licence or the IFMP, but has been implemented through Fishery Variation Order in the past.

There has been some experimental work using pelagic trawl doors, with the hope of reducing impact and fuel costs.

PI 2.3.x ETP Species.

In the area of fishery, ETP (SARA listed) species include northern and spotted wolffish, striped bass (St. Lawrence population) and leatherback turtle.

Currently, there are increasing trends in abundance in both wolffish species, and there have been no recorded catches of the others. See COSEWIC assessments.

PI 2.3.2 Management strategy.

Conditions of Licence define least harm release requirements.
Required to record SARA listed species catches.

PI 2.3.3 – Info/ monitoring

At-sea observer coverage records interactions. See DFO 2012/066.

PI 2.4.1 – 2.4.3 Habitat

2012 – See Proceeding (1), Research Doc (2) and Science Advisory Report (1) documents resulting from May 2012 meeting on habitat. Work with industry to address the outstanding condition from the initial certification.

Cédric Arseneau to send DFO Policy on Sensitive Benthic Areas.

See DFO 2012/041 regarding sponges and corals in GSL. No records of black corals in GSL, very few gorgonians and soft corals.

DFO SAR 2012/054 maps (p.8). identifies threshold areas of sponges and sea pens. DFO will close areas of threshold concentrations in 2014.

Conditions from initial certification.

1. info condition is closed.

2. management objectives are set (through Sensitive Benthic Area policy), impact avoidance and reductions.
3. Acceptable impacts determined and reviewed (see DFO 2010/ 054), Kenchington et al, 2010.

Work plan for Fisheries Management includes application of the Sustainable Fisheries Framework, to this fishery, Precautionary Approach framework and benthic habitats.

2.4.3 – Info/ monitoring

Information appears good.

PI 2.5.1 – 2.5.3 Ecosystem

Biodiversity and community structure – i.e. non-catch mortality.

Current proposals for ecosystem structure, based on existing current info.

See Dutil et al. Also need to review Savenkoff model documents.

See Chabot Res Doc (Communities in ZIEB), Plourde.

See references in the shrimp atlas paper.

In 2012, there were two specific ecosystem issues in the GSL which captured attention, firstly, was mortality of young beluga whales, secondly, increased mortality in gannets. There is no information available at this time to link these events to removals of shrimp by the fishery. Possible hypothesis is related to decreased availability of pelagic fish in the upper water column, possibly because of warmer surface water temperatures.

Some work being done on benthic community composition, there is a M.Sc. thesis on diversity in the GSL but not on species comp and communities. The Plourde project will help to pull some of that information together.

Principle 3

Resource Management Meeting.

Bernard Morin (DFO Resource Management), Daniel Boisvert (DFO Resource Management), Cédric Arseneau (DFO Policy), Louise Savard (DFO Science).

Discussion planned with industry for early 2013 to conduct the risk analysis associated with the Sensitive Benthic Areas policy. Also need an analysis of the fisheries impacts in relation to these areas. These discussions may result in suggested area closures, however, no timeline available yet. DFO Resource Management hopeful to have measures identified and in place if necessary by the end of 2013.

Resource management moving towards a multiyear management approach. Next full sitting of the Gulf Shrimp Advisory Committee scheduled for February 2014. Going forward, subcommittees of the GSAC could meet to review/ approve interim measures to address specific problems should they arise between the biennial meetings.

Industry colloquium planned for December 2012, part of that process will be to look at environmental sustainability, another will be to provide recommendations on governance of the fishery moving forward (i.e. biennial management planning process).

Currently plan to use the Environmental Risk Assessment Framework (ERAF) to evaluate possible impact risks from the fishery on sensitive benthic areas.

Finalized IFMP is expected prior to the 2013 season in order to incorporate the outcomes realized during the industry colloquium.

PI 3.1.1 Governance

Overarching documents which describe the fishery:

- Fisheries Act and associated regulations
- Oceans Act and associated regulations
- Sustainable Fisheries Framework
- Aboriginal Fisheries Strategy
- Aboriginal Fisheries Policy
- Licensing Policy
- SFF Checklist (internal DFO doc)

PI 3.1.2 Consultation

Currently, regular annual consultation through GSAC and IFMP process. In the future, it is expected that GSAC will be biennial, and function through a subcommittee (Executive) during the interim period. The final IFMP should describe this.

In 2012, there were approximately 35 GSAC members who participated in the meeting. In 2013, it is expected that a subcommittee of major representatives will meet. Documents and interim decisions to be circulated electronically. GSAC members can interact with subcommittee representatives should an issue arise. Final version of the IFMP should describe this.

ENGOS are currently not full standing members of GSAC. They can attend and observe. Can request to make presentations. Can not participate in decision making process. There are no funds available to support ENGOS. Currently not a great deal of interest/ feedback from ENGOS in relation to the shrimp fishery.

PI 3.1.3 General Objectives

SFF Checklist provides Principle 2 related objectives. Checklist completed for this fishery, but a copy could not be provided to the assessment team.

PI 3.1.4 Incentives

Group A/ Group B licenses – ITQ

Currently, high licence fees, review of Canadian licensing fees underway.

