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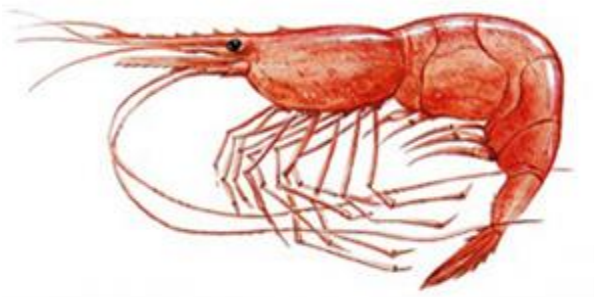
Gulf of St Lawrence Northern Shrimp Trawl



Public Comment Draft Report

Conformity Assessment Body (CAB)	Lloyd's Register
Assessment team	Paul Knapman and Julian Addison
Fishery client	L 'Association Coopérative des Pêcheurs de L'Ile Ltée. Association Québécoise de l'Industrie de la Pêche. Produits Belle-Baie Ltée. Association of Seafood Producers Inc.
Assessment Type	Full Assessment

Assessment Data Sheet

CAB details		**Lloyd's Register**
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Assessment Team	Team Leader	Paul Knapman
	P3/2 Assessor	Paul Knapman
	P1/2 Assessor	Julian Addison

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2 Glossary

ACAG	Association des Crevettiers Acadiens du Golfe
ACMSA	Atlantic Canadian Mobile Shrimp Association
AOI	Areas of Interest (candidate areas for protection)
ASP	Association of Seafood Producers
BMSY	Biomass supporting Maximum Sustainable Yield
C&P	DFO Conservation and Protection Branch
CIL	Cold Intermediate Layer
CoC	MSC Chain of Custody Certification
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CPUE	Catch Per Unit Effort
DFO	Department of Fisheries and Oceans (Canada)
DMP	Dockside Monitoring Program
EBSA	Ecologically and Biologically Significant Areas
EEZ	Exclusive Economic Zone
ENGO	Environmental Non Governmental Organisation
ETP	Endangered, Threatened, Protected species
F	Fishing mortality
FMSY	Fishing mortality at Maximum Sustainable Yield
FAM	MSC Fisheries Assessment Methodology
GEAC	Groundfish Enterprise Allocation Council
GSL	Gulf of St. Lawrence
GOSLIM	Gulf of St. Lawrence Integrated Management
IFMP	Integrated Fisheries Management Plan
ITQ	Individual Transferrable Quota
LOA	Length Overall
LRP	Limit Reference Point
MPA	Marine Protected Area
MSC	Marine Stewardship Council
MSC FCR	Marine Stewardship Council Fisheries Certification Requirements
MSE	Management Strategy Evaluation
MSY	Maximum Sustainable Yield
P1	Principle 1

P2	Principle 2
P3	Principle 3
PI	Performance Indicator
SBA	Significant Benthic Area
SeBA	Sensitive Benthic Area
SARA	Species at Risk Act
SFA	Shrimp Fishing Area
SFF	Sustainable Fisheries Framework
SG	Scoring Guidepost
SPA	Sequential Population Analysis
SSB	Spawning Stock Biomass
EGSAC	Estuary and Gulf Shrimp Advisory Committee
TAC	Total Allowable Catch
TRP	Target Reference Point
URP	Upper Reference Point
USR	Upper Stock Reference (synonymous with URP)
VPA	Virtual Population Analysis
Y/R	Yield per Recruit

3 Executive summary

This report is the Public Comment Draft Report which provides details of the MSC assessment process for the Gulf of St. Lawrence Northern Shrimp Trawl Fishery for Association Québécoise de l'Industrie de la Pêche (AQIP), L 'Association Coopérative des Pêcheurs de L'Ile Ltée, Produits Bell-Baie Ltée and the Association of Seafood Producers (ASP). The process began with publication of the ACDR on 10th October 2019 and was concluded (to be determined at a later date).

A review of information presented by the client has been scored by the assessment team and through the publication of the ACDR and the site visit that followed on the 12th November 2019, these scores have been reviewed by the assessment team and amended as appropriate.

The scoring presented in this report has been reviewed by peer reviewers and the client and the assessment team hav reviewed all comments and revised scores appropriately. The client action plan has also been submitted and accepted by the team and included in the report.

Stakeholders are once again encouraged to review the PCDR and scoring (and responses to previous input where relevant) presented in this assessment and use the Stakeholder Input Form to provide evidence to the team of where changes to scoring are still necessary.

The **Target Eligibility Date** for this assessment is 18th September 2019 (agreed by a variation request).

The assessment team for this fishery assessment comprised of Paul Knapman, who was team leader with shared Principle 2 responsibilities and Principle 3 lead and Julian Addison who was the Principle 1 lead and shared Principle 2 responsibilities. Paul MacIntyre was the traceability expert advisor.

Client fishery strengths

There is a precautionary, reference point framework in place that provides the basis for harvest control rules.

Bycatch in the fishery is very low due to use of the Nordmore grate. The gear also accurately target areas where shrimp are found and, as a result, the fisheries have no significant impact on populations of bycatch species.

No ETP species are affected by the fishery.

There has been considerable work in the Gulf of St. Lawrence to identify areas of sensitive benthic habitat, and sensitive benthic areas have been protected.

The management system is consistent with a comprehensive national and regional legal and policy framework for managing fisheries and ecosystems.

There is a comprehensive integrated fisheries management plan that clearly defines the long term and fishery specific objectives, and that describes the strategies and tactics for achieving them, based on the precautionary approach, and scientific advice.

Roles and responsibilities in DFO Quebec are clearly defined, and there is a high degree of consultation between managers and stakeholders through the Advisory Committee, such that decision making is transparent, and there are no ongoing or recurrent disputes.

Client fishery weaknesses

The trawl fishery's "move on protocols" have not been scientifically tested.

The management system does not have an occasional external review.

Determination

On completion of the review of information and site visit, and scoring, the Assessment Team determine that the fishery meets the MSC standard as no PIs are scored less than 60. **This does not represent the final determination by the CAB.**

For interested readers, the report also provides background to the target species and fishery covered by the assessment, the wider impacts of the fishery and the management regime, supported by full details of the assessment team, a full list of references used and details of the stakeholder consultation process.

Lloyd’s Register confirm that this fishery is within scope.

4 Report details

4.1 Authorship and peer review details

All team members listed below have completed all requisite training and signed all relevant forms for assessment team membership on this fishery.

Assessment team leader and Principle 3 and 2 specialist: Paul Knapman

Paul is an independent consultant based in Halifax, Nova Scotia, Canada. Paul began his career in fisheries nearly 30 years ago as a fisheries officer in the UK, responsible for the enforcement of UK and EU fisheries regulations. He then worked with the UK government's nature conservation advisors (1993-2001), as their Fisheries Programme Manager, responsible for establishing and developing an extensive programme of work with fisheries managers, scientists, the fishing industry and ENGOs, researching the effects of fishing and integrating nature conservation requirements into national and European fisheries policy and legislation.

Between 2001-2004 he was Head of an inshore fisheries management organisation in England, with responsibility for managing an extensive area of inshore fisheries on the North Sea coast. The organisations responsibilities and roles included: stock assessments; setting and ensuring compliance with allowable catches; developing and applying regional fisheries regulations; the development and implementation of fisheries management plans; the lead authority for the largest marine protected area in England.

In 2004, Paul moved to Canada and established his own consultancy providing analysis, advisory and developmental work on fisheries management policy in Canada and Europe. He helped draft the management plan for one of Canada's first marine protected areas, undertook an extensive review on IUU fishing in the Baltic Sea and was appointed as rapporteur to the European Commission's Baltic Sea Regional Advisory Council.

In 2008, Paul joined Moody Marine as their Americas Regional Manager, with responsibility for managing and developing their regional MSC business. He became General Manager of the business in 2012. Paul has been involved as a lead assessor, team member and technical advisor/reviewer for more than 50 different fisheries in the MSC programme. Paul has previously led audits and assessments of the Canada Scotian Shelf Prawn Trawl Fishery. He returned to fisheries consultancy in 2015. Paul is a MSC qualified Lead Assessor.

Assessment team member and Principle 1 and 2 specialist: Julian Addison

Dr Julian Addison is an independent fisheries consultant with more than 30 years' experience of stock assessment and provision of management advice on shellfish fisheries, and a background of scientific research on shellfish 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 experienced shellfish management approaches in North America as a visiting scientist at DFO in Halifax, Nova Scotia and at NMFS in Woods Hole, Massachusetts. 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 extensive experience of the MSC certification process primarily as a P1 team member but also as a P2 team member and team leader. He has undertaken nearly 30 MSC full assessments of crustacean and mollusc fisheries worldwide. He has also undertaken MSC pre-assessments in Europe, North America and Australia and over 50 annual surveillance audits and technical reviews. He is a member of the MSC Peer Review College and has carried out peer reviews of MSC assessments worldwide of a wide range of fish and shellfish fisheries. Julian has previously been a MSC audit team member for the Gulf of St. Lawrence Trawl Fishery. Julian is a MSC qualified lead assessor and has completed his RBF training.

Expert advisor: Paul Macintyre

Paul started working in the Aquaculture sector in 1975, managing salmon farms and processing factories for a large multi-national before transferring in 1990 to aquaculture audit and inspection.

During the last 25 years Paul has carried out over 3,000 audits and inspections of aquaculture and fish processing operations across the UK salmon and trout industry and internationally in the cod, tilapia and shrimp aquaculture sectors. Paul's primary interest is salmonids however his role as Aquaculture Director with Lloyd's Register has involved him in the development and trial audit of a number of new aquaculture and agricultural standards.

Paul is a qualified Lead Assessor and approved to audit BRC, MSC / ASC Chain of Custody, GlobalGAP, Organic Aquaculture, Freedom Food, Label Rouge, Best Aquaculture Practices, ASC Salmon and Friend of the Sea. Paul also audits to UK and French retailer standards

4.2 Peer Reviewers

Peer reviewers used for this report were Jerry Ennis and Nick Caputi. A summary CV for each is available in the **Assessment downloads** section of the fishery's entry on the MSC website.

Jerry Ennis

Dr Gerald P. Ennis completed a Ph.D. in marine biology at the University of Liverpool in the early 1970s, following undergraduate and graduate degrees at Memorial University of Newfoundland in the 1960s,. 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. As Head of Shellfish Section for 27 years, Dr Ennis 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 NewfoundlandLabrador 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. Since retiring, Dr Ennis has published several articles aimed at presenting fishery science primarily to harvesters and has participated in most aspects of the MSC certification process for several Atlantic Canada fisheries.

Nick Caputi

Dr Nick Caputi obtained his PhD from Murdoch University in 1989 with a thesis based on stockrecruitment relationships for crustacean fisheries in Western Australia. From 1974 to 1998 he worked as a statistician for the Department of Fisheries (Western Australia) working on fisheries projects from all major commercial and recreational fisheries. Since 1998 he has been the Supervising Scientist of the Invertebrate Branch of the Department, which is responsible for research on rock lobster, pearl oyster, prawns, scallop, blue swimmer crab, deep sea crab and abalone. Seven of these fisheries have achieved the Marine Stewardship Council certification with the western rock lobster fishery being the first. Dr Caputi's research focus is stock assessment but he has also been involved with MSC P2 and P3 issues with over 40-years' experience and publication of over 60 peer-reviewed papers (18 as lead author), 25 reports and 18 book chapters. His research includes catch predictions based on pre-recruit abundance, environmental effects on recruitment, spawning stock-recruitment relationships, climate change effects on fisheries, harvest strategies and maximum economic yield. The management of the western rock lobster fishery is based on a bio-economic model and a length-structured stock assessment model. He has participated in 6 Center of Independent Experts' reviews of fisheries in the USA, on invertebrate fisheries and climate change. He has also participated in stock assessments in Mozambique on the shrimp fishery (1998-2004), rock lobster (2007) and artisanal shrimp (2003).

4.3 RBF Training

Julian Addison has been fully trained in the use of the MSC's Risk Based Framework (RBF).

4.4 Version details

Table 1. Fisheries program documents versions.

Document	Version number
MSC Fisheries Certification Process	**Version 2.1**
MSC Fisheries Standard	**Version 2.01**
MSC General Certification Requirements	**Version 2.4.1**
MSC Reporting Template	**Version 1.0**

5 Unit(s) of Assessment and Certification and results overview

5.1 Unit(s) of Assessment and Unit(s) of Certification

5.1.1 Unit(s) of Assessment

Table 2. Units of Assessment (UoA)

UoA 1	**Description**
Species	Northern Shrimp (*Pandalus borealis*)
Stock	Shrimp Fishing Area 8 (Esquiman)
Geographical area	Gulf of St. Lawrence, Canada
Harvest method / gear	Otter trawl
Client group	• Association Québécoise de l'Industrie de la Pêche (AQIP) • L'Association Coopérative des Pêcheurs de L'Ile Ltée, • Produits Bell-Baie Ltée • Association of Seafood Producers (ASP)
Other eligible fishers	Other shrimp fishers operating in the region subject to the terms of the certificate sharing agreement
UoA 2	**Description**
Species	Northern Shrimp (*Pandalus borealis*)
Stock	Shrimp Fishing Area 9 (Anticosti)
Geographical area	Gulf of St. Lawrence, Canada
Harvest method / gear	Otter trawl
Client group	• Association Québécoise de l'Industrie de la Pêche • L'Association Coopérative des Pêcheurs de L'Ile Ltée, • Produits Bell-Baie Ltée
Other eligible fishers	Other shrimp fishers operating in the region subject to the terms of the certificate sharing agreement
UoA 3	**Description**
Species	Northern Shrimp (*Pandalus borealis*)
Stock	Shrimp Fishing Area 10 (Sept Iles)
Geographical area	Gulf of St. Lawrence, Canada
Harvest method / gear	Otter trawl

Client group	• Association Québécoise de l'Industrie de la Pêche • L'Association Coopérative des Pêcheurs de L'Ile Ltée • Produits Bell-Baie Ltée
Other eligible fishers	Other shrimp fishers operating in the region subject to the terms of the certificate sharing agreement
UoA 3	**Description**
Species	Northern Shrimp (*Pandalus borealis*)
Stock	Shrimp Fishing Area 12 (Estuary)
Geographical area	Gulf of St. Lawrence, Canada
Harvest method / gear	Otter trawl
Client group	• Association Québécoise de l'Industrie de la Pêche • L'Association Coopérative des Pêcheurs de L'Ile Ltée • Produits Bell-Baie Ltée
Other eligible fishers	Other shrimp fishers operating in the region subject to the terms of the certificate sharing agreement

It should be noted that for UoA 1 the Association of Seafood Producers (ASP) is a member of the client group through a certification sharing agreement. ASP is not a member of the client group for the other UoAs.

It should also be noted that other eligible fishers may join a UoC through a certificate sharing arrangement. In this instance, the client group has indicated they are willing to enter into certificate sharing arrangements with other eligible fishers.

Lloyd's Register confirm that the fisheries are within scope of the MSC certification being sought and the UoAs are compliant with client wishes for assessment coverage and in full conformity with MSC criteria.

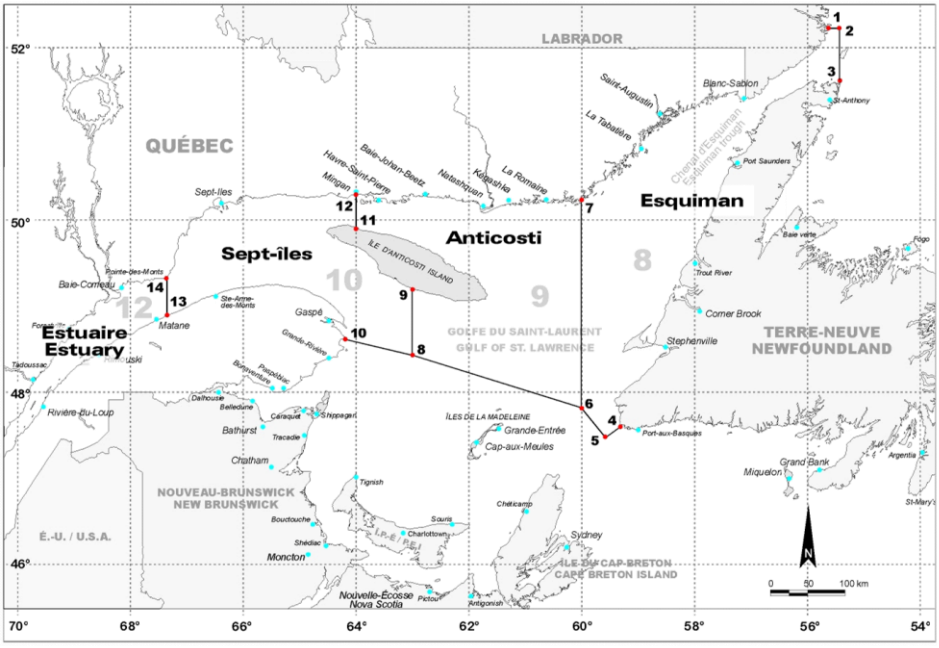

Figure 1. Map of the Units of Assessment boundary

5.1.2 Unit(s) of Certification

Table 3. Units of Certification (UoC)

UoC 1	**Description**
Species	Northern Shrimp (*Pandalus borealis*)
Stock	Shrimp Fishing Area 8 (Esquiman)
Geographical area	Gulf of St. Lawrence, Canada
Harvest method / gear	Otter trawl
Client group	• Association Québécoise de l'Industrie de la Pêche (AQIP) • L'Association Coopérative des Pêcheurs de L'Ile Ltée, • Produits Bell-Baie Ltée • Association of Seafood Producers (ASP)
UoC 2	**Description**
Species	Northern Shrimp (*Pandalus borealis*)
Stock	Shrimp Fishing Area 9 (Anticosti)
Geographical area	Gulf of St. Lawrence, Canada
Harvest method / gear	Otter trawl
Client group	• Association Québécoise de l'Industrie de la Pêche • L'Association Coopérative des Pêcheurs de L'Ile Ltée, • Produits Bell-Baie Ltée
UoC 3	**Description**
Species	Northern Shrimp (*Pandalus borealis*)
Stock	Shrimp Fishing Area 10 (Sept Iles)
Geographical area	Gulf of St. Lawrence, Canada
Harvest method / gear	Otter trawl
Client group	• Association Québécoise de l'Industrie de la Pêche • L'Association Coopérative des Pêcheurs de L'Ile Ltée • Produits Bell-Baie Ltée
UoC 4	**Description**
Species	Northern Shrimp (*Pandalus borealis*)
Stock	Shrimp Fishing Area 12 (Estuary)

Geographical area	Gulf of St. Lawrence, Canada
Harvest method / gear	Otter trawl
Client group	• Association Québécoise de l'Industrie de la Pêche • L'Association Coopérative des Pêcheurs de L'Ile Ltée • Produits Bell-Baie Ltée

5.2 Assessment results overview

5.2.1 Determination, formal conclusion and agreement

To be drafted at Final Draft Report
To be completed at Public Certification Report

The report shall include a formal statement as to the certification determination recommendation reached by the assessment team on whether the fishery should be certified.

The report shall include a formal statement as to the certification action taken by the CAB's official decision-makers in response to the Determination recommendation.

Reference(s): FCP v2.1 Section 7.21

5.2.2 Principle level scores

Table 4. Principle level scores

Principle Scores				
Principle	**UoC 1**	**UoC 2**	**UoC 3**	**UoC 4**
Principle 1 – Target Species	85.0	85.0	83.3	85.0
Principle 2 – Ecosystem	89.3	88.7	88.0	88.0
Principle 3 – Management System	90.4	90.4	90.4	90.4

5.2.3 Summary of conditions

Table 5. Summary of conditions

Condition number	Condition	Performance Indicator	Related to previously raised condition? (Y/N/NA)
1 - 4	Evidence is required to show: • There is a partial strategy in place that is expected to achieve the Habitat Outcome 80 level of performance or above; • There is some objective basis for confidence that the measures/partial strategy will work; • There is some quantitative evidence that the measures/partial strategy is being implemented successfully There is some quantitative evidence that the UoA complies with both its management requirements and with	**PI 2.4.2**	**N**

Condition number	Condition	Performance Indicator	Related to previously raised condition? (Y/N/NA)
	protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.		
5 - 8	By the third annual audit the client shall provide evidence that the Gulf of St. Lawrence Shrimp Trawl Fishery management system is subject to regular internal and occasional external review.	**PI 3.2.4**	**N**

5.2.4 Recommendations

Recommendations are included to highlight how the management or operation of the fishery could be enhanced and contribute to ongoing efforts to ensure the long-term sustainability of the fishery. Recommendations do not impose a mandatory requirement nor are they auditable, however, they do act as a marker for future audits and assessments and may highlight actions that will ensure information or evidence of good management remain current and continue to meet MSC requirements.

Recommendation for PI 1.2.4

The assessment team recommends that the main stock indicator is presented with confidence intervals.

6 Evaluation results

6.1 Eligibility date

The eligibility date for this fishery is the 18th September 2018, as agreed by the MSC through variation request.

6.2 Traceability within the fishery

The Gulf of St. Lawrence Northern Shrimp Trawl Fishery is managed through a limited entry and licence based management system. The fishery currently consists of a total of 128 licensed trawl vessels.

Harvesters are required to renew licences annually, report catch and comply with conditions of license related to regulation of the fishery, thereby allowing DFO to track the number of licence holders in total as well as the number of active licence holders in the fishery.

Through requirements associated with 100% 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 area from which it was harvested.

The possibility of vessels fishing outside of the UoC is mitigated by licence requirements that mandates that vessels cannot fish in more than one SFA on a single fishing trip, unless accompanied by an observer.

The main ports of landing for the shrimp trawl fishery are required to be investigated. Other ports in Atlantic Canada may be used in the event of vessel distress or inclement weather.

Mandatory requirements set out in licence conditions ensure traceability within the fishery:

- The vessels are remotely monitored with VMS emitting a signal every 30 minutes. The signal can be enhanced if C&P were concerned of a potential infringement.
- The vessels must hail-out prior to leaving port and hail-in prior to returning to port.
- At-sea monitoring is undertaken via enforcement aircraft and vessels, and periodically by fishery observers.
- The vessels are only engaged in fishing for Northern shrimp.
- Transshipping is not permitted.
- All landings for the trawl fishery are 100% dockside monitored.
- All traceability and segregation systems for products are already in place, as appropriate for client group members of the existing certification.

There is a single at sea processing trial project underway within the fishery. The client representative confirmed that the shrimp is frozen, packed and labeled at-sea. Further labelling of the pallet is undertaken on landing at the storage facility. The storage facility is covered by existing CoC certification. (D. Butler pers. comm.).

All of the remaining harvested shrimp is landed for processing as fresh (iced), whole shell-on product. The raw material is then cooked and peeled prior to being sold. Members of the client group (processing companies) are required to have a valid chain of custody certification 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.

Table 6. Traceability within the fishery

Factor	Description
Will the fishery use gears that are not part of the Unit of Certification (UoC)? If Yes, please describe: - If this may occur on the same trip, on the same vessels, or during the same season; How any risks are mitigated.	Only small meshed trawl gears are used in the fishery being assessed. Other mobile or fixed gear fisheries use mesh sizes that are too big to retain shrimp. Therefore, there is no risk for non-certified gear use.

Factor	Description
Will vessels in the UoC also fish outside the UoC geographic area? If Yes, please describe: - If this may occur on the same trip; - How any risks are mitigated.	The possibility of vessels fishing outside of a UoC is mitigated by licence requirements that mandates that vessels cannot fish in more than one SFA on a single fishing trip, unless accompanied by an observer. VMS confirms where vessels fish and at-sea or aerial surveillance can also be used to confirm adherence to this requirement.
Do the fishery client members ever handle certified and non-certified products during any of the activities covered by the fishery certificate? This refers to both at-sea activities and on-land activities. - Transport - Storage - Processing - Landing - Auction If Yes, please describe how any risks are mitigated.	All landings are subject to dockside monitoring. Landings are either made direct to the processors or stored in bonded cold storage facilities – all of which are subject to existing chain of custody certification and so the facility owners are well versed in the traceability requirements set by MSC. The risk to chain of custody, post landing, is therefore considered to be minimal. There are several New Brunswick vessels permitted to harvest Northern shrimp in the Gulf of St. Lawrence as well as the Scotian Shelf (SFA 13-15). These vessels are required to either offload product prior to changing fishing zones or are required to have an at-sea observer on board who can verify catch quantities and segregation prior to moving to new fishing zones. Only one vessels is permitted to process at-sea and is the subject of an on-going feasibility study. As well as having to carry an observer for 50% of the trips the client representative confirmed that while the shrimp is frozen and packed onboard it is landed to a plant where it is labeled. This processing facility has chain of custody certification and so the product is subject to appropriate chain of custody requirements. All landings are subject to 100% monitoring.
Does transhipment occur within the fishery? If Yes, please describe: - If transhipment takes place at-sea, in port, or both; - If the transhipment vessel may handle product from outside the UoC; - How any risks are mitigated.	No transhipment is allowed in the fishery nor is there any incentive to do so. So there is considered to be no risk with respect to traceability.
Are there any other risks of mixing or substitution between certified and non-certified fish? If Yes, please describe how any risks are mitigated.	No other risks of substitution between fish from a UoC (certified catch) and fish from outside a UoC (non-certified catch) before subsequent chain of custody is required were identified by the assessment team or highlighted by stakeholders at the site visit.

6.3 Eligibility to enter further chains of custody

The fishery assessment covers all Northern shrimp, *P. borealis*, landed from vessels operating in SFAs 8, 9, 10, 12 until the point of landing, therefore the scope of certification ends at the point of landing. Downstream certification of the product requires the appropriate chain of custody certification.

The fishery certificate is applicable to all vessels that are legally licenced to fish for shrimp using trawl in SFAs 8, 9, 10, 12. Any shrimp landed by vessels operating within the UoCs is considered to be within scope

and MSC certified, provided that the product is purchased by members of the client group. The client group members, at the time of re-assessment, are:

- Association of Seafood Producer (ASP) members (NB. buying from vessels fishing in SFA 8 only) :
  - 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).
- L'Association Coopérative Des Pêcheurs De L'île Ltée
- L'Association Québécoise de l'Industrie de la Pêche (AQIP) members :
  - Les Pêcheries Marinard Ltée
  - Les Fruits de Mer de l'Est du Québec (1998) Ltée
  - LA Crevette du Nord Atlantique Inc"
- Produits Belle-Baie Ltée.

Beyond landing, any company taking ownership of the product and wishing to identify it as MSC certified will need to be one of the listed companies above and hold a valid chain of custody certificate.

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 companies and member companies.

6.4 Eligibility of Inseparable or Practicably Inseparable (IPI) stock(s) to enter further chains of custody

The distribution of *P. montagui* can overlap with that of *P. borealis* within the Gulf of St. Lawrence and, as a result, is liable to be caught in the trawl fishery. Owing to their physical similarities and appearance they are inseparable during the normal fishing operation and practically inseparable during processing (MSC FCR v 2.0 7.4.13.1 a & b). MSC refer these species or stocks as "Inseparable or Practically Inseparable (IPI)".

This was recognised at the last re-assessment/certification of the trawl fishery. At that time the quantities of P. Montagui in the catch were estimated to be < 2% of the total catch and not considered to create a significant impact on the IPI stock as a whole. 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. Subsequent annual audits have reviewed the percentage of P. montagui in the total catch and it has remained at < 2%.

At the last audit, i.e. the 4th audit, which coincided with the stopped re-assessment site visit, DFO Science confirmed that, through a collaborative agreement with the shrimp fishery, 150 samples of shrimp are collected annually and used by DFO to better understand the catch profile throughout the year. This includes the recording of *P. montagui*.

From the 150 samples collected during the 2017 season, *P. montagui* made up < 2% of the catch in each of the SFAs.

Noting that the last completed re-assessment of the trawl fishery was undertaken using MSC CR v 1.3, the requirements for IPI stocks remain the same in MSC FCP v 2.1. (see sections 7.5.8-13 and Annex PA).).

The assessment team are therefore content that the sampling conducted by DFO provides a reasonable estimate of the proportion of *P. montagui* in the annual catch and corresponds to previous figures provided at MSC audits and assessments of the trawl fishery. As such, *P. montagui* is still considered to be an IPI species and, given the low levels of catch (0.010%), the fishery is not considered to have a significant impact on the stock. An announcement has been published on the MSC website with these details.

This means that *P. montagui* can enter into certified chains of custody with *P. borealis*. The proportion of the total catch of *P. montagui* will be checked at future surveillance audits. If the proportion of *P. montagui* increases to between 2-15% of the total catch, according to MSC FCR v 2.0, the stock will need to be

assessed against Principle 1 at the next re-assessment, or, techniques will need to be developed to effectively separate catches of *P. montagui* from the P. borealis catch, or, measures to reduce the proportion of *P. montagui* to <2% will have to be implemented.

7 Scoring

7.1 Summary of Performance Indicator level scores

Principle	Component	Performance Indicator (PI)		UoC Score			
				1	2	3	4
1	Outcome	1.1.1	Stock status	80	80	70	80
		1.1.2	Stock rebuilding	N/A	N/A	80	N/A
	Management	1.2.1	Harvest strategy	95	95	95	95
		1.2.2	Harvest control rules & tools	80	80	80	80
		1.2.3	Information & monitoring	90	90	90	90
		1.2.4	Assessment of stock status	85	85	85	85
2	Primary species	2.1.1	Outcome	100	100	95	95
		2.1.2	Management	95	95	95	95
		2.1.3	Information	100	100	95	100
	Secondary species	2.2.1	Outcome	80	80	80	80
		2.2.2	Management	95	90	90	90
		2.2.3	Information	100	95	95	90
	ETP species	2.3.1	Outcome	100	100	100	100
		2.3.2	Management	90	90	90	90
		2.3.3	Information	80	80	80	80
	Habitats	2.4.1	Outcome	95	95	95	95
		2.4.2	Management	60	60	60	60
		2.4.3	Information	80	80	80	80
	Ecosystem	2.5.1	Outcome	90	90	90	90
		2.5.2	Management	85	85	85	85
		2.5.3	Information	90	90	90	90
3	Governance and policy	3.1.1	Legal & customary framework	100	100	100	100
		3.1.2	Consultation, roles &	95	95	95	95
		3.1.3	Long term objectives	100	100	100	100
	Fishery specific management system	3.2.1	Fishery specific objectives	90	90	90	90
		3.2.2	Decision making processes	85	85	85	85
		3.2.3	Compliance & enforcement	85	85	85	85
		3.2.4	Monitoring & management performance evaluation	70	70	70	70

7.2 Overview of the fishery

The following has been adapted from the Integrated Fishery Management Plan (IFMP) for the Northern Shrimp in the Estuary and Gulf of St. Lawrence (Areas 8, 9, 10 and 12) (*Pandalus borealis*) (DFO, 2018a) the last Public Certification Report (PCR) for the fishery assessment (Intertek 2014), previous surveillance reports and the latest stock assessment status update (DFO, 2018b).

The Gulf of St. Lawrence Northern shrimp trawl fishery is conducted by trawlers in four Shrimp Fishing Areas (SFA) that are also identified by geographic names: SFA 8 (Esquiman Estuary), SFA 9 (Anticosti), SFA 10 (Sept-Iles) and SFA12 (Estuary) (see Figure 2).

This is a limited entry fishery, in 2017, 128 licences were issued. Of these, 106 were active (B. Morin, DFO, pers. comm. and DFO, 2018a).

The fishery opens on April 1 and closes on December 31, or before, if the Total Allowable Catch (TAC) is reached. The fishery has been managed by TAC since 1982.

The TACs are distributed according to the following sharing that was established in 2009:

- **Group A Licence Holders** - (Newfoundland and Labrador and Quebec) allocated 73.23% of the SFA 8 TAC. Of this, Newfoundland and Labrador receives 88.9% and Quebec 11.1%. Through their association, fishermen on the Lower North Shore who have access to temporary allocations share 8.94% of Quebec's share.
- **Group B Licence Holders** - (Quebec and New Brunswick) allocated 24.41% of SFA 8 TAC; 97.64% of SFA 9 and 10; 100% of SFA 8. A sharing agreement between the Quebec and New Brunswick "traditional" fleet and the groundfish dependant fish harvesters (termed "New Access") has been in place since 2010. This agreement attributes 13.5% to groundfish dependant fish harvesters. Of this, the association of fishermen of the Lower North Shore receives 13.6% in temporary allocations in each of the SFAs.
- Prince Edward Island (PEI) and Nova Scotia receive 2.36% from the TACs of the SFAs Esquiman, Anticosti and Sept-Îles.

A combination of Individual Quota (IQ) and Individual Transferable Quota (ITQ) is in operation between Group A and B licence holders.

The TACs and other regulations are set out in a Conservation Harvesting Plan (CHP) published as an annual Notice to Fishers on the DFO website (DFO, 2018c).

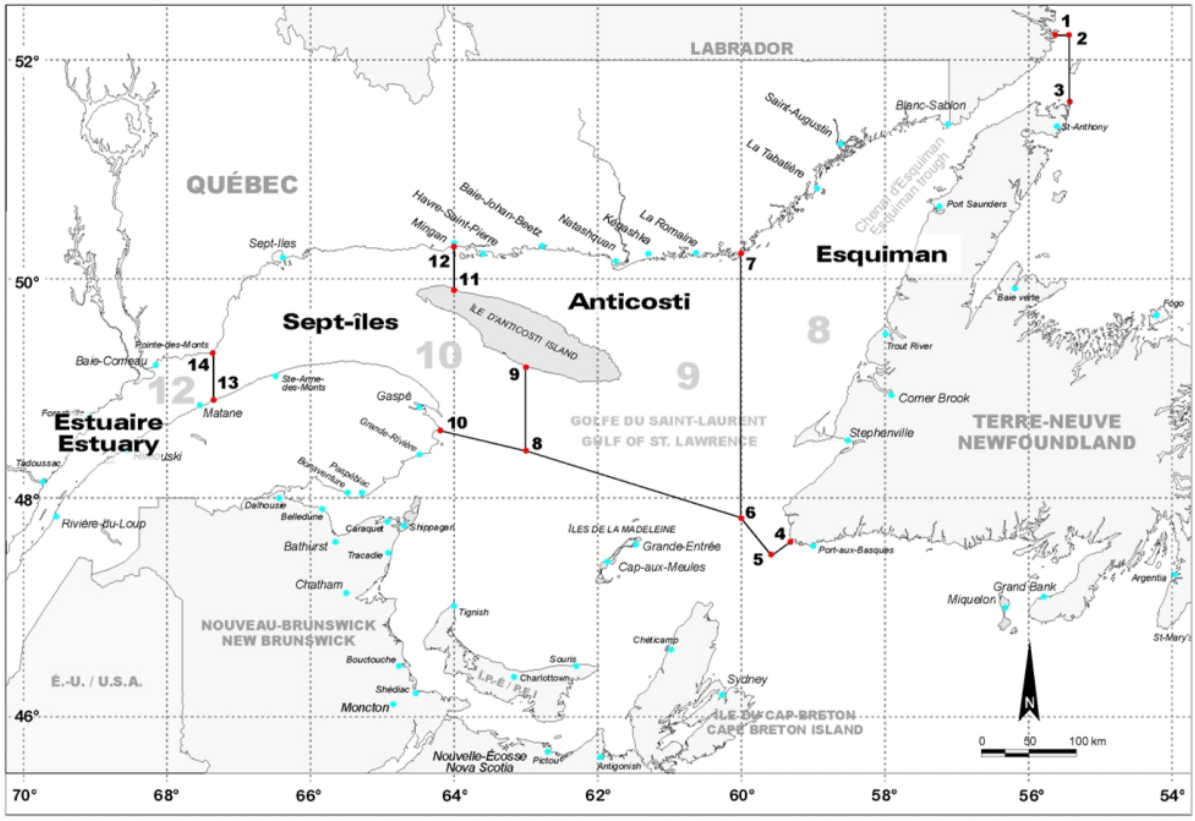

Figure 2. Shrimp Fishing Areas (SFA) in the Estuary and Gulf of St. Lawrence (Source: DFO, 2018a)

Technical conservation measures include a minimum mesh size (40 mm) and, since 1993, the compulsory use of the Nordmore grate (Figure 3), which reduces groundfish by-catch. A protocol to limit small bycatch is also in place, particualry to limit the catch of small redfish.

Monitoring of fishing activity and catches is maintained through mandatory use of a satellite vessel monitoring system (VMS), completion of log books (with elogs being phased in from 2018), a dockside monitoring program that covers 100% of the landings, and an industry funded observer program which aims to cover at least 5% of fishing trips in each year.

With one exception, all shrimp are landed for processing as fresh (iced) whole, shell-on. The exception is one vessel, that is operating as an at-sea catcher/processer. In order to mitigate concerns that at-sea processing could encourage high-grading, resulting in discarding of small shrimp, the vessel is subject to 50% observer coverage. DFO reported at the February 2018, Estuary and Gulf Shrimp Advisory Committee (EGSAC) meeting (DFO, 2018d) that preliminary reports indicated that size categories in observed and unobserved landings were similar, suggesting that high-grading was not an issue.

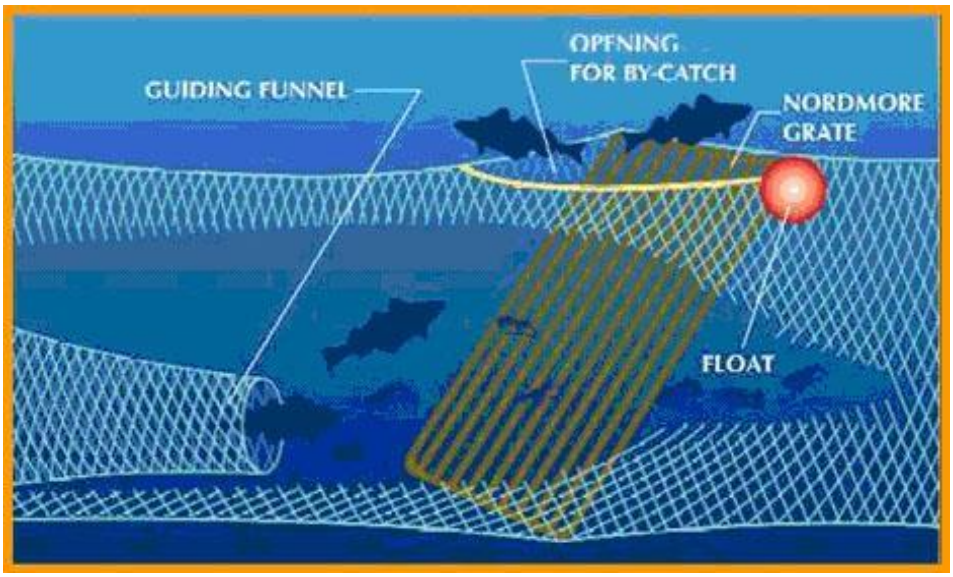

Figure 3. Nordmore separator grate for reducing bycatch in shrimp trawls. (Source: DFO 2010)

Trials using on-board mechanical devices to separate bycatch began in 2014. The intent of their use is to simplify the separation of bycatch, improve the working conditions on vessels and improve deck handling safety. DFO monitored the trial, including the comparison of bycatch when a separator was in use and not in use; the possibility for high-grading; and, the efficacy of separating bycatch. Results of the analysis satisfied DFO that the separator proved to be an efficient separating tool, reduced the time required to sort the bycatch; high-grading was not a concern; and, the landings were cleaner and of better quality. As a result, DFO has approved the voluntary use of the bycatch separator subject to management measures related to the collection of data and fishing patterns for future analysis as well as increased observer coverage (B. Morin, pers. comm.).

In the period 1990 to 2012, landings in the Gulf of St. Lawrence doubled, with the peak year for landings in 2010. Since then, the landings and TACs have declined in each SFA (Figure 4).

On average, the Quebec Region accounts for about 60% of the shrimp landings in the Estuary and Gulf of St. Lawrence. Newfoundland and Labrador and the Gulf regions each account for about 20% of Northern shrimp landings.

Experimental trap fishing for shrimp was attempted in the past in the Gulf of St. Lawrence (Gaspésie, Prince Edward Island and Newfoundland and Labrador), however, the catches were disappointing and the fishery never developed.