See IFMP draft.

PI 3.2.1 Fishery Specific Objectives

Available information supports P2 objectives for bycatch, habitat (communities).

Objectives for ETP not specifically linked to the fishery objectives, but are incorporated via other mechanisms (SARA log requirements, etc.).

Suggested that ETP objectives could possibly be added into the IFMP.

PI 3.2.2 Decision Making Process

Not evident how DFO explains decisions, particularly where decisions of actions not taken (when suggested by industry).

PI 3.2.3 Compliance and Monitoring

Annual report on Compliance and Protection efforts provided to GSAC on an annual basis. Report includes table of at-sea observer coverage by region and fishing area. Copy to be provided.

There is a webpage available through the DFO website which details convictions under the Fisheries Act. See the Media section. Inspection fines and convictions available publicly. Percentage of at-sea observer coverage has previously been identified as a concern, particularly for Esquiman.

Industry will be paying 100% of observer coverage.

Vessel Monitoring system mandatory in 2012. Violation reports triggered by “exception” (i.e. vessel fishing within closed area parameters. In this instance, Fishery Officers will inspect vessel and confirm data.

PI 3.2.4 – Research Plan

There is not a formal research plan in place (as corresponding to MSC requirements). There is comprehensive research done on an on-going basis to address all outstanding concerns.

PI 3.2.5 Monitoring Review.

SFF Checklist is conducted and reviewed within the DFO. There is an annual report done on the checklist process.

Auditor General review conducted prior to 2000. Full review planned for 2013. Commissioner of the Environment and Sustainable Development (CESD) process fed into the sustainable development review.

See Chapter 4 of 2011 CESD report.

4. IFC Assessment Team Questions

Assessment team questions for stakeholders

Section 3 incorporates summary of issues discussed in relation to performance indicators.

5. Other issues

(e.g. any other stakeholders we should contact, any written submissions to follow?)

None identified.

Stakeholder Interview Record

Assessment Team	Names
Lead Assessor	Steve Devitt
P1 Team Member	Don Parsons
P2 Team Member	Howard Powles
P3 Team Member	Colin Bannister

Meeting Location	Via Teleconference	
Date	9 November 2012	
Stakeholders Name	Affiliation	
Serge Haché	L'Association Coopérative des Pêcheurs de L'Île Ltée, member of the client group	

Comments:

The lead assessor conducted introductions, explained MSC evaluation process for current stage of assessment and described the objectives of the meeting, which were:

- Confirm the client's

2. Status

What is the nature of the organisations interest in the fishery (e.g. client / science / management / industry / eNGO etc)

L'Association Coopérative des Pêcheurs de L'Île Ltée (ACPI) has been a client group member for the GSL northern shrimp certification since the initial certification process started. ACPI are also involved in the Scotian Shelf shrimp fishery certification as well as the Gulf of St. Lawrence snow crab certification. The company has seen the rise in importance for having the fisheries certified.

3. Stakeholder Key Issues

What, if any, specific substantive issues or concerns are identified regarding the fishery? (P1 – P2 – P3) and what information is available to allow us to determine the status of the fishery in relation to each issue?

Mr. Haché agreed to provide his perspective of the fishery, certification process and to respond to any of the team's questions.

Processors and harvesters require the certification in order to sell the product into Europe. Some customers don't care about MSC certification, but many have made MSC a requirement in order to sell the product.

Industry have concerns about management. Primarily, cuts to DFO budgets has raised concerns about the ability of the department to do the necessary science. There have been cuts to DFO science budgets, the Laroque decision reduced the opportunity for industry to contribute financial support for science.

Costs are being pushed down to industry. DFO is moving 100% of at-sea observer costs to industry. DFO moving the costs of managing crab and lobster trap tags to industry as well. Moving to a biennial management cycle and survey.

Is the client comfortable with the forthcoming changes to management? PA and TAC adjustment rules?

Will need to see how the multiyear process works starting next spring. Confident that the process should work as described and agreed. Information will be provided by DFO science and put into the TAC adjustment model.

Quality is a significant concern for the processors. They continue to work with harvesters to improve the on-board handling of shrimp. There is improvement, but more is required. With steaming times of 18 to 36 hours, the product needs to be stored correctly in order to deliver the best quality possible to the plants.

A couple of vessels outside the NB fleet have started experimenting with twin trawls. This should allow the vessels to be more efficient when catch rates are lower and should allow for quicker harvest when catch rates are high, one potential problem is that boat crews can physically only handle so much product per day.

Industry agrees with the current DFO opinion of stock status. There is a strong sense of collaboration between the harvesters, processors and DFO science. Their harvesters and the plant provide all their data to Louise Savard, who uses it in the commercial fishery indicators.

Does the client agree with the 15% reduction in TAC in the two areas for 2012/13?

Yes. Hopefully this will allow the stocks to rebuild a bit. The landing rates in those areas have been good for a long time, need to be managed sustainably. The NB fleet operators are quite young and need the stock healthy for a long time to come.

Is there concern about DFO finding a replacement for Louise Savard?

Yes, industry has raised this issue with DFO, no current clarification as to who/ if will replace.

Changes to gear?

Yes, there is ongoing experimentation with gear changes, but this is not happening in the NB vessels. Everyone knows that bottom trawling is not the best for habitat, if it can be improved, all the better.

4. IFC Assessment Team Questions

Assessment team questions for stakeholders

Section 3 incorporates summary of issues discussed in relation to performance indicators.

5. Other issues

(e.g. any other stakeholders we should contact, any written submissions to follow?)

None identified.

Stakeholder Interview Record

Assessment Team	Names
Lead Assessor	Steve Devitt
P1 Team Member	Don Parsons
P2 Team Member	Howard Powles
P3 Team Member	Colin Bannister

Meeting Location	Hôtel Plaza Québec	
Date	9 November 2012	
Stakeholders Name	Affiliation	
Sylvain Samuel (via teleconference)	Exec Dir. Association des capitaines propriétaires de la Gaspésie	

Comments:

The lead assessor conducted introductions, explained MSC evaluation process for current stage of assessment and described the objectives of the day's meeting, which were:

- Update the team's understanding of the current status of the fishery
- Discuss and understand status of remaining conditions from the existing certification
- General discussion of current DFO approaches to stock assessment; fishery bycatch, habitat and ecosystem interactions research and fishery management.
- DFO responses to specific questions from team members about individual performance indicators.

2. Status

What is the nature of the organisations interest in the fishery (e.g. client / science / management / industry / eNGO etc)

Association des capitaines propriétaires de la Gaspésie is one of the important GSAC members, representing shrimp harvesters based in the Gaspé. Mr. Samuel participates regularly in the GSAC, representing Group B harvesters.

3. Stakeholder Key Issues

What, if any, specific substantive issues or concerns are identified regarding the fishery? (P1 – P2 – P3) and what information is available to allow us to determine the status of the fishery in relation to each issue?

Mr. Samuel wished to convey the importance of work supported by the harvest industry over the last certification period and wished to convey information regarding efforts to improve shrimp trawl gear in order to hopefully reduce benthic impacts and fuel costs.

Mr. Samuel started by providing background on the harvest sector's involvement in the management process.

Individual quotas were introduced to the fishery in the early 1990s, and ITQs were confirmed in the fishery in 93-94. This introduced the transferability of quota between harvesters.

Concept of co-management was also introduced in the 1990s. Industry and DFO struck the first co-management 5-year agreement in 1996. One of the main contributions of harvesters to the co-management process was increased scientific work on the stock.

Second 5-year co-management agreement struck in 2002. During this period, additional work was conducted to better understand shrimp biology. Laboratory experiments were conducted on biology, reproduction and survivability. There was also work conducted by the commercial processors to improve product quality.

In 2008/ 09, the first MSC certification was awarded. Certification was important and harvesters conformed to requirements (conditions) of certification. This included a project to commercialize the MSC certified product in the market place, which included an agreement with the harvesters. This agreement led to a scheduling of fishing trips, with a limit on quantities to be landed. Overall effect was to rationalize and slow down processing so that raw material (shrimp) was delivered to the processing plants in predictable manner. As a result, product quality increased across the fishery.

Over the last 2 – 3 years, there has been an on-going evaluation of management measures, introduction of the Precautionary Approach to be used in setting TACs, defined rules on how TAC to be adjusted, and moving away from an annual assessment.

Now, the fishery is working with status indicators, which are based on both scientific surveys and commercial fishing result (which can be understood by harvesters). There is a transparent adjustment process for the TAC, which allows everyone to understand how/ why the TACs change. Stock assessment surveys to be conducted every 2 years with ongoing annual sampling of the commercial catch to provide an update of commercial indicators on an on-going basis.

Currently updating the Integrated Fishery Management Plan. The update will include the Precautionary Approach decision rules and TAC adjustment guidelines. Will also outline the administrative changes to the GSAC. Also expect that forthcoming decisions related to bycatch and habitat impacts (and possible mitigation measures) would be included in the IFMP update process.

Currently, the association has two projects planned to evaluate possible changes to gear, with the objective of reducing gear impacts. This includes experimenting with twin trawls, which could have the benefit of higher catches over the same distance, thus reducing habitat impacts by catching quota sooner. Second project included experimenting with pelagic trawl doors (as opposed to traditional bottom contact doors). The hope in this experiment is similar catch rates with less benthic impact and reduced fuel costs (as a result of not dragging doors over the bottom). Results would need to be evaluated and a cost-benefit analysis would be conducted. If results are favorable, it would be expected that industry would pursue changes to the gear.

What is the association's view of stock health?

Members don't fish in Esquiman. Currently, 4 shrimp fishing area stocks are healthy. Industry agreed with the 15% reduction in TAC in Sept Iles and Anticosti, the most important fishing areas for the Quebec fleet. The understanding is that the 15% reduction should retain those stocks in the healthy zone and prevent moving into the precautionary zone. Want to avoid (at all costs) allowing any of the stocks from moving into the critical zone.

4. IFC Assessment Team Questions

Assessment team questions for stakeholders

Section 3 incorporates issues discussed with stakeholder.

5. Other issues

(e.g. any other stakeholders we should contact, any written submissions to follow?)