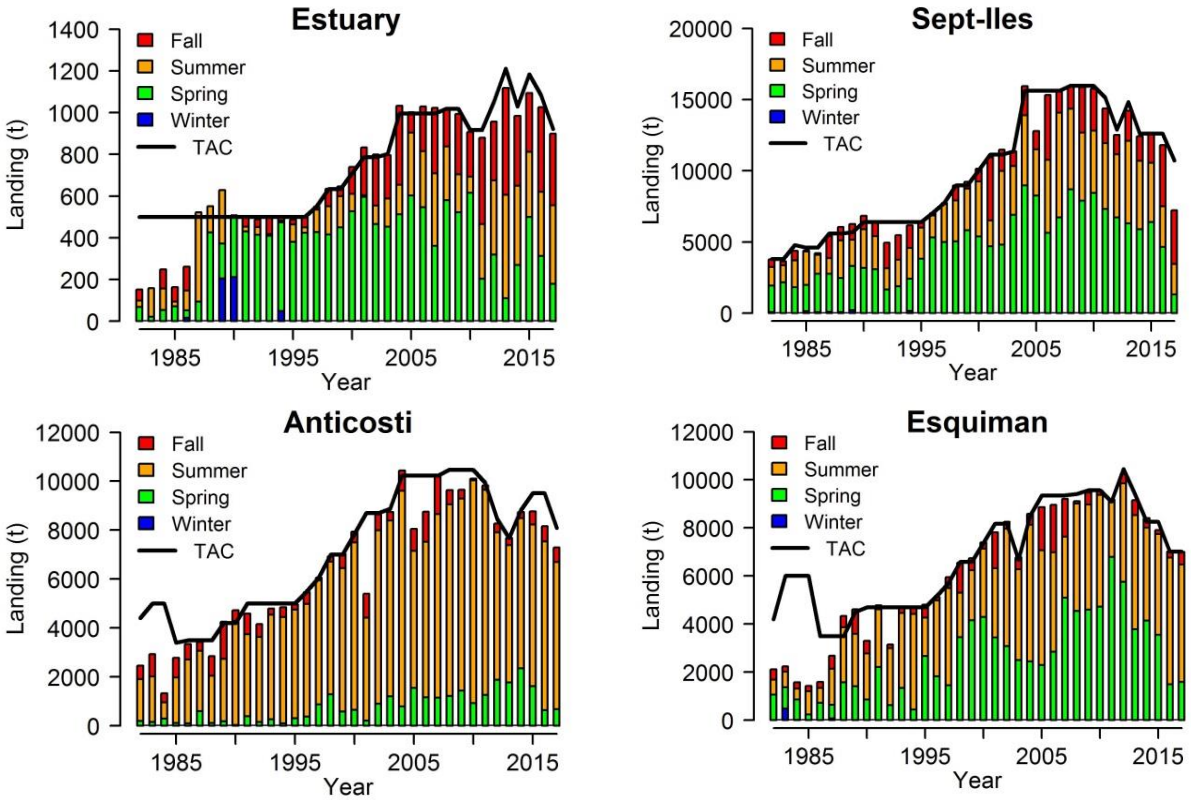

Figure 4. Seasonal landings and TACs by fishing area and year (DFO, 2018b)

Using logbook and VMS data from 2012-2017 the distribution of shrimp trawl fishing effort in the Gulf of St. Lawrence can be seen in Figure 5 below:

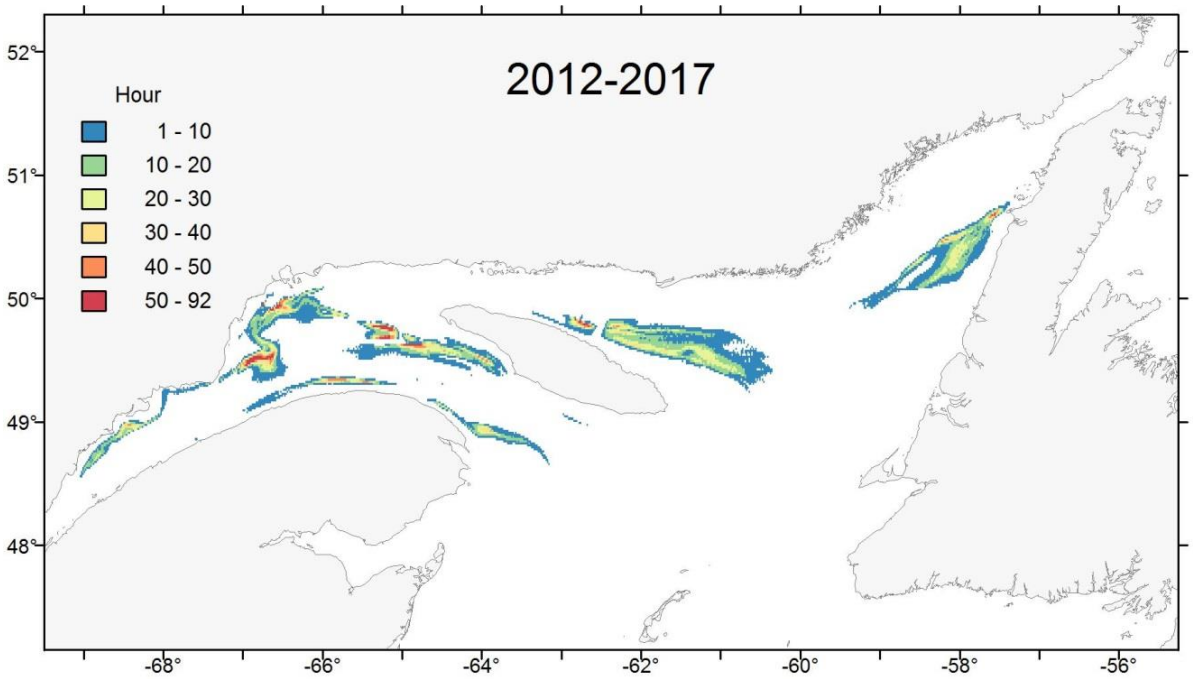

Figure 5. Distribution of mean fishing effort from 2012 to 2017 according to VMS (DFO, 2018b)

References - (**NB The reader should note that a reference list is provided after each key section and the same reference may be repeated with a slightly different prefix.)**

Intertek 2014, Public Certification Report of the Gulf of St. Lawrence Northern Shrimp Trawl Fishery https://fisheries.msc.org/en/fisheries/gulf-of-st-lawrence-northern-shrimp-trawl-fishery/@@assessments

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DFO. 2018b. Assessment of Northern Shrimp stocks in the Estuary and Gulf of St. Lawrence in 2017. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2018/015. http://publications.gc.ca/collections/collection_2018/mpo-dfo/fs70-6/Fs70-6-2018-015-eng.pdf

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DFO. 2018d. Draft minutes of the 2018 Estuary and Gulf Shrimp Advisory Committee (EGSAC) annual meeting.

MSC Fisheries Certification Requirements and Guidance, Version 2.0, 1st October 2014. https://www.msc.org/for-business/certification-bodies/fisheries-standard-program-documents

7.3 Principle 1

7.3.1 Principle 1 background

Taxonomy and geographic range

The Northern shrimp, *Pandalus borealis* (Krøyer, 1838), also known as the pink shrimp or cold water prawn, is a caridean shrimp of the family Pandalidae. It is distributed across the North Atlantic around Greenland, Iceland, the Barents Sea and Svalbard, and south to Massachusetts in the Northwest Atlantic and to the North Sea in the Northeast Atlantic (Figure 6), and across the North Pacific from the Bering Sea south to Japan and Oregon (Holthuis, 1980). In all these areas there are important commercial fisheries for *Pandalus borealis*.

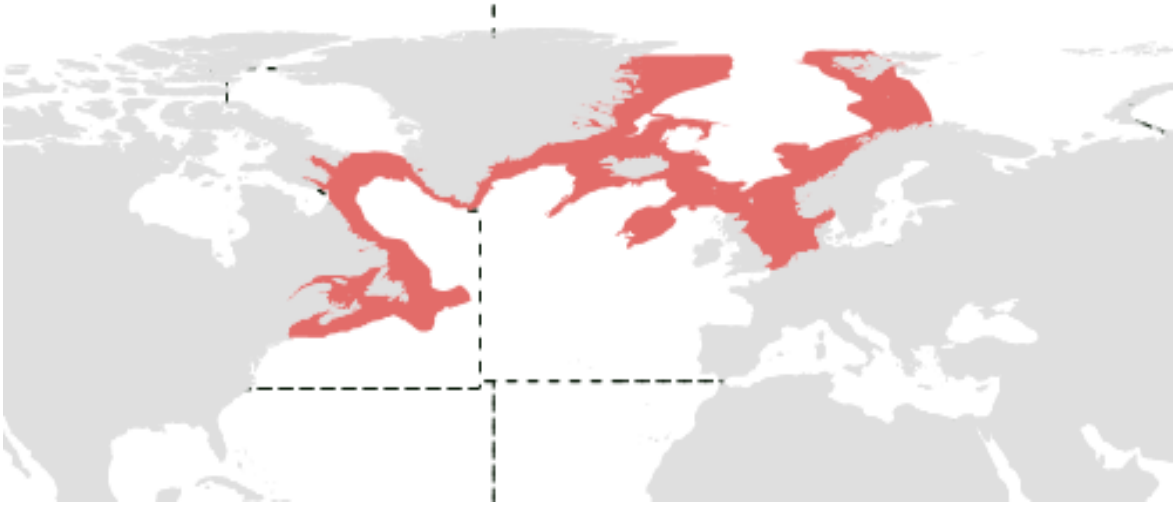

Figure 6. Distribution of *Pandalus borealis in* Atlantic waters.

(Source: www.fao.org/fishery/species/3425/en)

Stock structure

As noted above, *Pandalus borealis* is distributed over a wide geographical area in Atlantic Canadian waters south to the Gulf of Maine. Migration of egg-carrying females into shallower waters in connection with egg-hatching has been observed in *Pandalus borealis* (Horsted, 1978), and juveniles may migrate from shallower to deeper water (Smidt, 1981). In addition, the larvae of *Pandalus borealis* may be transported as far as 300 km during the pelagic phase as revealed by particle tracking models in the Barents Sea (Pedersen *et al*., 2003) suggesting some connectivity between populations across large geographical areas. Within the Estuary and Gulf of St Lawrence, there are four fishery management areas (SFAs 8, 9, 10 and 12; Figure 1) that were identified from the distribution of all stages of development of the species, including the juveniles and breeding females, although no genetic differences between the four geographical areas have been identified (Sévigny *et al*., 2000). Recently the genetics of stock structure of *Pandalus borealis* in the Northwest Atlantic from Hudson Strait south to the Gulf of Maine and out to the Flemish Cap has been studied using DNA microsatellites. Whilst the samples from the Gulf of Maine and Flemish Cap appeared to be genetically distinct from other areas, within the area covered by Nova Scotia, Newfoundland and Labrador, the populations appeared genetically homogeneous (Jorde *et al*., 2014). A similar lack of genetic divergence over wide geographical scales was observed in the Northeast Atlantic; there was no significant genetic variation observed among shrimp samples from the Barents Sea and Svalbard (Martinez *et al.*, 2006) or between oceanic samples from Skagerrak and the eastern North Sea (Knutsen *et al*., 2014), although both studies identified elevated levels of genetic differentiation between Norwegian and Skagerrak fjord samples. Whilst there is likely to be no clear genetic differentiation between shrimp stocks in SFAs 8, 9, 10 and 12, there is a clear geographical separation between the fisheries in the four SFAs, and with stock surveys and management advice undertaken separately for SFAs 8, 9, 10 and 12, it is reasonable to consider for this assessment that the populations in the four SFAs constitute separate stocks. At a workshop in 2014, a similar issue was considered for assessment of Northern shrimp in SFAs 4-7 following the publication of the results of the Jorde *et al* (2014) study. The workshop concluded that whilst it could be reasoned that the populations

of shrimp across the whole continental shelf could be treated as a single stock unit, there were biological differences across SFAs and that there was no compelling reason to change the current scale of the management areas (DFO, 2016a).

Biology and life history

Northern shrimp, *Pandalus borealis*, is found primarily in areas with soft, muddy sediments on the continental shelves in the North Atlantic, usually at depths between 50 and 500 m (Shumway *et al*., 1985) but can also be found in depths over 800 m in the Barents Sea. In the Estuary and Gulf of St Lawrence fishery, fishing activity is generally conducted at depths between 200 and 300m. The annual research surveys show that the median depth for northern shrimp distribution is 260 m, and the median temperature is 5.2 °C (Bourdages *et al.*, 2018a;b).

Northern shrimp is widespread in the Estuary and in the northern Gulf of St. Lawrence, but DFO research survey data indicate that since 2000 the areas of shrimp concentration where over 95% of the biomass is distributed have decreased from 54,000 km^2 to 33,000 km^2 (Figure 7). In consequence, VMS data show that certain traditional fishing grounds have been abandoned because of the low abundance of shrimp, and the fishing area where activity is most intense currently corresponds to an area of 2,250 km^2, where 54% of all fishing effort is deployed (Figure 8). The fishing footprint currently overlaps 14% of the shrimp's distribution range.

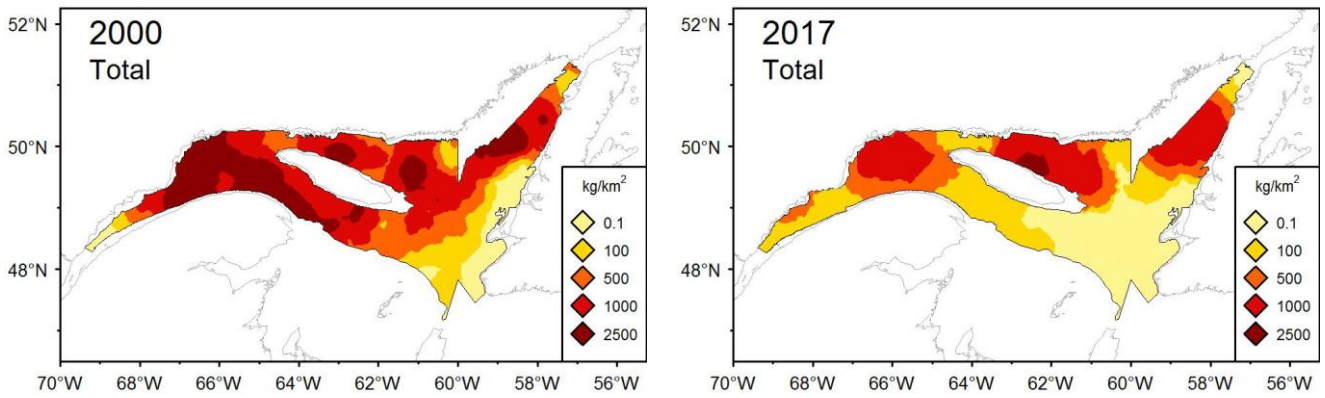

Figure 7 Northern shrimp catch rates (kg/km^2) distribution in the DFO survey in 2000 and 2017. (Source: DFO, 2018a)

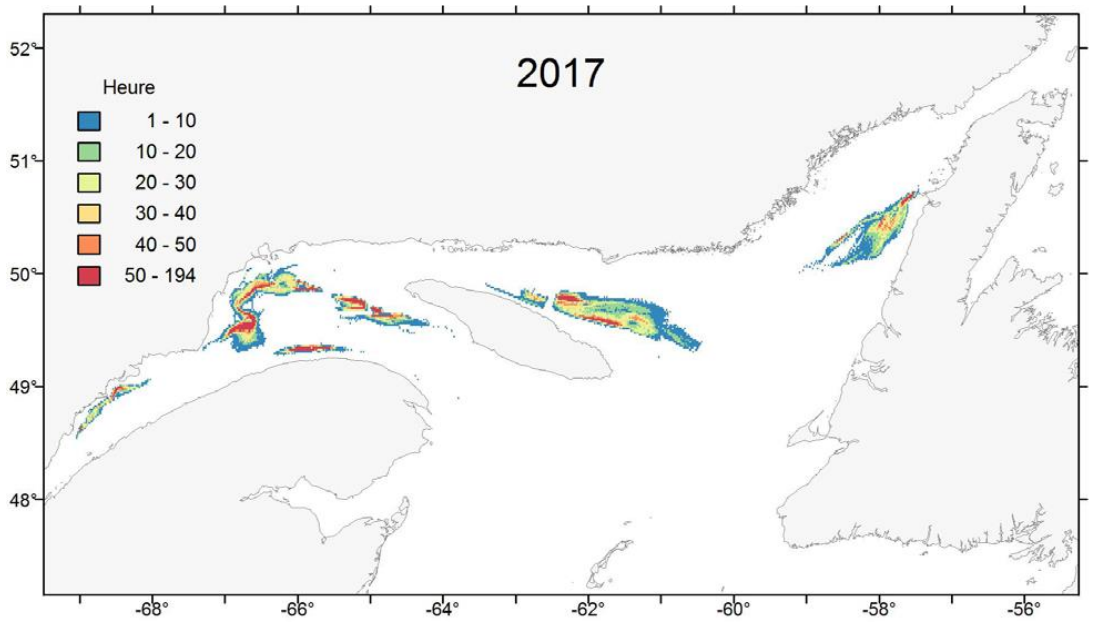

Figure 8 Distribution of the mean fishing effort for 2017 according to data from the vessel monitoring system (VMS). (Source: DFO, 2018a)

In the Estuary and Gulf of St. Lawrence, the size of females varies along an east-west gradient, the smallest being observed in the Esquiman Channel and the largest in the Estuary. Highest densities of shrimps are found in the temperature range 1 to 6º C but shrimp can be found in temperatures ranging from 0 to 14º C, and temperature seems to be closely correlated with changes in abundance (Shumway *et al*., 1985). Temperature, together with depth, substratum and salinity, are all major physical determinants of the distribution of *Pandalus borealis* (Bergström, 2000).

Northern shrimp are protandrous hermaphrodites – in the Estuary and Gulf of St. Lawrence they mature as males about age 2, mate for two or three years before changing sex at approximately 21 mm carapace length (CL) and then spend the rest of their lives as females (Bourdages *et al*., 2019). Large shrimp tend therefore to be females. Sex transition to females can be influenced by temperature, density and total mortality rates. The newly-transformed (primiparous) females spawn in autumn and the ovigerous females carry their eggs attached to their abdomen until April-May when the larvae are hatched. The larvae go through five pelagic larval stages over a period of 3-4 months before settling to the ocean floor, although particle tracking models reveal that the larvae of *Pandalus borealis* may be transported as far as 300 km during the pelagic phase (Pedersen *et al*., 2003). The breeding (multiparous) females reproduce at least twice and have a life span of around 7 years in the Estuary and Gulf of St Lawrence. Shrimps make annual migrations related to the reproductive cycle, with ovigerous females moving to shallower waters in early winter in order to release their larvae in spring, before returning to deeper water (200-300 m) following release of the larvae (Bourdages *et al*., 2018b). Shrimp are crustaceans that have a hard outer shell, which they must periodically shed (molt) in order to grow. During the day time, shrimp feed on or near the bottom whereas, at night, they can migrate vertically and feed on zooplankton (Shumway *et al*., 1985). Successful recruitment appears to be dependent on synchronisation of emergence of larvae with the spring bloom, and favourable temperature conditions for the development and growth of larvae and the zooplankton community (shrimp prey).

Shrimp are important prey for several species such as cod, Greenland halibut, skates and wolffish as well as harp seals (Parsons, 2005) and predation mortality is thought to be an important factor in shrimp stock dynamics. Cod in particular can consume large amounts of shrimp. Decreases in all these fish species during the 1990s may have contributed significantly toward observed increases in many shrimp populations in the Northwest Atlantic, including those in the Estuary and Gulf of St. Lawrence. Marine mammals are also known to prey on northern shrimp, although this relationship has not been quantified for the Estuary and Gulf of St. Lawrence. However recent observed increases in both cod and redfish may have an influence on current and future shrimp population abundance. Temperature may be the single most important driving factor in Pandalus stock dynamics. The Gulf of St. Lawrence is near the southern limit of the northern shrimp's distribution, and the species is present there in temperatures nearing the upper level of its thermal preference. In addition, larvae that emerge in the surface layer are exposed to a much wider range of temperatures, from

about 0 °C to above 10 °C, which can affect their survival. The northern shrimp is therefore vulnerable to surface and deep-water warming (Ouellett *et al*., 2017). In the Gulf of Maine, sea surface temperatures have been correlated with changes in the shrimp populations with higher surface water temperatures leading to decreased shrimp abundance. It is likely that the higher water temperatures observed in the Estuary and Gulf of St. Lawrence in recent years (Figure 9) have contributed towards observed decreases in the shrimp population in this area. Monitoring of commercial catches show a low incidence of disease in the shrimp fisheries In Atlantic Canada. The main diseases observed are black spot, black gill, bopyrid isopod parasite, and microsporidium. There have been recent suggestions that prevalence may have increased, but there is no evidence of increased prevalence from the monitoring program in the Northwest Atlantic (Manon Cassista-Da Ros, DFO, pers. comm.). The shrimp stock is therefore subject to abundance variations related to recruitment, changes in environmental and ecosystem conditions and natural predation, and may therefore be susceptible to changes in productivity which could impact on the sustainability of the fisheries.

Detailed descriptions of shrimp biology and life history are provided by Shumway *et al* (1985), DFO (2018b) and Hardie *et al* (2018).

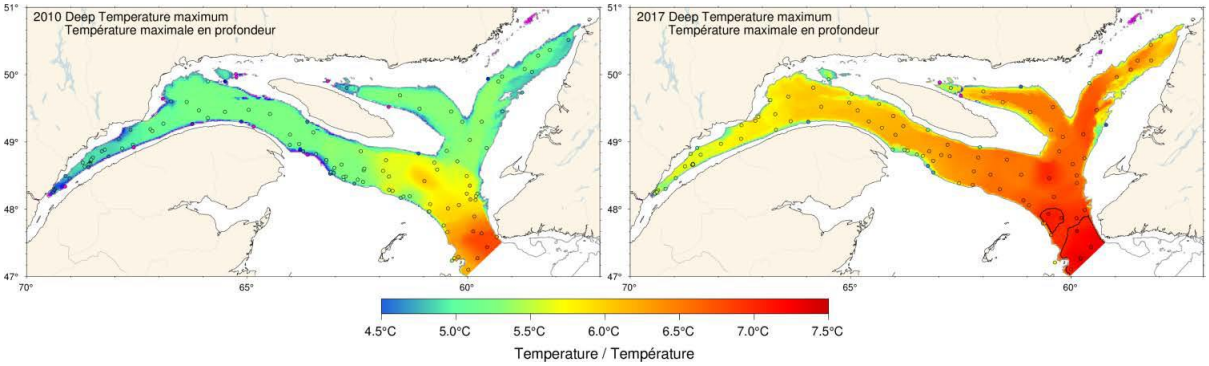

Figure 9 Maps of the maximum temperature at depths typically found between 200 and 300 m in the Estuary and Gulf of St. Lawrence for 2010 and 2017. (Source: DFO, 2018a)

Pandalus borealis is not a key low trophic level (LTL) species in the Estuary and Gulf of St. Lawrence ecosystem, as it does not meet all the criteria set out in paragraphs SA2.2.8-SA2.2.10 of the MSC Fisheries Certification Requirements (FCR) v2.0 (MSC, 2014). *Pandalus borealis* is prey for cod, Greenland halibut, redfish and other predators such as harp seals in this area, but does not appear to play a major role in the diet of any species, unlike some species of small pelagic fishes (Bundy, 2004). Available evidence suggests that whilst shrimp are an important prey item for a range of species in areas where they are abundant, consumption is highly variable depending on predator species, predator size, and area, and therefore they are not necessarily a main or essential component of the diet of predators (Parsons, 2005). Although *Pandalus borealis* is widely distributed within the Northwest Atlantic waters, catches are low on an ecosystem scale and *Pandalus borealis* is unlikely to play an important role in energy transfer in the ecosystem as shrimp predators will consume other prey species.

Harvest strategy

General harvest strategy

The Estuary and Gulf of St. Lawrence northern shrimp fishery takes place exclusively within the Canadian EEZ and is therefore wholly managed by the Canadian Government. The overarching Canadian legislation which underlies management of the fishery is the Fisheries Act 1985, which is currently being reviewed under the parliamentary process. In addition, operation and management of fisheries is prescribed by the Atlantic Fishery Regulation, 1985 and licensing and monitoring requirements are described by the Fishery (General) Regulations 1993.

The two key elements of the harvest strategy are the setting of reference points and the associated harvest control rules (HCRs) which are governed by DFO's Sustainable Fisheries Framework (SFF) (DFO, 2009). Reference points and HCRs are described in detail below.

Canadian shrimp fisheries are managed within Shrimp Fishing Areas (SFAs) as designated by DFO (Figure 1), and the objectives for the fishery and the management measures used to achieve those objectives are

set out in the IFMP for Northern Shrimp in the Estuary and Gulf of St. Lawrence (Areas 8, 9, 10 and 12) (DFO, 2018b). In relation to the achievement of sustainable shrimp fishing, the IFMP's objectives are to help maintain the abundance of stocks in the healthy zone, to study the predation of northern shrimp by groundfish, particularly redfish, and to study the impact of environmental change on the northern shrimp, and so recognise that changes in shrimp stocks are driven by predator abundance and environmental factors in addition to exploitation levels.

The fishery is managed through a co-management approach and consultation with the fishing industry, including development and revision of the IFMP, is through the Estuary and Gulf Shrimp Advisory Committee (EGSAC), which consists of shrimp harvesters, First Nations, shrimp processors, provincial governments and resource managers from DFO. The EGSAC advises the Minister 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. The most recent meeting of the EGSAC was held in 2018. In the past EGSAC meetings have been held every two years, but in the light of the current decline in shrimp stocks in the Estuary and Gulf of St. Lawrence, meetings will now be held annually (DFO, 2018c). Although the IFMP sets out all the management objectives and measures for the fishery, it should be noted that the IFMP is not a legally binding instrument, and under the Fisheries Act, 1985, the Minister can modify any provision set out in the IFMP.

Elements of the harvest strategy

The harvest strategy for the shrimp fishery in SFAs 8, 9, 10 and 12 consists of a series of management regulations designed to safeguard the stock through limiting exploitation rate and allowing sufficient mature females to remain available for reproduction, and to minimise the impact of the fishery on the wider ecosystem. The harvest strategy also includes a comprehensive monitoring programme and a robust control and enforcement regime.

Management regulations etc.

Fishing effort is controlled through a limited entry licensing fishery with no new licences available. There is a mandatory requirement for vessels to remain within a single fishing area (SFA) for each fishing trip, although this may be relaxed if an observer is on board the vessel.

The fishery has been managed by a Total Allowable Catch (TAC) since 1982, and there is a combination of individual quota (IQ) and Individual Transferable Quota (ITQ) systems operating within the fishery, which minimises the potential for any 'latent' fishing effort.

There is a series of regulations governing fishing gear in the fishery to minimise the capture of small non-commercial sized shrimps and bycatch species. Fishing for northern shrimp in the Estuary and Gulf of St Lawrence is not permitted using fishing gear other than trawls. There is a minimum trawl mesh size of 40mm, and since 1993 the use of a Nordmore grate (Figure 3) has been mandatory with specified bar spacing (minimum 19 mm, maximum 25 mm) and attachment rules. Use of a double liner over the grate is forbidden during the season. Strict regulations about recording lost gear are now included within the licence conditions and are explicit within the Conservation Harvesting Plan (CHP).

A protocol to limit small bycatch is also in place whereby 10-min longitude by 10-min latitude grid squares are closed when average bycatch rates of undersized Greenland halibut, cod and redfish exceeds a pre-determined level. Redfish bycatch was the cause of a number of area closures in 2016. No closures were applied in the 2019 season (Hugo Bourdages, DFO Science, pers. comm.). The specified level of bycatch changed in 2017 from a percentage of the catch to a specified volume of 90 kgs (B. Morin, DFO, pers. comm. and DFO, 2018c).

The fishery is open from 1 April to 31 December. In December 2017, a series of area closures were implemented in the Gulf of St. Lawrence to conserve corals and sponges as part of the Coral and Sponge Conservation Strategy for Eastern Canada. The total area closed to shrimp trawling represents approximately 4% of the total area of the Estuary and Gulf region, but few areas were targeted anyway by shrimp trawlers as corals, in particular, can cause damage to shrimp trawls and are therefore avoided. To minimise interactions between the shrimp trawl fleet and the snow crab static gear fishery in the area, there is a voluntary and temporary agreement that shrimp trawlers will not fish in depths less than 75 fathoms (137 m).

The regulations are set out in a Conservation Harvesting Plan (CHP) published as an annual Notice to Fishers on the DFO website (DFO, 2018d) and includes information on TACs, seasons, fishing areas, all regulations, requirements for catch recording, marine mammal interaction reporting and requirements for reporting under the Species at Risk Act.

Review of the harvest strategy

The overarching fisheries policy is reviewed on a regular basis through for example, the Atlantic Fisheries Policy Review – A Policy Framework for the Management of Fisheries on Canada's Atlantic Coast (DFO, 2004). A review of the Fisheries Act, 1985 is currently undergoing passage through the Canadian parliament. The IFMP for the Estuary and Gulf of St. Lawrence shrimp fishery (DFO, 2018b) is an 'evergreen' document which is reviewed by DFO on an annual basis in consultation with stakeholders at the EGSAC when all aspects of the harvest regime, e.g. TACs, observer sampling levels etc. may be reviewed. The fishery regulations and TAC for the shrimp fishery are published annually through a Conservation Harvesting Plan (CHP).

Monitoring/data/information

Fisheries-dependent data

Fishing activity is monitored through a Vessel Monitoring System (VMS) which is mandatory on all vessels and through which fishing position is recorded every 30 minutes. All vessels are required to 'hail out' on leaving port and to 'hail in' prior to landing.

Completion of log books recording catches and hours fished on a daily basis is mandatory for all vessels. Electronic log book submission will be implemented across the fleet in phases commencing in 2018. Vessels are also required to complete separate log books under the Species at Risk Act (SARA). There is a 100% coverage of landings through the Dockside Monitoring Programme (DMP), and the catch data recorded in log books are validated with the processing plant purchase slips and with landings recorded through the DMP. Samples of the commercial catch have been taken at the point of landing since 1982 through which the size, sex and stage of maturity of individuals are recorded.

There is an observer programme in place which records the size composition of all shrimps caught in the trawl and records and measures bycatch species. The aim of the observer programme is to cover 5% of all fishing trips per fishing season. The target was met in all areas of the fishery except Newfoundland in 2016 and 2017. However, it increased from 2.5% in 2016 to 3.6% in 2017 in Newfoundland (DFO, 2018c)

Discarding is prohibited in the shrimp fishery, and automatic sorters are not permitted at the current time, so discarding of small shrimps is prevented. One vessel currently has a licence to process shrimp catches at sea, but this vessel is subject to 50% observer coverage to assess whether any discarding of small shrimp occurs during the on-board processing. Comparison of catch size compositions and landings size compositions from this vessel demonstrates that there is minimal discarding of small shrimp and provides no evidence of high-grading.

Fishery-independent surveys

A fishery-independent research trawl survey has been undertaken in the Estuary and Gulf of St. Lawrence every year since 1990 providing information on the abundance, size distribution and maturity stage of Pandalus across the area. The survey is considered to cover the entire distribution range of *P. borealis* in the Estuary and northern Gulf of St. Lawrence. The research survey is multidisciplinary survey and aims to describe the biodiversity of Gulf species and the physical and biological oceanographic conditions. The objectives of this survey include assessing the biodiversity of species found near the sea bottom, estimating the abundance of groundfish and invertebrates, assessing physical and biological oceanographic conditions (phytoplankton and zooplankton), monitoring the pelagic ecosystem and taking inventories of marine mammals and seabirds. In addition stomach analysis of Greenland halibut and redfish is undertaken to provide insights into predation rates on shrimps.

In addition to the multidisciplinary nature of the research survey, there is a programme of scientific projects relating to the Pandalus populations conducted by the Institute Maurice Lamontagne funded in whole or in part by DFO national programs. These projects respond directly to priority directions presented in the scientific frameworks and are part of the Ecosystem Science strategic research program (DFO, 2018b). Recent projects include examination of the trophic interactions and the effects of predation on vertebrate and

invertebrate communities of the Estuary and northern Gulf of St. Lawrence ecosystem by a mass-balance model, assessment of the northern shrimp's physiological response to climate change and variability, vulnerability assessment of key commercial species (species selected based on their role in the northern shrimp/Greenland halibut trophic interactions) to climate change, and status assessment of the physical and biochemical oceanographic environment of the Gulf of St. Lawrence.

There is a comprehensive inspection, monitoring and surveillance programme undertaken by DFO's Conservation and Protection Division (C & P) and the level of enforcement activity is risk-assessed with the Estuary and Gulf shrimp fishery being considered a low risk fishery. C&P's activities include checking compliance with fishing areas, including closed areas, through aerial surveillance activities and checking VMS data, boarding of vessels at sea to check compliance with fishing gear regulations (e.g. mesh size, installation of sorting grate) and completion of log books and compliance with landings declarations regulations.

Stock assessments methods and approaches

Stock indicators

Commercial fisheries statistics (log book data) are used to calculate fishing effort and catch per unit effort (CPUE). In conjunction with sampling of the commercial catch for carapace length, sex and maturity, log book data on catch and effort allow estimates of catch by size category and maturity stage. CPUE is standardised to take into account changes in the fishing capacity/power and in the seasonal fishing patterns using a GLM procedure with variables vessel length and propulsion power, month and year. Full details on the methodology of analysing catch and effort data from log books can be found in Bourdages and Marquis (2019).

An annual 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 uses a four-sided Campelen 1800 shrimp trawl equipped with a Rockhopper footgear, and on average 187 fishing stations are sampled per year. The survey data are used to estimate the distribution and abundance of shrimp and some groundfish species. Abundance of shrimp is estimated by size category and stage of maturity, and a geostatistical method (kriging) is used to estimate biomass and coefficients of variation for both males and females from the surveys. Full details of the survey methodology can be found in Bourdages *et al*. (2018a;b).

Annual exploitation rate in the shrimp fishery can be calculated from total annual catch / estimate of biomass from the research survey.

DFO Precautionary Approach

Reference points and harvest control rules (HCRs) for the Estuary and Gulf of St. Lawrence shrimp fishery are based upon DFO's Precautionary Approach (PA) Framework of the Sustainable Fisheries Framework (SFF) which uses the PA conservation requirements identified by DFO Science to guide implementation of the PA in the management of Canadian fisheries (DFO 2009). It suggests the development of a comprehensive set of reference points, removal references and pre-agreed harvest decision rules that may be triggered according to the status of the resource, while giving the latitude to take into account scientific information that may vary substantially from one stock to another. For example, it allows the use of alternate reference points when quantitatively derived biomass metrics are not available.

There are three primary components of the PA Framework, (1) reference points and stock status zones, (2) harvest strategy and harvest decision rules, and (3) the need to take into account uncertainty and risk.

There are four reference points. The limit reference point (LRP) represents the stock status below which serious harm is occurring to the stock. The upper stock reference point (USR) is the stock level below which removals must be progressively reduced in order to avoid reaching the LRP. The USR can be the target reference point (TRP) but generally the TRP is set at a higher stock level than the USR. The removal reference is then the maximum acceptable removal rate for the stock, normally expressed in terms of fishing mortality or harvest rate. The reference points act as boundaries between the critical, cautious and healthy zones as shown in the diagram below.

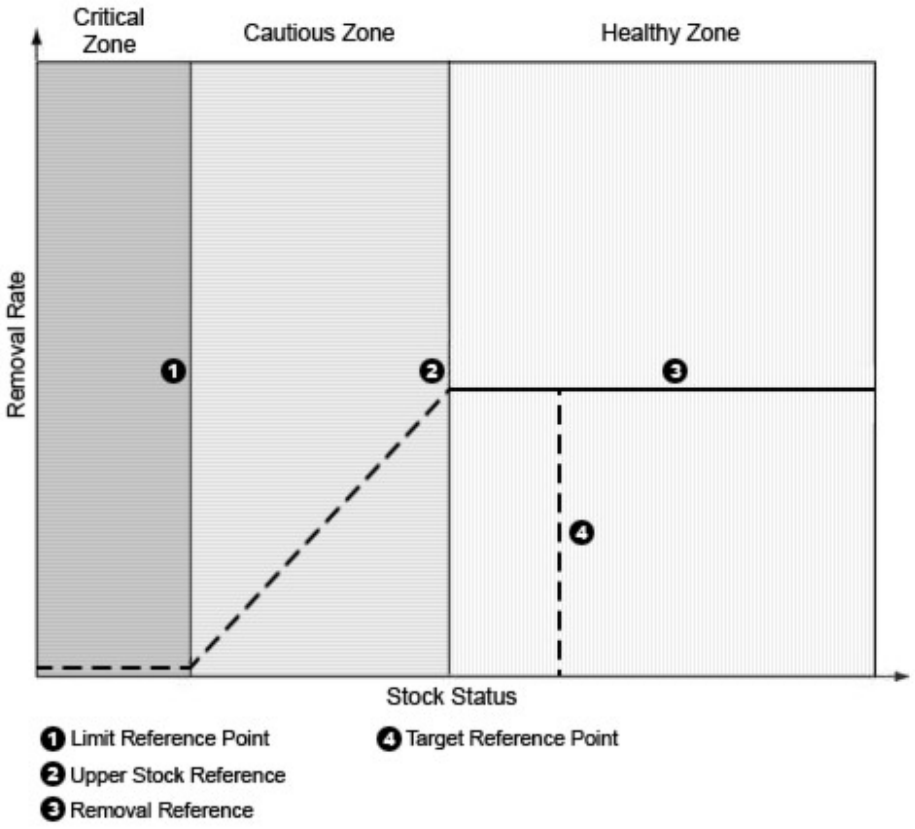

Figure 10. DFO PA Framework: reference points and stock status zones. (Source: DFO, 2009).

Reference points will usually be determined using standard biomass and harvest metrics. However, for a number of stocks, such measurements are not available. In these cases, precautionary management actions should be based on the estimates of productive potential and harvest that are the most appropriate for the stock of concern and data available, with the objective of avoiding serious harm to reproductive capacity of the stock.

DFO's PA Guidance suggests that an appropriate LRP for biomass is 40% B_{MSY} (the biomass which supports maximum sustainable yield (MSY)), and that USR should be set at 80% B_{MSY}. Setting a TRP above the USR equates therefore to a biomass level equivalent to B_{MSY}. Similarly, the PA guidance is that the removal reference or fishing mortality rate should be at or below F_{MSY} (the fishing mortality rate which in the long term moves the stock to MSY) when the stock is in the healthy zone, should be reduced below F_{MSY} in the cautious zone and should be zero in the critical zone. In the absence of an analytical assessment which calculates B_{MSY} and F_{MSY}, the PA guidance suggests options for provisional estimates of B_{MSY} including the average index of biomass over a productive period, or the biomass corresponding to 50% of the maximum historical biomass. Similarly, options for provisional estimates of F_{MSY} include the average index of fishing mortality that did not lead to stock decline over a productive period.

Reference points and harvest guidelines for the Estuary and Gulf and St. Lawrence stock

There is no analytical stock assessment of the Estuary and Gulf of St. Lawrence shrimp stock and so in the absence of an estimate of B_{MSY}, the biomass reference points are defined in terms of the main stock status indicator which is based on two independent sources of data, the catch per unit of effort (CPUE) from the commercial fishery in June, July and August, and the index of shrimp abundance from the DFO research survey in August. From these two sources of data, indices for male and female components are estimated, giving a total of four indices by fishing area. In order to combine them into one indicator, each index is standardized in relation to a reference period.

The assessment of the status of shrimp stocks in the Estuary and Gulf of St. Lawrence therefore relies on information from both fisheries-dependent and fisheries-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 rationales for setting the LRP and USR are provided in Savard (2012). The LRP is based upon the time series of the main stock indicator. For all four shrimp stocks the main stock indicator was very low in the early 1980s during a period of high predator abundance, and in the early 1990s when predator abundance was low. Despite these low shrimp stock abundances and the differing levels of predation pressure, shrimp abundance increased rapidly in the late 1990s in all four stocks characterised by strong year classes, providing evidence that recruitment impairment had not occurred in the 1980s and early 1990s. The LRP was therefore set at the average of the minimal indicator of the two periods of the beginning of the 1980s and 1990s.

The USR has been positioned at a level that provides a sufficiently large cautious zone to allow the early detection of a decline in the stock and therefore allowing sufficient time for the stock to respond to any management measures that may be implemented. The shrimp stock in each of the 4 UoCs was considered to be stable with sustainable catches during the period 1996 to 2002, and therefore during this period the biomass approximated to B_{MSY}. The USR was therefore set at 80% of the average of stock status indicators for the 1996 to 2002 period. However, the USR value corresponds to stock abundances observed during a period of very low predator abundance. If the biomasses of the large groundfish species return to the high values historically observed, it may be necessary to review the USR since it is not certain whether the shrimp stocks could reach such abundance levels under maximum predation conditions. In addition, it is not clear that the reference points are still appropriate considering recent observed increases in water temperature in the Gulf of St. Lawrence. However during the site visit, Hugo Bourdages (DFO, pers.comm.) noted that the observed increases in temperature may be caused by a temporary change in temperature regime and may not necessarily be linked to global climate change, and therefore the changes may be reversible and it may be premature to revise the current reference points.

Values of the LRP and USR for the four UoCs are given below in Table 7. There are no defined TRPs for any of the UoCs, with the harvest strategy designed to ensure that the main stock indicator is always above the USR (equivalent to 80% of B_{MSY}) and therefore fluctuating around a level consistent with Bmsy. TRPs were proposed at a peer review meeting in November 2011, but they were not formally adopted.

Table 7. Reference points based on the main stock indicator for Estuary (SFA 12), Sept-Iles (SFA 10), Anticosti (SFA 9) and Esquiman (SFA 8). (Source: DFO, 2011)

	Estuary	Sept-Iles	Anticosti	Esquiman
Limit Reference Point (LRP)	0.65	0.53	0.60	0.45
Upper Stock Reference Point (USR)	1.12	1.33	1.18	1.34

In line with these reference points, the key harvest control rule is that the annual TAC will be based upon an exploitation rate dependent on the state of the stock in relation to the LRP and USR, i.e. whether the stock is in the healthy, cautious or critical zone. Prior to setting TACs through formal decision rules, the harvest in year t+1 was observed to be correlated with the main stock indicator in year t (Figure 11), and this relationship underlies the harvest guidelines set out in the IFMP (DFO, 2018b). When the main stock indicator is above the USR in the healthy zone, the TAC must set at a level based upon an exploitation rate equivalent to a removal reference rate, defined as the mean rate observed between 1990 and 2010. In other words, the TAC is set at a constant proportion of the stock biomass. When the main stock indicator is between the USR and LRP, the TAC is again set at a constant proportion of the stock biomass but at a much lower proportion than when the stock is in the healthy zone. When the main stock indicator is below the LRP, the TAC is not set at zero but based on a constant and very low exploitation rate equivalent to 25% of the exploitation rate permitted in the healthy zone (DFO, 2018b). According to the harvest guidelines set out in the IFMP, the projected harvests are derived by applying the relationship (slope and intercept) between the harvest in year t+1 and stock status in year t to the main stock indicator (MSI). The relationship between the MSI and the projected harvests (equivalent to the exploitation rate) is shown for the three stock status zones for the 4 UoCs in Table 8.

The harvest guidelines in the IFMP state that the TAC is adjusted if the difference between the projected harvest and the TAC that was implemented in the preceding year is higher than 5%. Within the healthy zone, the change in TAC between years is capped at 15%, which should ensure relative stability of the stock and fishery (Desgagnés and Savard, 2012). However it should be noted that due to concerns about the current stock status in both Estuary and Sept-Iles in 2017 the TAC implemented in 2017 was a reduction from the 2016 TAC of significantly more than 15% (see below.)