None identified.

Stakeholder Interview Record

Assessment Team	Names
Lead Assessor	Steve Devitt
P1 Team Member	Don Parsons
P2 Team Member	Howard Powles
P3 Team Member	Colin Bannister

Meeting Location	Via Teleconference	
Date	13 November 2012	
Stakeholders Name	Affiliation	
Cédric Arseneau	DFO Policy & Economics	
Clément Beaudoin	DFO Conservation and Protection	
Bernard Morin	DFO Resource Management	

Comments:

The lead assessor introduced everyone and indicated that the assessment team wished to better understand the Compliance and Enforcement issues for the fleet.

2. Status

What is the nature of the organisations interest in the fishery (e.g. client / science / management / industry / eNGO etc)

Fisheries and Oceans Canada (DFO) is the unique fishery management and science agency for the candidate fishery. Mr. Beaudoin works with DFO Conservation and Protection (C&P) and was asked to provide the team with responses in relation to compliance within the shrimp fleet.

3. Stakeholder Key Issues

What, if any, specific substantive issues or concerns are identified regarding the fishery? (P1 – P2 – P3) and what information is available to allow us to determine the status of the fishery in relation to each issue?

Mr. Beaudoin started by indicating that generally, the fleet is not a significant concern for C&P and that compliance is thought to be very good within the fleet.

In 2012, mandatory vessel monitoring system (VMS) requirements were imposed on the fleet. This has required significant resources on the part of C&P in order to get over technical hurdles with the equipment. There were also administrative hurdles around managing the monitoring end. Most of the issues with the shrimp fleet are corrected, now working on issues in the turbot fleet VMS.

There have been some issues where shrimpers have been too close to fixed gear, which has caused some conflict between the two harvest sectors. Also some issues related to fixing the Nordmore grids properly in the trawls. In 2012, C&P conducted a blitz to verify grids installed properly. Several instances where grids were found either not well attached or improperly attached.

DFO C&P retrained enforcement officers on the issue surrounding grid use and installation, in order to verify that the same message and rules were being used across the board. Education campaign was undertaken, however, this will result in an increased number of infractions. Part of the root cause may be related to an increase in halibut prices, since shrimpers can land halibut >85 cm, there is some incentive for catching these on the grids.

There has been a gear conflict between shrimpers and crabbers. DFO has facilitated a working group between the two sectors, who appear to be working towards an agreed compromise.

Observer coverage, particularly in Esquiman continues to be a challenge. Part of the problem is that the NL observer company can't keep enough trained personnel on the roster to achieve the 5% target coverage.

How confident is C&P in the observer data?

As 5%, C&P and Science feel that there is sufficient information to manage the fishery, less than 5% becomes more problematical.

What are the sanctions used in the fishery?

For non-compliance related to the Nordmore grid, the sanctions have been more serious. In one instance, DFO seized the grid and a week's worth of catch.

For issues such as hailing out <12 hours prior to sailing, or logbook incompleteness, use administrative sanctions.

90% of infractions do not go to court, cost is very high and evidence requirements are stiff.

Overall, most infractions in the fleet are considered minor. If repetitive issues arise, then monitored. Currently, 99.98% of the landings are shrimp and about 0.02% are groundfish. Shrimpers have IT quota for cod and redfish.

Training. In Quebec, new harvesters are required to undergo professional training, this helps to provide a base level of knowledge on the fishing regulatory environment.

C&P do provide an annual report to the GSAC, which allows everyone to understand what the on-going concerns of C&P are as well as levels of conformance.

The team requested information on number of infractions, percentages of at-sea observer coverage in each SFA and level of enforcement contacts between C&P officers and shrimp fleet members.

4. IFC Assessment Team Questions

Assessment team questions for stakeholders

Section 3 incorporates summary of issues discussed in relation to performance indicators.

5. Other issues

(e.g. any other stakeholders we should contact, any written submissions to follow?)

None identified.

Appendix 4: Agency Support of Client Action Plan

Fisheries and Oceans Canada provided a letter of support for the Client Action Plan, it is attached below.



Pêches et Océans
Canada

Direction régionale de la
gestion des pêches
Région du Québec

Fisheries and Oceans
Canada

Regional Fisheries Management
Branch
Quebec Region

Security / Classif. sécurité

Québec, December 4, 2013

Your ref. / Votre réf.

Our ref. / Notre réf.

Mr. Serge Haché, Association coopérative des pêcheurs de l'Île Ltée
Mr. Fernand Brideau, Produits Belle-Baie Ltée
Mr. Jean-Paul Gagné, Association québécoise de l'industrie de la pêche
Mr. Derek Butler, Association of Seafood Producers

**Subject: DFO's response to action plan proposed by clients requesting renewal of
MSC certification for Gulf of St. Lawrence shrimp fishery**

Dear Sirs:

Fisheries and Oceans Canada (DFO) has reviewed the action plan you prepared in response to the conditions identified by the assessment committee for the renewal of the Gulf of St. Lawrence shrimp fishery certification. As specified in recent exchanges with Department employees to complete its assessment, the committee requires a letter of support from DFO for your action plan.