Table 8. Relationship between the main stock indicator (MSI) and the projected harvest in the healthy, cautious and critical zones for all four UoCs. (Source: DFO Science)

	Healthy zone harvest	Cautious zone harvest	Critical zone harvest
Estuary	470.7 x MSI	(962.4 x MSI) – 551.8	117.7 x MSI
Sept-Iles	5868.9 x MSI	(8819.4 x MSI) – 3910.5	1469.7 x MSI
Anticosti	4176.4 x MSI	(7819.1 x MSI) – 4197.5	1044.1 x MSI
Esquiman	3524.0 x MSI	(4871.1 x MSI) – 1808.8	881.0 x MSI

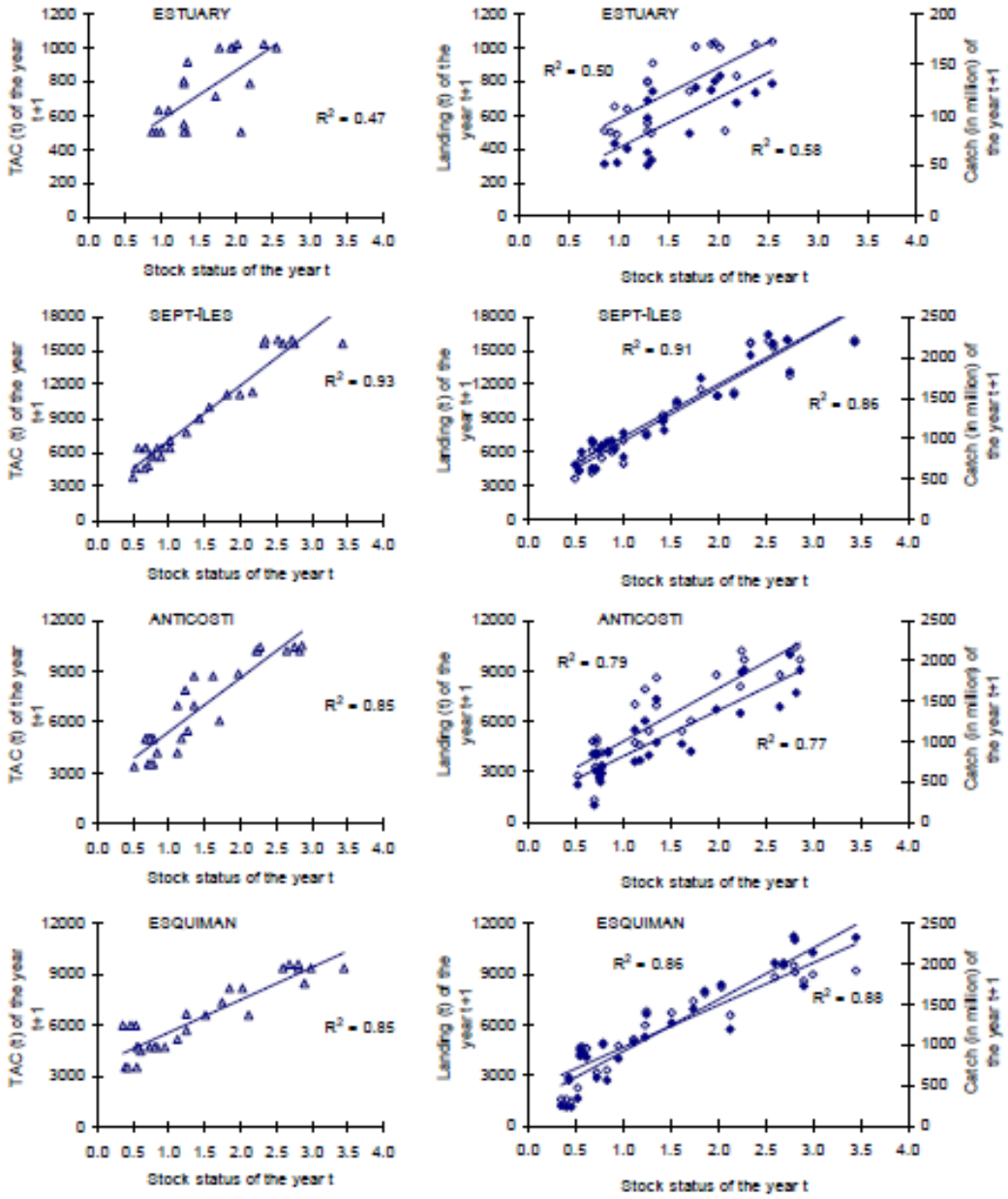

Figure 11. Relationship between the main stock status indicator in a given year (t) and the TACs adopted the following year (t+1) after scientific recommendations (left) as well as commercial fishery results (right: landings in weight, open symbols, and catches in numbers, closed symbols) for the period 1982-2010 (except Estuary, 1990-2010). (Source: DFO, 2011)

Stock assessment and the advisory process

A full stock assessment of the Estuary and Gulf of St. Lawrence shrimp stock is undertaken biennially and the status of the stock is consequently reviewed at a Regional Peer Review meeting convened by the Quebec Region of DFO and attended by all stakeholders. The review follows the peer-review process, policies and guidelines that have been developed by the Canadian Science Advisory Secretariat (CSAS) for DFO. Following the Regional Peer Review, the results of the assessment are published formally as a Science Advisory Report (SAR). The SAR is essentially a summary of the stock assessment following peer review, and the full assessment is published as a DFO Research Document. In addition regular framework meetings thoroughly review and critically assess the background information and the stock assessment methodology for the Estuary and Gulf of St. Lawrence shrimp stock. Review meetings will be attended by regional stakeholders, DFO, First Nation representatives and occasional expert reviewers. In interim years, science advice is provided as a stock status update, reviewed only by DFO Science, CSAS and expert reviewers and published as a DFO Science Response. The stock status update will be reviewed by EGSAC. The most

recent regional peer review took place in January 2018, the focus of which was to provide scientific advice on managing the shrimp stock in the Estuary and Gulf of St. Lawrence for the 2018 fishing season. The proceedings from this regional review are published in DFO (2018e).

Stock status

History of the stock

Shrimp stocks in the Estuary and Gulf of St. Lawrence were relatively stable in the 1980s in all four SFAs, but then increased dramatically in the 1990s driven by strong year classes following a decline in groundfish predator abundance (Worms and Myers, 2003). Stock biomass fluctuated in the early 2000s, but in all areas has declined since 2010 due to poor age classes, increasing predator abundance and increased water temperatures. Landings of shrimp have reflected trends in stock abundance gradually increasing from about 1,000 tonnes in the early 1970s to more than 35,000 tonnes in 2004 and 2007–2010. Landings have since decreased continuously and were 22,431 tonnes in 2017. A similar decline has been observed across all four SFAs (Figure 12). TACs have been reduced in recent years in line with declining stock indicators, but there continues to be good compliance and rigorous enforcement of catch limits and the TAC has not been exceeded in recent years in any of the SFAs (Figure 12).

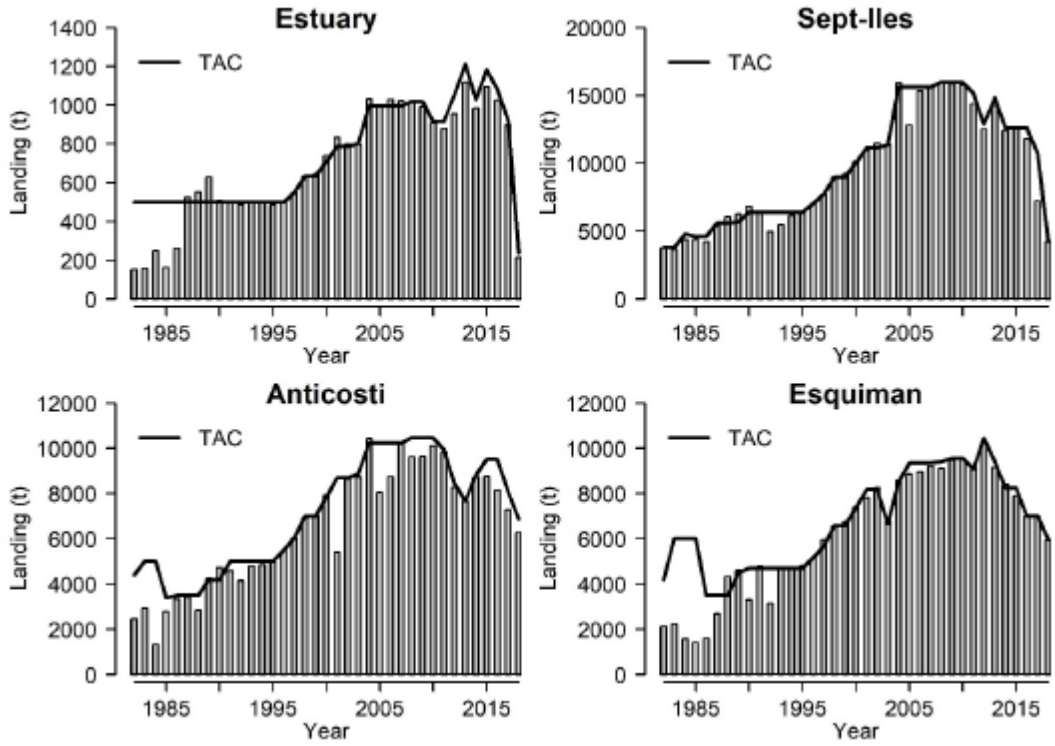

Figure 12. Landings and Total Allowable Catch (TAC) by fishing area from 1982 to 2018. The 2018 landings data are preliminary up to 17 December 2018. (Source: DFO, 2019).

Current stock status

The main stock status indicator is based on two independent sources of data, the catch per unit of effort (CPUE) from the commercial fishery in June, July and August, and the index of shrimp abundance from the DFO research survey in August. From these two sources of data, indices for male and female components are estimated, giving a total of four indices by fishing area. In order to combine them into one indicator, each index is standardized in relation to a reference period. The stock indicators provide the fisheries management authorities with the projected harvests for the following year in SFA 8, 9, 10 and 12, according to the guidelines of the precautionary approach.

CPUEs have varied widely over time and have followed similar trends since 1982 in all four areas. Since 2014, CPUEs have been decreasing in the four areas and, in 2017, they reached values comparable to those observed in the early 2000s (Figure 13; DFO, 2018a)). In 2018, CPUE increased in Estuary but continued to decline in Sept-Iles, Anticosti and Esquiman (Figure 15).

The DFO survey biomass index indicates a downward trend for several years in all areas. The biomasses observed in 2017 and 2018 in all four SFAs are comparable to those observed in the early 1990s (Figure 14 and Figure 16).

The exploitation rate index has increased and is above the series average (1990–2016) in each area except Anticosti, where it decreased in 2017 and is close to the average (Figure 15). Whilst caution should be applied in interpreting exploitation rate index as it does not estimate the absolute exploitation rate or relate the index to target exploitation rates, it provides a rough guide to how exploitation may have changed across the years.

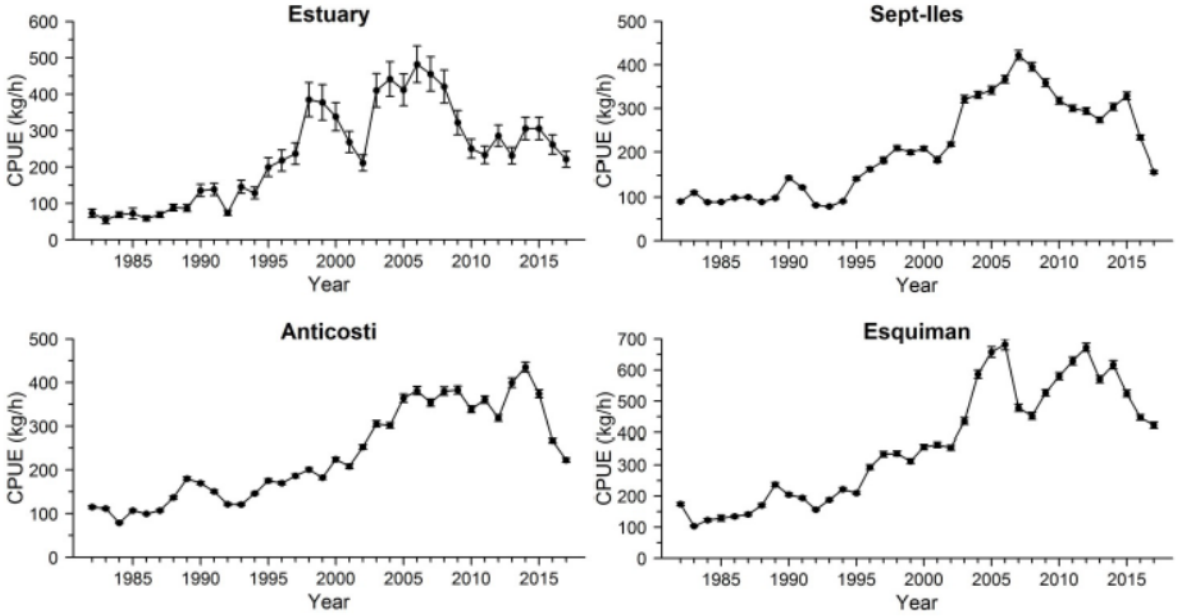

Figure 13. Standardized catch per unit effort (CPUE) in the four SFAs including 95% confidence intervals. (Note that data from 2018 are not included in the 2018 stock update). (Source: DFO, 2018a)

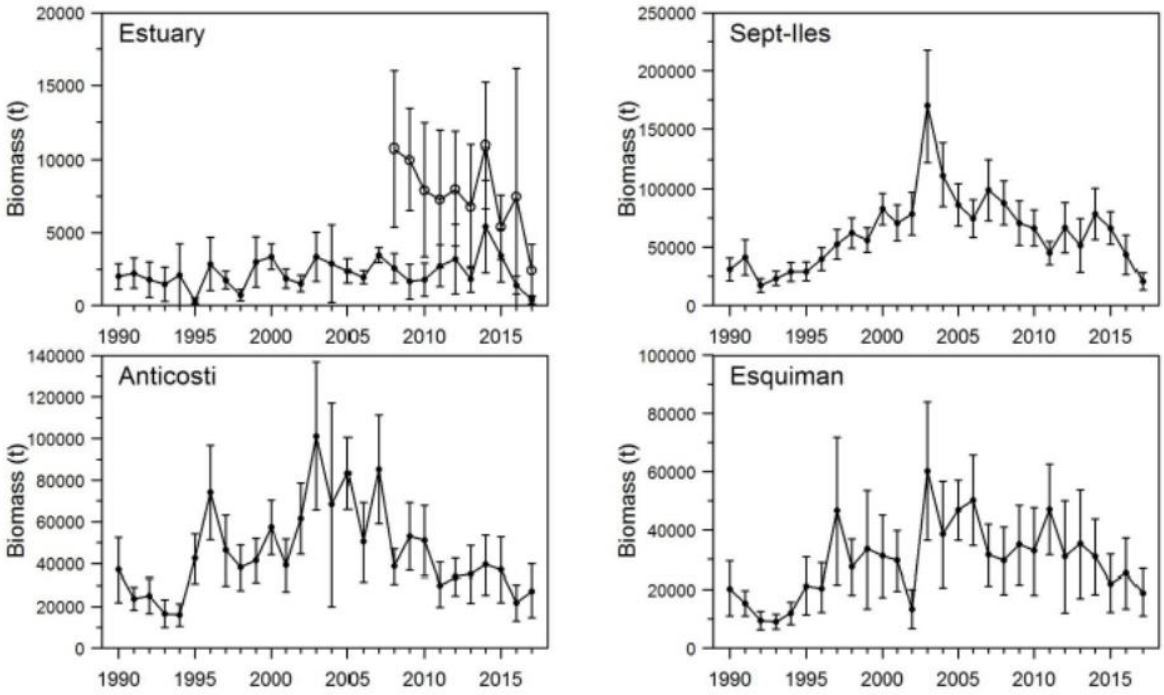

Figure 14. Shrimp biomass index from the research survey (confidence interval 95%) for all SFAs. For Estuary, the open circles represent results obtained by integrating strata from the shallow portion that were added in 2008. (Note that data from 2018 are not included in the 2018 stock update). (Source DFO: DFO, 2018a)

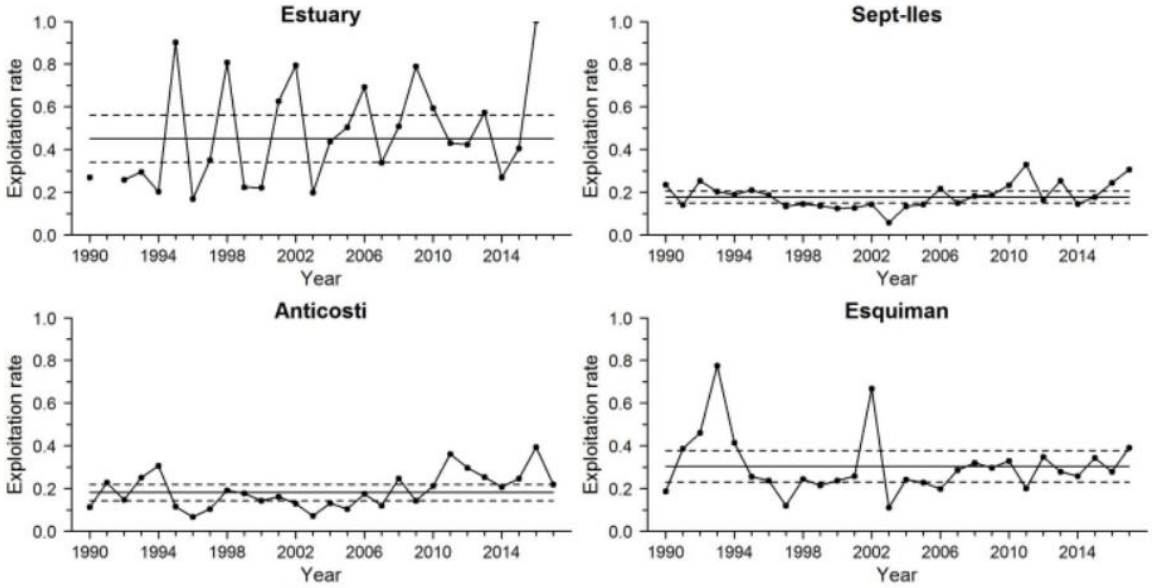

Figure 15. Index of the exploitation rate by fishing area and by year. The solid horizontal line represents the 1990-2015 mean ± 0.5 standard deviation. (Note that data from 2018 are not included in the 2018 stock update). (Source: DFO, 2018a)

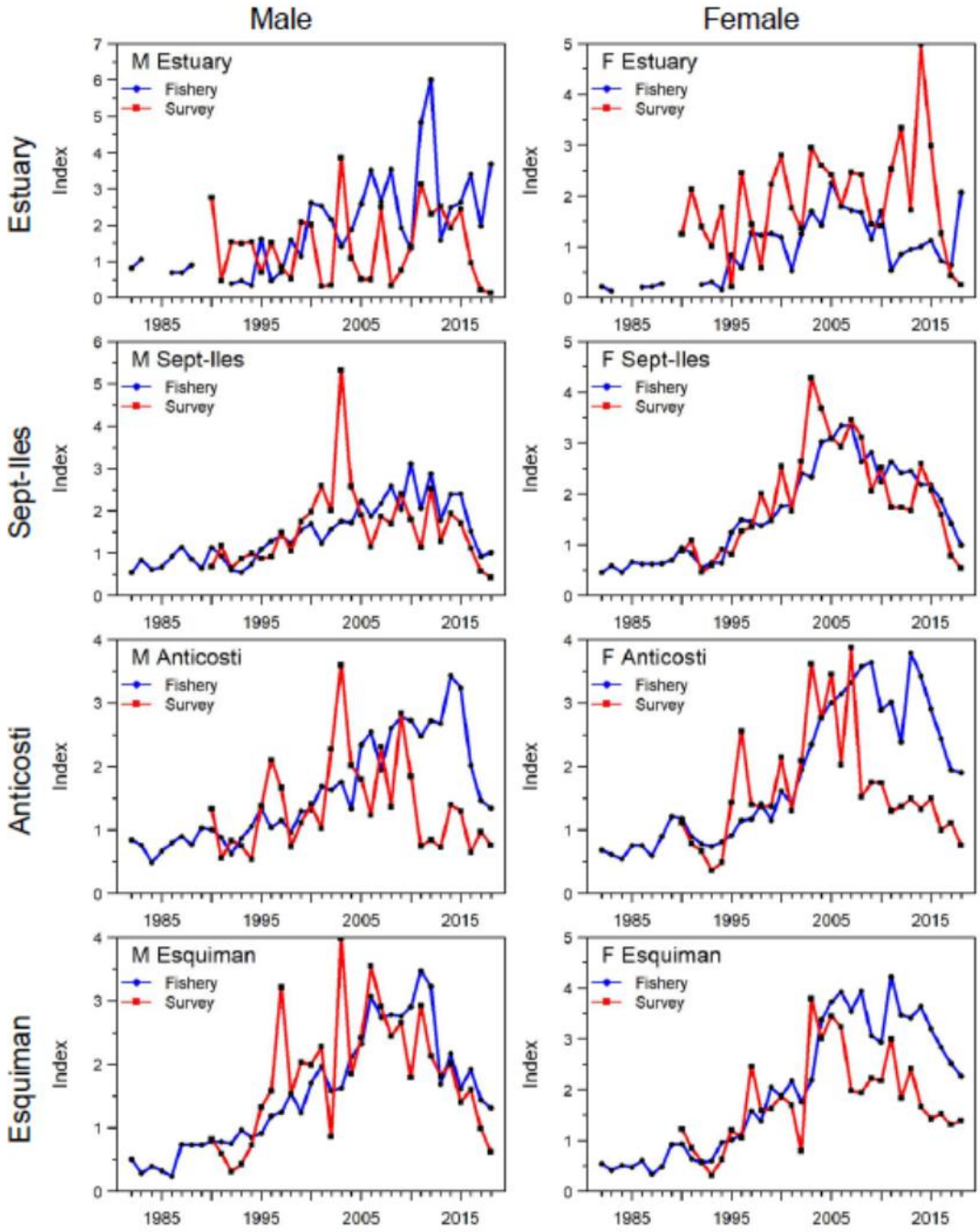

Figure 16. Standardised indices of catch per unit effort of male and female shrimp in the commercial fishery (blue) and abundance of male and female shrimp from the DFO survey (red) by fishing area and year. (Source: DFO, 2019)

Based upon the commercial CPUE and research survey biomass index, the main stock indicator for the Estuary and Gulf of St. Lawrence shrimp stocks had been relatively stable from 2000 to 2015 for Estuary (SFA 12), Anticosti (SFA 9), and Sept-Iles (SFA 10), but had been declining in recent years in Esquiman (SFA 8). However in 2016 the main stock indicator declined in all four SFAs, but was still in the healthy zone above the Upper Stock Reference point (USR) in all SFAs (Figure 16). In 2017 the stock indicator for both Estuary and Sept-Iles dropped into the cautious zone having been in the healthy zone since the late 1990s. In 2017 the main stock indicator in Anticosti and Esquiman remained in the healthy zone, but just above the cautious zone (Figure 16).

The most recent stock assessment published in January 2019 is based upon the Science Response Process of December 17, 2018 (DFO, 2019). (Note that this 2018 stock update does not contain a full set of figures

and tables and so Figures 12-14 & 18 do not include data points for 2018.) The main stock indicator increased in Estuary in 2018 to move from the cautious zone to the healthy zone (Figure 17). However in Sept-Iles, Anticosti and Esquiman, the downward trend in the main stock indicator continued in 2018. The indicator for Sept-Iles was in the cautious zone for the second consecutive year, and for Anticosti and Esquiman, the indicator was only just above the USR in the healthy zone (Figure 17). Initial analysis of data from the 2019 research survey shows that shrimp biomass is a little higher in 2019 than 2018 in all four SFAs, and this is mirrored in slightly higher commercial CPUE in 2019 than 2018 in all SFAs (Hugo Bourdages, DFO Science, pers. comm.).

The assessment team noted that there were differences between the trends in the fishery and survey stock indicators in recent years for both Estuary and Anticosti (Figure 16). This discrepancy is likely due to the two indices not sampling the same fraction of the population, with the survey covering the entire shrimp distribution, but the fishery targeting channel heads where shrimp abundance is higher (DFO, 2018a). The stock surveys are now more widespread than in previous years and the discrepancies between the stock surveys and fisheries indicators have not been so evident in recent years in Anticosti. However the discrepancies between the two indicators are still marked in Estuary. The research surveys are multi-disciplinary surveys and therefore station positions cannot be easily changed, but there are plans for an industry survey in 2020 to cover a wider geographical range of stations (Hugo Bourdages, DFO Science, pers. comm.).

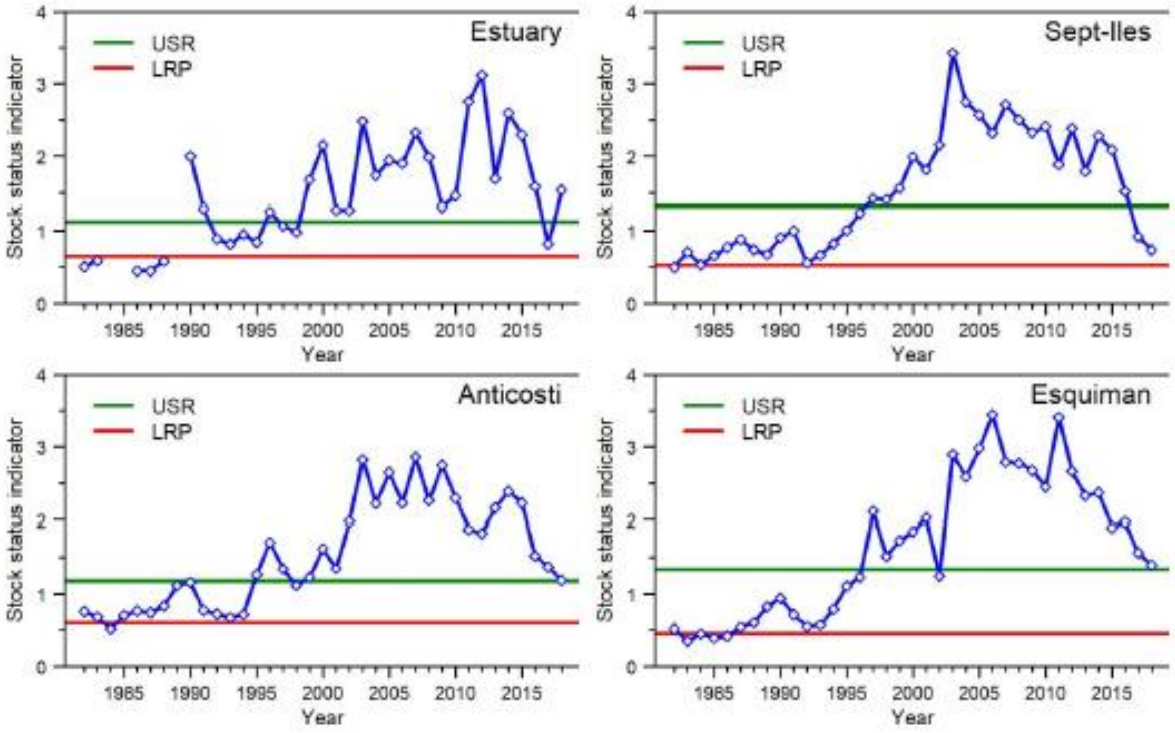

Figure 17. Main stock status indicator by year and limit (LRP) and upper (USR) stock reference points for each area. (Source: DFO, 2019)

DFO scientists consider that there are two main reasons for the observed decline in shrimp stocks in the Estuary and Gulf of St Lawrence – deep-water temperature continues to warm (Figure 9) and predator biomass, especially redfish, is increasing (Figure 18). These changes may have an impact on the dynamics and productivity of *Pandalus borealis*, including changes in spatial distribution, growth, reproduction and trophic relationships (DFO, 2018a). Redfish are a major predator of small (but not large) shrimp, and at the 2018 EGSAC meeting, DFO reported that *P. borealis* consumption by redfish was estimated to have more than doubled between 2016 and 2017. Any effect of temperature or other climatic factors on shrimp stock biomass is likely to be observed first in Esquiman (L. Savard, pers. comm.). Shrimp abundance by length class and sex from the DFO surveys show that both male and female abundance is declining in 2017 and that juvenile abundance (8-12mm CL) is low in 2016 and 2017 (Figure 19) suggesting that recruitment to the fishery is likely to be low in all SFAs in the short term (DFO, 2018a).

The outlook for the status of Northern shrimp stocks in the Estuary and Gulf of St. Lawrence is poor given the low recruitment, the warming water and the increasing predation by redfish. In the short term, the downward trend in these stocks is expected to continue (DFO, 2018a). In response to declining abundance of shrimp, DFO has instigated a sub-committee of EGSAC, the terms of reference which include “analysing major conservation, fishing management and economic issues of the shrimp fishery in the Estuary and Gulf of St. Lawrence, and developing actions and possible solutions to analyse regarding conservation, fishing management and economic issues identified on a short, medium and long term perspective.” The sub-committee has already met five times in 2019.

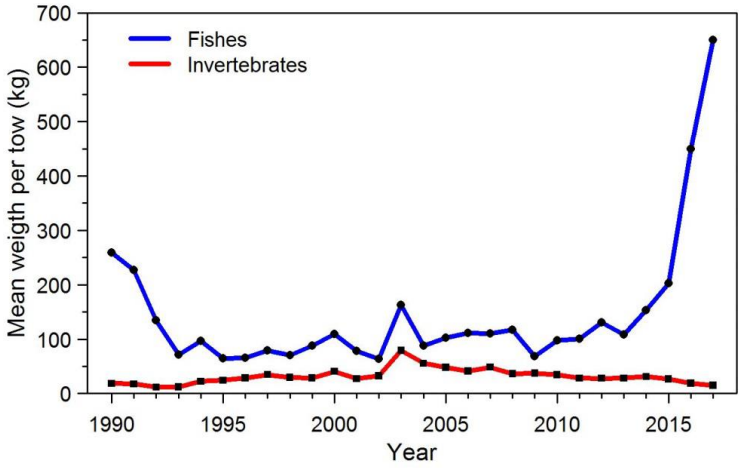

Figure 18. Biomass indices (kg per trawling tow) estimated during the DFO survey in the northern Gulf of St. Lawrence for invertebrates and fish. (Source: DFO, 2018a)

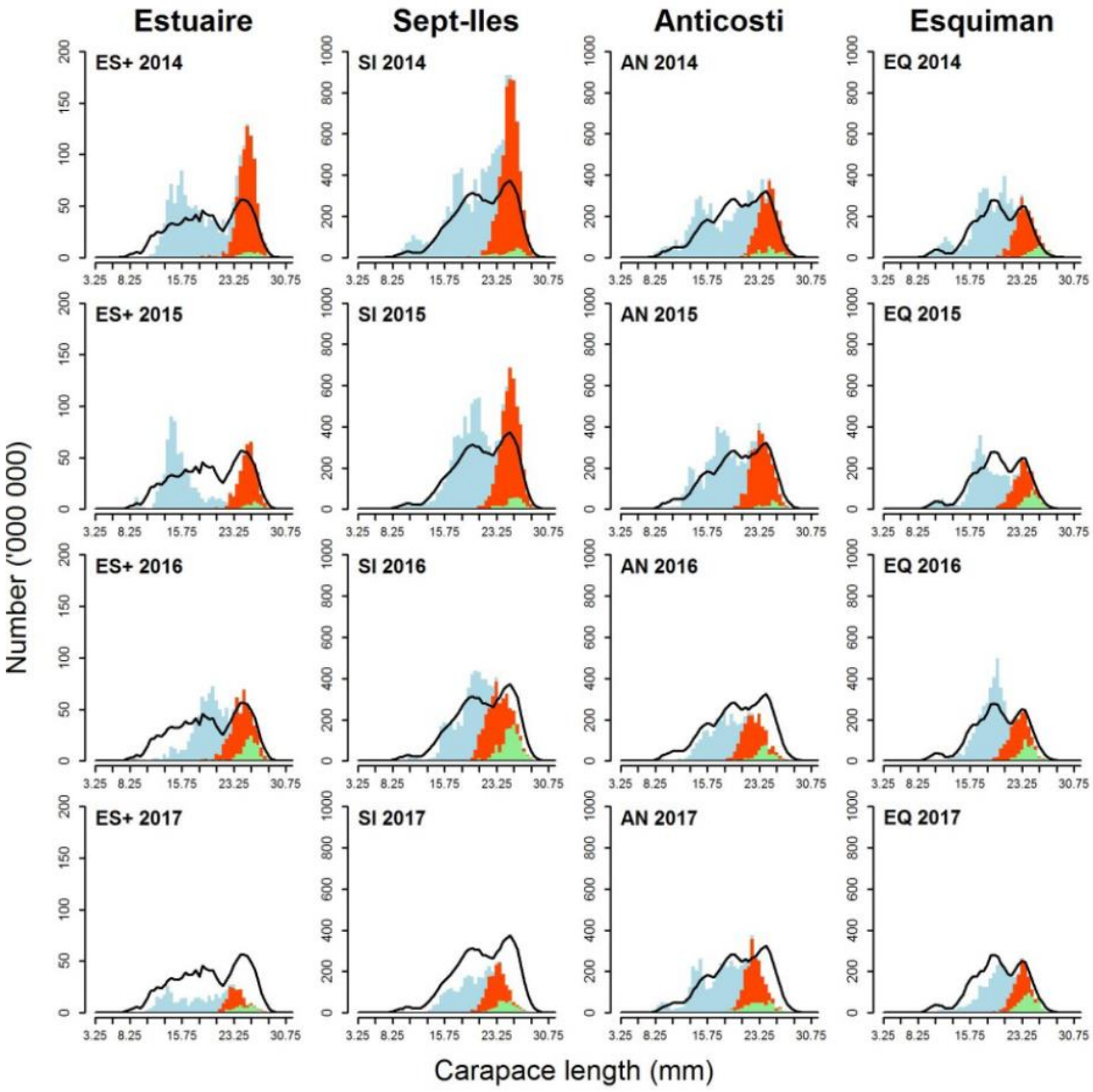

Figure 19. Shrimp abundance from the research survey (in number) by length class and by fishing area from 2014 to 2017. The histograms represent males (in blue), primiparous females (in red) and multiparous females (in green) and the solid line represents the mean of the years 1990-2015 (2008-2015 for the Estuary area). (Note that data from 2018 are not included in the 2018 stock update). (Source: DFO, 2018x)

Management advice based on stock status

Following the annual stock assessment updates, projected harvests are calculated by DFO Science for each SFA based on the harvest guidelines. This information is provided to Resource Management and, in consultation with the Estuary and Gulf of St Lawrence Shrimp Advisory Committee (EGSAC), the TACs for the following year are set.

Based on the projected harvests and using the decision rules (TAC will not change by more than 15% in any one year) the TACs for 2017 were set at 921 mt for Estuary, 10,715 mt for Sept-Iles, 8,084 mt for Anticosti, and 7,012 mt for Esquiman. These 2017 TACs represented a reduction of 15% in Estuary, Sept-Iles and Anticosti, whilst the TAC remained the same in Esquiman.

According to the harvest guidelines, the projected harvests for 2018 were 239 mt for Estuary, 4,267 mt for Sept-Iles, 5,722 mt for Anticosti and 5,508 mt for Esquiman (DFO, 2018a). Subsequently the TACs for 2018 were set at 239 mt for Estuary, 4,267 mt for Sept-Iles, 6,871 mt for Anticosti, and 5,960 mt for Esquiman. It should be noted that whilst the reductions in TAC in Anticosti and Esquiman have been limited to 15%, DFO Resource Management reduced the TACs in Estuary and Sept-Iles by 74% and 60% respectively directly following the scientific advice and therefore not applying the 15% rule.

Following these major reductions in TAC for 2018, total fishing effort declined by 30% in the fishery in 2018 (DFO, 2019). Preliminary landings for 2018 are 16,680 tonnes representing 96% of the total TAC for the four SFAs, with 100% of the TAC taken in Sept-Iles and Esquiman (Figure 12).

According to the harvest guidelines, the projected harvests for 2019 will be 724 tonnes for Estuary, 2658 tonnes for Sept-Iles, 4979 tonnes for Anticosti and 4930 tonnes for Esquiman (DFO, 2019) (Figure 20).

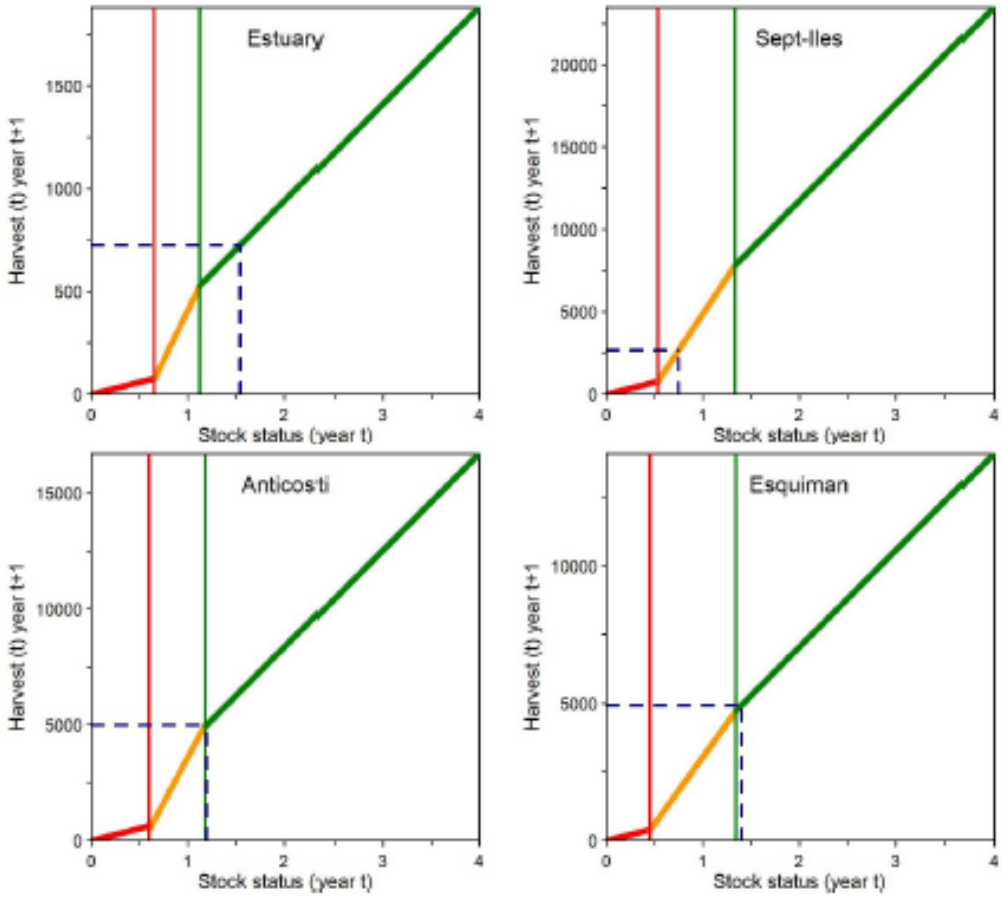

Figure 20. Harvest guidelines by fishing area. The projected harvest for 2019 is shown (dashed line) in view of the main stock indicator in 2018. (Source: DFO, 2019)

7.3.2 Catch profiles

See Figure 12 and corresponding information.

7.3.3 Total Allowable Catch (TAC) and catch data

Table 9. Total Allowable Catch (TAC) and catch data

	SFA 8 (Esquiman)				SFA 9 (Anticosti)			
TAC (mt)	Year	2017	Amount	7,012	Year	2017	Amount	8,084
Unit of Assessment share of TAC	Year	2017	Amount	7,012	Year	2017	Amount	8,084
Unit of Certification share of TAC	Year	2017	Amount	7,012	Year	2017	Amount	8,084
Total green weight catch by UoC (mt)	Year (most recent)	2017	Amount	7,004	Year (most recent)	2017	Amount	7,292
	Year (secon	2016	Amount	7,012	Year (secon	2016	Amount	8,153

	d most recent)				d most recent)			
	SFA 10 (Sept Iles)				**SFA 12 (Estuary)**			
TAC (mt)	Year	2017	Amount	10,715	Year	2017	Amount	921
Unit of Assessment share of TAC (%)	Year	2017	Amount	10,715	Year	2017	Amount	921
Unit of Certification share of TAC (%)	Year	2017	Amount	10,715	Year	2017	Amount	921
Total green weight catch by UoC (mt)	Year (most recent)	2017	Amount	7,236	Year (most recent)	2017	Amount	899
	Year (second most recent)	2016	Amount	11,810	Year (second most recent)	2016	Amount	1,025

7.3.4 Principle 1 Performance Indicator scores and rationales

PI 1.1.1 – Stock status

PI 1.1.1		The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring Issue		SG 60	SG 80	SG 100
a	Stock status relative to recruitment impairment			
	Guide post	It is **likely** that the stock is above the point where recruitment would be impaired (PRI).	It is **highly likely** that the stock is above the PRI.	There is a **high degree of certainty** that the stock is above the PRI.
	Met?	**Y (All UoCs)**	**Y (All UoCs)**	**N (All UoCs)**
	Justification	All UoCs For all UoCs the main stock indicator is well above the the limit reference point (LRP). For UoCs 1, 2 and 4, the main stock indicator is at least twice the value of the LRP and has been much higher in recent years (except in UoC 4 where it dipped below the USR in 2017). For UoC 3 the main stock indicator has declined in the last three years but is still between the USR and the LRP. Pandalus stock dynamics are driven by irregular strong year-classes, which are influenced as much by environmental variables as stock biomass, and whilst there have been no strong year-classes observed in recent years, there is no evidence of recruitment failure in the UoCs. The LRP is set at a level from which the stock has previously increased due most likely to a change in ecosystem conditions, primarily a reduction in predator abundance, and the LRP is therefore likely to be above the point where recruitment would be impaired (PRI). It is highly likely therefore that the stock is above the PRI in all UoCs. The SG60 and SG80 are met. There is some uncertainty around the main stock indicator in both UoC 2 Anticosti and UoC 4 Estuary because the main stock indicator is based upon a combination of survey and fishery indices and in recent years the two indices have shown different trends. In addition the main stock indicator has been declining for many years in all areas (notwithstanding an observed increase in 2018 in UoC 4 Estuary) which generates some uncertainty around the likelihood of imminent strong year classes. DFO scientists consider that observed increases in deep-water temperature and increases in predator biomass, especially redfish, are the two main reasons for the observed decline in shrimp stocks in the Estuary and Gulf of St Lawrence. These changes may have an impact on the dynamics and productivity of *Pandalus borealis*, including changes in spatial distribution, growth, reproduction and trophic relationships, and the short term outlook for recruitment in the fishery should be low in all areas (DFO, 2018a). It cannot be concluded therefore that there is a high degree of certainty that the stock is above the PRI in all UoCs. The SG100 is not met.		
b	Stock status in relation to achievement of MSY			
	Guide post		The stock is at or fluctuating around a level consistent with MSY.	There is a **high degree of certainty** that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years.
	Met?		**Y (UoCs 1, 2 and 4)** **N (UoC 3)**	**N (All UoCs)**

	Justification	UoC1 Esquiman, UoC2 Anticosti, UoC4 Estuary For UoCs 1, 2 and 4, the main stock indicator is currently at or above the USR, and has been much higher in recent years (except in UoC 4 where it dipped below the USR in 2017). The USR is set at a level of SSB equivalent to 80% of B_{MSY} in line with DFO's Precautionary Approach (section 4.1.2) and therefore it can be concluded that the stocks in UoCs 1, 2 and 4 are at or fluctuating around a level consistent with MSY as defined by the reference points. The SG80 is met. As the main stock indicator in UoC 1 and UoC 2 has now declined to the USR, and the main stock indicator in UoC 4 dipped below the USR in 2017, there is not a high degree of certainty that the stock has been fluctuating around or above a level consistent with MSY. SG100 is not met. In scoring this PI, the assessment team notes that the concept of a fixed value of MSY to which a harvest strategy should be aiming is not really tenable in the context of a fishery where recruitment is driven primarily by environmental factors such as water temperature and predator abundance. MSY is therefore more likely to vary with the production regime in place at the time. Whilst the management regime is clearly responding by reducing catches to levels consistent with current production, such a highly precautionary harvest strategy may not be able to maintain stocks at a level that was observed previously if the production regime has changed. In response to declining abundance of shrimp, DFO has instigated a sub-committee of EGSAC, the terms of reference which include "analysing major conservation, fishing management and economic issues of the shrimp fishery in the Estuary and Gulf of St. Lawrence, and developing actions and possible solutions to analyse regarding conservation, fishing management and economic issues identified on a short, medium and long term perspective." In other regions of Atlantic Canada, DFO is also developing a new quantitative stock assessment model for shrimp which incorporates both predation and environmental factors, and which would be used to define new reference points which take into account changes in the production regime. UoC3 Sept-Iles For UoC 3, the main stock indicator has been below the USR in 2017 and 2018, and therefore it cannot be concluded that the stock in UoC 3 is at or fluctuating around a level consistent with MSY. SG80 is not met. In terms of defining MSY and the status of the stock in relation to MSY, the caveats expressed above for UoCs 1, 2 and 4 apply also to UoC 3. Note: Whilst the SG80 is not met for PI 1.1.1 and the MSC CRv2.0 requires that each performance indicator that receives a score of less than 80 should have its own condition, the MSC Interpretations Page advises that, "In the case that the stock is depleted, and PI 1.1.1 scoring issue (b) scores less than 80, the CAB may present a rationale that PI 1.1.2 in CR2.0 fulfils the requirements of that condition." The assessment team therefore has not raised a condition as they considered that by scoring PI 1.1.2 for UoC 3 fulfils the need of a condition.
References		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. DFO. 2018a. Assessment of Northern Shrimp stocks in the Estuary and Gulf of St. Lawrence in 2017. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2018/015. DFO. 2018e. Proceedings of the regional peer review meeting of the assessment of the Estuary and Gulf of St. Lawrence shrimp stocks; January 23, 2018. DFO Can. Sci. Advis. Sec. Proceed. Ser. 2018/013.