DFO considers that the proposed action plan meets the requirements set out by the assessment committee in its preliminary report. We are confident that the implementation of DFO's sustainable fishery initiatives, such as the *Eastern Canada Coral and Sponge Conservation Strategy*, *Canada's Oceans Strategy* and the *Policy for Managing the Impact of Fishing on Sensitive Benthic Areas* can support the achievement of your action plan. DFO also intends to conduct by the third year of the action plan a risk analysis on the Gulf shrimp fishery, pursuant to the *Ecological Risk Assessment Framework* under the benthic areas policy. To integrate DFO's initiatives into your action plan, DFO will collaborate with the consultant you assign to meet the first two conditions of the action plan.

The Department will also collaborate with the clients in developing a research plan for Gulf shrimp in the coming years. DFO is currently updating its scientific strategy. The strategic plan will provide the orientations for research to support current and future departmental objectives. The specific elements of this plan for the Northern shrimp will be discussed and included in the peer review for the shrimp stock assessment survey.

Canada



104 Dalhousie St. Québec, QC G1K 7Y7
Tel.: 418-648-5783 / Fax: 418-648-7981
Patrick.Vincent@dfo-mpo.gc.ca

In closing, I would like to reiterate that it must be confirmed that all Gulf shrimp fishery stakeholders, particularly the harvesting sector, support and endorse the efforts to ensure the delivery of your action plan. I therefore strongly encourage you to share this plan with these stakeholders through this fishery's advisory committee at its next meeting in February 2014.

I trust everything will be to your satisfaction.

Sincerely,



Patrick Vincent
Regional Director

cc.: Mr. Bernard Morin, Advisor, Resource Management, DFO-Quebec Region
Mr. Marcel Boudreau, Director, Resource Management and Aboriginal Affairs,
DFO-Quebec Region
Mr. Serge Gosselin, Director, Demersal and Benthic Science Branch
Mr. Andrew Maw, Regional Director, Fisheries and Aquaculture Management,
DFO-Gulf Region
Mr. Kevin Anderson, Director, Fisheries and Aquaculture Management, DFO-
Newfoundland-and-Labrador Region
Mr. Steve Devitt, Intertek Moody Marine

Appendix 5: Stakeholder Comments and IFC Responses from Public Comment Draft Report

Comments were received from two stakeholder groups during the stakeholder comment period, including a co-submission from the David Suzuki Foundation and Ecology Action Centre, and comments from the MSC. The comments and IFC's responses to these comments are included below.

Appendix 5.1: IFC Responses to Stakeholder Comments received from David Suzuki Foundation/ Ecology Action Centre.



David
Suzuki
Foundation



January 23, 2014

Re: Stakeholder input on the Public Comment Draft Report for the "Gulf of St. Lawrence Northern Shrimp Trawl Fishery Shrimp Fishing Areas 8, 9, 10, 12"

To Steve Devitt,

Thank you for the opportunity to comment on the Public Comment Draft Report for the "Gulf of St. Lawrence Northern Shrimp Trawl Fishery Shrimp Fishing Areas 8, 9, 10, 12". We have reviewed the report and largely agree with the scores provided by the assessment team and the overall recommendation to certify this fishery. I appreciate your consideration of our input at this point in the assessment process.

This submission is limited to comments on the benthic impact score and condition. We have identified inconsistencies, lack of clarity, and improper conclusions with the information currently being used to understand the impacts this fishery has on benthic habitats. Given that a condition has been imposed on the fishery with respect to not having a strategy to address benthic impacts, it would be helpful if the report was clearer and consistent on the existing information pertaining to the current understanding of the fishery's benthic impacts. This information is needed to monitor and understand the anticipated improvements resulting from the condition.

The PCDR repeatedly cites that about 5% of the habitat has been impacted. This percentage is then used as a key component of the various scoring in 2.4.1., 2.4.2., and

2.4.3. The references to the origins and interpretation of this number in the report are inconsistent (Table 1). The PCDR cites a DFO (2012) paper, but that paper makes no reference or attempt to spatially define the extent of trawling relative to any meaningful ecosystem unit let alone conclude a 5% area of impact. The DFO paper used to inform the scoring is limited to an explanation of predicted sensitive habitats in relation to where the trawl fleet predominantly fishes. The paper makes no reference to the actual percentage of area trawled within the representative ecosystem type that coincides with the shrimp fishery (i.e., 200-300 m depth strata). The paper further acknowledges that “the distribution of the fishing effort by statistical square is not precise and the at- sea observer data cover only 5% of the fishing activities” and that “it is possible for a single grid square to cover a significant range of depths.” Simply put, the actual benthic impacts measured against any meaningful ecological scale is at best unknown.

The PCDR also cites a pers. comm for the origins of the same number (i.e. the 5%). If that is indeed the origin of the percentage, then some explanation of the analysis used should be provided.

In the table below we list excerpts from the PCDR referencing the 5% value and find that this value is inconsistently interpreted as either (1) a proportion of the historically fished area; (2) a proportion of the available habitat for northern shrimp; and (3) a proportion of the benthic communities associated with shrimp. Sometimes the DFO report is cited others it is a personal communication with L. Savard.

Table 1

Page #	Excerpts from PCDR
127	In any given year, the fishery impacts around 5% of the grid areas which have been fished at any time in the past, which could be taken as an
129	The fishery impacts 4,000-8,000 km ² per year, approximately 5% of the available habitat for northern shrimp and associated species.
132	Based on estimates of the gear footprint and fishing effort data, it is estimated that 4,000-8,000 km ² of the seabed is trawled annually, some 5% of the total area which has been historically fished (DFO, 2012a; total area of all grid areas which have seen some fishing over time is 107,000 km ² , Louise Savard, pers. comm.)
134	An area of 5% of the total potential bottom habitat for shrimp is fished in any given year
136	For non-catch impacts of the fishery on benthic biodiversity and communities, the main measure in place is geographic limitation of the fishery to around 5% of the potential area where the benthic communities associated with northern shrimp would occur
196	The fishery impacts 4,000-8,000 km ² per year, approximately 5% of the available habitat for northern shrimp and associated species (L. Savard, pers. comm.)”

Within the scope of this assessment it would be more valuable and reflective of the benthic impact to have an understanding of the total habitat within the preferred fishing range (i.e., 200-300m) in the Gulf of St. Lawrence ecozone. From this value determine the amount of that representative habitat (depth strata) that has been trawled or is trawled on an annual basis and also characterize the habitat features and sensitivity of the relevant depth strata.

We acknowledge that high quality habitat and risk information does not exist at present time and therefore is required for fulfilling the condition. By raising this issue, we are not claiming there is necessarily a problem, but the information currently being used to assess the performance is not appropriate for understanding the impacts and has not been adequately described in the PCDR. Furthermore, we would like to reiterate the statements found in PCDR on page 129 and in the condition that this fishery has not been adequately measured against the objectives of the policy on Managing Impacts of Fishing on Sensitive Benthic Areas or the associated Ecological Risk Assessment Framework.

IFC Response: The DFO Québec Region Science staff who provided the information on proportion of habitat fished used the number of grid squares 10 min latitude by 10 min longitude that had ever been fished for shrimp (based on log books) as an estimate of the total habitat within which the shrimp fishery operates. A total of 479 of these grid squares have been fished over the history of the fishery (Savard et al 2012, p. 4). The average area of these squares is 223 km² (Savard et al 2012 p. 4), so the estimate of total area of habitat in which the shrimp fishery has operated is 479 x 223 = 106,817 or about 107,000 km². This can be taken as an estimate of the habitat suitable for shrimp concentrations and associated species. Depending on the year, the shrimp fishery is estimated to trawl between 4,000 and 8,000 km² (DFO 2012ti p. 3), so in any given year the fishery may impact between 3.7% and 7.5% of the total “shrimp habitat”.

In the draft report we had referred to Louise Savard (pers. comm.) for this proportion and rounded it to 5% based on that pers. comm. We have modified the report text to clarify the basis for this statement and to give the range of percentage values (rounded up to 4%-8%).

We have reviewed the report and have revised the text which originally quoted 5% shrimp habitat. Changes were made in the following sections of the report:

- Executive Summary
- Section 3.4.1
- Appendix 1.1 Performance Indicator Scores and Rationale, in the following performance indicators:
 - PI 2.4.1 – 80a scoring rationale (SR)
 - 2.4.2 60a SR
 - 2.4.2 60b SR
 - 2.4.3 80b SR
 - 2.5.1 80a SR
 - 2.5.2 60a SR

Appendix 1.2 Conditions

- Condition 1
- Condition 2

The team does not agree that the benthic impacts are unknown. Some studies of impacts in the fishery area have been conducted (summarized in DFO 2012a) and inferences can be drawn from work in other areas; all of this information is summarized in the certification report.

We look forward to working with the MSC, the industry associations, the Department of Fisheries and Oceans, and Intertek Moody Marine to further the ecological performance of this fishery.

Thank you for your consideration of our comments.

Sincerely,



Scott Wallace, Ph.D.
Senior Research
Scientist David Suzuki
Foundation



Susanna Fuller, Ph.D.
Marine Conservation Coordinator
Ecology Action Centre

Appendix 5.2: IFC Responses to MSC Review and Report on Compliance with the scheme Requirements, 24 January 2014.



Marine House
1 Snow Hill
London EC1A 2DH
United Kingdom
Tel: +44 (0)20 7246 8900
Fax: +44 (0)20 7246 8901

Date 24/01/2014

SUBJECT: MSC Review and Report on Compliance with the scheme requirements

Dear Steve Devitt

Please find below the results of our partial review of compliance with scheme requirements.