	DFO. 2019. Update of stock status indicators for Northern Shrimp in the Estuary and Gulf of St. Lawrence. DFO Can. Sci. Advis. Sec. Sci. Resp. 2019/005.

Stock Status relative to Reference Points			
	Type of reference point	**Value of reference point**	**Current stock status relative to reference point**
Reference point used in scoring stock relative to PRI (SIa)	Limit reference point: average of the minimum value of the main stock indicator at the beginning of the 1980s and 1990s.	UoC 1 - 0.45 UoC 2 - 0.60 UoC 3 - 0.53 UoC 4 - 0.65	UoC 1 = 3.11 x LRP UoC 2 = 1.99 x LRP UoC 3 = 1.47 x LRP UoC 4 = 2.37 x LRP
Reference point used in scoring stock relative to MSY (SIb)	Upper stock reference point: 80% of the average value of the main stock indicator from 1996-2002	UoC 1 - 1.34 UoC 2 - 1.18 UoC 3 - 1.33 UoC 4 - 1.12	UoC 1 = 1.04 x USR UoC 2 = 1.01 x USR UoC 3 = 0.58 x USR UoC 4 = 1.38 x USR

OVERALL PERFORMANCE INDICATOR SCORE:	**UoC 1 – SFA 8 (Esquiman)**	**80**
	UoC 2 – SFA 9 (Anticosti)	**80**
	UoC 3 – SFA 10 (Sept Iles)	**70**
	UoC 4 – SFA 12 (Estuary)	**80**
CONDITION NUMBER (if relevant):	**UoC 1 – SFA 8 (Esquiman)**	**N/A**
	UoC 2 – SFA 9 (Anticosti)	**N/A**
	UoC 3 – SFA 10 (Sept Iles)	**See 1.1.2 (Rebuilding PI meets requirements of condition)**
	UoC 4 – SFA 12 (Estuary)	**N/A**

PI 1.1.2 – Stock rebuilding (UoC 3 only)

PI 1.1.2		Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe		
Scoring Issue		SG 60	SG 80	SG 100
a	**Rebuilding timeframes**			
	Guide post	A rebuilding timeframe is specified for the 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.		The shortest practicable rebuilding timeframe is specified which does not exceed **one generation time** for the stock.
	Met?	**Y**		**N**
	Justification	UoC 3 only. Male *Pandalus borealis* change sex to female at age 4-5 years in the Gulf of St. Lawrence, then mate and spawn that autumn and release larvae the following spring. The age at 50% maturity of *Pandalus borealis* in the Gulf of St. Lawrence is around 4 to 5 years and with natural mortality rates assumed to be around 0.5 to 1.0, this translates into a generation time (as defined by MSC GSA2.2.4) of around 6 years. Two generations are equivalent therefore to approximately 12 years. The harvest guidelines for the Estuary and Gulf of St. Lawrence shrimp stock require that harvests are reduced significantly if the main stock indicator drops below the USR (as has been observed in UoC 3) allowing rebuilding of the stock. Pandalus stock dynamics are driven by irregular strong year-classes, which are influenced as much by environmental variables as stock biomass, and therefore rebuilding of the stock requires the emergence of a strong year-class, in conjunction with a highly precautionary harvest strategy that will allow the strong year-class to persist through to contributing to the female spawning stock. Such low exploitation rates have been shown in other Pandalus fisheries to rebuild the stocks. Whilst the irregularity of strong year-classes does not permit the definition of a precise rebuilding timeframe, the current highly precautionary harvest strategy should ensure that the stock is rebuilt within two generations. The SG60 is met. The current harvest strategy permits a small, non-zero harvest even when the main stock indicator is below the LRP. The rebuilding timeframe is not therefore the shortest practicable, and so the SG100 is not met.		
b	Rebuilding evaluation			
	Guide post	Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within the specified timeframe.	There is evidence that the rebuilding strategies are rebuilding stocks, **or it is likely** based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the specified timeframe.	There is **strong** evidence that the rebuilding strategies are rebuilding stocks, **or it is highly likely** based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the specified timeframe.

	Met?	**Y**	**Y**	**N**
	Justification	UoC 3 only. Monitoring of the main stock indicator (which consists of both fishery-dependent and fishery-independent components) through annual stock assessments allows determination of whether re-building strategies are effective. The SG60 is met. There is no evidence currently that the stock is being rebuilt in UoC 3, and there is no simulation modelling which can estimate when stocks are likely to be re-built. However previous performance shows that the stock has rebuilt from low values of the main stock indicator similar to that observed currently in UoC 3. Such rebuilding requires the emergence of a strong year-class, and whilst no such strong year-classes have been observed recently, they are irregular in their nature, and it seems likely that a strong year class will occur within two generations, and with the precautionary harvest strategy should allow the rebuilding of the stock. SG80 is met. The assessment team notes that the concept of a fixed value of MSY to which a rebuilding strategy should be aiming is not really tenable in the context of a fishery where recruitment is driven primarily by environmental factors such as water temperature and predator abundance. MSY is therefore more likely to vary with the production regime in place at the time. Any rebuilding strategy must therefore be based upon a highly precautionary harvest strategy but may not be able to rebuild stocks to a level that was observed previously if the production regime has changed. In the light of increased water temperatures and higher abundance of predators in the Gulf of St. Lawrence in recent years, both of which can strongly influence recruitment dynamics, it is not highly likely that the stock will be rebuilt within two generations. SG100 is not met		
References		DFO. 2009. Sustainable Fisheries Framework (SFF) http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/overview-cadre-eng.htm 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. DFO. 2018a. Assessment of Northern Shrimp stocks in the Estuary and Gulf of St. Lawrence in 2017. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2018/015. DFO. 2018b. The Integrated Fisheries Management Plan (IFMP) for Northern Shrimp in the Estuary and Gulf of St. Lawrence (Areas 8, 9, 10 and 12) (*Pandalus borealis*). DFO. 2019. Update of stock status indicators for Northern Shrimp in the Estuary and Gulf of St. Lawrence. DFO Can. Sci. Advis. Sec. Sci. Resp. 2019/005. MSC Certification Requirements v2.0		

OVERALL PERFORMANCE INDICATOR SCORE:	**UoC 1 – SFA 8 (Esquiman)**	**N/A**
	UoC 2 – SFA 9 (Anticosti)	**N/A**
	UoC 3 – SFA 10 (Sept Iles)	**80**
	UoC 4 – SFA 12 (Estuary)	**N/A**

CONDITION NUMBER (if relevant):	**UoC 1 – SFA 8 (Esquiman)**	**N/A**
	UoC 2 – SFA 9 (Anticosti)	**N/A**
	UoC 3 – SFA 10 (Sept Iles)	**N/A**
	UoC 4 – SFA 12 (Estuary)	**N/A**

PI 1.2.1 – Harvest strategy

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
Scoring Issue		SG 60	SG 80	SG 100
a	Harvest strategy design			
	Guide post	The harvest strategy is **expected** to achieve stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy **work together** towards achieving stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and is **designed** to achieve stock management objectives reflected in PI 1.1.1 SG80.
	Met?	**Y**	**Y**	**Y**
	Justification	All UoCs. The overarching legislation which underlies management of the fishery is the Canadian Fisheries Act 1985 (currently under review). Operation and management of fisheries is prescribed by the Atlantic Fishery Regulation, 1985 and licensing and monitoring requirements are described by the Fishery (General) Regulations 1993. The objectives for the fishery and the management measures used to achieve those objectives are set out in the Integrated Fisheries Management Plan (IFMP). The IFMP's objectives are to help maintain the abundance of stocks in the healthy zone, to study the predation of northern shrimp by groundfish, particularly redfish, and to study the impact of environmental change on the northern shrimp, and so recognise that changes in shrimp stocks are driven by predator abundance and environmental factors in addition to exploitation levels. The fishery is managed through a co-management approach and consultation with the fishing industry, including development and revision of the IFMP, is through the Estuary and Gulf Shrimp Advisory Committee (EGSAC). The harvest strategy consists of a series of management regulations designed to safeguard the stock through limiting exploitation rate and allowing sufficient mature females to remain available for reproduction, and to minimise the impact of the fishery on the wider ecosystem. The two key elements of the harvest strategy are the setting of reference points and the associated harvest control rules (HCRs) which are governed by DFO's Sustainable Fisheries Framework. The harvest strategy also includes a comprehensive monitoring programme and a robust control and enforcement regime. Elements of the harvest strategy include control of fishing effort through a limited entry licensing scheme, a Total Allowable Catch (TAC), and a combination of individual quota (IQ) and Individual Transferable Quota (ITQ) systems which minimises the potential for any 'latent' fishing effort. In addition there are regulations governing fishing gear to minimise the capture of small non-commercial sized shrimps and bycatch species. Fishing is not permitted using fishing gear other than trawls, there is a minimum trawl mesh size of 40mm and the mandatory use of a Nordmore grate with specified bar spacing and attachment rules, and strict regulations about recording lost gear. There is a closed season, areas closed to protect corals and sponges, a protocol to limit small bycatch through short-term area closures, and a voluntary agreement to minimise interactions between the shrimp trawl fleet and the snow crab static gear fishery in the area. These elements of the harvest strategy along with the HCR work together to limit fishing mortality and maintain a high level of stock biomass, which along with rigorous monitoring of the fishery, ensure that stock management objectives are achieved. SG 60 is met.		

		The HCR ensures that the annual TAC is set at a precautionary level based upon an exploitation rate dependent on the state of the stock in relation to the limit and upper stock reference points. The harvest strategy is therefore responsive to the state of the stock (SG 80 is met) and the regular review of the IFMP and the publication of an annual Conservation Harvesting Plan (CHP) demonstrate that the harvest strategy is designed to achieve the stock management objectives reflected in PI 1.1.1. The SG 100 is met therefore. In scoring this PI, the assessment team notes that the concept of a fixed value of MSY to which a harvest strategy should be aiming is not really tenable in the context of a fishery where recruitment is driven primarily by environmental factors such as water temperature and predator abundance. MSY is therefore more likely to vary with the production regime in place at the time. Whilst the management regime is clearly responding by reducing catches to levels consistent with current production, such a highly precautionary harvest strategy may not be able to maintain stocks at a level that was observed previously if the production regime has changed. In response to declining abundance of shrimp, DFO has instigated a sub-committee of EGSAC, the terms of reference which include "analysing major conservation, fishing management and economic issues of the shrimp fishery in the Estuary and Gulf of St. Lawrence, and developing actions and possible solutions to analyse regarding conservation, fishing management and economic issues identified on a short, medium and long term perspective." In other regions of Atlantic Canada, DFO is also developing a new quantitative stock assessment model for shrimp which incorporates both predation and environmental factors, and which would be used to define new reference points which take into account changes in the production regime.		
b	Harvest strategy evaluation			
	Guide post	The harvest strategy is **likely** to work based on prior experience or plausible argument.	The harvest strategy may not have been fully **tested** but evidence exists that it is achieving its objectives.	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.
	Met?	**Y**	**Y**	**N**
	Justification	All UoCs. There is mandatory recording of catch and fishing effort through log books, observer sampling of catches, 100% dockside monitoring of landings and processing plant purchase slips must be completed. Cross-checks by DFO show that these elements of the harvest strategy are working effectively, and vessel inspections and review of VMS data confirm that there is compliance with all management regulations. Annual TACs are set based upon precautionary harvest guidelines, and there is no evidence that TACs have been exceeded in recent years. The SG60 is met. Fishery-independent stock surveys and annual assessments of stock status demonstrate that the main stock indicator has been at or above the upper stock reference point in recent years in Esquiman, Anticosti and Estuary, but is now between the upper stock reference point and the limit reference point in Sept-Iles. Whilst the main stock indicator has generally been declining in all UoCs in recent years, Pandalus stocks are driven by irregular large year-classes, and the lack of such large year classes in recent years is considered by DFO scientists to be due to continuing warming of deep-water temperature in the Estuary and Gulf of St. Lawrence and to increases in predator biomass, especially redfish, rather than because of deficiencies in the harvest strategy. The current highly precautionary harvest strategy, which results in the fishery footprint overlapping with only 14% of the shrimp stock distribution, should allow an increase in the main stock indicator when the next large year		

		class appears. There is evidence therefore that in general the harvest strategy is achieving its objectives. SG 80 is met. The harvest strategy has not been fully evaluated through, for example, a management strategy evaluation (MSE) and therefore SG 100 is not met.		
c	Harvest strategy monitoring			
	Guide post	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	**Y**		
	Justification	All UoCs. A comprehensive monitoring programme is in place which includes mandatory submission of log books recording catches and hours fished, recording of fishing activity through a mandatory Vessel Monitoring System (VMS) and all vessels are required to 'hail out' on leaving port and to 'hail in' prior to landing. There is a 100% coverage of landings through the Dockside Monitoring Programme (DMP), and the catch data recorded in log books are validated with the processing plant purchase slips and with landings recorded through the DMP. Samples of the commercial catch are taken on landing through which the size, sex and stage of maturity of individuals are recorded. An observer programme records the size composition of all shrimps caught in the trawl and records and measures bycatch species. The observer programme aims to cover 5% of all fishing trips per fishing season. An annual fishery-independent research trawl survey provides information on the abundance, size distribution and maturity stage of Pandalus across the area. The research survey also records the physical and biological oceanographic conditions, and stomach analysis of Greenland halibut and redfish is undertaken to provide insights into predation rates on shrimps. There is a comprehensive inspection, monitoring and surveillance programme undertaken by DFO which includes checking compliance with fishing areas, including closed areas, through aerial surveillance activities and checking VMS data, boarding of vessels at sea to check compliance with fishing gear regulations (e.g. mesh size, installation of sorting grate) and completion of log books and compliance with landings declarations regulations. The information from the annual survey and monitoring of the commercial fishery provides the data on which an annual stock assessment is conducted to assess stock status in relation to reference points. Monitoring is in place therefore to determine whether the harvest strategy is working. SG 60 is met.		
d	Harvest strategy review			
	Guide post			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			**Y**
	Justification	All UoCs. National and regional fisheries policy is reviewed on a regular basis through for example, the Atlantic Fisheries Policy Review – A Policy Framework for the Management of Fisheries on Canada's Atlantic Coast, and at present a review of the Fisheries Act, 1985 is currently undergoing passage through the Canadian Parliament. The IFMP is an 'evergreen' document which is reviewed by DFO on an annual basis in consultation with stakeholders at the EGSAC when all aspects of the harvest regime, e.g. TACs, observer sampling levels etc. may be reviewed. The fishery regulations and TAC for the shrimp fishery are published annually through a Conservation Harvesting Plan (CHP). A		

		Framework meeting is held every 5 years to review and critically assess the background information and the stock assessment methodology for the the Estuary and Gulf of St. Lawrence shrimp stock. SG100 is met.		
e	Shark finning			
	Guide post	It is **likely** that shark finning is not taking place.	It is **highly likely** that shark finning is not taking place.	There is a **high degree of certainty** that shark finning is not taking place.
	Met?	**Not relevant**	**Not relevant**	**Not relevant**
	Justification	All UoCs. Sharks are not a target species in this fishery.		
f	**Review of alternative measures**			
	Guide post	There has been a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock.	There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock and they are implemented as appropriate.	There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock, and they are implemented, as appropriate.
	Met?	**Not relevant**	**Not relevant**	**Not relevant**
	Justification	All UoCs. There is a minimum mesh size in the trawl fishery of 40 mm which ensures that primarily large female shrimp are caught with smaller shrimp passing through the mesh. Discarding is prohibited in the shrimp fishery, and automatic sorters are not permitted at the current time, so discarding of small shrimps is prevented. High level observer coverage of the single vessel which has a licence to process shrimp catches at sea demonstrated that there is minimal discarding of small shrimp and provided no evidence of high-grading. Although some smaller male shrimp may also be caught, these small shrimps are bagged up and sold as there is a market for these small shrimps. The assessment team concluded that there was no unwanted catch of shrimps in the fishery, and so this scoring issue is not scored.		
References	Bourdages, H., Marquis, M.C., Nozères, C. and Ouellette-Plante, J. 2018b. Assessment of northern shrimp stocks in the Estuary and Gulf of St. Lawrence in 2017: data from the research survey. DFO Can. Sci. Advis. Sec. Res. Doc. 2018/057. iv + 67 p. DFO. 2004. Atlantic Fisheries Policy Review – A Policy Framework for the Management of Fisheries on Canada's Atlantic Coast http://www.dfo-mpo.gc.ca/fm-gp/policies-politiques/afpr-rppa/framework-cadre-eng.htm DFO. 2009. Sustainable Fisheries Framework (SFF) http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/overview-cadre-eng.htm DFO. 2018b. The Integrated Fisheries Management Plan (IFMP) for Northern Shrimp in the Estuary and Gulf of St. Lawrence (Areas 8, 9, 10 and 12) (*Pandalus borealis*). DFO, 2018c. Draft minutes of the 2018 Estuary and Gulf Shrimp Advisory Committee (EGSAC) annual meeting.			

	DFO. 2018d. Conservation Harvesting Plan Northern Shrimp Areas 8, 9, 10 and 12. Notice to Fish Harvesters. March 22, 2018. https://inter-l01.dfo-mpo.gc.ca/applications/opti-opei/notice-avis-detail-eng.php?pub_id=1499&todo=view&type=1&region_id=4&sub_type_id=5&species=702&area=1858 DFO. 2018e. Proceedings of the regional peer review meeting of the assessment of the Estuary and Gulf of St. Lawrence shrimp stocks; January 23, 2018. DFO Can. Sci. Advis. Sec. Proceed. Ser. 2018/013. DFO. 2019. Update of stock status indicators for Northern Shrimp in the Estuary and Gulf of St. Lawrence. DFO Can. Sci. Advis. Sec. Sci. Resp. 2019/005. Ouellet, P., Chabot, D., Calosi, P., Orr, D. and Galbraith, P. S. 2017. Regional variations in early life stages response to a temperature gradient in the northern shrimp *Pandalus borealis* and vulnerability of the populations to ocean warming. Journal of Experimental Marine Biology and Ecology. 497: 50-60.

OVERALL PERFORMANCE INDICATOR SCORE:	**UoC 1 – SFA 8 (Esquiman)**	**95**
	UoC 2 – SFA 9 (Anticosti)	**95**
	UoC 3 – SFA 10 (Sept Iles)	**95**
	UoC 4 – SFA 12 (Estuary)	**95**
CONDITION NUMBER (if relevant):	**UoC 1 – SFA 8 (Esquiman)**	**N/A**
	UoC 2 – SFA 9 (Anticosti)	**N/A**
	UoC 3 – SFA 10 (Sept Iles)	**N/A**
	UoC 4 – SFA 12 (Estuary)	**N/A**

PI 1.2.2 – Harvest control rules and tools

<table>
<tr><td colspan="2">PI 1.2.2</td><td colspan="3">There are well defined and effective harvest control rules (HCRs) in place</td></tr>
<tr><td colspan="2">Scoring Issue</td><td>SG 60</td><td>SG 80</td><td>SG 100</td></tr>
<tr><td rowspan="3">a</td><td colspan="4">HCRs design and application</td></tr>
<tr><td>Guide post</td><td>Generally understood HCRs are in place or available that are expected to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached.</td><td>Well defined HCRs are in place that ensure that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock fluctuating around a target level consistent with (or above) MSY, or for key LTL species a level consistent with ecosystem needs.</td><td>The HCRs are expected to keep the stock fluctuating at or above a target level consistent with MSY, or another more appropriate level taking into account the ecological role of the stock, most of the time.</td></tr>
<tr><td>Met?</td><td>Y</td><td>Y</td><td>N</td></tr>
<tr><td></td><td>Justification</td><td colspan="3">All UoCs. The key harvest control rule (HCR) is that the annual TAC will be based upon an exploitation rate dependent on the state of the stock in relation to the limit reference point (LRP) and upper stock reference point (USR). The main stock status indicator is based on two independent sources of data, the catch per unit of effort (CPUE) from the commercial fishery, and the index of shrimp abundance from the DFO research survey. From these two sources of data, indices for male and female components are estimated, giving a total of four indices by fishing area. In order to combine them into one indicator, each index is standardised in relation to a reference period. When the main stock indicator is above the USR in the healthy zone, the TAC must be set at a level based upon an exploitation rate equivalent to a removal reference rate, defined as the mean rate observed between 1990 and 2010. In other words, the TAC is set at a constant proportion of the stock biomass. When the main stock indicator is between the USR and LRP, the TAC is again set at a constant proportion of the stock biomass but at a much lower proportion than when the stock is in the healthy zone. When the main stock indicator is below the LRP, the TAC is not set at zero but based on a constant and very low exploitation rate equivalent to 25% of the exploitation rate permitted in the healthy zone (DFO, 2018b). According to the harvest guidelines set out in the IFMP, the projected harvests are derived by applying the relationship (slope and intercept) between the harvest in year t+1 and stock status in year t to the main stock indicator as set out in the table below.

Relationship between the main stock indicator (MSI) and the projected harvest in the healthy, cautious and critical zones for all four UoCs.
<table>
<tr><th></th><th>Healthy zone harvest</th><th>Cautious zone harvest</th><th>Critical zone harvest</th></tr>
<tr><td>Estuary</td><td>470.7 x MSI</td><td>(962.4 x MSI) – 551.8</td><td>117.7 x MSI</td></tr>
<tr><td>Sept-Iles</td><td>5868.9 x MSI</td><td>(8819.4 x MSI) – 3910.5</td><td>1469.7 x MSI</td></tr>
<tr><td>Anticosti</td><td>4176.4 x MSI</td><td>(7819.1 x MSI) – 4197.5</td><td>1044.1 x MSI</td></tr>
<tr><td>Esquiman</td><td>3524.0 x MSI</td><td>(4871.1 x MSI) – 1808.8</td><td>881.0 x MSI</td></tr>
</table>
The harvest guidelines in the IFMP state that the TAC is adjusted if the difference between the projected harvest and the TAC that was implemented in the preceding year is higher than 5%. Within the healthy zone, the change in TAC between years is capped at 15%, which should ensure relative stability of the stock and fishery.

The LRP is set at a value of the main stock indicator from which the stock has previously increased due most likely to a change in ecosystem conditions, primarily a reduction in</td></tr>
</table>

		predator abundance, and can therefore be considered to be above the point of recruitment impairment (PRI) and therefore the HCR ensures that the exploitation rate is reduced as the PRI is approached. The SG60 is met. Although it is difficult to define a fixed value of MSY for the Estuary and Gulf of St. Lawrence shrimp stock because stock dynamics are driven primarily by environmental influences and predator abundance, the HCR is based upon the DFO Precautionary Approach guidance on setting reference points where the USR is considered to be approximately 80% of a level consistent with MSY. The harvest strategy is designed to ensure that the main stock indicator is always above the USR (equivalent to 80% of B_{MSY}) and therefore fluctuating around a level consistent with B_{MSY}. A well-defined HCR is therefore in place and the SG80 is met. As noted above, shrimp stock dynamics may be strongly influenced by predator abundance, and the USR value corresponds to stock abundances observed during a period of very low predator abundance. If the biomasses of the large groundfish species return to the high values observed historically, it may be necessary to review the USR since it is not certain whether the shrimp stocks could reach such abundance levels under maximum predation conditions. In response to declining abundance of shrimp, DFO has instigated a sub-committee of EGSAC, the terms of reference which include "analysing major conservation, fishing management and economic issues of the shrimp fishery in the Estuary and Gulf of St. Lawrence, and developing actions and possible solutions to analyse regarding conservation, fishing management and economic issues identified on a short, medium and long term perspective." In other regions of Atlantic Canada, DFO is also developing a new quantitative stock assessment model for shrimp which incorporates both predation and environmental factors, and which would be used to define new reference points which take into account changes in the production regime.The SG100 is not met therefore.		
b	HCRs robustness to uncertainty			
	Guide post		The HCRs are likely to be robust to the main uncertainties.	The HCRs take account of a **wide** range of uncertainties including the ecological role of the stock, and there is **evidence** that the HCRs are robust to the main uncertainties.
	Met?		**Y**	**N**
	Justification	All UoCs. There are inherent uncertainties about the relationship between catch rate (CPUE) data and stock abundance, and therefore the HCRs are based upon a main stock indicator which incorporates both fishery-dependent (CPUE) and fishery-independent (biomass estimate from research survey) indices of stock abundance. The precautionary, reference point framework addresses uncertainty within the calculation of confidence limits for the stock abundance indices. CPUE data from the fishery is standardised to account for variation due to changes in fishing power and seasonality and 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. There is some uncertainty underlying the main stock indicator used in the HCR. The indicator is based upon a combination of survey and fishery indices and in recent years the two indices have shown different trends in UoC 2 Anticosti and UoC 4 Estuary. Whilst the CPUE data cover all the vessels in the fleet, the footprint of the fishery covers only 14% of the overall shrimp distribution, whereas the research survey covers the whole shrimp distribution within the Estuary and northern Gulf of St. Lawrence. The annual research survey uses a stratified random sampling design, and a geostatistical method (kriging) is used to estimate shrimp biomass. Whilst confidence intervals are		

		provided for both survey and fishery indices of stock biomass, the main stock indicator is presented without confidence intervals and the assessment team has recommended under PI 1.2.4 that confidence intervals are provided for this combined stock indicator. The research survey sampling plan is continuously revised to ensure that it remains representative of the stock as a whole. Uncertainty related to the selection of harvest control rules has been addressed through the use of a simulation model that projected the stock trajectory over 25 years. The main uncertainty in shrimp stock dynamics is unpredictability of recruitment and the irregularity of strong year-class strengths which drive the stock dynamics. The variability in recruitment may be strongly influenced by environmental conditions and predator abundance, but the HCRs ensure that the TACs are set at highly precautionary exploitation rates which take into account this uncertainty in recruitment, irrespective of the factors driving that variability. Whilst the harvest guidelines stipulate that the change in TAC between years is capped at 15%, in recent years there have been uncertainties about stock status, and TACs have therefore been reduced by significantly more than 15% to take into account that uncertainty. The HCRs are therefore likely to be robust to the main uncertainties and the SG80 is met. As noted above, variability in recruitment may be strongly influenced by predator abundance, and the USR value corresponds to stock abundances observed during a period of very low predator abundance. If the biomasses of the large groundfish species return to the high values observed historically, it may be necessary to review the USR and the HCR since it is not certain whether the shrimp stocks could reach such abundance levels under maximum predation conditions. In response to declining abundance of shrimp, DFO has instigated a sub-committee of EGSAC, the terms of reference which include “analysing major conservation, fishing management and economic issues of the shrimp fishery in the Estuary and Gulf of St. Lawrence, and developing actions and possible solutions to analyse regarding conservation, fishing management and economic issues identified on a short, medium and long term perspective.” In other regions of Atlantic Canada, DFO is also developing a new quantitative stock assessment model for shrimp which incorporates both predation and environmental factors, and which would be used to define new reference points which take into account changes in the production regime. The ecological role of the shrimp stock is not therefore fully taken into account in the HCR and so the SG100 is not met.
c	**HCRs evaluation**	
	Guide post	There is **some evidence** that tools used **or available** to implement HCRs are appropriate and effective in controlling exploitation. **Available evidence indicates** that the tools in use are appropriate and effective in achieving the exploitation levels required under the HCRs. **Evidence clearly shows** that the tools in use are effective in achieving the exploitation levels required under the HCRs.
	Met?	**Y** **Y** **N**
	Justification	All UoCs. Limitations on fishing effort, TACs, technical measures to minimise capture of juvenile shrimps and rigorous enforcement regimes are appropriate harvest control tools that are considered to be effective at controlling exploitation. The principal tools for controlling exploitation rate in response to changes in stock status are the setting of an annual TAC based upon an evaluation of the main stock indicator in relation to the LRP and USR, and a monitoring and enforcement regime to ensure that TACs are not exceeded. The harvest guidelines stipulate that the change in TAC between years is capped at 15%, but in recent years there have been concerns about stock status, and TACs have therefore been reduced by significantly more than 15%, ensuring that precautionary action is taken to ensure that exploitation rates do not exceed sustainable levels. Available evidence from fisheries statistics indicates that TACs have not been

		exceeded in recent years and so exploitation levels required under the HCRs have been achieved. SG60 and SG80 are met. Until recently, the harvest control tools have ensured that the exploitation levels required under the HCRs have been achieved. However in recent years there has been an absence of the strong year-classes which drive Pandalus stock dynamics. Observed increases in water temperature and increased predator abundance are the most likely reasons for relatively poor year-classes, but following recent declines in the main stock indicator in all UoCs possibly due to over-exploitation in addition to ecosystem changes, the assessment team took a precautionary view and concluded that there is no clear evidence that the harvest control tools are fully effective at achieving the required exploitation levels. SG100 is not met.
References		Bourdages, H., and Marquis, M.C. 2019. Assessment of northern shrimp stocks in the Estuary and Gulf of St. Lawrence in 2017: commercial fishery data. DFO Can. Sci. Advis. Sec. Res. Doc. 2018/056. iv + 99 p. Bourdages, H., Marquis, M.C., Nozères, C. and Ouellette-Plante, J. 2018b. Assessment of northern shrimp stocks in the Estuary and Gulf of St. Lawrence in 2017: data from the research survey. DFO Can. Sci. Advis. Sec. Res. Doc. 2018/057. iv + 67 p. Desgagnés, M. and L. Savard. 2012. A model for simulating harvest strategies applicable to northern shrimp. DFO Can. Sci. Advis. Sec. Res. Doc. 2012/101. ii+ 52 p. DFO. 2009. Sustainable Fisheries Framework (SFF) http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/overview-cadre-eng.htm 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. DFO. 2018a. Assessment of Northern Shrimp stocks in the Estuary and Gulf of St. Lawrence in 2017. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2018/015. DFO. 2018b. The Integrated Fisheries Management Plan (IFMP) for Northern Shrimp in the Estuary and Gulf of St. Lawrence (Areas 8, 9, 10 and 12) (*Pandalus borealis*). DFO. 2019. Update of stock status indicators for Northern Shrimp in the Estuary and Gulf of St. Lawrence. DFO Can. Sci. Advis. Sec. Sci. Resp. 2019/005. Ouellet, P., Chabot, D., Calosi, P., Orr, D. and Galbraith, P. S. 2017. Regional variations in early life stages response to a temperature gradient in the northern shrimp *Pandalus borealis* and vulnerability of the populations to ocean warming. Journal of Experimental Marine Biology and Ecology. 497: 50-60.

OVERALL PERFORMANCE INDICATOR SCORE:	**UoC 1 – SFA 8 (Esquiman)**	**80**
	UoC 2 – SFA 9 (Anticosti)	**80**
	UoC 3 – SFA 10 (Sept Iles)	**80**
	UoC 4 – SFA 12 (Estuary)	**80**

CONDITION NUMBER (if relevant):	**UoC 1 – SFA 8 (Esquiman)**	**N/A**
	UoC 2 – SFA 9 (Anticosti)	**N/A**
	UoC 3 – SFA 10 (Sept Iles)	**N/A**
	UoC 4 – SFA 12 (Estuary)	**N/A**

PI 1.2.3 – Information and monitoring

PI 1.2.3		Relevant information is collected to support the harvest strategy		
Scoring Issue		SG 60	SG 80	SG 100
a	Range of information			
	Guide post	**Some** relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	**Sufficient** relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.	A **comprehensive range** of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
	Met?	**Y**	**Y**	**Y**
	Justification	All UoCs. Information on stock biomass, stock structure and distribution is available from the annual fishery-independent stock survey and information on the stock and the fishery is available from CPUE indices from commercial fisheries log book data. In addition, there is an observer programme which records the size composition of all shrimps caught in the trawl and records and measures bycatch species, and samples of the commercial catch have been taken at the point of landing since 1982 through which the size, sex and stage of maturity of individuals are recorded. Biological information including fecundity and maturity are available from fishery sampling and associated biological programmes. There is therefore comprehensive information on stock structure and productivity for the Estuary and Gulf of St. Lawrence shrimp stock. Fleet composition is well understood in this limited entry fishery and is described in the IFMP, stock abundance is monitored through the fishery-independent trawl survey, and UoA removals are rigorously monitored through the 100% Dockside Monitoring Programme. The estimate of stock biomass from the stock survey, rigorous monitoring of catches and landings and strict enforcement of TACs therefore provide sufficient data to support the harvest strategy including the HCR. The fishery-independent survey is is multidisciplinary survey and aims to describe the biodiversity of Gulf species and the physical and biological oceanographic conditions. The objectives of this survey include assessing the biodiversity of species found near the sea bottom, estimating the abundance of groundfish and invertebrates including Pandalus, assessing physical and biological oceanographic conditions (phytoplankton and zooplankton), monitoring the pelagic ecosystem and taking inventories of marine mammals and seabirds. In addition stomach analysis of Greenland halibut and redfish is undertaken to provide insights into predation rates on shrimps. A programme of scientific projects relating to the Pandalus populations is conducted by the Institute Maurice Lamontagne funded in whole or in part by DFO national programs and these projects are set out in the IFMP. There is therefore comprehensive information available on a wide range of parameters that may not be directly related to the harvest strategy. There is therefore a comprehensive range of information available and SG 60, 80 and 100 are met.		
b	Monitoring			

	Guide post	Stock abundance and UoA removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and UoA 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.	**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.
	Met?	**Y**	**Y**	**N**
	Justification	All UoCs. Stock abundance and biomass is accurately and regularly recorded through the annual fishery-independent trawl survey, and indices of abundance are also available through the commercial fisheries CPUE indices. Landings are rigorously monitored through log books, the dockside monitoring programme (DMP) and processing plant purchase slips. DFO cross-checks demonstrate that landings are accurately recorded for all vessels. Minimal discards of small shrimp occur in the trawl fishery, because the mesh size is such that all shrimp caught are large and therefore landed. Landings therefore represent all UoA removals. The data from the research survey and CPUE data from log books are combined to produce a single main stock indicator and the HCR is based upon an evaluation of this indicator against the LRP and USR. The stock indicators are monitored with sufficient frequency to support the harvest control rule. SG 60 and 80 are met. Whilst there is a good understanding of the uncertainties in the information and data available, it is not clear that the assessment and management of the shrimp stocks are robust to those uncertainties. SG 100 is not met.		
c	Comprehensiveness of information			
	Guide post		There is good information on all other fishery removals from the stock.	
	Met?		**Y**	
	Justification	All UoCs. There is no trap fishery for shrimp in the Estuary and Gulf of St. Lawrence as fishing gear other than trawls is not permitted. Recreational fishing is prohibited. All other trawl fisheries in the area use a larger mesh size than that used in the shrimp fishery, which will ensure that *Pandalus borealis* is not caught in the net. In addition, other trawl fisheries tend to fish in depths where Pandalus are not found. Any incidental catches of shrimp in other trawl fisheries would be recorded in the DMP. SG80 is met therefore.		
References		Bourdages, H., and Marquis, M.C. 2019. Assessment of northern shrimp stocks in the Estuary and Gulf of St. Lawrence in 2017: commercial fishery data. DFO Can. Sci. Advis. Sec. Res. Doc. 2018/056. iv + 99 p. Bourdages, H., Marquis, M.C., Nozères, C. and Ouellette-Plante, J. 2018b. Assessment of northern shrimp stocks in the Estuary and Gulf of St. Lawrence in 2017: data from the research survey. DFO Can. Sci. Advis. Sec. Res. Doc. 2018/057. iv + 67 p.		

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OVERALL PERFORMANCE INDICATOR SCORE:	**UoC 1 – SFA 8 (Esquiman)**	**90**
	UoC 2 – SFA 9 (Anticosti)	**90**
	UoC 3 – SFA 10 (Sept Iles)	**90**
	UoC 4 – SFA 12 (Estuary)	**90**
CONDITION NUMBER (if relevant):	**UoC 1 – SFA 8 (Esquiman)**	**N/A**
	UoC 2 – SFA 9 (Anticosti)	**N/A**
	UoC 3 – SFA 10 (Sept Iles)	**N/A**
	UoC 4 – SFA 12 (Estuary)	**N/A**

PI 1.2.4 – Assessment of stock status

PI 1.2.4		There is an adequate assessment of the stock status		
Scoring Issue		SG 60	SG 80	SG 100
a	Appropriateness of assessment to stock under consideration			
	Guide post		The assessment is appropriate for the stock and for the harvest control rule.	The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA.
	Met?		**Y**	**N**
	Justification	All UoCs. The annual assessment of the Estuary and Gulf of St. Lawrence shrimp stock is based upon an evaluation of the main stock indicator which is based on two independent sources of data, the catch per unit of effort (CPUE) from the commercial fishery, and the index of shrimp abundance from the DFO research survey. From these two sources of data, indices for male and female components are estimated, giving a total of four indices by UoC. In order to combine them into one indicator, each index is standardised in relation to a reference period. The main stock indicator is evaluated against limit (LRP) and upper (USR) stock reference points, which have been defined in relation to observed trends in the Estuary and Gulf of St. Lawrence shrimp stock over the last 45 years. In the Estuary and Gulf of St. Lawrence shrimp stock there is a low exploitation rate and a very strong influence of environmental factors and predator abundance on year-class strength and stock abundance. In consequence it is difficult to define a fixed value for maximum sustainable yield (MSY) and therefore a stock assessment approach for this shrimp stock using a population model-based framework is considered unlikely to be informative and therefore not appropriate for this fishery. The key harvest control rule is that the annual TAC will be based upon an exploitation rate dependent on the state of the stock in relation to the LRP and USR, i.e. whether the stock is in the healthy, cautious or critical zone. When SSB is above the USR in the healthy zone, the TAC must set at a level based upon an exploitation rate equivalent to a removal reference rate, defined as the mean rate observed between 1990 and 2010. When the main stock indicator is between the USR and LRP, the TAC is again set at a constant proportion of the stock biomass but at a much lower proportion than when the stock is in the healthy zone. When the main stock indicator is below the LRP, the TAC is not set at zero but based on a constant and very low exploitation rate equivalent to 25% of the exploitation rate permitted in the healthy zone. The fishery-dependent data cover all vessels in the fleet, and the fishery-independent research trawl survey has been undertaken every year since 1990 providing information on the abundance, size distribution and maturity stage of Pandalus across the area. The survey is considered to cover the entire distribution range of *P. borealis* in the Estuary and northern Gulf of St. Lawrence. The assessment uses both comprehensive fishery-dependent and fishery-independent data and is therefore appropriate for the stock and for the harvest control rule. The SG 80 is met. The USR value corresponds to stock abundances observed during a period of very low predator abundance. If the biomasses of the large groundfish species return to the high values observed historically, it may be necessary to review the USR since it is not certain whether the shrimp stocks could reach such abundance levels under maximum predation conditions. In addition, the reference points may need to be re-evaluated if recent observed increases in water temperature in the Gulf of St. Lawrence continue in future years.		

		(FCRV2.0 SA2.2.7 notes that "As ecosystem productivity may change from time to time as marine environments change naturally, for instance under conditions of regime shift, the team shall verify that reference points are consistent with ecosystem productivity.") Whilst water temperature, physical and biological oceanographic conditions and stomach contents of known shrimp predators are recorded during the fishery-independent stock survey, these parameters are not currently included within the main stock indicator used to evaluate the status of the stock. The assessment does not therefore fully take into account the major features of shrimp biology and the UoA, and the SG100 is not met.		
b	Assessment approach			
	Guide post	The assessment estimates stock status relative to generic reference points appropriate to the species category.	The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.	
	Met?	**Y**	**Y**	
	Justification	<u>All UoCs</u>. Limit (LRP) and upper (USR) stock biomass reference points for the Estuary and Gulf of St. Lawrence shrimp stock have been defined in terms of the main stock indicator which is based on two independent sources of data, the catch per unit of effort (CPUE) from the commercial fishery, and the index of shrimp abundance from the DFO research survey. For all four UoCs the main stock indicator was very low in the early 1980s during a period of high predator abundance, and in the early 1990s when predator abundance was low. Despite these low shrimp stock abundances and the differing levels of predation pressure, shrimp abundance increased rapidly in the late 1990s in all four UoCs characterised by strong year classes, providing evidence that recruitment impairment had not occurred in the 1980s and early 1990s. The LRP was therefore set at the average of the minimal indicator of the two periods of the beginning of the 1980s and 1990s, as the stock has demonstrably recovered from that low level. The shrimp stock in each of the 4 UoCs was considered to be stable with sustainable catches during the period 1996 to 2002, and therefore during this period the biomass approximated to B_{MSY}. In line with DFO's Precautionary Approach (PA) Framework of the Sustainable Fisheries Framework, the USR was therefore set at 80% of the average of stock status indicators for the 1996 to 2002 period. Although there are no defined target reference points (TRPs) for any of the UoCs, the harvest strategy is designed to ensure that the main stock indicator is always above the USR (equivalent to 80% of B_{MSY}) and therefore fluctuating around a level consistent with B_{MSY}. In addition to the definition of the LRP and USR in each UoC, the TAC must be set at a level based upon an exploitation rate equivalent to a removal reference rate, defined as the mean rate observed between 1990 and 2010. Each year the DFO assessment evaluates the main stock indicator relative to the LRP and USR and sets harvest rates at a level consistent with the removal rate reference point. The SG 60 and 80 are met therefore.		
c	Uncertainty in the assessment			
	Guide post	The assessment **identifies major sources** of uncertainty.	The assessment takes uncertainty into account.	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a **probabilistic** way.
	Met?	**Y**	**Y**	**N**

	Justification	All UoCs. Commercial fisheries statistics (log book data) are used to calculate fishing effort and catch per unit effort (CPUE) which is standardised to take into account changes in the fishing capacity/power and in the seasonal fishing patterns using a GLM procedure with variables vessel length and propulsion power, month and year. Mean annual values are presented with 95% confidence intervals. There are uncertainties relating to the use of CPUE as an index of stock abundance, and the fishery may not overlap with the overall distribution of the stock, and therefore the approach used in the Estuary and Gulf of St. Lawrence shrimp stock is to define the main stock indicator based upon both a fishery-dependent index (CPUE from the commercial fleet) and a fishery-independent estimate of stock biomass from the research survey which covers the whole distribution of the stock. The annual research survey is conducted with a shrimp trawl following a stratified random sampling design. Abundance of shrimp is estimated by size category and stage of maturity, and a geostatistical method (kriging) is used to estimate biomass and coefficients of variation for both males and females from the surveys. Shrimp are protandrous (i.e. change sex), and therefore it is important that the main stock indicator incorporates indices of both the male (recruitment to the female component) and the female stock components (spawning stock). The HCRs and harvest guidelines specify that TACs should not vary by more than 15% in consecutive years, but due to concerns about stock status, recent TACs have been set at much lower levels than those prescribed within the harvest guidelines. The assessment has identified the major sources of uncertainty and taken them into account. SG60 and SG80 are met. Whilst confidence intervals are provided for both the survey and fishery indices, the main stock indicators are presented without such confidence intervals. The assessment team recommends therefore that the main stock indicator is presented with confidence intervals. The assessment does not evaluate stock status in a probabilistic way and therefore SG100 is not met.
d	Evaluation of assessment	
	Guide post	The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?	**N**
	Justification	All UoCs. Whilst the assessment approach is considered to be robust as it uses empirical estimates of B_{MSY} and appropriate reference points rather than a population-based model, and there has been some preliminary management strategy evaluation, the assessment approach has not been formally tested. Prior to the implementation of precautionary reference points for the assessment of stock status in 2012, a multiple indicator method was used to evaluate stock status as the basis for TAC adjustments. Other assessment approaches (e.g. yield-per-recruit, stock production modelling, Bayesian State Space Biomass Dynamic Model VPA) have been attempted for *P. borealis* in Atlantic Canada, but it cannot be concluded that alternative

		approaches have been rigorously explored for the Estuary and Gulf of St. Lawrence stock. The SG100 is not met.		
e	Peer review of assessment			
	Guide post		The assessment of stock status is subject to peer review.	The assessment has been **internally and externally** peer reviewed.
	Met?		**Y**	**Y**
	Justification	All UoCs. A full stock assessment of the Estuary and Gulf of St. Lawrence shrimp stock is undertaken biennially and the status of the stock is consequently reviewed at a Regional Peer Review meeting convened by the Quebec Region of DFO and attended by all stakeholders. The review follows the peer-review process, policies and guidelines that have been developed by the Canadian Science Advisory Secretariat (CSAS) for DFO. Following the Regional Peer Review, the results of the assessment are published formally as a Science Advisory Report (SAR), and the full assessment is published as a DFO Research Document. In addition regular framework meetings thoroughly review and critically assess the background information and the stock assessment methodology for the Estuary and Gulf of St. Lawrence shrimp stock. Review meetings will be attended by regional stakeholders, DFO, First Nation representatives and occasional expert reviewers. In interim years, science advice is provided as a stock status update, reviewed only by DFO Science, CSAS and expert reviewers and published as a DFO Science Response. The stock status update will be reviewed by EGSAC. The stock assessment is subject to peer review – SG80 is met. As the assessment receives internal and external peer review SG100 is met.		
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OVERALL PERFORMANCE INDICATOR SCORE:	**UoC 1 – SFA 8 (Esquiman)**	**85**
	UoC 2 – SFA 9 (Anticosti)	**85**
	UoC 3 – SFA 10 (Sept Iles)	**85**
	UoC 4 – SFA 12 (Estuary)	**85**
CONDITION NUMBER (if relevant):	**UoC 1 – SFA 8 (Esquiman)**	**N/A**
	UoC 2 – SFA 9 (Anticosti)	**N/A**
	UoC 3 – SFA 10 (Sept Iles)	**N/A**
	UoC 4 – SFA 12 (Estuary)	**N/A**

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7.4 Principle 2

7.4.1 Principle 2 background

Primary and Secondary species

Information is available on the bycatch of non-target species in the Estuary and Gulf of St. Lawrence *Pandalus borealis* fishery from the DFO observer programme in the trawl fishery. In addition to shrimp catch and size/sex composition, the observer programme in the trawl fishery monitors the weight of bycatch and discards of other non-target species. The main objective of the observer coverage in the Canadian Pandalus fisheries is to qualitatively account for bycatch diversity while being able to quantify species occurrence associated with the shrimp fishery. The target for observer coverage is 5% of sets, distributed among the various shrimp fishing areas (SFAs). The level of observer coverage has generally achieved the 5% target overall, and a study of the representativeness of observer coverage in several Gulf of St. Lawrence fisheries concluded that observer coverage in the northern shrimp fishery was essentially randomly distributed in the fishery and therefore representative of the overall fishery (Benoît and Allard, 2009). Observer coverage varies across the various fleets in the four UoCs, and historically the observer coverage on Newfoundland vessels in the Esquiman Channel (UoC 1) had been only 2%. However, coverage increased from 2.5% in 2016 to 3.6% in 2017 in Newfoundland (B. Morin, DFO Quebec, pers. comm.). DFO Science provided the assessment team with information on the percentage observer coverage - calculated as (number of fishing hours covered by the at-sea observer / total number of fishing hours) x 100 for each UoC for each year since 2000. The average observer coverage from 2013 to 2017 was 4.0% in Esquiman (SFA 8, UoC 1), 5.1% in Anticosti (SFA 9, UoC 2), 5.5% in Sept-Iles (SFA 10, UoC 3) and 4.4% in Estuary (SFA 12, UoC 4).

Bycatch information is provided each year in the DFO stock assessment reports (or science updates in years when there is not a full assessment). As part of the assessment process, this bycatch information is reviewed at meetings of the Estuary and Gulf Shrimp Advisory Committee (EGSAC), which are attended by Science and Conservation and Protection Division (C & P) staff, as well as external participants such as representatives from indigenous groups, industry and ENGOs. The annual assessment and review provide an opportunity to consider whether there may be a need for additional at-sea monitoring (e.g. if any concerns arose), to meet management, science or C & P objectives.

Trawl fishery – nature and regulations

DFO has implemented a “Policy on Managing Bycatch” (DFO, 2013a) which aims to take into account retained and non-retained species bycatch in all fisheries management plans. The DFO Policy on Managing Bycatch aims to ensure that Canadian fisheries are managed in a manner that supports the sustainable harvesting of aquatic species by:

1) minimizing the risk of fisheries causing serious or irreversible harm to bycatch and discard species,

2) accounting for total catch, including bycatch and discards.

The current fishing practices and the regulations covering the trawl fishery ensure that bycatch levels in the trawl fishery are low. The use of the Nordmore sorting grate (or grid) in the shrimp trawl (Figure 3) has been mandatory in the *Pandalus borealis* fishery in the Estuary and Gulf of St. Lawrence shrimp fishery since 1993. The sorting (or separating) grate is designed to stream by-catch of fish out of the shrimp trawl, allowing maximum reduction of by-catch of juvenile and adult fish. The use of a second net (or pouch) over the sorting grate to retain large fish streamed out by the grate is prohibited during the fishing season. The IFMP (DFO, 2018a) includes a protocol for closing 10-min longitude by 10-min latitude grid squares when bycatch exceeds a specified level. Redfish bycatch was the cause of a number of area closures in 2016. No closures were applied in the 2019 season (Hugo Bourdages, DFO Science, pers. comm.). The specified level of bycatch changed in 2017 from a percentage of the catch to a specified volume of 90 kgs. (B. Morin, pers. comm. and DFO 2018b). In addition fishermen will try to avoid areas with high bycatch rates as there is no commercial value for bycatch species and high bycatches require increased time sorting catches. Fishermen will also use 30cm toggle chains to keep nets off the bottom which reduces the catch of demersal and benthic species.

Trials on the use of on-board mechanical devices to separate bycatch showed that the separator proved to be an efficient separating tool, reduced the time required to sort the bycatch, produced cleaner and better quality landings, and there was no evidence of high-grading. DFO has now approved their use on board shrimp trawlers subject to management measures related to the collection of data and fishing patterns for

future analysis as well as increased observer coverage. At the site visit, DFO Resource Management reported that there were 8 vessels using mechanical bycatch separators in 2018. Gear modifications have therefore effectively minimised the bycatch of groundfish species in the trawl such that the trawl fishery has limited interaction with, and low impact on, other non-target species. Individuals of all non-target species caught in the trawl may be released back to sea immediately as the use of the separator grate and the prohibition on the use of an additional pouch over the grate ensures that the catch of large commercial-sized is minimised. There are additional protocols for the release of Endangered, Threatened or Protected (ETP) species (see below).

Bycatch species in the trawl fishery

Bycatches estimated from the observer programme were previously very low averaging around 1.8% of the total shrimp landings (DFO, 2018c), but since 2013 have increased significantly above the long term average and reached a peak of 1500 tonnes in 2016 equivalent to approximately 5% of the shrimp landings (Figure 21, Table 10). Despite the significant increase in bycatches in the last few years, average overall bycatch levels of 5% across the four SFAs continues to represent a very clean catch. Total catches estimated per species in these bycatches represent less than 1% of the estimate of their respective biomass in the DFO survey (DFO, 2018c).

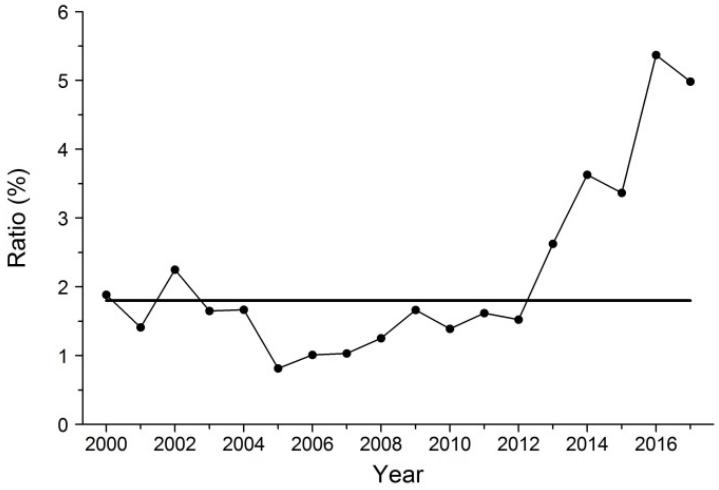

Figure 21. Ratio (%) of bycatches to total northern shrimp catches. Solid lines indicate the average for the years 2000 to 2015. (Source: DFO, 2018c).

Table 10. Bycatch (t) and ratio (%) of the bycatch of the northern shrimp catch by year and SFA for all species combined (Source: Bourdages and Marquis, 2019)

SFA	Bycatch (t)					Ratio (%)				
	8	9	10	12	Total	8	9	10	12	Total
Year										
2000	80	168	227	20	495	1.08	2.12	2.24	2.71	1.89
2001	125	70	152	6	353	1.60	1.29	1.39	0.69	1.41
2002	316	107	225	9	657	3.83	1.24	1.96	1.19	2.25
2003	85	85	276	11	457	1.25	0.97	2.43	1.42	1.65
2004	165	105	324	8	601	1.92	1.01	2.03	0.73	1.67
2005	175	60	158	17	410	1.98	0.75	1.23	1.66	1.34
2006	42	108	187	8	345	0.47	1.24	1.22	0.82	1.01
2007	94	124	145	10	373	1.02	1.21	0.93	1.02	1.04
2008	86	113	206	43	448	0.95	1.17	1.29	4.18	1.25
2009	283	124	169	25	599	2.98	1.28	1.06	2.49	1.67
2010	111	176	176	41	505	1.16	1.75	1.12	4.53	1.39
2011	66	137	329	23	555	0.72	1.40	2.29	2.60	1.62
2012	69	147	260	12	488	0.68	1.78	2.08	1.25	1.53
2013	144	89	539	74	845	1.57	1.16	3.79	6.60	2.63
2014	192	307	588	22	1109	2.28	3.52	4.73	2.28	3.63
2015	200	337	433	52	1022	2.53	3.85	3.44	4.72	3.37
2016	291	272	886	55	1504	4.15	3.34	7.50	5.35	5.37
2017	198	257	553	67	1075	2.84	3.86	7.87	7.43	4.98
Mean 2000-2015	140	141	275	24	579	1.63	1.61	2.08	2.43	1.83

From 2000 to 2017, the proportion of pink glass shrimp (*Pasiphaea multidentata*) and striped shrimp (*Pandalus montagui*) was estimated at 0.8% and 0.2% respectively. *Pandalus montagui* are very similar in appearance and physical attributes to *P. borealis* and are inseparable during the normal fishing operation and practically inseparable during processing, and are therefore defined by the MSC as “Inseparable or Practically Inseparable (IPI) stocks. For a full description of how catches of *P. montagui* in the *P. borealis* targeted fishery are treated as an IPI stock see section 6.4 below.

In addition to the summary reports of bycatches provided in DFO stock assessment reports and science updates, and the summary table reproduced above from Bourdages and Marquis (2019), the assessment team was provided with raw catch composition data from the observer programme by Hugo Bourdages, DFO Science, Mont-Joli. The observer data provides bycatch weights by species raised to the total catches in the Pandalus fishery and separated by SFA from 2013 to 2017. Based on these data, Tables 8 to 11 describe the bycatch species composition, the estimated weight by species across the fleet, and the percentage of the total catch that each species contributed. 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. For all bycatch statistics, it should be noted that the bycatch rate is very likely over-estimated for the more uncommon species due to the minimum 1 kg weight recorded by the observers (e.g. a single sand lance would be recorded as 1 kg despite weighing only a few grams). The figures for weight and percentage of total catch are the average across the 5 years of observer sampling from 2013 to 2017. In each SFA, there were approximately 100 species (or species groups) identified during the observer programme. Table 11 through to Table 14 provide information only on those species that contribute at least 0.01% of the total catch.

Table 11. Catch composition (target species and bycatch species) from the commercial shrimp fishery in SFA8 Esquiman (UoC 1). Average catches of all species from 2013 to 2017 from the DFO observer data. (Minimum recorded weight per species is 1kg.) (Source: Hugo Bourdages, DFO Science)

Species common name	Species Latin name	Weight of catch (tonnes)	% of total catch weight
Northern shrimp	*Pandalus borealis*	7283.64	97.510
Redfish	*Sebastes spp.*	119.35	1.598
Capelin	*Mallotus villosus*	19.78	0.265
Greenland halibut	*Reinhardtius hippoglossoides*	12.57	0.168
Atlantic herring	*Clupea harengus*	9.07	0.121
Witch flounder	*Glyptocephalus cynoglossus*	5.94	0.080
Pink glass shrimp	*Pasiphaea multidentata*	4.92	0.066
American plaice	*Hippoglossoides platessoides*	4.13	0.055
White barracudina	*Arctozenus risso*	2.22	0.030
Atlantic cod	*Gadus morhua*	1.85	0.025
Thorny skate	*Raja radiata*	1.85	0.025
Atlantic halibut	*Hippoglossus hippoglossus*	1.46	0.020
Other species		2.88	0.038
Total		**7469.66**	**100.00**

Table 12. Catch composition (target species and bycatch species) from the commercial shrimp fishery in SFA9 Anticosti (UoC 2). Average catches of all species from 2013 to 2017 from the DFO observer data. (Minimum recorded weight per species is 1kg.) (Source: Hugo Bourdages, DFO Science)

Species common name	Species Latin name	Weight of catch (tonnes)	% of total catch weight
Northern shrimp	*Pandalus borealis*	7826.59	96.873
Redfish	*Sebastes spp.*	118.05	1.461
Pink glass shrimp	*Pasiphaea multidentata*	32.60	0.404
Capelin	*Mallotus villosus*	27.31	0.338
Atlantic herring	*Clupea harengus*	21.60	0.267
Greenland halibut	*Reinhardtius hippoglossoides*	18.37	0.227
White barracudina	*Arctozenus risso*	14.74	0.182
Witch flounder	*Glyptocephalus cynoglossus*	5.71	0.071
Other shrimp-like spp.		3.23	0.040
American plaice	*Hippoglossoides platessoides*	2.51	0.031
Atlantic halibut	*Hippoglossus hippoglossus*	2.33	0.029
Atlantic cod	*Gadus morhua*	1.43	0.018
Thorny skate	*Raja radiata*	0.99	0.012
Other species		3.74	0.047
Total		8079.20	100.00

Table 13. Catch composition (target species and bycatch species) from the commercial shrimp fishery in SFA10 Sept-Iles (UoC 3). Average catches of all species from 2013 to 2017 from the DFO observer data. (Minimum recorded weight per species is 1kg.) (Source: Hugo Bourdages, DFO Science)

Species common name	Species Latin name	Weight of catch (tonnes)	% of total catch weight
Northern shrimp	*Pandalus borealis*	11968.35	95.260
Redfish	*Sebastes spp.*	392.73	3.126
Greenland halibut	*Reinhardtius hippoglossoides*	69.17	0.551
Capelin	*Mallotus villosus*	26.93	0.214
Atlantic herring	*Clupea harengus*	22.65	0.180
Other shrimp-like spp.		21.17	0.168
White barracudina	*Arctozenus risso*	14.45	0.115
Witch flounder	*Glyptocephalus cynoglossus*	11.08	0.088
American plaice	*Hippoglossoides platessoides*	7.70	0.061
Atlantic cod	*Gadus morhua*	4.59	0.037
Thorny skate	*Raja radiata*	4.34	0.035
Atlantic hagfish	*Myxine glutinosa*	3.81	0.030
Atlantic halibut	*Hippoglossus hippoglossus*	2.94	0.023
Eelpouts	*Lycodes spp.*	2.61	0.021
Pink glass shrimp	*Pasiphaea multidentata*	1.43	0.011
Other species		9.96	0.079
Total		**12563.91**	**100.00**

Table 14. Catch composition (target species and bycatch species) from the commercial shrimp fishery in SFA12 Estuary (UoC 4). Average catches of all species from 2013 to 2017 from the DFO observer data. (Minimum recorded weight per species is 1kg.) (Source: Hugo Bourdages, DFO Science)

Species common name	Species Latin name	Weight of catch (tonnes)	% of total catch weight
Northern shrimp	*Pandalus borealis*	1076.03	95.352
Redfish	*Sebastes spp.*	20.54	1.820
Greenland halibut	*Reinhardtius hippoglossoides*	15.06	1.334
Atlantic cod	*Gadus morhua*	3.00	0.265
Capelin	*Mallotus villosus*	2.99	0.265
White barracudina	*Arctozenus risso*	2.85	0.252
Atlantic herring	*Clupea harengus*	2.43	0.215
American plaice	*Hippoglossoides platessoides*	1.69	0.150
Eelpouts	*Lycodes spp.*	0.74	0.065
Thorny skate	*Raja radiata*	0.58	0.051
Other shrimp-like spp.		0.46	0.040
Poachers	Agonidae	0.35	0.031
Sea snails	*Liparis spp.*	0.28	0.025
Arctic cod	*Boreogadus saida*	0.16	0.014
Hookear sculpins	*Artediellus spp.*	0.16	0.014

Species common name	Species Latin name	Weight of catch (tonnes)	% of total catch weight
Four beard rockling	*Enchelyopus cimbrius*	0.14	0.012
Striped pink shrimp	*Pandalus montagui*	0.12	0.010
Other species		0.90	0.085
Total		**1128.48**	**100.00**

The total catch composition is very similar in all four UoCs (Tables 8 to 11). In all areas, the catch of the target species, *Pandalus borealis*, constitutes over 95% of the catch, and the most abundant bycatch species are redfish (*Sebastes spp*.). In Esquiman (SFA 8, UoC1), Anticosti (SFA 9, UoC 2) and Sept-Iles (SFA 10, UoC 3), the bycatch composition is very similar with redfish, Greenland halibut, capelin, Atlantic herring, American plaice, white barracudina, Atlantic cod, witch flounder, thorny skate and Atlantic halibut being species observed in sizable numbers in the bycatch in all three areas. In the southern parts of the Gulf of St. Lawrence Estuary, some additional species contribute more than 0.01% of the catch with hagfish and eelpouts observed in the bycatch in Sept-Iles (SFA 10, UoC3) and eelpouts, poachers, sea snails, Arctic cod, hookear sculpins and four beard rockling all observed in Estuary (SFA 12, UoC 4).

The pink glass shrimp (*Pasiphaea multidentata*) constitutes more than 0.01% of the catch in Esquiman, Anticosti and Sept-Iles (Tables 8 to 10), whereas the striped pink shrimp (*Pandalus montagui*), which is designated as an IPI species, was recorded in observer samples from Estuary (Table 14).

The catch from the Pandalus trawl in the Estuary and Gulf of St. Lawrence is therefore very “clean”, and the assessment team considered significant bycatch species to be those that constituted more than 0.1% of the total catch. Over the period 2013 to 2017, significant bycatch species as identified from the observer programme were therefore redfish, capelin, Greenland halibut and Atlantic herring in Esquiman (SFA 8, UoC 1). In Anticosti (SFA 9, UoC 2), significant bycatch species were redfish, capelin, Atlantic herring, Greenland halibut, white barracudina and pink glass shrimp. In Sept-Iles (SFA10, UoC 3), significant bycatch species are redfish, Greenland halibut, capelin, herring, other shrimp-like species and white barracudina. In Estuary (SFA 12, UoC 4) significant bycatch species are redfish, Greenland halibut, Atlantic cod, capelin, white barracudina, Atlantic herring and American plaice.

Designation of bycatch species

According to MSC FCR V2.0 SA 3.1.3.3, primary species are those where management tools are in place, intended to achieve stock management objectives reflected in either limit or target reference points. According to MSC FCR v2.0 SA 3.1.4, secondary species are those that do not fall into the definitions of target, primary or ETP species (MSC, 2014).

For primary and secondary species, a ‘main’ designation is then given where either the catch of a species by the UoA comprises 5% or more by weight of the total catch of all species by the UoA, or the species is classified as ‘less resilient’ and the catch of the species by the UoA comprises 2% or more by weight of the total catch of all species by the UoA. A species is classified as ‘less resilient’ if its productivity indicates that it is intrinsically of low resilience, or, the existing knowledge of the species indicates that its resilience has been lowered due to anthropogenic or natural changes to its life-history.

In the case where individuals are released alive they shall not contribute to the definition of ‘main’ but strong scientific evidence of a very low post-capture mortality must be provided. In cases where a species does not meet the designated weight thresholds of 5% or 2%, as above, but the catch of the UoA is exceptionally large such that even small catch proportions of a P2 species significantly impact the affected stocks/populations, then they are also classed as main (MSC, 2014).

The purpose of this section of the report is to review the information available about non-target catches in the fishery so that the “primary” and “secondary” species can be identified; and then to establish which of these species are “main”.

The proportion of the bycatch species in all SFAs / UoCs in the Estuary and Gulf of St. Lawrence shrimp fishery is low. The only bycatch species constituting > 0.1% of the total catch in the fishery over the period 2013 to 2017 as identified from the observer programme in the various SFAs / UoCs were redfish (mixed) (*Sebastes* spp.), capelin (*Mallotus villosus*), Greenland halibut (*Reinhardtius hippoglossoides*), Atlantic

herring (*Clupea harengus*), Atlantic cod (*Gadus morhua*), American plaice (*Hippoglossoides platessoides*), white barracudina (*Arctozenus risso*), pink glass shrimp (*Pasiphaea multidentata*) and other shrimp-like species (Tables 8 to 11).

As noted above, bycatches of redfish are not differentiated by species in the observer samples and are considered to be a mixture of the deepwater redfish, *Sebastes mentella*, and the Acadian redfish, *S. fasciatus*. In the Northwest Atlantic, redfish distribution ranges from the Gulf of Maine, northwards off Nova Scotia and the southern Newfoundland Banks, in the Gulf of St. Lawrence and along the continental slope and deep channels from the southwestern Grand Bank to areas as far north as Baffin Island (DFO, 2012a). Within the overall redfish distribution, DFO recognises various management units which broadly correspond to biological stocks. Redfish caught in the Estuary and Gulf of St. Lawrence shrimp trawl fishery will comprise of *S. fasciatus* and *S. mentella* from Unit 1 (Figure 22), although studies of genetic variation suggest that Units 1 and 2 contain a single population of both species (DFO, 2016a; 2018d).

For the redfish stocks DFO had previously adopted limit reference points as 40% of the median Bmsy estimate from the fitting of a Bayesian surplus production model. DFO also suggested that it would be possible to set an additional upper stock reference point (USR) for these stocks at 80% Bmsy in line with the DFO Precautionary Approach Framework (DFO, 2009a). From 2016 to 2018 a Management Strategy Evaluation (MSE) approach was used to define reference points and a subsequent harvest control rule (HCR) (DFO, 2018e). On the basis that it is possible to assess the status of the redfish stocks in relation to reference points, they can be considered as primary species.

Both species of redfish are long-lived (maximum age about 75 years) and late-maturing (generation time 16-18 years) and so the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) designated the Gulf of St. Lawrence / Laurentian Channel population of *S. mentella* to be endangered and the Atlantic population (including Unit 1) of *S. fasciatus* to be threatened (COSEWIC, 2010). However neither species of redfish are on Schedule 1 of the Species at Risk Act (SARA), and cannot therefore be designated as an ETP species. They should therefore be designated as primary species. With the COSEWIC designation of the redfish species, the populations that might be caught as bycatch in the Estuary and Gulf of St. Lawrence shrimp fishery stock should be considered as ‘less resilient’. In UoCs 1, 2 and 4, the bycatch of redfish is below the 2% threshold of the total catch defined for less resilient species, so redfish can be designated as minor primary species in these UoCs. However in UoC 3, Sept-Iles, the bycatch of redfish comprised approximately 3% of the total catch from 2013-2017 (Table 13), and so redfish is designated as a main primary species in UoC 3.

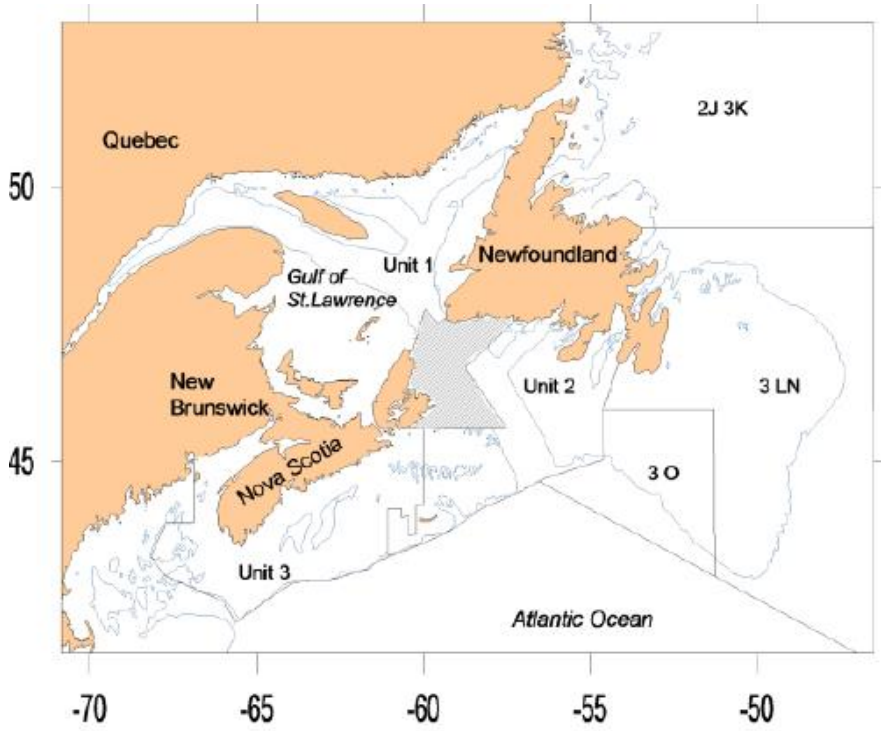

Figure 22. Units 1 and 2 redfish stock management areas. The grey area represents the seasonal common area (January to May, Unit 1 and June to December, Unit 2). (Source: DFO, 2016a)

There is an annual stock assessment for capelin in the Estuary and Gulf of St. Lawrence (Divisions 4RST) which provides an annual performance index (tonnes/day/vessel for the purse and tuck seine fishery (DFO, 2018f). The fishery is managed through a TAC which changes in response to changes in the performance index and other fishery information. However there are no defined reference points for this fishery, and the most recent stock assessment report notes that, "*The first directed abundance survey on Gulf capelin will occur in the spring of 2018. From this survey, it will be possible to estimate capelin biomass and from this, help define a decisional framework for the fishery and a TAC based on the precautionary approach.*" On that basis the assessment team concluded that capelin should be considered as a secondary species, and as the bycatch of capelin is below the threshold of 5% of the total catch, capelin is therefore a minor secondary species.

There is a stock assessment of Greenland halibut in Division 4RST. The fishery is subject to several management measures including a TAC to limit the exploitation of the stock and a minimum size of 44 cm which aims to protect the reproductive potential of the population. The main indicators used for the assessment are taken from fishery statistical data, sampling of commercial catches and research surveys. Whilst previously stock assessments had described trends in the various stock indicators, the peer review of the 2017 assessment defined a stock status monitoring indicator and an LRP, and at the 2018 peer review a USR was proposed by the science sector. The 2017 assessment provides an evaluation of the current value of the stock status indicator in relation to the LRP and USR, and therefore the assessment team considered that Greenland halibut could be considered as a primary species. As the bycatch of Greenland halibut constituted less than 5% of the total catch in the Estuary and Gulf of St. Lawrence shrimp fishery, it should be considered to be a minor primary species.

Atlantic herring is managed in the southern Gulf of St. Lawrence in Division 4T in relation to limit and upper stock reference points, and can therefore be considered as a primary species. The West coast of Newfoundland 4R herring fishery is managed by a TAC associated with both spring-spawning and fall spawning stocks. The assessment estimates stock biomass from acoustic surveys and uses commercial fishery data within a Sequential Population Analysis (SPA) to estimate spawning stock biomass relative to limit and upper stock reference points. Herring in 4R can therefore be considered to be a primary species. In contrast, Atlantic herring on the Quebec North Shore (Division 4S) is managed through a preventative TAC because of lack of data. Assessment of stock status is based upon a series of acoustic surveys, but with a relatively short time series of data, it is not possible currently to analytically assess the two herring spawning groups in the North Shore of Quebec, or to establish reference points. Atlantic herring in Division 4S should

therefore be considered to be a secondary species. Herring in all three NAFO Divisions (4T, 4R and 4S) constituted less than 5% of the total catch in the Estuary and Gulf of St. Lawrence shrimp fishery, and so 4T and 4R herring can be considered to be minor primary species and 4S herring can be considered to be a minor secondary species respectively.

Atlantic cod is managed within NAFO Divisions 4RS through a TAC and the assessment evaluates spawning stock biomass in relation to a limit reference point. Atlantic cod can therefore be considered as a primary species, and as cod bycatch constituted less than 5% of the total catch in the Estuary and Gulf of St. Lawrence shrimp fishery, it can be considered as a minor primary species.

The Gulf of St. Lawrence population of American plaice encompasses the entire Gulf of St. Lawrence including areas west of Newfoundland, and the lower St. Lawrence estuary (NAFO Divisions 4RS and 4T). Gulf of St. Lawrence American Plaice are managed as two stocks (4RS and 4T) but only Southern Gulf (4T) plaice are assessed. The assessment of American plaice in 4T uses a three-year moving average of the RV survey biomass index for commercial-sized plaice (≥ 30 cm) as the indicator of stock status in the interim years of the multi-year management cycle, and this indicator is compared to an LRP for this stock. The southern Gulf of St. Lawrence population of American plaice is considered as threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and is listed as data-deficient (COSEWIC, 2009). American plaice is not on Schedule 1 of the Species at Risk Act (SARA), and cannot therefore be designated as an ETP species. It should therefore be designated as a primary species. The COSEWIC listing of American plaice, along with the most recent assessment of the stock confirms that the stock should be considered as 'less resilient'. The bycatch of American plaice is below the 2% threshold of the total catch defined for less resilient species, so American plaice can be designated as a minor primary species.

Pink glass shrimp, white barracudina and other shrimp-like species are not managed species and each species (or species grouping) constituted less than 5% of the total catch and are therefore considered as minor secondary species.

A summary of the designations of the bycatch species in the trawl fishery into primary and secondary species for each of the UoCs, and whether they are considered as main or minor species is given in Table 15 through to Table 18 below.

Table 15. Designation of main and minor primary and secondary species caught as bycatch in the Esquiman area (SFA 8, UoC 1) of the Estuary and Gulf of St. Lawrence shrimp trawl fishery.

Species	Primary or Secondary	Main or Minor
Redfish (mixed)	Primary	Minor
Greenland halibut	Primary	Minor
Atlantic herring	Primary	Minor
Capelin	Secondary	Minor

Table 16. Designation of main and minor primary and secondary species caught as bycatch in the Anticost area (SFA 9, UoC 2) of the Estuary and Gulf of St Lawrence shrimp trawl fishery.

Species	Primary or Secondary	Main or Minor
Redfish (mixed)	Primary	Minor
Greenland halibut	Primary	Minor
Atlantic herring	Secondary	Minor
Capelin	Secondary	Minor
White barracudina	Secondary	Minor
Pink glass shrimp	Secondary	Minor

Table 17. Designation of main and minor primary and secondary species caught as bycatch in the Sept-Iles area (SFA 10, UoC 3) of the Estuary and Gulf of St. Lawrence shrimp trawl fishery.

Species	Primary or Secondary	Main or Minor
Redfish (mixed)	Primary	Main
Greenland halibut	Primary	Minor

Species	Primary or Secondary	Main or Minor
Atlantic herring	Primary (4T) /Secondary (4S)	Minor
Capelin	Secondary	Minor
White barracudina	Secondary	Minor
Other shrimp-like species	Secondary	Minor

Table 18. Designation of main and minor primary and secondary species caught as bycatch in the Estuary area (SFA 12, UoC 4) of the Estuary and Gulf of St. Lawrence shrimp trawl fishery.

Species	Primary or Secondary	Main or Minor
Redfish (mixed)	Primary	Minor
Greenland halibut	Primary	Minor
Atlantic herring	Primary	Minor
Atlantic cod	Primary	Minor
American plaice	Primary	Minor
Capelin	Secondary	Minor
White barracudina	Secondary	Minor

Stock status of primary bycatch species

Redfish

Recent DFO research surveys indicated that there were three abundant redfish year classes in Unit 1 in 2011, 2012 and 2013, and these cohorts are the most abundant ever observed in the research surveys (DFO, 2018d). Following sustained low levels of stock biomass well below the previously agreed LRP, the total minimum trawlable biomass estimated from the research survey in Unit 1 in 2017 was the highest value observed since 1984 for both *S. mentella* and *S. fasciatus* (Figure 23). Approximately half of the 2011 cohort should be larger than the commercial size of 22 cm in 2018. A similar pattern was observed in Unit 2 from Groundfish Enterprise Allocation Council (GEAC) surveys and the combined minimum trawlable biomass for both species in Units 1 and 2 is the highest in recent times (Figure 24). An MSE approach was adopted in 2016-2018 which proposed a Limit Reference Point (LRP) and an Upper Stock Reference (USR) of 40% and 80%, respectively, of the model-estimated survey mean spawning stock biomass (Bref). The estimate of stock biomass from the stock survey in 2017 shows that after many years of the stocks of both *S. mentella* and *S. fasciatus* being in the critical zone below Blim, the *S. mentella* stock is now in the healthy zone above the USR, and the *S. fasciatus* stock is in the cautious zone (Figure 25).

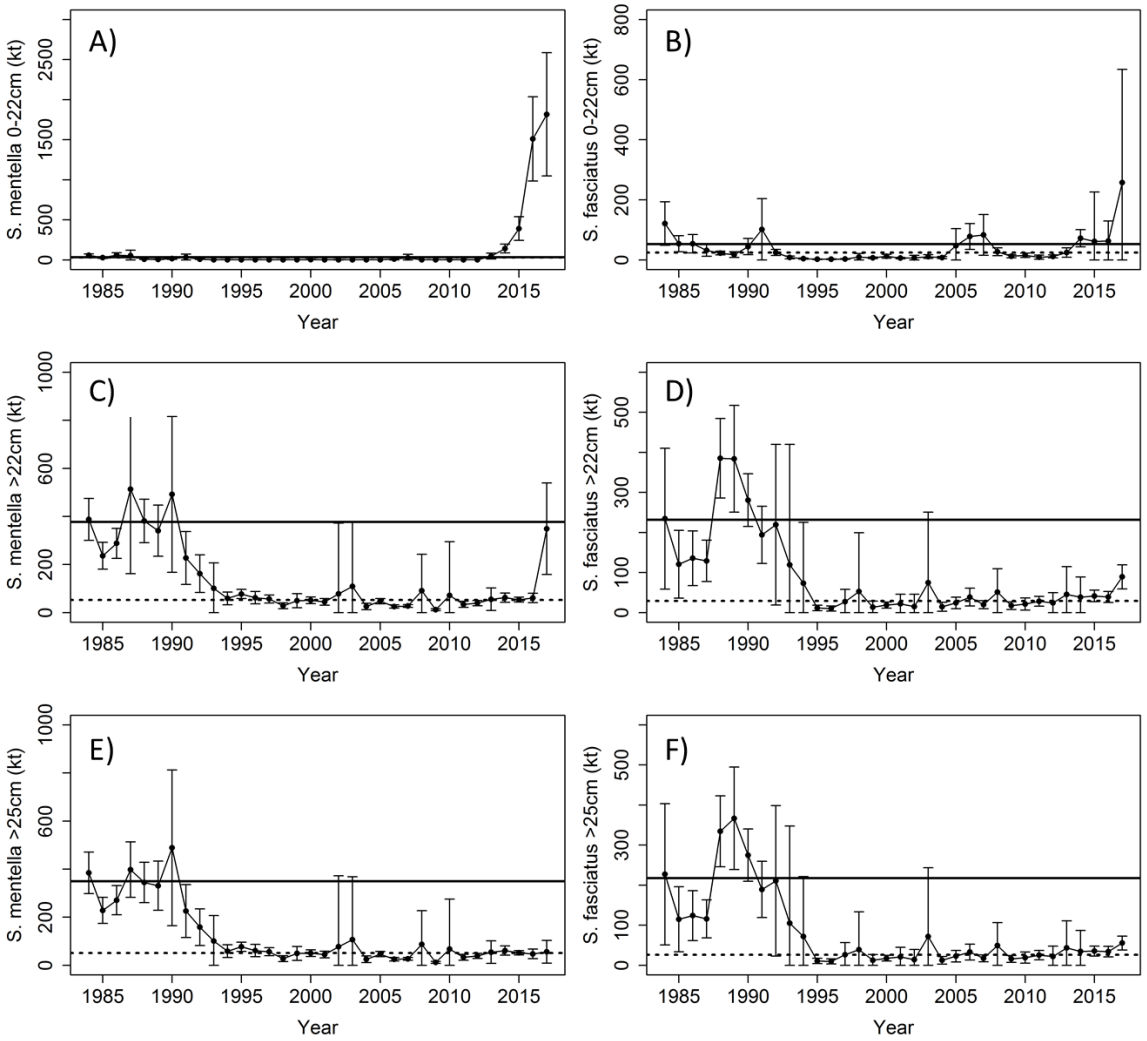

Figure 23. Minimum trawlable biomass in thousands of tonnes (kt) of *S. mentella* and S*. fasciatus*, 0-22 cm (A-B), >22 cm (C-D), and > 25 cm (E-F) in Unit 1 DFO survey from 1984 to 2017. The solid and dotted lines represent the mean for the 1984-1990 and 1995-2015 periods, respectively. (Source: DFO, 2018d)

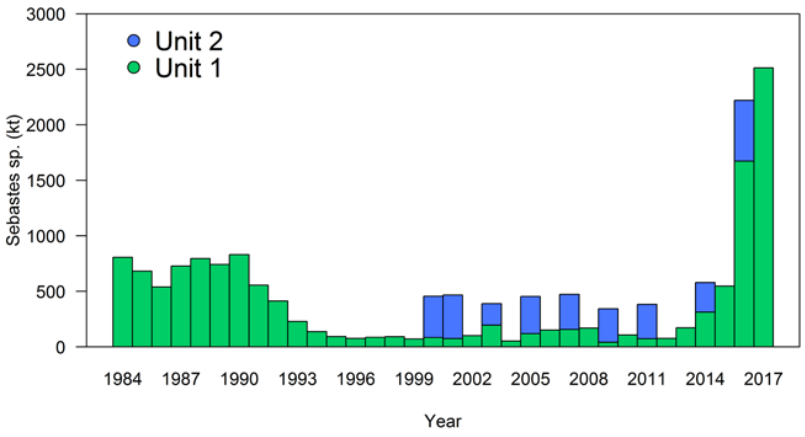

Figure 24. Minimum trawlable biomass of Sebastes sp. (*S. mentella* and *S. fasciatus*) in Units 1 and 2 based on DFO and GEAC indices. (Source: DFO, 2018d)

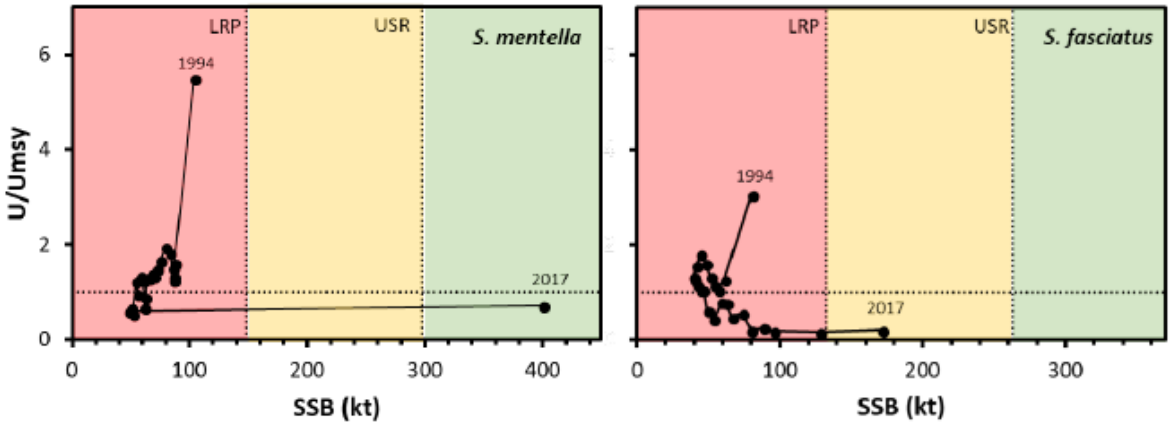

Figure 25. Estimated stock trajectories for *S. mentella* and *S. fasciatus* wit respect of the proposed reference [points. The horizontal line represents the level of exploitation consistent with MSY. (Source: DFO, 2018e)

Greenland halibut

The assessment of the Greenland Halibut stock (4RST) is mostly based on analysis of commercial fishery data and from two trawl research surveys conducted annually. The performance index in the commercial fishery (CPUE, standardised to account for changes based on NAFO subarea, soak time and seasonal pattern) over the entire Gulf decreased by almost 50% between 2016 and 2018 and has been below the 1999-2017 series average since 2017. Of the three sectors, the CPUE index in the western Gulf decreased by 66% from the historical highs of 2015 and 2016 and has been below the series average since 2017. In the North Anticosti and Esquiman sectors, the index has been below the average of each series since 2013, but increased in 2018 compared to 2017 (Figure 26, DFO, 2018f; 2019a). The biomass of fish larger than 40 cm estimated during the DFO summer survey (which represents a proxy for mature stock biomass) was chosen as the indicator of the Greenland Halibut stock status. The selected LRP corresponds to the geometric mean of the estimated mature biomass for the period 1990 to 1994, which is the lowest level of population where a recovery of the stock was observed. An upper stock reference (USR) was proposed at the winter 2018 peer review representing 80% of biomass at maximum sustainable yield (Bmsy), and the proposed proxy for Bmsy is the geometric average of the indicator for the 2004-2012 productive period. The current annual biomass indicator puts the Greenland halibut stock in the cautious zone between the LRP and USR (Figure 27).