CAB	Intertek Fisheries Certification Ltd. (IFC)
Lead Auditor	Steve Devitt
Fishery Name	Gulf of St Lawrence northern shrimp trawl fishery Esquiman Channel
Document Reviewed	Public Comment Draft Report

Ref	Type	Page	Requirement	Reference	Details	PI
3914	Minor	p. 61	CR-27.6.1 v.1.3	27.6.1 The CAB shall nominate a date from which product from a certified fishery is likely to be eligible to bear the MSC ecolabel (the target eligibility date). This could be: 27.6.1.1 The date of the certification of the fishery; or 27.6.1.2 Any date prior to the certification of the fishery up to a maximum of six months prior to the publication of the most recent Public Comment Draft Report. This date should be linked to: a. The beginning of the fishery management year in which the Public Comment Draft Report is published; or, b. The start of the fishing season in which the Public Comment Draft Report is published; or, c. Any other logical date with regard to the applicant fishery.	PCDR says that "The target eligibility date for product from the fishery under assessment is concurrent with the expiry of the existing certificate. As this is a recertification assessment, any product landed prior to the expiry of the exiting certificate is considered certified". Section 1 of the PCDR says that the initial certification validity period for SFAs 9, 10, 12 was from 18.09.08 to 22.09.13 and certification validity period for SFA 8 is from 30.03.09 to 30.03.14. Since the initial certification the validity period for SFAs 9, 10, 12 has already expired therefore the PCDR should state this and CAB should nominate a specific date as target eligibility date. Also the CAB may consider if the target eligibility date can be nominated	

					<p>the same for SFAs 9,10, 12 and SFA 8 in this assessment to make it aligned for all four UoC. This section of the PCDR also does not clarify if the certification for SFAs 9,19,12 has been extended or not.</p> <p>PCDR also says "The actual eligibility date will be concurrent with the expiry of the existing certificate". This statement seems to be incorrect at the stage of PCDR as there is an opportunity that in PCR the actual eligibility date will be fixed different from the target eligibility date.</p>	
3915	Guidance	p. 62	CR-27.12.1.5 v.1.3	27.12.1 The CAB shall determine if the systems of tracking and tracing in the fishery are sufficient to make sure all fish and fish products identified and sold as certified by the fishery originate from the certified fishery. The CAB shall consider the following points and their associated risk for the integrity of certified products: 27.12.1.5 Any transshipment activities taking place.	<p>The PCDR says "Over the course of the assessment it was evident that there were no concerns associated with transshipping in the fishery under consideration"</p> <p>It is not clear from the content of this section of the PCDR if transshipments take place and how transshipping activities work.</p>	
3916	Guidance	p. 62	CR-27.12.1.6 v.1.3	27.12.1 The CAB shall determine if the systems of tracking and tracing in the fishery are sufficient to make sure all fish and fish products identified and sold as certified by the fishery originate from the certified fishery. The CAB shall consider the following points and their associated risk for the integrity of certified products: 27.12.1.6 The number and/or location of points of landing.	<p>PCDR does not specify the number and location of the points of landings.</p> <p>PCDR says: "Product from the fishery under assessment is landed in any port authorized by DFO where certified dockside monitoring companies can verify weight and species composition of offloaded product". It could be beneficial if the link or reference to the DFO' webpage is provided where the list of authorized ports can be found.</p>	

3918	Guidance	p. 61-62	CR-27.12.2.1 v.1.3	<p>27.12.2 If the CAB determines the systems are sufficient, fish and fish products from the fishery may enter into further certified chains of custody and be eligible to carry the MSC ecolabel. The CAB shall determine:</p> <p>27.12.2.1 The scope of the fishery certificate, including the parties and categories of parties eligible to use the certificate and the point (s) at which chain of custody is needed. a. Chain of custody certification shall always be required following a change of ownership of the product to any party not covered by the fishery certificate. b. Chain of custody certification may be required at an earlier stage than change of ownership if the team determines that the systems within the fishery are not sufficient to make sure all fish and fish products identified as such by the fishery originate from the certified fishery. c. If the point where chain of custody certification is required is covered by the fishery certificate, the team shall determine the parties or category of parties covered by the fishery certificate that require chain of custody certification.</p>	<p>On page 62 there is reference to “the Unit of Certification”. This is inconsistent with page 61 which says "There are four units of certification and all fishing operations relative to this recertification assessment are conducted within these four shrimp fishing areas"</p> <p>On page 62 in section 5.3 it is mentioned there are three SFAs : involved. As noted above, the fishery certificate is applicable to all permitted trawl vessels that hold valid ITQ licences for the three SFAs." This statement seems to be incorrect as there are 4 SFAs.</p>	
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3919	Minor	62	CR-27.12.2.1 v.1.3	27.12.2 If the CAB determines the systems are sufficient, fish and fish products from the fishery may enter into further certified chains of custody and be eligible to carry the MSC ecolabel. The CAB shall determine: 27.12.2.1 The scope of the fishery certificate, including the parties and categories of parties eligible to use the certificate and the point (s) at which chain of custody is needed. a. Chain of custody certification shall always be required following a change of ownership of the product to any party not covered by the fishery certificate. b. Chain of custody certification may be required at an earlier stage than change of ownership if the team determines that the systems within the fishery are not sufficient to make sure all fish and fish products identified as such by the fishery originate from the certified fishery. c. If the point where chain of custody certification is required is covered by the fishery certificate, the team shall determine the parties or category of parties covered by the fishery certificate that require chain of custody certification.	On page 62 the list of eligible client group members for SFA 8, 9, 10, 12 is provided. The Association of Seafood Producers (ASP) members are eligible for SFA 8 only while other client group members (L'Association Cooperative des Pêcheurs de L'Île Ltée, Produits Belle-Baie Ltée, L'Association québécoise de l'industrie de la pêche) are eligible for SFA 8,9,10,12 It should be made more clear if beyond landing the client group members for SFA 8 (ASP members) are eligible to buy and handle products landed from SFA 9, 10, 12 if they have separate CoC certification. What is the system in place to ensure that vessels under the ASP group members (if they have only access to SFA 8) do not fish in SFA 9,10,12? It could be beneficial if report provides the link or reference to the list of eligible vessels to fish in SFA 8, and SFA 9,10,12	
3920	Guidance	12	*N/A v.n/a	(blank)	The report is a bit confusing on whether or not the four SFAs are one UoC or four separate UoCs. The report states "The rationale for choosing these units of certification...", but since the SFAs are not scored separately, the assumption is that they have been combined into one UoC. Further, see other comments below.	
3921	Guidance	198-204	*N/A v.n/a	(blank)	The "consultation on condition" section for each condition states "IMM will need to report formal consultation with DFO (if DFO agrees to support the client action plan with resources." This should be changed since consultation with DFO has already occurred, as per their letter in Appendix 4.	