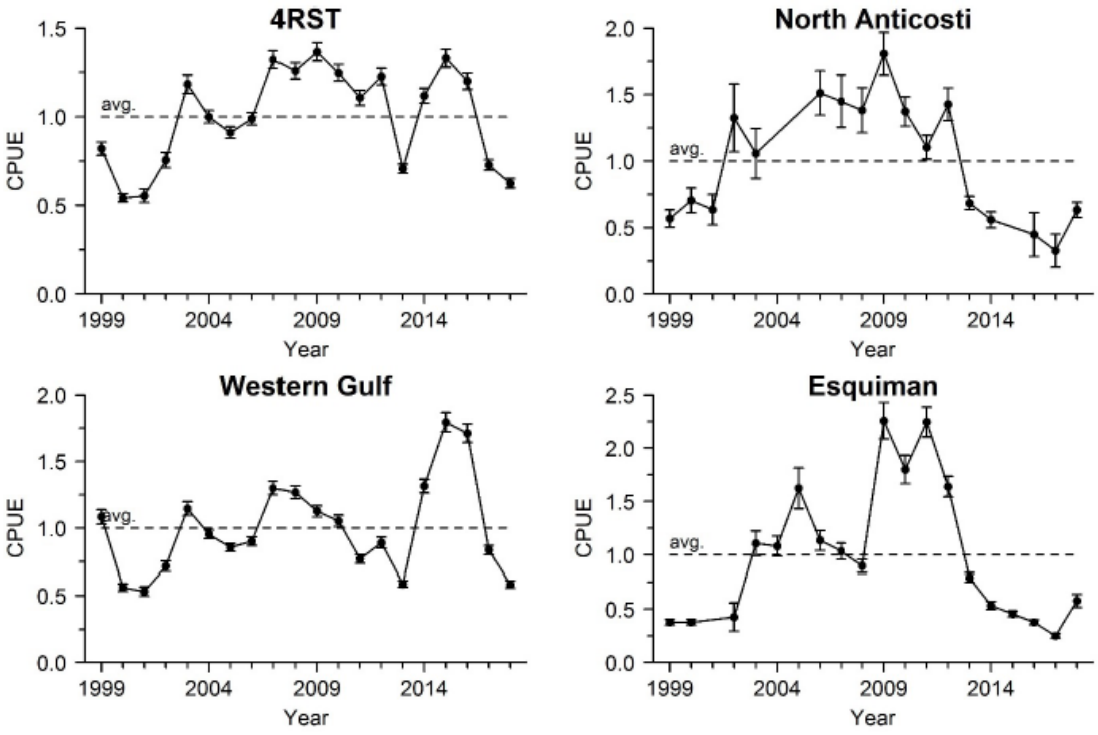

Figure 26. Standardised indices of fishery performance (CPUE) for the whole Gulf of St. Lawrence and sub-areas. Horizontal dotted lines represent the average of the series. (Source: DFO, 2019a)

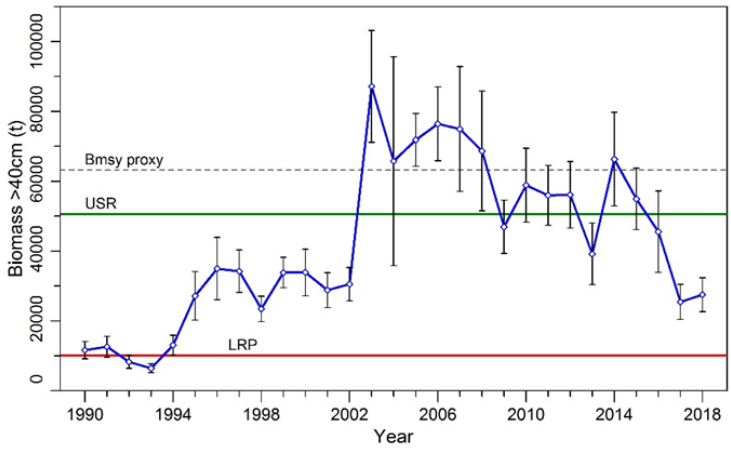

Figure 27. Annual biomass indicator for Greenland Halibut over 40 cm from the DFO survey series. Green line , USR; red line, LRP. (Source: DFO, 2019a)

Atlantic herring

Gulf of St. Lawrence 4T

The most recent assessment of the Gulf of St. Lawrence 4T herring fishery Fall Spawner Component (DFO, 2018g) showed that the median estimate of spawning stock biomass (SSB) had fallen below the Upper Stock Reference (USR) point in recent years and at the start of 2018 the SSB was estimated to be 112,000 tonnes (Figure 28). The average fishing mortality rate on ages 5 to 10 has been below $F_{0.1}$ (the removal reference level in the healthy zone, F = 0.32) since 2012 (Figure 29). The TAC in 2017 for the Gulf of St. Lawrence (4T) herring fishery was 35,000 tonnes and the preliminary recorded landings were 20,500 tonnes.

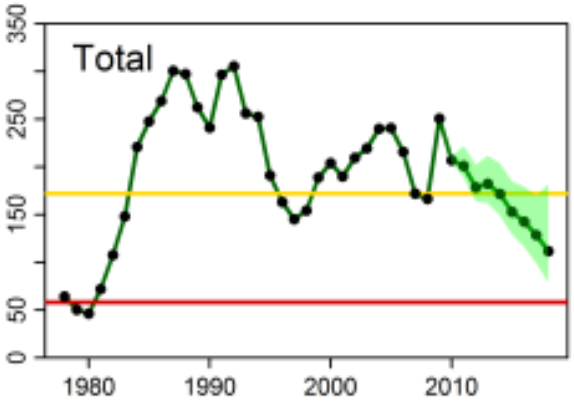

Figure 28. Estimated total spawning stock biomass (SSB) of fall spawning herring for the Southern Gulf of St. Lawrence. Line and circles represent the median estimates and the green shading represents the 95% confidence intervals. Yellow and red horizontal lines represent the USR and LRP respectively. (Source: DFO, 2018g)

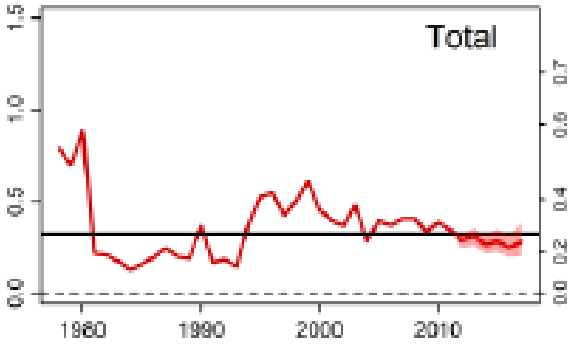

Figure 29. Estimated age 5 to 10 fishing mortality rates (instantaneous rates on left axis, annual exploitation rate on right axis) of fall spawning herring for the Southern Gulf of St. Lawrence. Horizontal line is $F_{0.1}$ (the removal reference level in the healthy zone, F = 0.32). (Source: DFO, 2018g)

West of Newfoundland Division 4R

Based on a series of acoustic surveys, the total biomass index of spring-spawning herring in the West of Newfoundland (Division 4R) stock fell considerably between 1991 and 1993, and after some stability, the index declined again from 34,500 tonnes in 2002 to 5,050 tonnes in 2017, one of the lowest values of the series (Figure 30, DFO, 2018h). The index of the total biomass of fall herring spawning stock increased from 1999 to 2013 to reach 165,674 tonnes but has subsequently declined to 48,486 tonnes in 2017, a level that had not been observed since the mid-1990s. According to the last acoustic survey, fall herring spawning stock fish represent 90% of the total abundance of herring.

Estimates of spawning stock biomass from the SPA analytical model using commercial fishery data show a similar trend to the acoustic index estimating a very low level of spring herring spawning stock biomass in recent years below the limit reference point (LRP = 37,384 tonnes), despite sustained conservation measures (Figure 31, DFO, 2018h). The SPA estimate of spawning stock biomass for the fall stock also shows similar trends to the acoustic indices. Estimates of spawning stock biomass increased sharply between 2003 and the early 2010s, and then declined steadily until 2017 when it was approaching the upper reference point (URP = 61,074 tonnes).

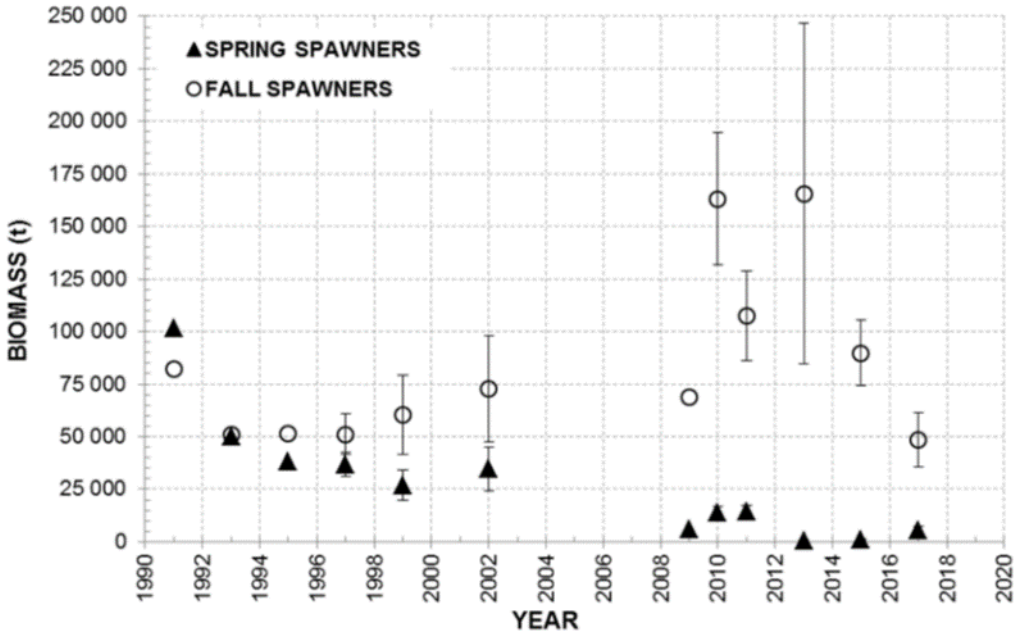

Figure 30. Total biomass index (with standard error) for the spring (triangles) and fall (circles) spawning herring stocks on the West coast of Newfoundland (NAFO Division 4R) estimated by the acoustic survey from 1991 to 2017. (Source: DFO, 2018h)

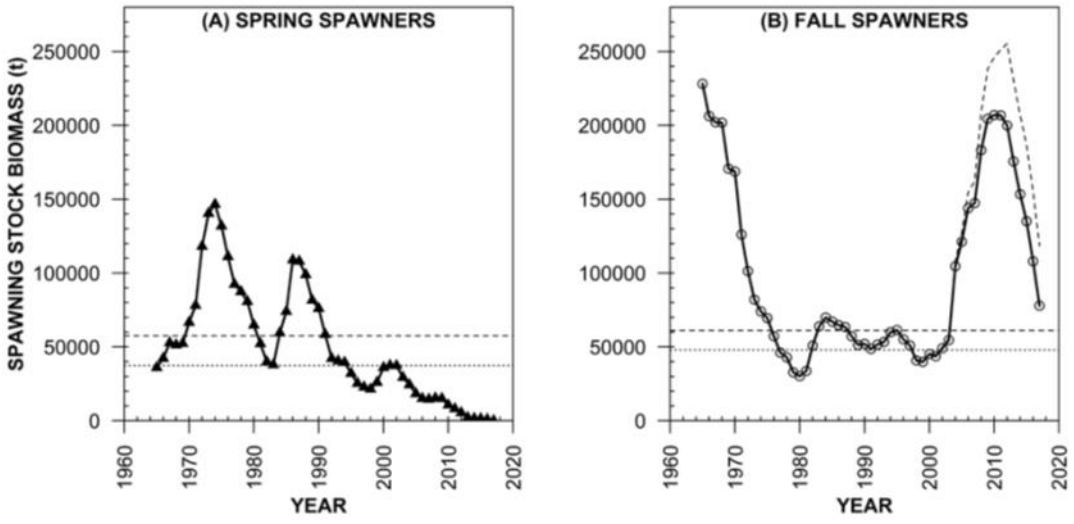

Figure 31. Spawning stock biomass estimated by the sequential population analysis for spring (A) and fall (B) spawners on the West coast of Newfoundland (NAFO Division 4R). The dashed line shows the retrospective pattern observed when excluding the 2017 acoustic survey. Horizontal dashed lines: upper reference points. Horizontal dotted lines: limit reference points. (Source: DFO, 2018h)

Atlantic cod

For Atlantic cod in the northern Gulf of St. Lawrence (Division 4RS, Figure 32) the stock update in 2018 showed no significant changes in stock status (DFO, 2018i; 2019b). The average number of cod per tow in the DFO survey increased slightly in 2018 but is still low in comparison to observed levels in the late 1980s when stock biomass was high (Figure 33), but declines were observed in 2018 in the mean number of cod per tow for the mobile gear sentinel fisheries survey and for the standardized catch per unit effort (CPUE) index for the sentinel longline fishery programme. A slight increase was observed in the standardized CPUE index for the sentinel gillnet fishery programme, but the value was still very low (DFO, 2018i; 2019b). The most recent full stock assessment of the cod stock in the northern Gulf of St. Lawrence indicated that

estimates of spawning stock biomass (SSB) from virtual population analysis (VPA) were very low and that the stock remains in the critical zone and well below the limit reference point estimated at 116,000 t. The 2019 estimate is at 10% of the limit reference point (DFO, 2019b).

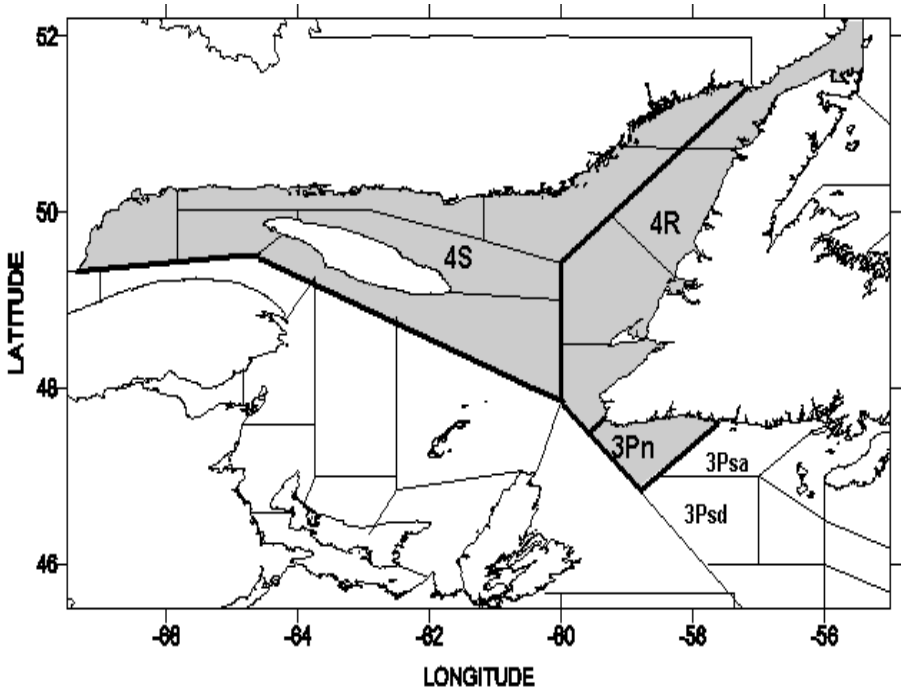

Figure 32. Cod stock management area in the northern Gulf of St. Lawrence (4RS, 3Pn). (Source: DFO, 2017b)

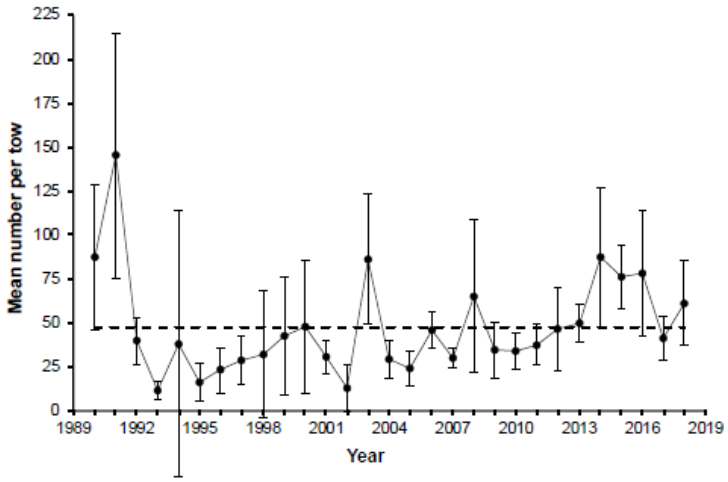

Figure 33. Mean number of cod per 15-minute tow during the DFO research survey in Division 4RS. The error bars indicate 95% confidence intervals. The dotted line represents the 1990–2017 series average. (Source: DFO, 2019b)

American plaice

The three-year moving average of the RV survey biomass index for commercial-sized American plaice (≥ 30 cm) is the main stock indicator for the Gulf of St. Lawrence population. For 2018, the three-year (2016 to 2018) average value of the index is 3.11 kg per tow (Figure 34) which is well below the LRP of 19.5 kg per tow.

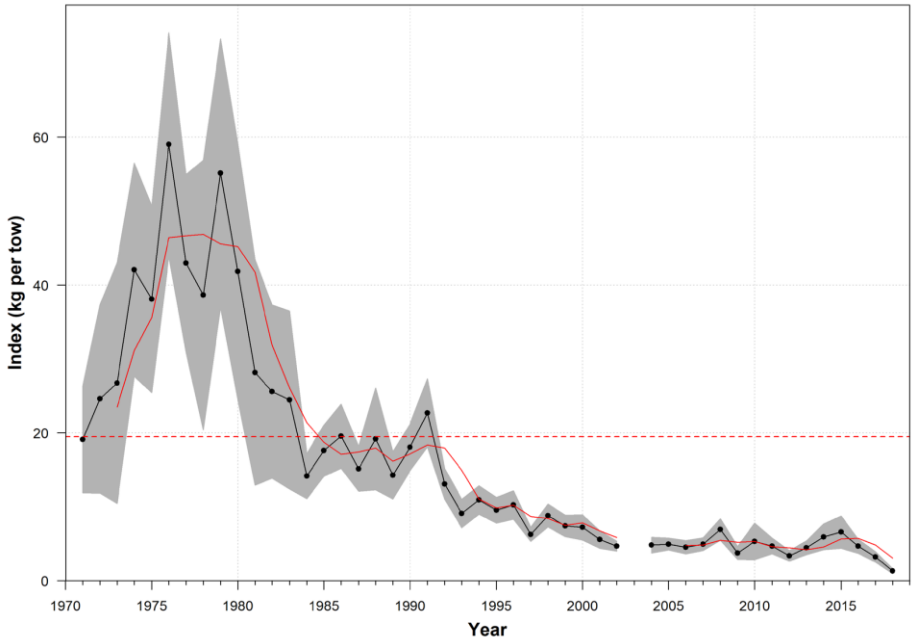

Figure 34. Annual RV survey index (kg per tow) of commercial size (≥ 30 cm total length) American Plaice in the southern Gulf of St. Lawrence, 1971 to 2018. Black circles and line are the stratified mean estimates with 95 % confidence intervals of the annual means. Red solid line is the three-year moving average. Horizontal dotted line is the LRP. (Source: DFO, 2019c).

Stock status of secondary bycatch species

Capelin

The landings of capelin in Divisions 4RST in 2017 of 1973 tonnes were the lowest recorded landings since 2001 and were a significant decline from 2016 landings. Most of the landings from the purse and tuck seine fisheries are from the west coast of Newfoundland in Division 4R. The performance of the 4R purse and tuck seine fisheries is calculated using a standardised index of catch per unit effort (CPUE) of tonnes/day/vessel (DFO, 2018j). The index increased from 2004 to 2013, but has since declined, but in 2017 the index is still above the long term mean value from 1986 to 2017 (Figure 35). A similar performance index was also calculated for the 4Tn purse seine fishery in the Southern Gulf of St. Lawrence, but due to the small sample size, the fit of the standardisation model is poor and no statistically significant trend can be discerned.

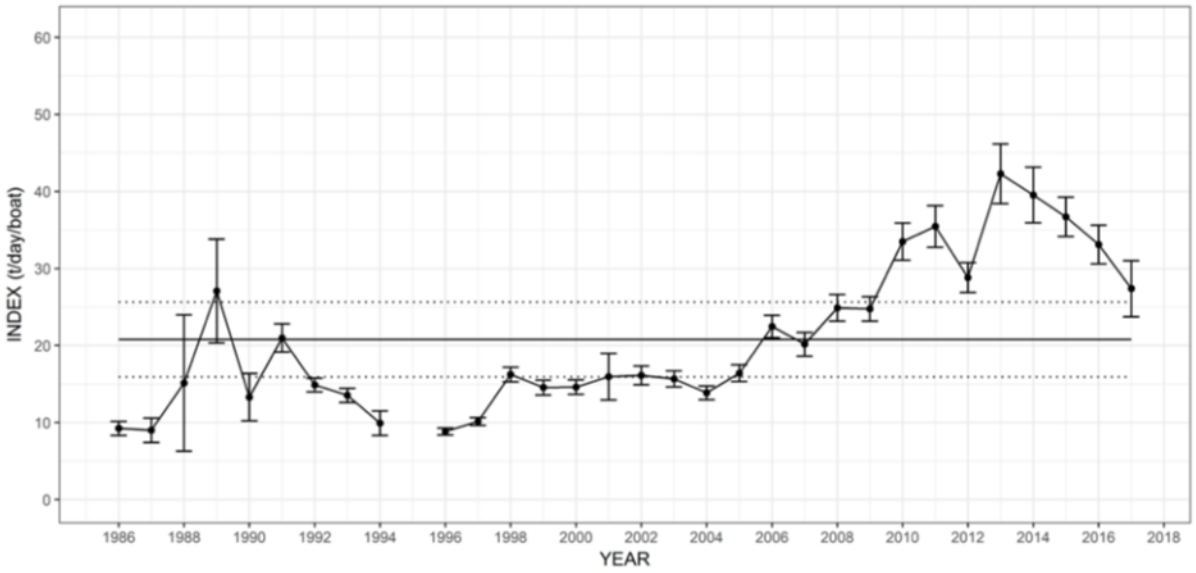

Figure 35. Performance index for the purse and tuck seine fishery in Division 4R from 1986 to 2017. Horizontal lines represent the mean (± s.d.) from 1986 to 2017. (Source: DFO, 2018j)

Herring

Quebec North Shore Division 4S

The stock biomass index for spring and fall spawners in the herring 4S stock (Figure 36) has decline significantly since 2010 (Figure 37). Catches of spring and fall herring spawners are currently composed primarily of fish that are 10+ years old, and there has been no significant recruitment since 2005.

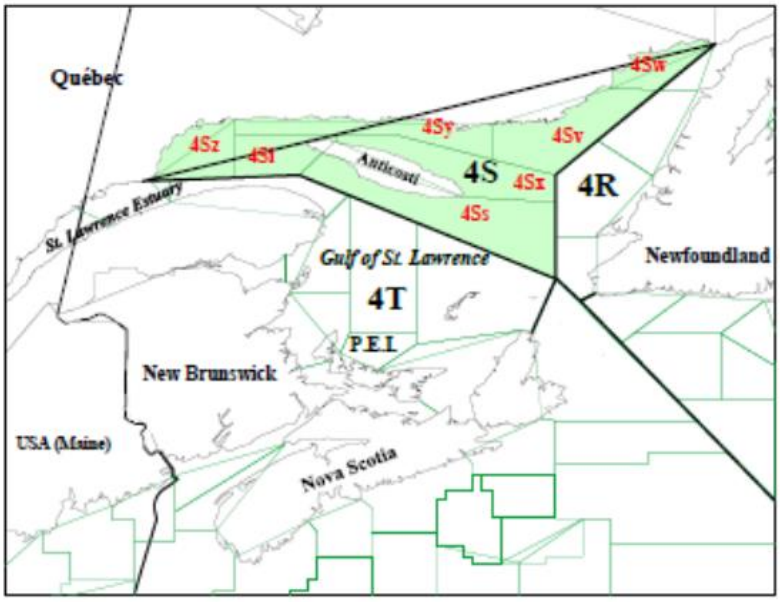

Figure 36. Geographical description of NAFO Division 4S for herring. (Source: DFO, 2017a)

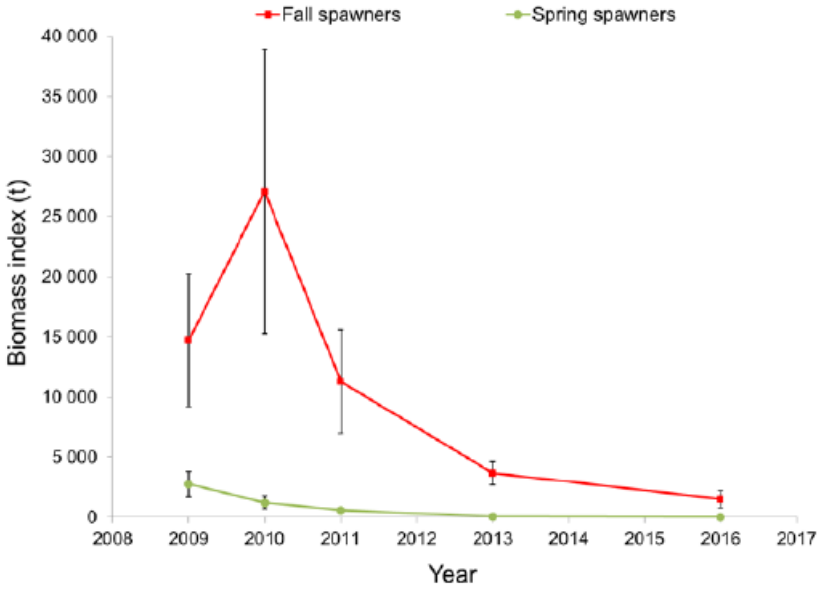

Figure 37. Biomass index (with standard error) of spring (green) and fall (red) herring spawner stocks as estimated by acoustic surveys in area 4Sw in the eastern part of the lower North Shore in Quebec. (Source: DFO, 2017a)

There is no information available on stock status for pink glass shrimp, white barracudina or for the various species which make up the bycatch category 'other shrimp-like species'.

Strategy for managing bycatch

There are a series of measures in place which significantly reduce the bycatch of non-target species in the shrimp trawl. Use of the Nordmore grate (or grid) is mandatory in the fishery and experimental studies have demonstrated that the grid minimises the catch of larger bycatch (e.g. Isaksen and Solvdal, 1997; Richards and Hendrickson, 2006) and there are area closure protocols for undersized Greenland halibut, cod and

redfish (triggered by a pre-determined average catch rate of undersized halibut and redfish) set out within the IFMP (DFO, 2018a). Restrictions on the level of fishing through a limited entry licensing scheme in the shrimp fishery, and a TAC on shrimp catches ensures that the potential impact on bycatch species is controlled. There are also a number of research projects in progress which aim to reduce bycatch. These projects are evaluating the development of a semi-pelagic trawl, the effectiveness of LED lights to reduce the bycatch of capelin, redfish, and Greenland halibut, and the development of a multi-level trawl to study the vertical distribution of bycatch and northern shrimp for purposes of optimizing shrimp trawls, the assessment of a bycatch separator aboard shrimp vessels, and sea trials to evaluate the performance of a new trawl-mounted sensor (net sounder) to discriminate shrimp from bycatch. Fishing activity in the shrimp fishery is monitored through log books and VMS, and as described above, the DFO observer programme provides detailed information on the species composition of the bycatch and a quantitative estimate of bycatch levels.

Endangered, Threatened or Protected (ETP) species

According to MSC FCR v2.0, ETP species are those that are recognised by national ETP legislation or by an international binding agreement such as species listed in Appendix 1 of the Convention on International Trade in Endangered Species (CITES) and agreements concluded under the Convention on Migratory Species (CMS) (MSC, 2014). Species that appear exclusively on non-binding lists and that are not included under national legislation or binding international agreement are not considered as ETP species under MSC standards. ETP species also include species classified by MSC as “out of scope” (amphibians, reptiles, birds and mammals) that are listed in the IUCN Redlist as vulnerable (VU), endangered (EN) or critically endangered (CE).

The primary legislation governing ETP species in Canada is the Species at Risk Act (SARA) which came into force in 2003. The Act is a federal government commitment to prevent wildlife species from becoming extinct and secure the necessary actions for their recovery. It provides the legal protection of wildlife species and the conservation of their biological diversity. The Act prohibits the killing, harming, harassing, capturing, taking or possessing any species listed on Schedule 1 of the Act as an Extirpated, Endangered, or Threatened species and against damaging or destroying the habitat of a species listed as Endangered or Threatened.

Based on the above definitions, ETP species in Canadian fisheries are those listed as Endangered or Threatened on Schedule 1 of the Species at Risk Act (SARA Public Registry http://www.sararegistry.gc.ca/). Note that Canada is not a party to CMS.

SARA recognises the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) which was created in 1977 as an advisory body. COSEWIC is an expert committee that assesses and designates species that are in danger, and SARA takes COSEWIC's designations into consideration when establishing the legal list of wildlife species at risk. Under SARA, species are classified according to status, namely Extinct, Extirpated, Endangered, Threatened or Special Concern. Species listed as Threatened, Endangered or Extirpated are subject to immediate prohibitions and DFO must plan their recovery by developing recovery strategies followed by action plans within the timelines set out in the Act. Species listed as Special Concern are not subject to any prohibitions, but management plans must be developed to enable conservation of these species and their habitats in order to ensure that they do not in future become Threatened or Endangered due to human activity.

The following list of species are designated as ETP species in the Estuary and Gulf of St. Lawrence: Spotted Wolffish, Northern Wolffish and Leatherback Turtle. Individuals of all these three species caught as bycatch in the shrimp fishery must be immediately returned to the water and, if the fish is still alive, in a manner that causes it the least harm. In addition to the three species above, the Great White Shark and four marine mammals are considered as ETP species in the Gulf of St. Lawrence - North Atlantic Right Whale, Blue whale, Fin whale and the St. Lawrence Estuary population of Beluga whale. Information related to catches of species at risk including the species listed above as well as the striped bass (St. Lawrence Estuary population) must be recorded in the Species at Risk section of the logbook. The full list of ETP species relevant to the estuary and Gulf of St. Lawrence shrimp fishery is given in Table 19.

Table 19. ETP species in the Estuary and Gulf of St. Lawrence designated under SARA or under Appendix 1 of CITES.

Species	National legislation / CITES	Status
Northern wolffish (*Anarhichas denticulatus*)	SARA	Threatened
Spotted wolffish (*Anarchicas minor*)	SARA	Threatened
Leatherback turtle (*Dermochelys coriacea*)	SARA and CITES	Endangered
Blue whale (*Balaenoptera musculus*)	SARA and CITES	Endangered
North Atlantic right whale (*Eubalaena glacialis*)	SARA and CITES	Endangered
Fin whale (*Balaenoptera physalus*)	SARA and CITES	Special Concern
Beluga whale (*Delphinapterus leucas*)	SARA	Endangered
Great White Shark (*Carcharodon carcharias*)	SARA	Endangered

Interactions of shrimp trawl fishery with ETP species

The observer data for 2013 to 2017 shows that there was a record of northern wolffish caught in 2017 in the Sept-Iles area (SFA 10 / UoC 3), but not in any of the previous years, and there were no records of northern wolffish caught in the other three SFAs/UoCs from 2013-2017. There were also records of spotted wolffish caught in the Esquiman area (SFA 8 / UoC 1) in 2016 and in the Anticosti area (SFA 9 / UoC 2) in 2015, but not in any of the other years between 2013 and 2017. There were no records of spotted wolffish caught in Sept-Iles (UoC 3) or Estuary (UoC 4) from 2013-2017. There was also a record of Atlantic wolffish (*Anarhichas lupis*) caught in 2013 in Sept-Iles (UoC 3). This species of wolffish is listed on SARA Schedule 1 and COSEWIC as Special Concern but is not considered an MSC ETP species because of its Special Concern status (i.e. not formally listed as Endangered or Threatened).

There have been no reports of any bycatches or entanglements of any whale species or leatherback turtles in the Estuary and Gulf of St. Lawrence shrimp trawl fishery, and no bycatches of Great White Shark. Whilst previous bycatch analysis indicates that SARA listed species are not currently a concern for the shrimp trawl fishery in the Estuary and Gulf of St. Lawrence, the situation will continue to be monitored via surveys and observer data and will be addressed should the situation change (DFO, 2018a). Other areas have reported that leatherback turtles and whales have been known to be entangled with anchor lines of fixed gear, and because of recent observed entanglements of North Atlantic Right Whales (NARW) with snow crab traps in the Gulf of St. Lawrence, NARW are considered briefly in this report.

The observer data also show bycatches of a number of species that may be considered as ‘less resilient’ including thorny skate (*Amblyraja radiata*), mixed redfish species (*Sebastes* spp.), American plaice (*Hippoglossoides platessoides*), and striped bass (*Morone saxatilis*). Thorny skate are designated as Special Concern on COSEWIC, but are not designated under SARA, so are not considered an ETP species in this fishery. The redfish are a mixture of two species, Acadian redfish (*Sebastes fasciatus*) and deepwater redfish (*Sebastes mentella*). COSEWIC designated the Gulf of St. Lawrence / Laurentian Channel population of *S. mentella* to be endangered and the Atlantic population (including the Gulf of St. Lawrence) of *S. fasciatus* to be threatened (COSEWIC, 2010). However neither species of redfish are on Schedule 1 of the Species at Risk Act (SARA), and cannot therefore be designated as an ETP species. Similarly the southern Gulf of St. Lawrence population of American plaice is considered as threatened by COSEWIC and is listed as data-

deficient (COSEWIC, 2009) but is not designated under SARA Schedule 1 so is not considered as an ETP species. The Southern Gulf of St. Lawrence population of striped bass is designated as Special Concern under COSEWIC, but is not designated under SARA, so is not considered an ETP species in this fishery.

As noted above, the Estuary and Gulf of St. Lawrence IFMP requires that any catches of the ETP species Northern wolffish, Spotted wolffish or Leatherback Turtle must be immediately returned to the water and, if still alive, in the manner that causes the least harm, and this also applies to any bycatches of striped bass and Atlantic halibut less than 85 cm (DFO, 2018a).

Any interactions with SARA species, e.g. wolffish, leatherback turtles and North Atlantic Right Whales must be made on specific SARA log sheets. The SARA log sheets are separate from the main log book and whilst wolffish are considered to be well recorded, it is not clear whether all interactions, including zero interactions, are recorded rigorously on the SARA log sheets. Leatherback turtles have never been recorded.

Wolffish *spp*.

There is a recovery plan in place for all three wolffish species (Kulka *et al*., 2007) and all species have shown signs of stock recovery in the last decade with increases in relative abundance and distribution in most areas surveyed (DFO, 2013b). Wolffish indices of abundance are available from demersal longline surveys and multi-species DFO trawl surveys. Kulka *et al.* (2007) concluded that since the cessation of the directed fishery, as well as closed areas regimes, current levels of by-catch were not hindering population recovery. Therefore fishing was not found to be hindering recovery as the populations were either stable or increasing. Whilst encounters with wolfish species in mobile gear does occur, all harvesters have been provided information or training regarding wolffish encounters and release, and it is believed that wolffish are released alive. If returned to the water with minimal handling, survivability is reportedly high (~100%) even after long tow times and after substantial exposure on deck (Grant *et al*., 2005).

North Atlantic Right Whale (NARW)

Following a significant decline in the population of NARW in the late 20th Century, a recovery strategy was developed for NARW and published in 2009 (Brown *et al*., 2009). The recovery strategy states that “there is no scope for allowable human-induced mortality, since population abundance is estimated as critically low…”, which has generally been interpreted as signifying that the Canadian national limit for the rebuilding of the NARW population is a zero-take. However Objective 2 of the Recovery Strategy for NARW (Brown *et al*., 2009) is to, “Reduce [i.e., not ‘prevent’] mortality and injury as a result of fishing gear interactions (entanglement and entrapment)”, suggesting that there is no formally agreed Canadian national limit.

Whilst a DFO report in 2016 estimated that the number of individuals of the NARW population increased from 438 to 522 (DFO, 2016b), most recent analyses suggest that there have been recent slight declines in the population following a sustained recovery of the population from 1990 to 2010 (Figure 38).

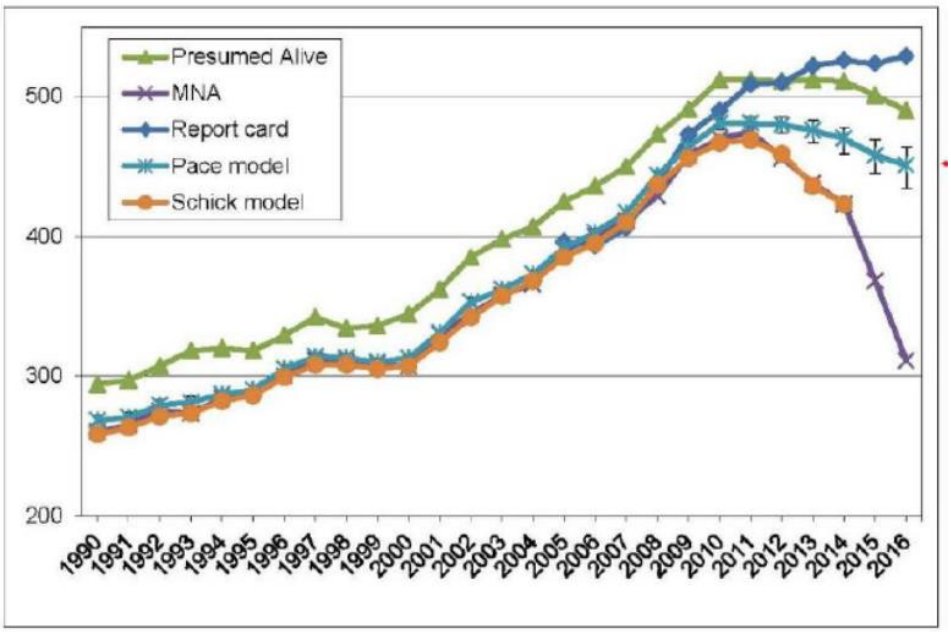

Figure 38. Population assessments of the NARW based upon 5 assessment methods. The Pace model (light blue line) (Pace *et al*., 2017) shows a point estimate with error bars representing the 95% probability range. (Source: Right Whale News, 2017)

There have been no recorded captures or interactions of NARW with the shrimp trawl fishery in the Estuary and Gulf of St. Lawrence, but NARW are considered in this report because of a recent mortality event in Atlantic Canada. During the 2017 summer, an aggregation of over 100 individual NARW was present in the southern Gulf of St. Lawrence and an unprecedented mortality event occurred (Daoust *et al*. 2017). Between June 6th and September 15th, 13 incidents involving 12 dead individuals were reported in the Gulf of St. Lawrence. By the end of the year, 18 NARW were reported to have been found dead. Necropsies on some of these whales concluded that fishing gear entanglement or blunt trauma, likely from vessels transiting the area, contributed or caused the fatalities. A further 5 NARW were observed as being entangled in fishing gear. The Southern Gulf of St. Lawrence snow crab fishery was implicated in a number of the fatal and non-fatal entanglements.

Whilst the risk of interaction with NARW comes mainly from fixed gear, in response to the situation, DFO undertook engagement sessions with the fishing industry in different Gulf, Maritimes and Atlantic provinces between October and early November 2017. Their purpose was to inform the industry of the situation, highlight that NARW and other whales migrate between the Gulf and the eastern seaboard of Canada and the U.S, whale behaviour may be changing in response to environmental change and that evidence shows that entanglement in fixed fishing gear and vessels strikes are the main threats to some whale species, in particular the NARW. The workshops were also intended to provide a forum through which recommendations on how operational aspects and management of fisheries could be adapted to mitigate any interactions with whales. For example, fishermen are required to report any lost gear to DFO in order to help identify the need to increase efforts to recover them, thereby reducing the risk of whale entanglements, and to provide information regarding all interactions with a marine mammal including bycatch, collisions and all sightings of entangled marine mammals that occur during fishing expeditions. While the shrimp fleet does not operate in the areas where the unusually high NARW aggregations were found in the southern Gulf of St. Lawrence in 2017, all groundfish licence holders have been issued with obligatory and voluntary measures in their 2018 licence conditions to mitigate risk of interactions (B. Morin, DFO Resource Management, Quebec, pers. comm.). In addition, the EGSAC meeting in 2018 was informed that in order to be able to continue exporting fish products to the US, Canada is aiming to collect further data to estimate bycatch of marine mammals in specific fisheries. Data will be collected through an at-sea observer program, reporting by fishermen (new clauses in the licence conditions), and through other tools, such as improving logbooks, updated Electronic logbooks, video monitoring, reporting forms and pilot projects to test new monitoring tools for marine mammals.

A Critical Habitat Order was issued in December 2017 for NARW (see http://www.registrelep-sararegistry.gc.ca/document/default_e.cfm?documentID=3207).

Critical habitat is the habitat necessary for the survival or recovery of a listed endangered, threatened or extirpated species in Schedule 1 of the Species at Risk Act (SARA). Critical habitat will be identified in the recovery strategy or action plan for each listed species and posted on the SARA Public Registry. The Critical Habitat Order is made to satisfy the obligation to ensure that the identified critical habitat of the NARW is legally protected. With the Order, the NARW benefits from the prohibition in subsection 58(1) of SARA against the destruction of any part of its critical habitat. The prohibition applies to anyone undertaking activities in and around the NARW critical habitat that would result in the destruction of any part of it. (https://www.registrelep-sararegistry.gc.ca/document/default_e.cfm?documentID=3207).

As the shrimp fishery is not an activity that is likely to destroy critical habitat for NARW, the Critical Habitat Order will not impact the fishery.

Regarding additional planned monitoring related to NARW, the following website provides some information on DFO's monitoring efforts for right whales: http://www.dfo-mpo.gc.ca/species-especes/mammals-mammiferes/narightwhale-baleinenoirean/alert-alerte/index-eng.html.

As stated there, DFO will use a variety of tools including aircraft surveillance, hydrophones, and glider technologies to search for NARW in 2018. DFO is also working with Canadian and international experts to review whale detection technologies, including acoustic buoys and gliders, to better detect right whales.

Habitat

According to MSC FCR v 2.0 SA3.13.2, if a benthic habitat is being assessed, the assessment team shall recognise habitat categories based on the following habitat characteristics:

1. Substratum – sediment type (e.g., hard substrate)
2. Geomorphology – seafloor topography (e.g., flat rocky terrace)
3. Biota – characteristic floral and/or faunal group(s) (e.g., kelp-dominated seagrass bed and mixed epifauna, respectively)

Furthermore, MSC FCR v 2.0 SA3.13.3 requires the team to determine which habitats are "commonly encountered" and/or "Vulnerable Marine Ecosystems (VME)", both of which are treated as "main habitats" with respect to the MSC assessment.

MSC FCR v 2.0 SA3.13.3.1 defines a commonly encountered habitat as a habitat that regularly comes into contact with a gear used by the UoA, considering the spatial (geographical) overlap of fishing effort with the habitat's range within the management area(s) covered by the governance body(s) relevant to the UoA.

MSC FCR v 2.0 GSA3.13.3.2 defines a VME as having one or more of the following characteristics[1]:

- Uniqueness or rarity – an area or ecosystem that is unique or that contains rare species whose loss could not be compensated for by similar areas or ecosystems;
- Functional significance of the habitat – discrete areas or habitats that are necessary for survival, function, spawning/reproduction, or recovery of fish stocks; for particular life-history stages (e.g., nursery grounds, rearing areas); or for ETP species;
- Fragility – an ecosystem that is highly susceptible to degradation by anthropogenic activities;
- Life-history traits of component species that make recovery difficult – ecosystems that are characterised by populations or assemblages of species that are slow growing, are slow maturing, have low or unpredictable recruitment, and/or are long lived; and,
- Structural complexity – an ecosystem that is characterised by complex physical structures created by significant concentrations of biotic and abiotic features.

[1] as defined in paragraph 42 of the Food and Agriculture Organization (FAO) of the United Nations Guidelines for the management of deep-sea fisheries in the high seas (2009).

- MSC also identify “potential VME”, to cover situations when a governance body uses a precautionary approach (e.g., where there is doubt over whether a habitat is a VME or not) and when a habitat is being treated as a potential VME (MSC FCR v2.0 GSA3.13.3.2.).

MSC also identifies “potential VME”, to cover situations when a governance body uses a precautionary approach (e.g., where there is doubt over whether a habitat is a VME or not) and when a habitat is being treated as a potential VME (MSC FCR v 2.0 GSA3.13.3.2.).

MSC FCR v2.0 requires that if any UoA encounters a VME there needs to be management measures in place to protect it. In order to ensure an unconditional pass with respect to managing the UoAs interaction with VMEs, the protection measures in place should include designated closed areas, and precautionary measures to avoid encounters with VMEs, e.g., scientifically based gear and habitat specific move-on rules with the intent of avoiding potential serious or irreversible harm on VMEs (MSC FCR v2.0 SA3.14.2.2).

In order to achieve the minimum conditional requirements, designated closed areas, and precautionary measures to avoid encounters with VMEs, based on commonly accepted move-on rules (MSC FCR v2.0 SA3.14.2.3) must be in place.

Commonly encountered habitats and the UoA

The Northern Gulf of St. Lawrence 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 290 m, while depths in the Esquiman and Anticosti Channels are greater than 200 m (Dufour et al., 2010) (see Figure 39).

Very few concentrations of *Pandalus borealis* are found south of the Laurentian Channel to the point that the commercial fishery has developed almost exclusively in the northern Gulf and Estuary (Savard et al. 2003). Traditional fishing grounds are located at depths of 200 to 300 m. Based on the data on fishing effort available since 1982, trawling has generally taken place regular in the Esquiman Channel north of the 49.5° of latitude, the Anticosti Channel west of 60° longitude and along the two slopes of the Laurentian Channel as far as the Estuary (DFO, 2018c) (see Figure 8).

Bottom sediments throughout much of the Northern Gulf of St. Lawrence are soft, characterised as “pelite” in available sediment maps (Loring and Nota 1973) (see Figure 40). The channel bottoms feature fine sediment (pelite, sandy pelite), while the channel slopes are characterized by coarser sediment (gravelly-sandy pelite) (DFO, 2012b).
a.

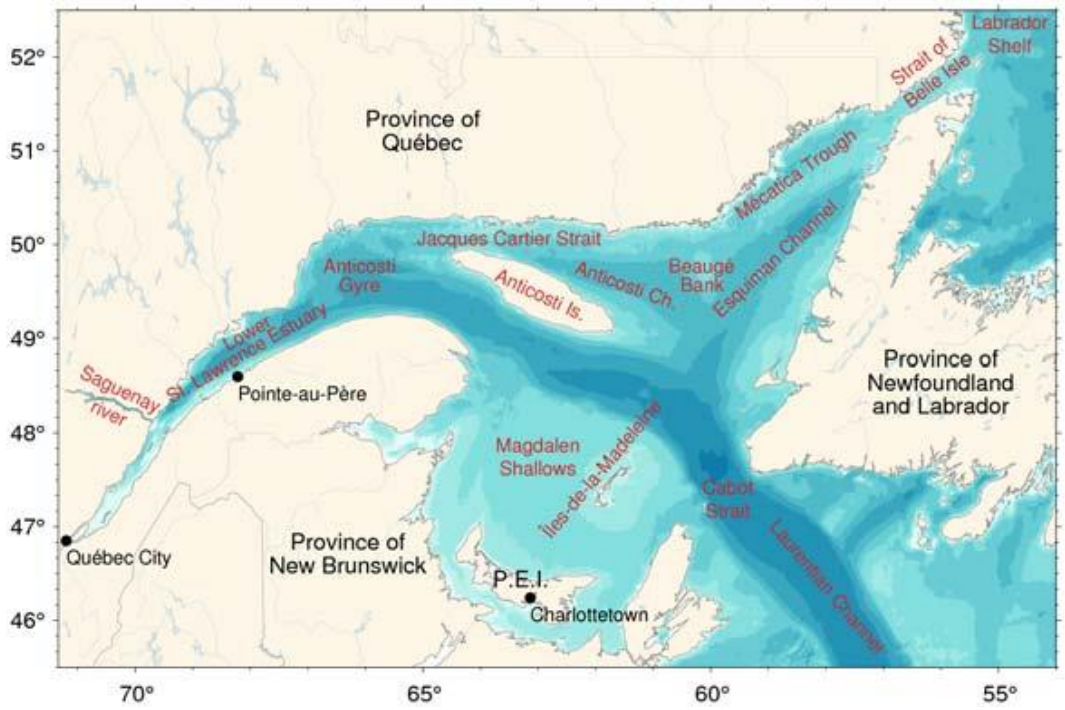

Figure 39. A map of the Gulf of St. Lawrence showing the most prominent bathymetric features (Source: Dufour et al 2010).

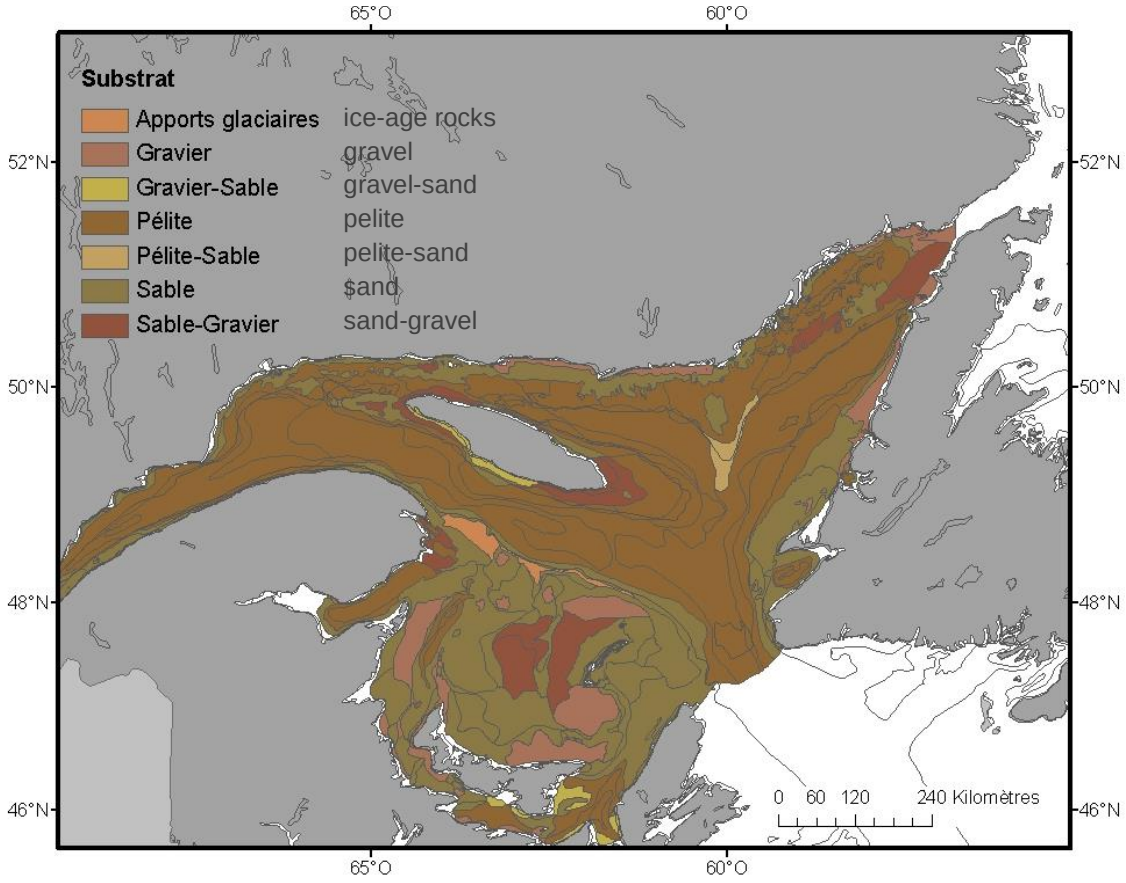

Figure 40. Surficial sediments in the Gulf of St. Lawrence (Source: Loring and Nota 1973 in Lévesque et al., 2012).

Using this information and, based on the requirements of MSC FCR SA3.13.2, the characteristics of the commonly encountered habitats being assessed for the shrimp trawl fishery are described in Table 20.

Table 20. Characteristics for the commonly encountered habitat in the Gulf of St. Lawrence shrimp trawl fishery

Habitat Type	Geomorphology	Biota
Pelite, sandy pelite	Dark yellowish brown / greenish grey; soft, silty clay grading to clayey silt (glacial drift - pleistocene). Median grain size of 0.003 – 0.06 mm. Simple surface structure: unrippled/flat; current rippled/directed scour; (Loring and Nota, 1973).	Common species of fauna found in areas with muddy bottoms include *P. borealis*, Actiniaria (sea anemones), Pennatulacea (sea pens), polychaete worms, brittle- stars and starfish (Moritz et al 2013)
Gravelly-sandy pelite	Dark greenish/grey, soft, silty sand grading locally to sand and well-sorted sand. Median grain size of 0.006 – 0.6 mm. Unrippled/flat; current rippled/directed scour; wave rippled (Loring and Nota, 1973).	Common species of fauna found in areas with gravelly sandy silty bottoms include *P. borealis*, Actiniaria (sea anemones), Pennatulacea (sea pens), Porifera (sponges) (Moritz et al 2013)

An estimate of the total habitat suitable for fishable concentrations of shrimp was initially undertaken in 2012 (DFO, 2012b) and (Savard, 2012). The Gulf of St. Lawrence was divided into grid squares; 10 minutes of latitude by 10 minutes of longitude, and, by using logbook entries, it was shown that 479 of these squares had been visited by shrimp fishing vessels between 1982 and 2011 (Savard, 2012). By taking the average area of these squares it was estimated that the total area of commonly encountered habitat suitable for fishable concentrations of shrimp was about 107,000 km^2 and, depending on the year, shrimp trawling was estimated to impact 4,000 to 8,000 km^2 of bottom habitat per year (including overlapping tows), which is 4% - 8% of the estimated total “shrimp habitat” (DFO 2012b), i.e. commonly encountered habitat.

In 2015, an update of the footprint was undertaken using the most recent surveys and fishing effort information. The results indicate that Northern shrimp stocks in the Estuary and Gulf of St. Lawrence are distributed over more than 95,000 km^2; 95% of the biomass is distributed over less than 45,000 km^2; approximately 6,400 km^2 of seabed is trawled annually; and, 47% of the fishing effort is deployed in an area of 1,850 km^2. This equates to approximately 7% of the shrimp habitat / commonly encountered habitat. This information was presented at the second annual MSC surveillance audit of the fishery in 2016 https://fisheries.msc.org/en/fisheries/gulf-of-st-lawrence-northern-shrimp-trawl-fishery/@@assessments.

Vulnerable Marine Ecosystems (VMEs) and the UoA

Canada has taken a number of steps to protect benthic ecosystems in direct response to international recognition of the potential impact of fishing on sensitive benthic marine ecosystems, e.g. FAO Code of Conduct for Responsible Fishing (1992), United Nations’ Sustainable Fisheries Resolution (2006), FAO Guidelines for the Management of Deep-Sea Fisheries in the High Seas (2009).

In 2009, DFO published the Policy on Managing the Impacts of Fishing on Sensitive Benthic Areas (DFO, 2009b) (hereafter referred to as the “SeBA Policy”). The stated purpose of the SeBA Policy is to help DFO manage fisheries to mitigate impacts of fishing on sensitive benthic areas (SeBAs) or avoid impacts of fishing that are likely to cause serious or irreversible harm to sensitive marine habitat, communities and species. The policy states that management decisions to address the impacts of fishing in SeBAs will be based on precautionary and ecosystem approaches, and take into account socio-economic considerations (DFO 2009b).

The Policy outlines processes for: 1. the assembling and collection of data and information on benthic habitat, communities and species; 2. the assessment of the data and information to determine the ecological and biological significance of the benthic features and to determine the risk of serious or irreversible harm the

fishing activity may cause to these features; and 3. taking appropriate management decisions, using an ecosystem approach and precaution.

A key tool for use in the implementation of the Policy is the Ecological Risk Assessment Framework (ERAF) (DFO, 2013c) which outlines a process for identifying the level of ecological risk of fishing activity and its impacts on sensitive benthic areas in the marine environment. The Department has developed this framework specifically for use in managing cold water corals and sponge-dominated communities.

An important step in the implementation of the SeBA Policy has been to identify ecologically and biologically significant cold-water coral or sponge-dominated regional habitats, termed Significant Benthic Areas (SBAs) (DFO 2017c). 'Significance' is determined through the ERAF process and based on current knowledge of these species, communities and ecosystems. SBAs are the equivalent of VMEs in the context of the FAO International Guidelines for the Management of Deep-Sea Fisheries in the High Seas (FAO, 2009) (DFO, 2017e).

SBAs have been identified within Atlantic Canada and Eastern Arctic waters using species distribution models and kernel density estimation based on observations from trawl surveys, video/photographic research surveys, and records from fisheries observer programs (Kenchington et al. 2016, DFO 2017c).

By overlaying fishing activity on the SBAs, possible SeBAs can be identified. This is illustrated in Figure 41.

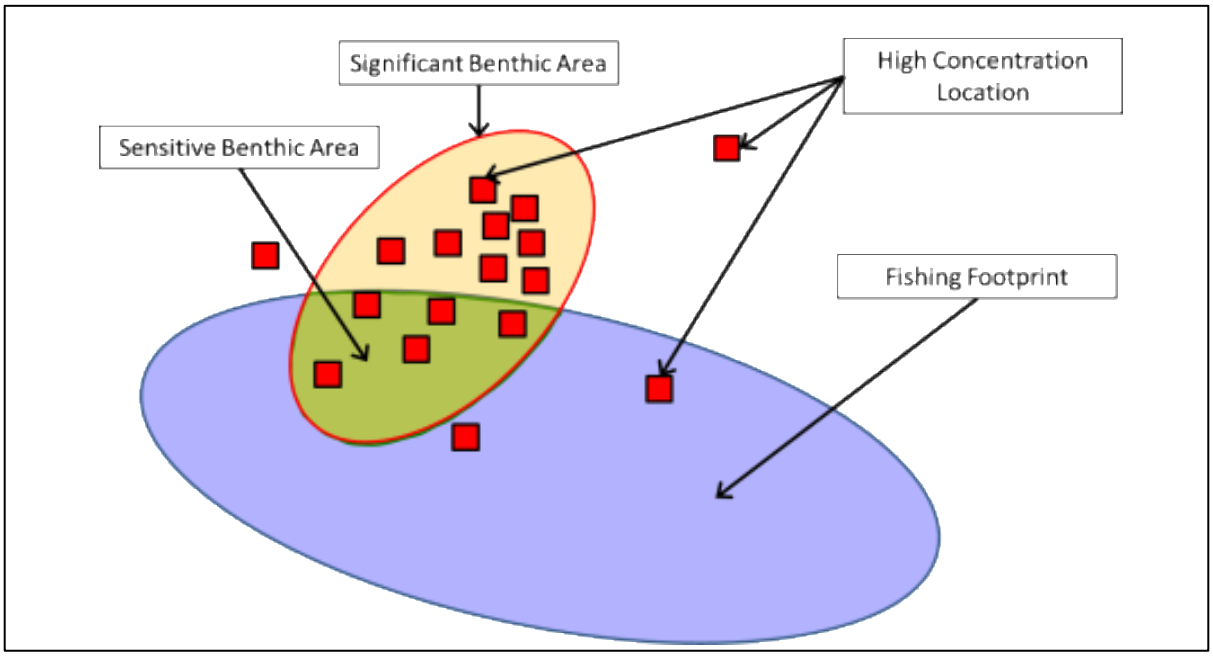

Figure 41. A conceptual model showing the location of a Significant Benthic Area and, where it overlaps with a fishing activity, leads to a possible Sensitive Benthic Area (Source DFO 2017c)

Koen-Alonso et al (2018), used logbook and VMS data to map fishing activity of all the major fisheries operating in Canada's Atlantic and Eastern Arctic marine waters and overlapped this with the SBAs. The overlap was evaluated from the fishing activity and the SBA perspective. These calculations included: % of fishery footprint inside SBAs; and, % of SBAs being fished. The Gulf of St. Lawrence shrimp trawl fishery was included in the study.

Figure 42 shows the distribution of SBAs in the Gulf of St. Lawrence bioregion[2]. Figure 43 and Figure 44 show the overlap of the shrimp trawl fishing effort with the SBAs.

[2] A map of Canada's bio-regions can be found at http://www.dfo-mpo.gc.ca/oceans/maps-cartes/bioregions-eng.html

Table 21 presents the data associated with the shrimp trawl fishery in relation to the SBAs.

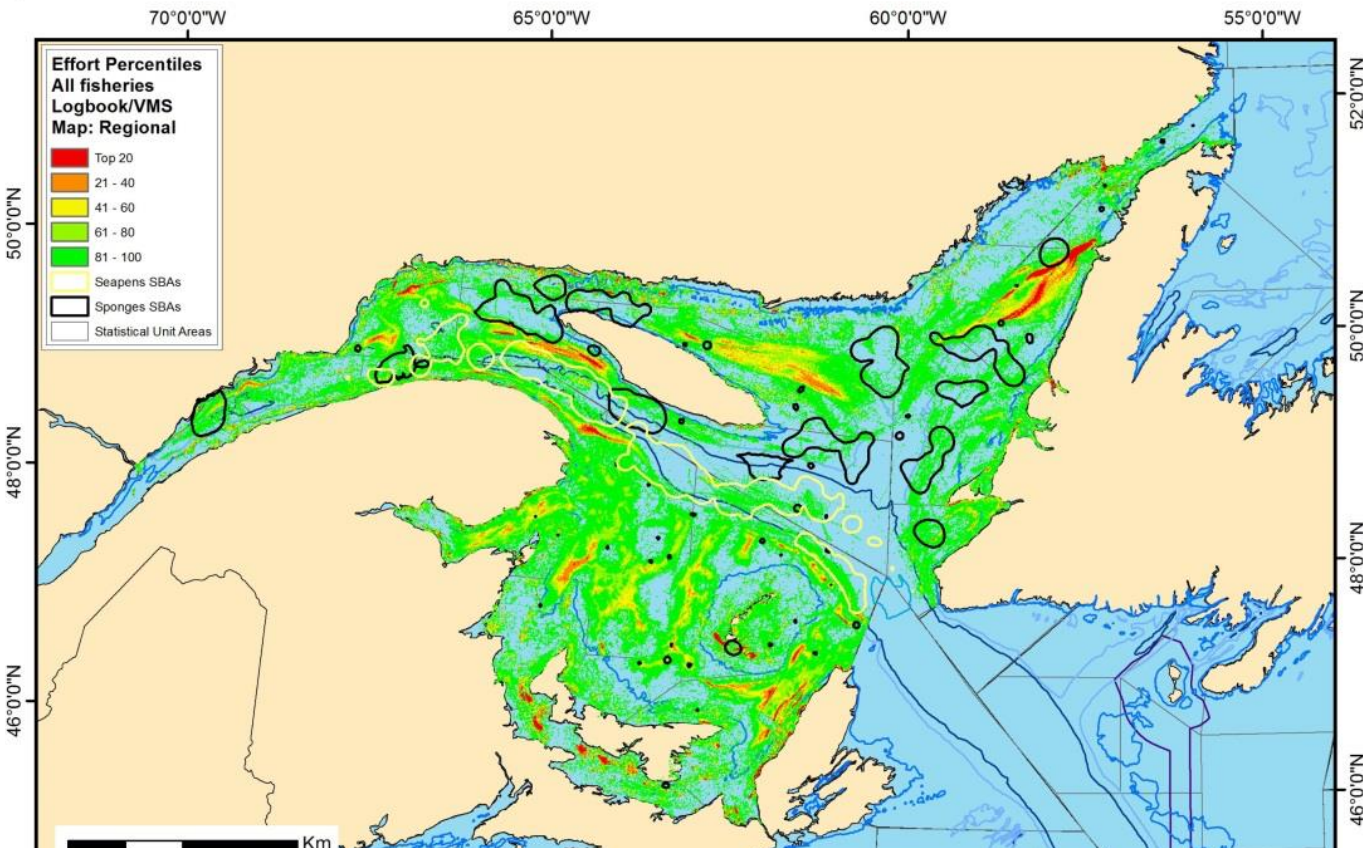

Figure 42. The distribution of Significant Benthic Areas in the Gulf of St. Lawrence. Inset locations GSL1 and GSL2 are shown in more detail in Figure 43 and Figure 44 below and include the overlap of the shrimp trawl fishing effort with the Significant Benthic Areas. (No shrimp fishing takes place in GSL3) (Source - Koen-Alonso et al, 2018)

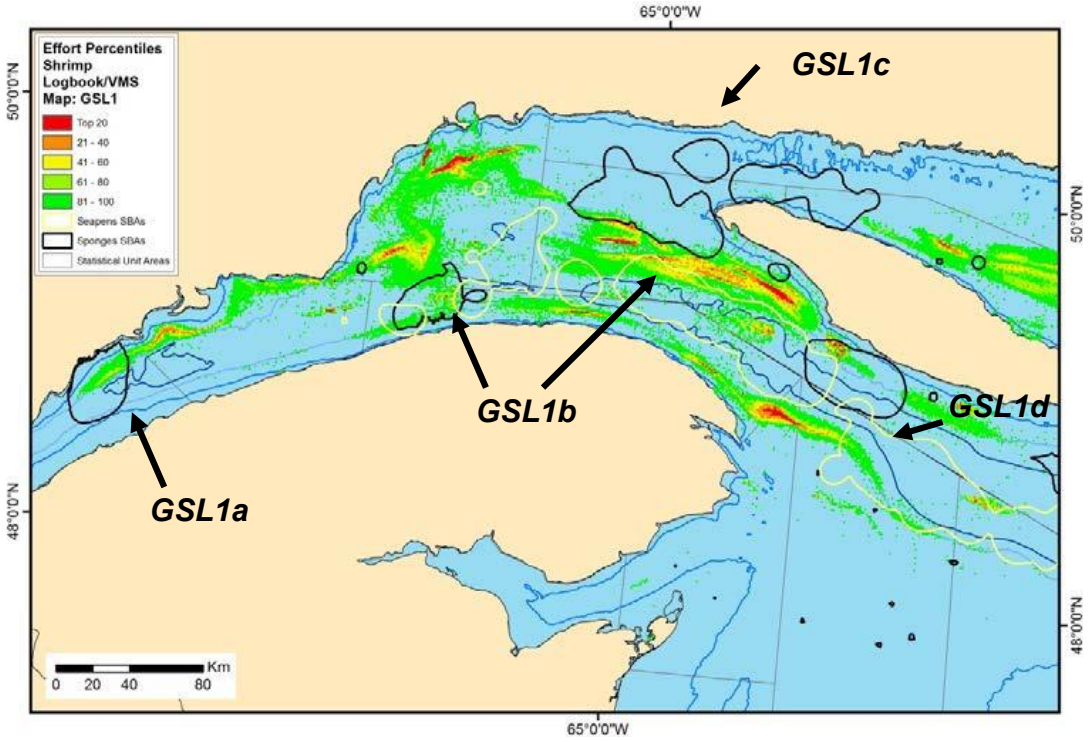

Figure 43. Overlap between shrimp trawl fishing effort and Significant Benthic Areas in the Gulf of St. Lawrence bioregion (inset GSL1). Arrows indicate general areas of overlap with higher fishing intensity. (Source - Koen-Alonso et al, 2018)

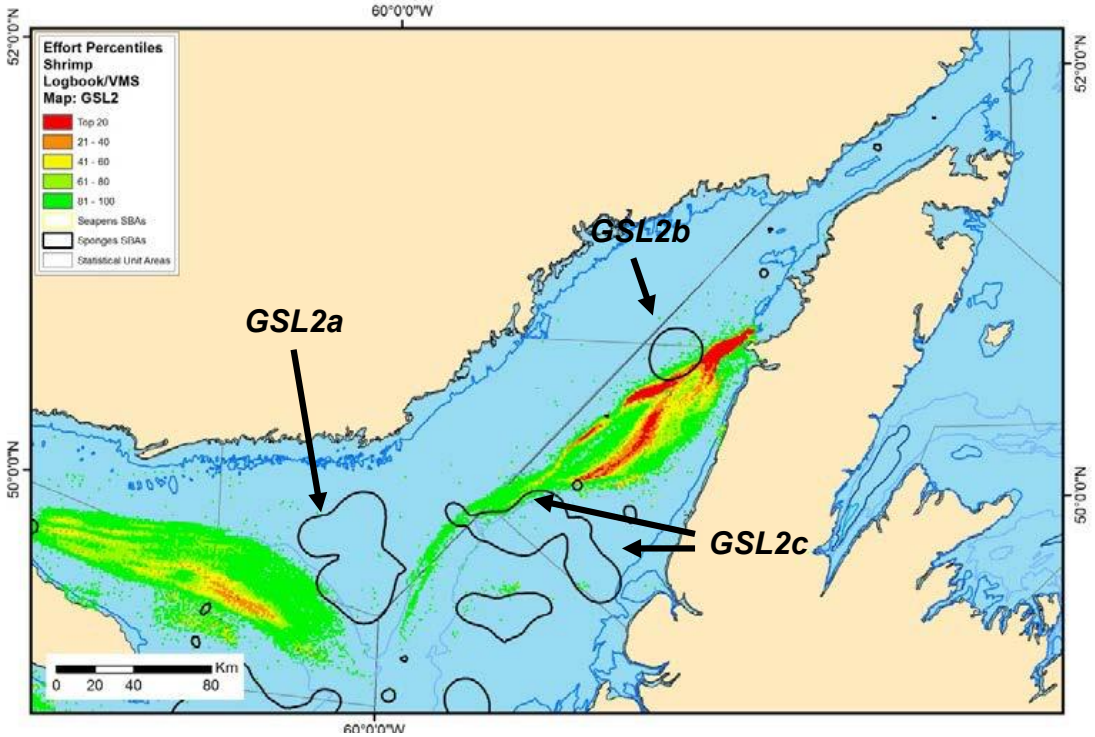

Figure 44. Overlap between shrimp trawl fishing effort and Significant Benthic Areas in the Gulf of St. Lawrence bioregion (inset GSL2). Arrows indicate general areas of overlap with higher fishing intensity (Source - Koen-Alonso et al, 2018).

Table 21.Overlap between the shrimp trawl fishery and Significant Benthic Areas in the Gulf of St. Lawrence bioregion based on available georeferenced data from: (a) logbooks (b) VMS and (c) merged logbooks and VMS.

Geo-referenced data source	Geo-referenced effort %	Fishing footprint km²	SE*	SP*	SE^	SP^	SE†	SP†
(a) logbooks	89.1	15,503	1,242	848	8.0	5.5	8.2	4.4
(b) VMS	40.5	20,284	1,231	1,149	6.1	5.7	8.1	6.0
(C) merged logbooks and VMS	88.6	24,538	1,915	1,608	7.8	6.6	12.7	8.4

The surface areas of Significant Benthic Areas in the Gulf of St. Lawrence bioregion:
Sea Pen (SE) = 15,115 km^2 and, Sponge (SP) = 19,090 km^2

* *Overlap between shrimp fishery footprint and Significant Benthic Area (km^2);*
^ *Percentage of shrimp fishery footprint that overlaps with Significant Benthic Area (%);*
† *Percentage Significant Benthic Area that overlaps with the shrimp fishery footprint (%).*

Cumulative impacts on VME habitats

MSC FCR v 2.0 SA3.14.3 requires that the cumulative impact of MSC certified or in assessment fisheries on VMEs is taken into account. There are a number of other fisheries operating in the Gulf of St. Lawrence that have been MSC certified or are in assessment – see Table 33. Some of these fisheries may overlap with the shrimp trawl fishery however as PI 2.4.2 a & c has scored below SG 80 in this assessment the cumulative impacts on VMEs has not been evaluated. If an SG 80 score is considered appropriate in future surveillance audits this aspect of VME scoring will be evaluated.

Impacts of the fishery on habitat

No direct field studies of trawl impacts on habitats used by shrimp have been conducted in the fishery area, but a number of studies have been undertaken to assimilate information that can be used to identify the effects of shrimp trawling. Grant (2012), provides a detailed description of the shrimp trawl fishing gear commonly used in Eastern Canada and reviews the potential impacts of the gear; DFO (2012b), summarises information on fishing activities and on sensitive benthic species and provides an assessment of the impact on trawling on benthic communities in the Gulf of St. Lawrence. Lévesque (2012), outlines the information that can be used to identify sites where sustained Northern shrimp trawl fishing could have a major impact on benthic habitats in the Gulf of St. Lawrence; and, Moritz et al (2015), investigated whether shrimp trawling had long/medium/short term impacts on mega-benthic invertebrate taxa richness, biomass and community structure in the Gulf of St. Lawrence. In summary, they concluded:

- Shrimp fishing generally takes place at water depths of 200 to 300 m in the Esquiman and Anticosti channels as well as along the two slopes of the Laurentian Channel as far as in the Estuary. The traditional fishing grounds are located in areas where surface sediments are fine and consolidated and where natural disturbances have minimal impact.
- In the Gulf of St. Lawrence, significant concentrations of sea pens (soft corals) are observed in deep water in the Laurentian Channel, while sponges are distributed in aggregations throughout the area. Benthic communities may also constitute fragile ecosystems in that bottom trawling can reduce their diversity and modify their structure. The majority of habitats suitable for the establishment of highly diverse benthic communities are found in coastal areas.
- 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.
- Significant concentrations of sponges are distributed throughout the area at depths ranging from 100 to 300 m. Regular fishing activities appear to have affected sponge distributions. Few sponges are found in sectors where trawling is regular and intensive while aggregations are observed in sectors where trawling is rare (east of Anticosti Island)
- Where trawling was once regularly undertaken sponge aggregations appear to have returned to some degree - within approximately 20 years.
- Scientific and fishery trawling data analyses showed that no significant long-, mid- or short-term effect was detected on taxa richness.
- Significant but weak effects on biomass and community structure were detected at the mesoscale, i.e. at the scale of the fishing grounds.
- It is likely that benthic communities within fishing grounds have reached a disturbed state of equilibrium on which current trawling disturbance has limited or no further impacts.

In other reviews and studies of shrimp trawling and the impacts of trawling on bottom habitats (e.g. DFO, 2006; Rice 2006; NEFMC 2011; Yesson et al., 2016) it has been concluded, in general, that, while trawl impacts show up more rapidly on soft bottom habitats (mud, sand) than on harder bottom habitats, soft bottom habitats tend to recover more quickly (Rice 2006). Estimates for recovery from shrimp trawling on hard bottom range from 10 – 25 years whereas, for soft bottoms, around 5 years (Yesson et al 2016).

Habitat policy and management in the UoA

Following the first MSC re-certification of the Gulf of St. Lawrence Shrimp Trawl Fishery, a condition of certification was imposed to provide evidence that a partial strategy was in place, if necessary, to ensure that the fishery was highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm. As a result, the client conducted a preliminary assessment of the potential level of risk to sensitive benthic habitats and species from shrimp trawling. The assessment concluded that the risk level was moderate to high and that the shrimp fishery overlapped with areas where soft corals and sponges are found. As such, the client concluded that a “partial strategy[3]” was necessary.

The outcome of this work coincided with the development and implementation of DFOs Coral and Sponge Conservation Strategy for Eastern Canada (DFO 2015), the formation of a DFO Québec Region, Working Group on fishery impacts on sponge and coral areas and, new work on the distribution of corals and sponges (Murillo et al, 2016; Kenchington et al, 2016).

The Coral and Sponge Conservation Strategy was developed to outline the current state of knowledge of corals and sponges; provide the international and national context for coral conservation; and, to outline new and existing research and conservation efforts in eastern Canadian waters. The Strategy identifies conservation, management, and research objectives common to all five DFO management regions in eastern Canada (Central and Arctic, Québec, Gulf, Maritimes, and Newfoundland and Labrador) consistent with existing legislation and policy. The strategy also confirms that each DFO region will report annually on the status of target and actions identified within the strategy and the strategy will undergo a review every 5 years (DFO, 2015).

[3] In MSC terms, a “partial strategy” is represents a cohesive arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome and an awareness of the need to change the measures should they cease to be effective. It may not have been designed to manage the impact on that component specifically

Given the overlap between the client's response to the MSC condition of certification and the development of the DFO Coral and Sponge Conservation Strategy and suppporting research, the combined work resulted in a habitat partial strategy being adopted by EGSAC and included as an appendix in the IFMP.

In 2017, following collaboration between DFO Québec, Gulf and the Newfoundland and Labrador regions and extensive consultation with the fishing industry on 20 areas where significant concentrations of corals and sponges had been identified (http://www.qc.dfo-mpo.qc.ca/golfe-gulf/coraux-eng.html), 11 coral and sponge conservation areas were established (see Figure 45), resulting in the prohibition of all bottom contacting fishing gear within them.

Areas chosen for coral and sponge conservation may be included in a Marine Protected Area (MPA) Network for the Estuary and Gulf of St. Lawrence Bioregion (DFO, 2018k), which is currently at the planning stage, e.g. Banc-des-Américains is an 'Area of interest', close to the Gaspé Penninsula, and may be designated as a MPA in the near future. In the meantime, the coral and sponge conservation areas have contributed toward Canada's commitments to increase the amount of its marine and coastal areas that are protected to 5% by 2017 (achieved) and, 10% by 2020 and to protect VMEs according to the United Nations Resolution on Sustainable Fisheries. As of December 2017, Canada had reached 7.75% of its commitment.

As a direct result of the requirements set out in MSC FCR v2.0 to ensure protection and minimal impact of the UoA on VMEs, and, in the absence of DFO management requirements to have scientific or precautionary measures in place to avoid encounters with SBAs/VMEs, the MSC fishery client has developed, with the support of the shrimp harvesters, "Move-on Protocols". These have been based on the NAFO developed and implemented "move-on" rule as set out in Article 22, of the NAFO Conservation and Enforcement Measures, "Provisions in case of an encounter with VME indicator species" (NAFO, 2019).

The move-on protocols for the Quebec and Newfoundland shrimp harvesters became effective in the estuary and northern Gulf as of August 2019. Copies are included in Appendix 2. In summary, they require that if in 1 tow: 7 Kgs of sea pens; and/or 60 Kgs of other live coral; and/or 300 Kgs of sponges are caught then the vessel should cease fishing and move at least 2 nautical miles from their location and make a record of the encounter and forward to the client representative.

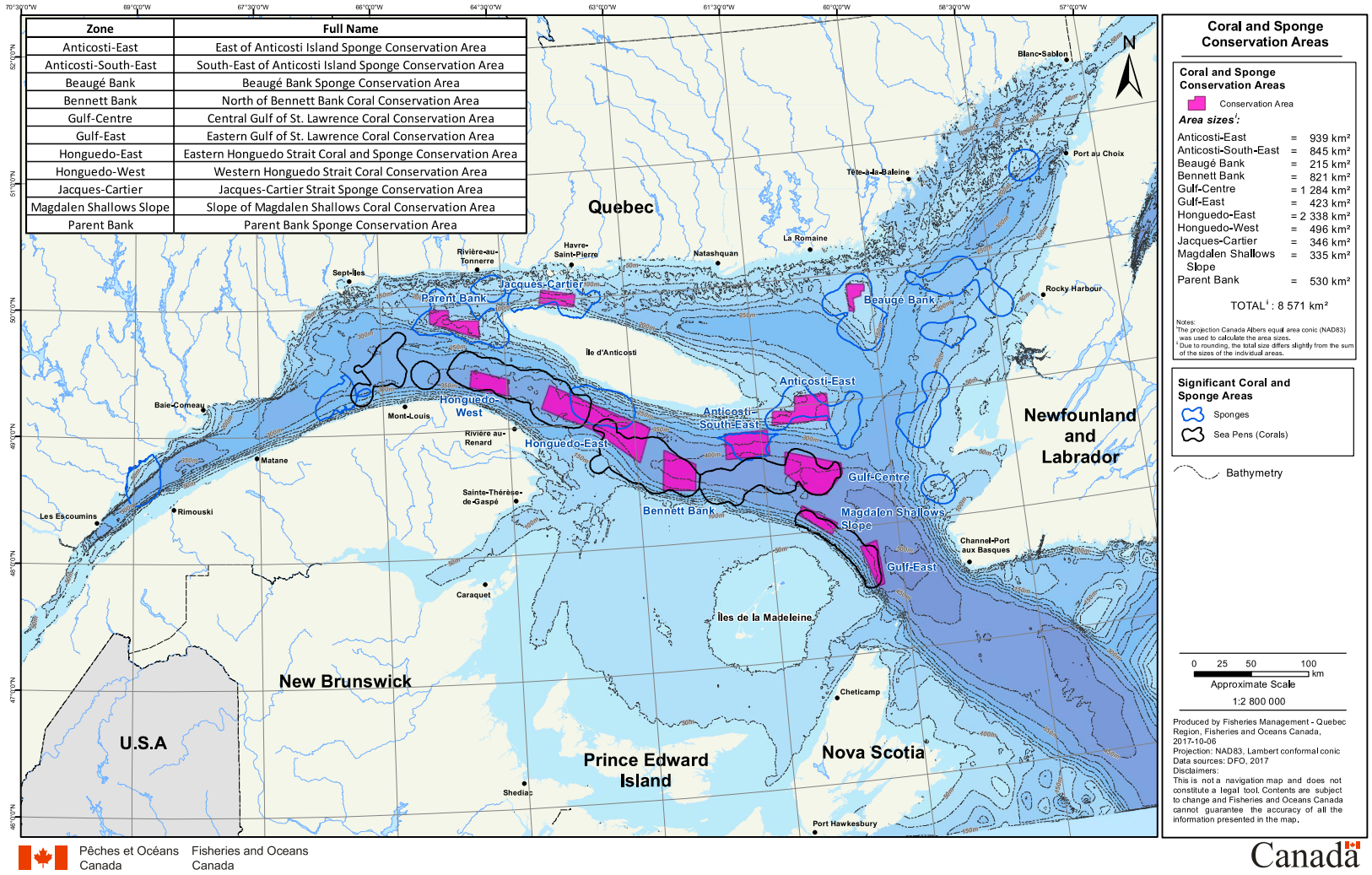

Figure 45. Coral and sponge conservation areas in the Gulf of St. Lawrence (http://www.qc.dfo-mpo.gc.ca/golfe-gulf/coraux-eng.html)

Ecosystem

The MSC defines 'key' ecosystem elements as the features of an ecosystem considered as being most crucial to giving the ecosystem its characteristic nature and dynamics, and are considered relative to the scale and intensity of the fishery. They are features most crucial to maintaining the integrity of its structure and functions and the key determinants of the ecosystem resilience and productivity (SA3.16.3, MSC 2014).

In this regard, the assessment considers the Estuary and Gulf of St. Lawrence as the 'ecosystem' for the shrimp trawl fishery. In turn, and because the gear type used in the fishery maintain contact with the seabed, benthic community structure and function is considered to be a 'key ecosystem element' for the trawl fishery as is the removal of the target species on trophic relationships.

The shrimp fishery is prosecuted in deeper channels and slopes (200 – 300 m) on the complex topography of the Estuary and Gulf of St. Lawrence. Shrimp are typically found on muddy bottoms of high organic content, within water temperatures between 2-6 °C (Dufour et al., 2010).

The deep-water area (> 150 m) in the Gulf of St. Lawrence is sourced from water from the Labrador Current (cold, less salty and well oxygenated) that has mixed with water from the Gulf Stream (warm, salty and not as well oxygenated). These mixed waters enter from the Laurentian Channel and flow up to the head of the Esquiman, Anticosti and Laurentian channels. It takes about three to four years for this water to flow between the Cabot Strait and the head of the Laurentian Channel. In recent decades, water from the Gulf Stream has made up a greater proportion of the mix, resulting in higher temperatures and oxygen depletion in the deep waters of the Gulf of St. Lawrence (DFO, 2018l). Water temperatures at all depths have increased throughout the Gulf of St. Lawrence. Temperatures at depths of 150 m, 200 m and 250 m remained above normal in 2017. A new record high of 6.3 °C was reached at 300 m. The seabed area covered by waters at temperatures above 6 °C has increased in the centre and north-west of the Gulf, but has decreased in the Anticosti and Esquiman channels, although this area remains large in both locations (see Figure 46).

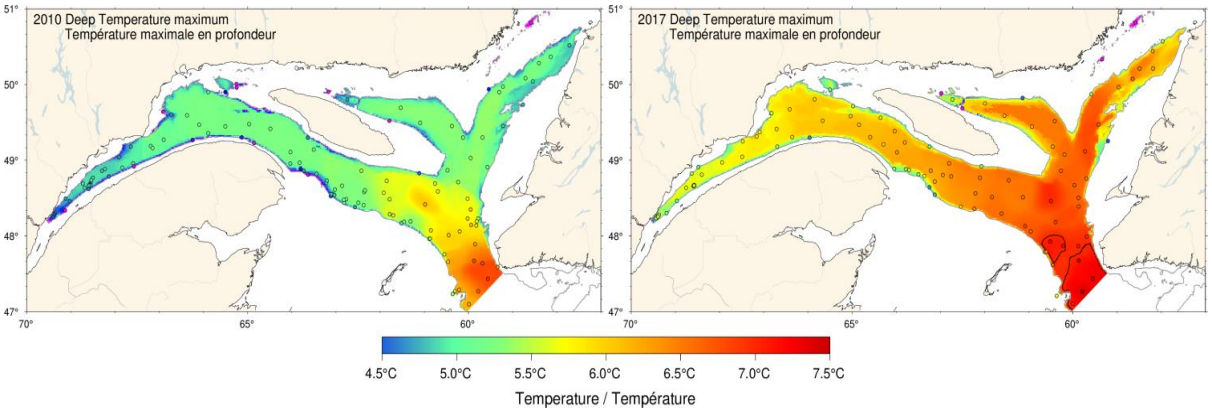

Figure 46. Maps showing the maximum temperature at depths typically found between 200 and 300 m for 2010 and 2017 (Source – DFO 2018l)

While these deep waters flow between the mouth and head of the Laurentian Channel, in the Estuary, *in situ* respiration and oxidation of organic matter reduce dissolved oxygen levels. As a result, the deep waters of the Estuary have the lowest dissolved oxygen levels. The last three years have seen the lowest oxygen concentrations in the St. Lawrence Estuary in the past 90 years. Saturation levels are below 18%, which is well below the 30% hypoxic threshold (DFO, 2018l).