This report is provided for action by the Conformity Assessment Body (CAB) and ASI in order to improve consistency with the MSC scheme requirements. MSC does not review all work products submitted by CABs, and this review should not be considered a checking service. If any clarification is required, please contact Jodi Bostrom on +44 (0)20 7246 8934 for more information.

Best regards,
Fisheries Oversight Director
Dan Hoggarth
Marine Stewardship Council

A handwritten signature in black ink, appearing to read 'Dan Hoggarth', is displayed within a white rectangular box.

cc: Accreditation Services International

Appendix 5.2: IFC Responses to MSC Review and Report on Compliance with the scheme Requirements, 24 January 2014.

IFC Response re: MSC Ref 3914: Section 5.1 has been modified to address the issues raised in this section and now reads as follows:

This is the first re-certification of these fisheries. The certification validity period for SFA 8 is from 30 March 2009 to 30 March 2014. The initial certification validity period for SFAs 9, 10, 12 was from 18 September 2008 to 22 September 2013. This certificate validity was extended to 31 January 2014 by Variation Request to the MSC in August 2013.

The Target Eligibility Date, i.e. the date from which product from a certified fishery may be permitted to bear the MSC Ecolabel, is 1st February 2014.

This date has been set owing to a combination of: a) the delayed re-certification which resulted in a variation that enabled the original certification of SFAs 9, 10, & 12 to be extended to 31st January 2014 and, b) CR 27.6.1.2, which allows the eligibility date to extend as far back as 6 months from the date of publication of the Public Comment Draft Report (PCDR). The PCDR is expected to be published in early February 2014.

Therefore, any shrimp caught on or after the 1st February 2014 (i.e. the end of the extended certificate date) will be eligible to display the MSC logo if the fishery is re-certified but client group members and businesses within the chain of custody for this fishery would need to comply with MSC certification requirements for Under MSC Assessment fishery (UMAF) product traceability.

Text referring to the actual eligibility date has been removed from Section 5.

IFC Response re: MSC Ref 3915: The comment regarding transshipment has been revised. The paragraph now reads as follows:

“There is no transshipping in this fishery. All vessels must hail out to fish in one SFA and return to offload the raw material prior to fishing in another SFA. The only time this practice varies is when there is an at-sea observer on board the vessel. Then, captains can notify DFO that they are moving to another SFA and the request is permitted as there is an observer to verify harvest and bycatch information in each area.”

IFC Response re: MSC Ref 3916: A sentence (as follows) has been added to identify core fishing harbours by province. It is important to note that not all these harbours are either logistically equipped to handle larger vessel offloads (such as shrimp) nor in locations appropriate for processing infrastructure. Hence, all these ports are not necessarily used by vessels in these fisheries.

“A list by province of Core Fishing Harbours which support commercial fishing operations is available at the following DFO website; <http://dfo-mpo.gc.ca/sch-ppb/liste-liste/harb-port-eng.asp?c=fc> .”

IFC Response re: MSC Ref 3918: Section 5.3 has been revised to correct inconsistencies related to the unit of certification.

IFC Response re: MSC Ref 3919: Further clarification regarding the status of the client group for SFA 8, specifically, the Association of Seafood Producers (ASP), has been added to specify that ASP members are not eligible to purchase raw material directly from SFA 9,

10, 12 permitted vessels for the purpose of selling as MSC certified, however, they can purchase raw or processed product from the SFA 9, 10, 12 client group members for further resale as MSC certified.

The system in place to prevent vessels from fishing in other SFAs, has been further detailed in the report. In short, vessels are required to have quota for each SFA that they are permitted to fish in. The chain of custody certifications should verify the the source of raw material for each client member and determine whether those companies are compliant with their eligibility to purchase from various SFAs.

IFC Response re: MSC Ref 3920: Clarification has been added to Section 1 and Section 5 to make it clear that there is one unit of certification.

IFC Response re: MSC Ref 3921: This section has been corrected.