Recent studies have shown that the increase in deep-water temperatures and oxygen depletion could result in a loss of habitat for species such as Northern shrimp and the Greenland halibut. According to forecasts, deep-water temperatures in the Gulf of St. Lawrence will remain high in the coming years. These are adverse conditions for the cold-water species such as Northern shrimp (DFO, 2018a; DFO, 2018l).

The Estuary and Gulf of St. Lawrence ecosystem, dominated by groundfish until the late 1980s, has transitioned to an ecosystem dominated by forage species from the 1990s to 2010. Shrimp abundance increased after the abundance of large-sized groundfish species decreased. Since 2013, the situation has been reversing: the abundance and biomass of invertebrates sampled in the DFO survey in August is

decreasing, while those of groundfish, mainly redfish, are increasing (Figure 47). Three strong cohorts (2011, 2012 and 2013) of redfish (*Sebastes mentella*) have contributed to this increase since 2013 in the Estuary and northern Gulf. The 2011 cohort, which is the most abundant, now has a modal length of 20 cm, and these young redfish are distributed throughout the northern Gulf channels. The redfish diet varies according to the size of the fish. When small, up to about 20 cm, redfish mainly consume zooplankton. At intermediate sizes of 20 to 30 cm, redfish mainly consume shrimp, including the Northern and white shrimp (*Pasiphaea multidentata*), while at about 30 cm, redfish mainly consume fish. Estimated predation by redfish on Northern shrimp has increased by a factor of six over the past two years (DFO, 2018c).

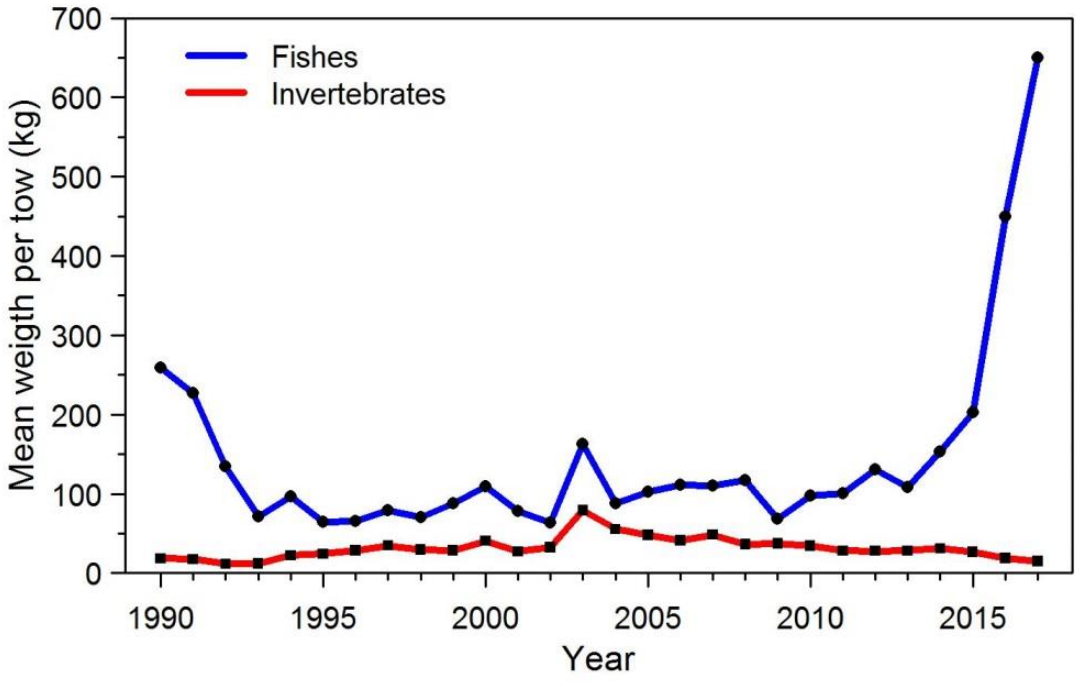

Figure 47. Biomass indices (kg per trawling tow) estimated during the DFO survey in the Northern Gulf of St. Lawrence for invertebrates and fish.

These changes in environmental and ecosystem conditions observed in the Estuary and Gulf of St. Lawrence have an impact on Northern shrimp population dynamics through their effects on such factors as abundance, spatial distribution, growth, reproduction and trophic relationships. Warming water and increased predation by redfish appear to be important factors in the northern shrimp's decline. These conditions are not expected to improve in the short term (DFO, 2018c).

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 Gulf of St. Lawrence. 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 sipuniculid 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 DFOs Comparative Dynmaics of Exploited Ecosystems in the North West Atlantic (CDEENA) website (https://slgo.ca/app-cdeena/en/accueil.shtml).

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 Gulf. 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).

Trophic relationships in the Northern Gulf of St. Lawrence have been studied in some detail. Savenkoff *et al.,* (2007) summarised changes in trophic patterns 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 Gulf of St. Lawrence 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). 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.

Ecosystem management

Under the Oceans Act and the Policy and Operational Framework for Integrated Management of Estuarine, Coastal and Marine Environments in Canada, (DFO, 2016b), DFO is committed to the development of large-scale and local integrated management plans for all of Canada's oceans. The governance, regulation and management of activities within and surrounding the Atlantic Canadian waters are shared between a variety of government departments and agencies involved in, or with an interest in, the use and management of resources within its coastal, estuarine and marine environments. The process is intended to involve all stakeholders. With respect to the Gulf of St. Lawrence, the Gulf of St. Lawrence Integrated Management (GOSLIM) initiative (DFO, 2018l) is being developed with the intention of coordinating the various initiatives carried out by stakeholders and authorities involved in protecting the Gulf of St. Lawrence marine environment.

Since 2006, DFO has undertaken the identification of Ecologically and Biologically Significant Areas (EBSAs) within the Gulf of St. Lawrence (DFO, 2007). Ten EBSA have been identified and mapped (see Figure 48).

Designation as an EBSA does not afford an area any special legal status, but it does draw attention to an area’s high ecological or biological significance, and may promote the application of higher standards of management (DFO 2009b). Identification of an area as an EBSA also indicates that if the area were disturbed or disrupted, the ecological consequences would be greater than an equal disturbance of most other areas.

At a fisheries policy level, Canada has developed a Sustainable Fisheries Framework (SFF) which builds on existing fisheries management practices to form a foundation for implementing an ecosystem approach in the management of its fisheries to ensure continued health and productivity while protecting biodiversity and fisheries habitat (DFO, 2009a). The primary goal of the SFF is to ensure that Canada’s fisheries are environmentally sustainable, while supporting economic prosperity. It is designed to foster a more rigorous, consistent, and transparent approach to decision making across all key fisheries in Canada. It also incorporates existing policies with new and evolving policies using a phased-in approach, and develops tools to monitor and assess results of conservation and sustainable use in order to identify areas that may need improvement. Overall, the SFF provides the foundation of an ecosystem- based and precautionary approach to fisheries management in Canada (DFO, 2009a).

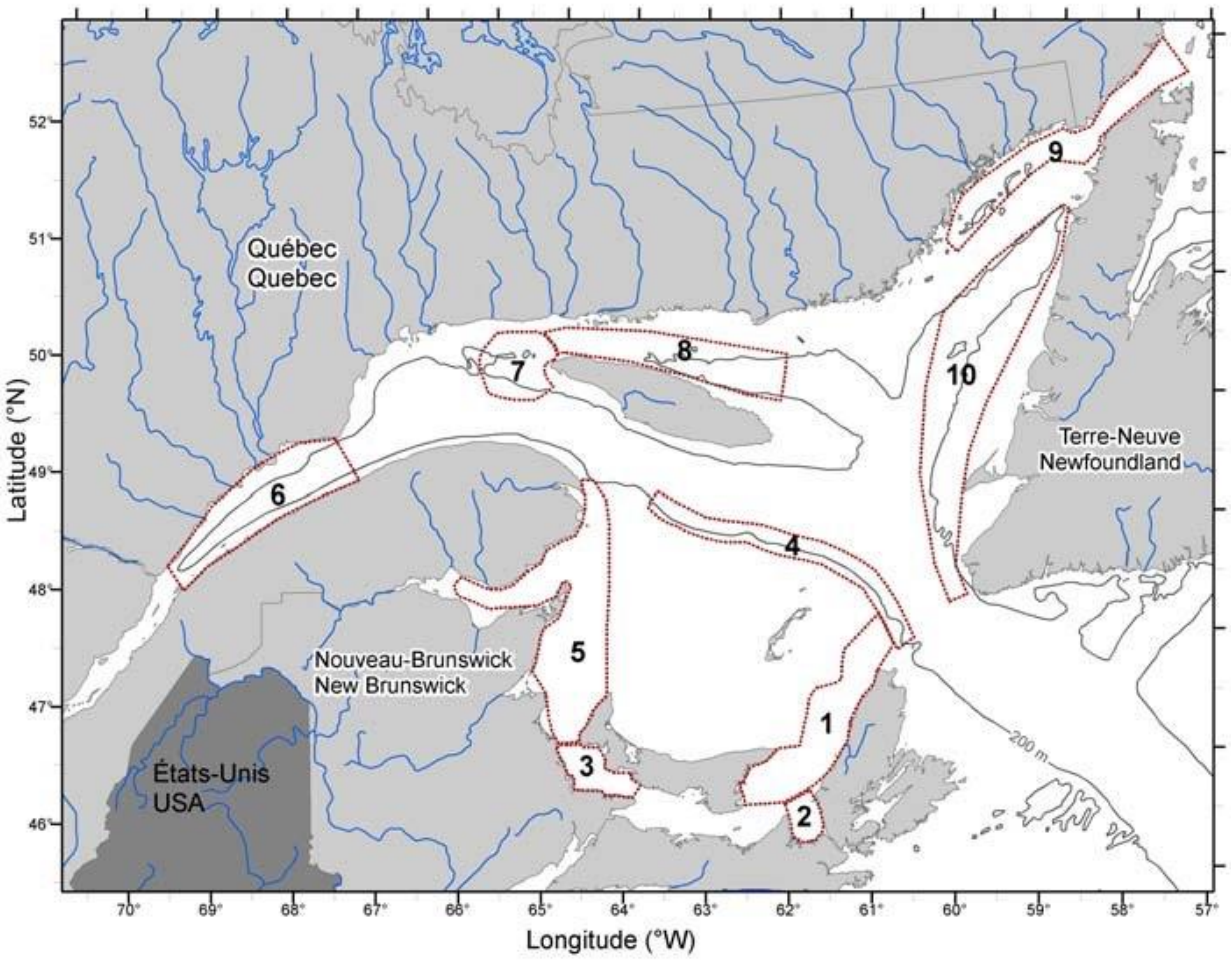

Figure 48. EBSA distribution in the Estuary and Gulf of St. Lawrence: EBSA (1) western Cape Breton, (2) St. George's Bay, (3) Northumberland Strait, (4) the southern fringe of the Laurentian Channel, (5) the south- western coast of the Gulf, (6) the lower estuary, (7) western Anticosti Island, (8) northern Anticosti Island, (9) the Strait of Belle Isle, (10) the west coast of Newfoundland.

The SFF comprises two main elements: (1) conservation and sustainable use policies, and, (2) planning and monitoring tools.

The conservation and sustainable use policies incorporate precautionary and ecosystem approaches into fisheries management decisions. These policies include:

- A Fishery Decision-Making Framework Incorporating the Precautionary Approach;
- Managing Impacts of Fishing on Benthic Habitat, Communities and Species;
- Policy on New Fisheries for Forage Species;
- Ecological Risk Assessment Framework for Coldwater Corals and Sponges dominated communities;
- Policy on Managing Bycatch; and,
- Guidance on Implementation of the Policy on Managing Bycatch.

(Source: http://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/overview-cadre-eng.htm)

A key planning and monitoring tool used to implement the policies are IFMPs. They play a critical role as the primary resource management tool through which the SFF policies are applied. With respect to the Guf of St. Lawrence shrimp fishery, the the IFMP includes a description of how the precautionary approach is used and informs the decision-making with respect to the Northern shrimp stocks; includes a section on Sensitive Benthic Areas, including corals and sponges; and, discusses bycatch and protocols for managing bycatch (DFO, 2018a).

DFO also conduct “Sustainability Survey for Fisheries” (DFO 2018m), where currently 170 fish stocks are subject to an annual, 16 question survey, divided into two sections: (1) The implementation of the Precautionary Approach, and (2) Status of IFMPs and the implementation of the Policy for Managing Bycatch and Species at Risk. The results from the surveys are used to help monitor the effectiveness of the Framework.

DFO’s Ecosystem Science Framework (DFO, 2017d) was developed to provide an effective and comprehensive approach for identifying, monitoring, and interpreting trends important to ecosystem sustainability and integrating knowledge about the effects of human activities on ecosystem components. DFO (2017d) describes a new framework for realigning the DFO science programme to support an ecosystem approach to management and better reflect an ecosystem science programme.

Table 22. Scoring elements

Component	Scoring elements	Main / Minor	Data-deficient?
P1 – Target species	Northern prawn/shrimp (*Panaduls borealis*)	Main	No
P2 – Primary species	Redfish (*Sebastes spp.*) (UoC 3)	Main	No
	Redfish (*Sebastes spp.*) (UoCs 1,2 & 4)	Minor	No
	Greenland halibut (*Reinhardtius hippoglossoides)* (All UoCs)	Minor	No
	Atlantic herring 4T (*Clupea harengus*) (UoCs 1&2)	Minor	No
	Atlantic cod (*Gadus morhua*) (UoC 4)	Minor	No
	American plaice (*Hippoglossoides platessoides*) (UoC 4)	Minor	No
P2 – Secondary species	Capelin (*Mallotus villosus*) (All UoCs)	Minor	Yes
	Atlantic herring 4S (*Clupea harengus*) (UoCs 2&3)	Minor	Yes
	White barracudina (*Arctozenus risso*) (UoCs 2,3 & 4)	Minor	Yes
	Pink glass shrimp (*Pasiphaea multidentata*) (UoC 2)	Minor	Yes
	Other shrimp-like species (UoC 3)	Minor	Yes
P2 - ETP	Northern wolffish (*Anarhichas denticulatus*) (All UoCs)	N/A	No
	Spotted wolffish (*Anarchicas minor*) (All UoCs)	N/A	No
P2 - Habitat	Pelite, sandy pelite / gravelly sandy pelite	Main	No
P2 - VME	Sea pens and sponge habitats	Main	No
P2 - Ecosystem	Trophic relationships (removal of shrimp as a forage species)	Main	No
	Benthic community structure and function	Main	No

7.4.2 Principle 2 Performance Indicator scores and rationales

PI 2.1.1 – Primary species outcome

PI 2.1.1		The UoA aims to maintain primary species above the PRI and does not hinder recovery of primary species if they are below the PRI.		
Scoring Issue		SG 60	SG 80	SG 100
a	Main primary species stock status			
	Guide post	Main primary species are **likely** to be above the PRI OR If the species is below the PRI, the UoA has measures in place that are **expected** to ensure that the UoA does not hinder recovery and rebuilding.	Main primary species are **highly likely** to be above the PRI OR If the species is below the PRI, there is either **evidence of recovery** or a demonstrably effective strategy in place **between all MSC UoAs which categorise this species as main**, to ensure that they collectively do not hinder recovery and rebuilding.	There is a **high degree of certainty** that main primary species are above the PRI **and are** fluctuating around a level consistent with MSY.
	Met?	**UoC 3** **Redfish Y** **UoCs 1, 2 & 4** **N/A**	**UoC 3** **Redfish Y** **UoCs 1, 2 & 4** **N/A**	**UoC 3** **Redfish N** **UoCs 1, 2 & 4** **N/A**
	Justification	**UoC 3** Redfish is the only species in UoC 3 that is designated as a main primary species. Bycatches of redfish are not differentiated by species in the observer samples and are considered to be a mixture of the deepwater redfish, *Sebastes mentella*, and the Acadian redfish, *S. fasciatus*. Recent DFO research surveys indicated that the 2011, 2012 and 2013 year-classes of redfish in Unit 1 are the most abundant ever observed in the research surveys. The total minimum trawlable biomass estimated from the research survey in Unit 1 in 2017 was the highest value observed since 1984 for both *S. mentella* and *S. fasciatus*. A similar pattern was observed in Unit 2 from Groundfish Enterprise Allocation Council (GEAC) surveys and the combined minimum trawlable biomass for both species in Units 1 and 2 is the highest in recent times. An MSE approach was adopted in 2016-2018 which proposed a Limit Reference Point (LRP) and an Upper Stock Reference (USR) of 40% and 80%, respectively, of the model-estimated survey mean spawning stock biomass (Bref). The estimate of stock biomass from the stock survey in 2017 shows that after many years of the stocks of both *S. mentella* and *S. fasciatus* being in the critical zone below Blim, the *S. mentella* stock is now in the healthy zone above the USR, and the *S. fasciatus* stock is in the cautious zone. Redfish are therefore highly likely to be above the PRI and the SG60 and SG80 are met.		

		Whilst there have been strong year classes of redfish in recent years suggesting that there is a high degree of certainty that redfish are above the PRI, the stock of *S. mentella* is still in the cautious zone, and therefore it cannot be concluded that the redfish stocks are fluctuating around a level consistent with MSY. SG100 is not met. **UoCs 1, 2 & 4** There are no main primary species in the fishery in UoCs 1, 2 and 4, so this scoring issue is not scored in these three UoCs according to the MSC Interpretations Page: https://mscportal.force.com/interpret/s/article/P2-species-outcome-PIs-scoring-when-no-main-or-no-minor-or-both-PI-2-1-1-1527262009344		
b	Minor primary species stock status			
	Guide post			Minor primary species are highly likely to be above the PRI OR If below the PRI, there is evidence that the UoA does not hinder the recovery and rebuilding of minor primary species
	Met?			**<u>UoC 1</u>** **Redfish Y** **Greenland halibut Y** **<u>UoC 2</u>** **Redfish Y** **Greenland halibut Y** **<u>UoC 3</u>** **Greenland halibut Y** **Herring Y** **<u>UoC 4</u>** **Redfish Y** **Greenland halibut Y** **Herring Y** **Cod N** **American plaice N**
	Justification	<u>UoC 1 SFA 8 (Esquiman)</u> There are two minor primary species in UoC 1 – redfish and Greenland halibut. **Redfish**. Bycatches of redfish are not differentiated by species in the observer samples and are considered to be a mixture of the deepwater redfish, *Sebastes mentella*, and the Acadian redfish, *S. fasciatus*. Recent DFO research surveys indicated that the 2011, 2012 and 2013 year-classes of redfish in Unit 1 are the most abundant ever observed in the research surveys. The total minimum trawlable biomass estimated from the research survey in Unit 1 in 2017 was the highest value observed since 1984 for both *S. mentella*		

and *S. fasciatus*. A similar pattern was observed in Unit 2 from Groundfish Enterprise Allocation Council (GEAC) surveys and the combined minimum trawlable biomass for both species in Units 1 and 2 is the highest in recent times. An MSE approach was adopted in 2016-2018 which proposed a Limit Reference Point (LRP) and an Upper Stock Reference (USR) of 40% and 80%, respectively, of the model-estimated survey mean spawning stock biomass (Bref). The estimate of stock biomass from the stock survey in 2017 shows that after many years of the stocks of both *S. mentella* and *S. fasciatus* being in the critical zone below Blim, the *S. mentella* stock is now in the healthy zone above the USR, and the *S. fasciatus* stock is in the cautious zone. Redfish are therefore highly likely to be above the PRI and the SG100 is met.

Greenland halibut. The assessment of the Greenland Halibut stock (4RST) is based on analysis of commercial fishery data and two trawl research surveys conducted annually. The performance index in the commercial fishery (CPUE, standardised to account for changes based on NAFO subarea, soak time and seasonal pattern) over the entire Gulf decreased by almost 50% between 2016 and 2018 and has been below the 1999-2017 series average since 2017. Of the three sectors, the CPUE index in the western Gulf decreased by 66% from the historical highs of 2015 and 2016 and has been below the series average since 2017. In the North Anticosti and Esquiman sectors, the index has been below the average of each series since 2013, but increased in 2018 compared to 2017. The biomass of fish larger than 40 cm estimated during the DFO summer survey (which represents a proxy for mature stock biomass) was chosen as the indicator of the Greenland Halibut stock status. The selected LRP corresponds to the geometric mean of the estimated mature biomass for the period 1990 to 1994, which is the lowest level of population where a recovery of the stock was observed. An upper stock reference (USR) was proposed representing 80% of biomass at maximum sustainable yield (Bmsy), and the proposed proxy for Bmsy is the geometric average of the indicator for the 2004-2012 productive period. The current annual biomass indicator puts the Greenland halibut stock in the cautious zone between the LRP and USR. Despite recent declines in CPUE in Anticosti and Esquiman, the Greenland halibut stock is highly likely to be above the PRI and the SG100 is met.

<u>UoC 2 SFA 9 (Anticosti)</u>

There are two minor primary species in UoC 2 – redfish and Greenland halibut.

Redfish & Greenland halibut. Scoring rationales are as for UoC 1 with both redfish and Greenland halibut meeting the SG100.

<u>UoC 3 SFA 10 (Sept-Iles)</u>

There are two minor primary species in UoC 3 – Greenland halibut and Atlantic herring in Division 4T.

Greenland halibut. Scoring rationales are as for UoC 1 with both Greenland halibut meeting the SG100.

Herring. The most recent assessment of the Gulf of St. Lawrence 4T herring fishery Fall Spawner Component showed that the median estimate of spawning stock biomass (SSB) had fallen below the Upper Stock Reference (USR) point in recent years but was still well above the LRP. The average fishing mortality rate on ages 5 to 10 has been below $F_{0.1}$ (the removal reference level in the healthy zone, F = 0.32) since 2012. The herring stock in 4T is therefore highly likely to be above the PRI and SG100 is met.

<u>UoC 4 SFA 12 (Estuary)</u>

There are five minor primary species in UoC 4 – redfish, Greenland halibut, Atlantic herring in Division 4T, Atlantic cod and American plaice.

Redfish, Greenland halibut and herring. Scoring rationales for redfish and Greenland halibut are as for UoC 1 and scoring rationales for herring are as for UoC 3 with redfish, Greenland halibut and herring all meeting the SG100.

		Cod. For Atlantic cod in the northern Gulf of St. Lawrence the stock update in 2018 showed that the average number of cod per tow in the DFO survey increased slightly in 2018 but is still low in comparison to observed levels in the late 1980s when stock biomass was high, but declines were observed in 2018 in the mean number of cod per tow for the mobile gear sentinel fisheries survey and for the standardized catch per unit effort (CPUE) index for the sentinel longline fishery programme. A slight increase was observed in the standardized CPUE index for the sentinel gillnet fishery programme, but the value was still very low. The most recent full stock assessment of the cod stock in the northern Gulf of St. Lawrence indicated that estimates of spawning stock biomass (SSB) from virtual population analysis (VPA) were very low and that the stock remains in the critical zone and well below the limit reference point estimated at 116,000 t. The 2019 estimate is at 10% of the limit reference point. The stock is therefore not highly likely to be above the PRI and the SG100 is not met. **American plaice**. The three-year moving average of the RV survey biomass index for commercial-sized American plaice (≥ 30 cm) is the main stock indicator for the Gulf of St. Lawrence population. For 2018, the three-year (2016 to 2018) average value of the index is 3.11 kg per tow which is well below the LRP of 19.5 kg per tow. American plaice is therefore not highly likely to be above the PRI and the SG100 is not met.
References		https://mscportal.force.com/interpret/s/article/P2-species-outcome-PIs-scoring-when-no-main-or-no-minor-or-both-PI-2-1-1-1527262009344 DFO. 2017b. Assessment of the Northern Gulf of St. Lawrence (3Pn, 4RS) Cod Stock in 2016. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2017/042. https://waves-vagues.dfo-mpo.gc.ca/Library/40646725.pdf DFO. 2018d. Assessment of Redfish Stocks (*Sebastes fasciatus* and *S. mentella*) in Units 1 and 2 in 2017. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2018/032. https://waves-vagues.dfo-mpo.gc.ca/Library/40713684.pdf DFO. 2018f. Assessment of the Greenland Halibut stock in the Gulf of St. Lawrence (4RST) in 2017. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2018/035. https://waves-vagues.dfo-mpo.gc.ca/Library/40714007.pdf DFO. 2018g. Assessment of the southern Gulf of St. Lawrence (NAFO Div. 4T) spring and fall spawner components of Atlantic herring (*Clupea harengus*) with advice for the 2018 and 2019 fisheries. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2018/029. https://waves-vagues.dfo-mpo.gc.ca/Library/4071309x.pdf DFO. 2018i. Update of stock status indicators for northern Gulf of St. Lawrence (3Pn, 4RS) cod in 2017. DFO Can. Sci. Advis. Sec. Sci. Resp. 2018/008. https://waves-vagues.dfo-mpo.gc.ca/Library/40688677.pdf DFO. 2019a. Assessment of the Gulf of St. Lawrence (4RST) Greenland Halibut stock in 2018. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2019/023. http://www.dfo-mpo.gc.ca/csas-sccs/Publications/SAR-AS/2019/2019_023-eng.pdf DFO. 2019b. Assessment of the Northern Gulf of St. Lawrence (3Pn, 4RS) Atlantic cod stock in 2018. DFO Can. Sci. Advis. Rep. 2019/032. http://www.dfo-mpo.gc.ca/csas-sccs/Publications/SAR-AS/2019/2019_032-eng.pdf DFO. 2019c. Updated indices of abundance to 2018 for American Plaice and Yellowtail Flounder from NAFO Div. 4T. DFO Can. Sci. Advis. Sec. Sci. Resp. 2019/006. http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2019/2019_006-eng.pdf
	UoC 1 – SFA 8 (Esquiman)	**100**

OVERALL PERFORMANCE INDICATOR SCORE:	**Redfish 100** **Greenland halibut 100**	
	UoC 2 – SFA 9 (Anticosti) **Redfish 100** **Greenland halibut 100**	**100**
	UoC 3 – SFA 10 (Sept Iles) **Redfish 80** **Greenland halibut 100** **Herring 100**	**95**
	UoC 4 – SFA 12 (Estuary) **Redfish 100** **Greenland halibut 100** **Herring 100** **Cod 80** **American plaice 80**	**95**
CONDITION NUMBER (if relevant):	**UoC 1 – SFA 8 (Esquiman)**	**N/A**
	UoC 2 – SFA 9 (Anticosti)	**N/A**
	UoC 3 – SFA 10 (Sept Iles)	**N/A**
	UoC 4 – SFA 12 (Estuary)	**N/A**

PI 2.1.2 – Primary species management strategy

PI 2.1.2		**There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch.**		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are **measures** in place for the UoA, if necessary, that are expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are likely to above the point where recruitment would be impaired.	There is a **partial strategy** in place for the UoA, if necessary, that is expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are highly likely to be above the point where recruitment would be impaired.	There is a **strategy** in place for the UoA for managing main and minor primary species.
	Met?	**Y (All UoCs – all elements)**	**Y (All UoCs – all elements)**	**Y (All UoCs – all elements)**
	Justification	There is an overall strategy for the UoA for managing all the primary species caught in the 4 UoCs – redfish, Greenland halibut, herring in 4T, Atlantic cod and American plaice. There is a DFO-wide policy on managing bycatch, and the Integrated Fisheries Management Plan (IFMP) for the Estuary and Gulf of St. Lawrence shrimp fishery set outs the strategies and tactics for minimising any impact on bycatch species. There is limited entry of vessels in the fishery, an annual TAC, a minimum mesh size and the use of a Nordmore separator grid in the trawl has been mandatory since 1993. The use of a second net (or pouch) over the sorting grate to retain large fish streamed out by the grate is prohibited during the fishing season. The IFMP includes a protocol for closing 10-min longitude by 10-min latitude grid squares when bycatch exceeds a specified level. Fishermen use 30cm toggle chains to keep nets off the bottom which reduces the catch of demersal and benthic species, and will actively try to avoid areas with high bycatch rates as there is no commercial value for bycatch species and high bycatches require increased time sorting catches. All these measures constitute a strategy for minimising the impact of the fishery on all primary species, and as individuals of all non-target species caught in the trawl may be released back to sea immediately, fishing practice is focussed on minimising any bycatch. The five primary species that are caught across the 4 UoCs are also managed through a harvest strategy including reference points in line with DFO's Precautionary Approach. UoC 3. The only main primary species is redfish. As described above, there is a strategy in place to manage redfish which is expected to help rebuild stocks to levels which are highly likely to be above the point where recruitment would be impaired. SG60, SG80 and SG100 are met for redfish. For the minor primary species in UoC3, the SG60 and SG80 are met by default, and there is a strategy in place to manage these minor primary species. SG100 is met for the minor primary species. UoCs 1, 2 & 4. For the minor primary species, the SG60 and SG80 are met by default, and there is a strategy in place to manage these minor primary species. SG100 is met for all elements (minor primary species).		
b	Management strategy evaluation			
	Guide post	The measures are considered **likely** to work,	There is some **objective basis for confidence** that	**Testing** supports **high confidence** that the partial

		based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	the measures/partial strategy will work, based on some information directly about the fishery and/or species involved.	strategy/strategy will work, based on information directly about the fishery and/or species involved.
	Met?	**Y (All UoCs – all elements)**	**Y (All UoCs – all elements)**	**Y (All UoCs – all elements)**
	Justification	The key element of the strategy for minimising bycatch in the trawl fishery is the use of the Nordmore sorting grate (or grid) which has been mandatory in the Estuary and Gulf of St. Lawrence shrimp fishery since 1993, and there is evidence that such sorting or separator grids are highly effective in reducing bycatches in fisheries for *Pandalus borealis* (e.g. Richards & Hendrickson, 2006; Isaksen & Solvdal, 1997). The use of a second net (or pouch) over the sorting grate is prohibited during the fishing season ensuring that no large fish are retained. The mandatory use of a separator grid, a minimum mesh size, toggle chains to keep nets off the bottom and a protocol for closing areas in which bycatch rates are high, provide objective confidence that bycatch rates in the shrimp trawl fishery will be low, and that the restrictions on fishing effort and an annual TAC should result in low overall bycatches in the trawl fishery. Observer sampling shows that bycatch species constitute less than 5% of the total catch in all four UoCs, and total catches estimated per species in these bycatches represent less than 1% of the estimate of their respective biomass in the DFO survey. There is information directly from the fishery that there is high confidence that the strategy for managing the impact of the UoA on all primary species is working. SG 60, 80 and 100 are met for all elements (primary species) in all UoCs.		
c	Management strategy implementation			
	Guide post		There is **some evidence** that the measures/partial strategy is being **implemented successfully**.	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its overall objective as set out in scoring issue (a).
	Met?		**Y (All UoCs)**	**<u>UoC 1</u> Redfish Y Greenland halibut Y <u>UoC 2</u> Redfish Y Greenland halibut Y <u>UoC 3</u> Redfish N Greenland halibut Y Herring Y <u>UoC 4</u> Redfish Y Greenland halibut Y Herring Y Cod N American plaice N**
	Justification	All elements of the strategy for minimising bycatch have been implemented successfully. Monitoring and enforcement activities demonstrate that the separator grid is used on all vessels, fishing effort is limited and TACs are not exceeded in any of the UoCs. Data from		

		the observer programme demonstrate that bycatch rates are very low in all UoCs and that total bycatches of all primary species are a negligible proportion of the total removals. The SG 80 is met for all elements. <u>UoC 1 and UoC 2</u> For redfish, the strategy appears to be achieving its overall objective as stocks of both *S. fasciatus* and S. *mentella* are increasing and are now well above the PRI. The SG 100 is met for redfish stocks. For Greenland halibut, the stock is in the cautious zone between the LRP and USR, and therefore the strategy is achieving its overall objective and the SG100 is met. <u>UoC 3</u> Redfish is a main primary species in UoC 3, and whilst there is clear evidence that the strategy is being implemented successfully (SG80 is met), and that redfish stocks are above the PRI, it is not yet clear that the strategy has met its overall objective for a main primary species of ensuring that redfish is fluctuating around a level consistent with MSY. The SG100 is not met. As for UoCs 1 and 2, the strategy is achieving its overall objective for Greenland halibut. For herring in 4T, the median estimate of spawning stock biomass (SSB) had fallen below the Upper Stock Reference (USR) point in recent years but was still well above the LRP, and so the strategy is achieving its overall objective in relation to the herring fishery. The SG100 is met. <u>UoC 4</u> As for UoCs 1 and 2, the strategy is achieving its overall objective for redfish stocks and Greenland halibut and as for UoC 3 the strategy is achieving its overall objective for herring in 4T. For both cod and American plaice, the main stock indicator is well below the PRI, and so it cannot be concluded that the strategy is achieving its overall objective in relation to these elements. The SG100 is not met for cod and American plaice.		
d	Shark finning			
	Guide post	It is **likely** that shark finning is not taking place.	It is **highly likely** that shark finning is not taking place.	There is a **high degree of certainty** that shark finning is not taking place.
	Met?	**Not relevant (All UoCs)**	**Not relevant (All UoCs)**	**Not relevant (All UoCs)**
	Justification	No sharks are caught in the fishery in all UoCs, so this scoring issue is not scored.		
e	Review of alternative measures			
	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main primary species.	There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main primary species and they are implemented as appropriate.	There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of all primary species, and they are implemented, as appropriate.
	Met?	**Y (All UoCs – all elements)**	**Y (All UoCs – all elements)**	**N (All UoCs – all elements)**
	Justification	Non-target species are not retained in the Estuary and Gulf of St. Lawrence shrimp fishery and therefore all bycatch can be considered to be unwanted catch. The IFMP for the shrimp		

		fishery is regularly reviewed, and elements of the harvest strategy are reviewed by DFO on an annual basis in consultation with stakeholders at EGSAC. For example, on-board mechanical devices to separate bycatch have recently been trialled and have been demonstrated to reduce the time required to sort the bycatch, and to produce cleaner and better quality landings, and are therefore likely to reduce mortality of unwanted bycatch. UoC 3. The only main primary species is redfish, as described above, studies on bycatch are carried out and reviewed regularly so the SG60 and SG80 are met. For the minor primary species in UoC3, the SG60 and SG80 are met by default. For all primary species in UoC 3, the assessment team found no evidence that a review of measures to minimize the catch of all primary species is carried out biennially. SG 100 is not met. UoCs 1, 2 & 4. For the minor primary species, the SG60 and SG80 are met by default. Whilst such studies on bycatch are carried out and reviewed regularly, the assessment team found no evidence that a review of measures to minimize the catch of all minor primary species is carried out biennially. SG 100 is not met.
References		DFO. 2009a. Sustainable Fisheries Framework (SFF) http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/overview-cadre-eng.htm DFO 2013a. Policy on Managing Bycatch http://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/bycatch-policy-prise-access-eng.htm DFO. 2017b. Assessment of the Northern Gulf of St. Lawrence (3Pn, 4RS) Cod Stock in 2016. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2017/042. https://waves-vagues.dfo-mpo.gc.ca/Library/40646725.pdf DFO, 2018a. The Integrated Fisheries Management Plan (IFMP) for Northern Shrimp in the Estuary and Gulf of St. Lawrence (Areas 8, 9, 10 and 12) (*Pandalus borealis*). DFO, 2018b. Draft minutes of the 2018 Estuary and Gulf Shrimp Advisory Committee (EGSAC) annual meeting. DFO, 2018c. Assessment of Northern Shrimp stocks in the Estuary and Gulf of St. Lawrence in 2017. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2018/015. DFO. 2018d. Assessment of Redfish Stocks (*Sebastes fasciatus* and *S. mentella*) in Units 1 and 2 in 2017. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2018/032. https://waves-vagues.dfo-mpo.gc.ca/Library/40713684.pdf DFO. 2018f. Assessment of the Greenland Halibut stock in the Gulf of St. Lawrence (4RST) in 2017. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2018/035. https://waves-vagues.dfo-mpo.gc.ca/Library/40714007.pdf DFO. 2018g. Assessment of the southern Gulf of St. Lawrence (NAFO Div. 4T) spring and fall spawner components of Atlantic herring (*Clupea harengus*) with advice for the 2018 and 2019 fisheries. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2018/029. https://waves-vagues.dfo-mpo.gc.ca/Library/4071309x.pdf DFO. 2018i. Update of stock status indicators for northern Gulf of St. Lawrence (3Pn, 4RS) cod in 2017. DFO Can. Sci. Advis. Sec. Sci. Resp. 2018/008. https://waves-vagues.dfo-mpo.gc.ca/Library/40688677.pdf DFO. 2019a. Assessment of the Gulf of St. Lawrence (4RST) Greenland Halibut stock in 2018. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2019/023.

	http://www.dfo-mpo.gc.ca/csas-sccs/Publications/SAR-AS/2019/2019_023-eng.pdf DFO. 2019b. Assessment of the Northern Gulf of St. Lawrence (3Pn, 4RS) Atlantic cod stock in 2018. DFO Can. Sci. Advis. Rep. 2019/032. http://www.dfo-mpo.gc.ca/csas-sccs/Publications/SAR-AS/2019/2019_032-eng.pdf DFO. 2019c. Updated indices of abundance to 2018 for American Plaice and Yellowtail Flounder from NAFO Div. 4T. DFO Can. Sci. Advis. Sec. Sci. Resp. 2019/006. http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2019/2019_006-eng.pdf Isaksen, B. and Solvdal, A.V. 1997. Selection and survival in the Norwegian shrimp trawl fisheries. Proceedings of the 7th Russian/Norwegian Symposium: Gear Selection and Sampling Gears. Murmansk, 23-24 June 1997. Richards, A. and Hendrickson, L. 2006. Effectiveness of the Nordmore grate in the Gulf of Maine northern shrimp fishery. Fisheries Research 81(1): 100-106.

OVERALL PERFORMANCE INDICATOR SCORE:	**UoC 1 – SFA 8 (Esquiman) Redfish 95 Greenland halibut 95**	**95**
	UoC 2 – SFA 9 (Anticosti) Redfish 95 Greenland halibut 95	**95**
	UoC 3 – SFA 10 (Sept Iles) Redfish 90 Greenland halibut 95 Herring 95	**95**
	UoC 4 – SFA 12 (Estuary) Redfish 95 Greenland halibut 95 Herring 95 Cod 90 American plaice 90	**95**
CONDITION NUMBER (if relevant):	**UoC 1 – SFA 8 (Esquiman)**	**N/A**
	UoC 2 – SFA 9 (Anticosti)	**N/A**
	UoC 3 – SFA 10 (Sept Iles)	**N/A**
	UoC 4 – SFA 12 (Estuary)	**N/A**

PI 2.1.3 – Primary species information

PI 2.1.3		Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impact on main primary species			
	Guide post	Qualitative information is **adequate to estimate** the impact of the UoA on the main primary species with respect to status. OR If RBF is used to score PI 2.1.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for main primary species.	Some quantitative information is available and is **adequate to assess** the impact of the UoA on the main primary species with respect to status. OR If RBF is used to score PI 2.1.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for main primary species.	Quantitative information is available and is **adequate to assess with a high degree of certainty** the impact of the UoA on main primary species with respect to status.
	Met?	**<u>UoC 3</u>** **Redfish Y** **Greenland halibut N/A** **Herring N/A** **<u>UoCs 1, 2 & 4</u>** **N/A**	**<u>UoC 3</u>** **Redfish Y** **Greenland halibut N/A** **Herring N/A** **<u>UoCs 1, 2 & 4</u>** **N/A**	**<u>UoC 3</u>** **Redfish N** **Greenland halibut N/A** **Herring N/A** **<u>UoCs 1, 2 & 4</u>** **N/A**
	Justification	<u>UoC 3</u> For the main primary species, redfish, there is quantitative information from the observer programme on the total annual bycatch of redfish caught in UoC3. The target for observer coverage is 5% distributed among the various shrimp fishing areas (SFAs). DFO Science provided the assessment team with information on the percentage observer coverage - calculated as (number of fishing hours covered by the at-sea observer / total number of fishing hours) x 100. The average observer coverage from 2013 to 2017 was 5.5% in Sept-Iles (SFA 10, UoC 3). A study of the representativeness of observer coverage in several Gulf of St. Lawrence fisheries concluded that observer coverage in the shrimp fishery was essentially randomly distributed in the fishery and therefore representative of the overall fishery. There is good information on landings of redfish and estimated annual bycatches in the shrimp trawl fishery. The information available from the observer programme and from landings data is therefore adequate to assess the impact of the fishery in UoC 3 on stock status of redfish. SG60 and SG80 are met. Redfish bycatches are not recorded by species and therefore the information is not adequate to assess with a high degree of certainty the impact of the UoA on the stock status of the two redfish species. <u>UoCs 1, 2 & 4</u>		

		There are no main primary species for the fishery in UoCs 1, 2 & 4, so this scoring issue is not scored for these UoCs.		
b	Information adequacy for assessment of impact on minor primary species			
	Guide post			Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status.
	Met?			**Y (All UoCs, all elements)**
	Justification	<u>All UoCs</u> There is quantitative information from the observer programme on the total annual bycatch of all minor primary species caught in each of the four UoCs. The target for observer coverage is 5% distributed among the various shrimp fishing areas (SFAs). DFO Science provided the assessment team with information on the percentage observer coverage - calculated as (number of fishing hours covered by the at-sea observer / total number of fishing hours) x 100 for each UoC for each year since 2000. The average observer coverage from 2013 to 2017 was 4.0% in Esquiman (SFA 8, UoC 1), 5.1% in Anticosti (SFA 9, UoC 2), 5.5% in Sept-Iles (SFA 10, UoC 3) and 4.4% in Estuary (SFA 12, UoC 4). A study of the representativeness of observer coverage in several Gulf of St. Lawrence fisheries concluded that observer coverage in the shrimp fishery was essentially randomly distributed in the fishery and therefore representative of the overall fishery. There is good information on landings of all minor primary species in the Gulf of St. Lawrence and estimated annual bycatches in the shrimp trawl fishery equate to significantly less than 1% of the total landings for all minor primary species. The information available from the observer programme and from landings data is therefore adequate to conclude that the shrimp fishery has negligible impact on stock status of the minor primary species. SG 100 is met.		
c	Information adequacy for management strategy			
	Guide post	Information is adequate to support **measures** to manage **main** primary species.	Information is adequate to support a **partial strategy** to manage **main** Primary species.	Information is adequate to support a **strategy** to manage **all** primary species, and evaluate with a **high degree of certainty** whether the strategy is achieving its objective.
	Met?	**<u>UoC 3</u>** **Redfish Y** **Greenland halibut N/A** **Herring N/A** **<u>UoCs 1, 2 & 4</u>** **N/A (all elements)**	**<u>UoC 3</u>** **Redfish Y** **Greenland halibut N/A** **Herring N/A** **<u>UoCs 1, 2 & 4</u>** **N/A (all elements)**	**<u>UoC 3</u>** **Redfish N** **Greenland halibut Y** **Herring Y** **<u>UoCs 1, 2 & 4</u>** **Y (all elements)**
	Justification	There is good information collected from the observer programme over many years of the estimated annual bycatch of all primary species in all UoCs, there are accurate landings data for the Gulf of St. Lawrence of all primary species, and regular assessments of stock status for all main and minor primary species. There are empirical data on the efficiency of		

		the separator grid in *Pandalus borealis* fisheries, and accurate monitoring of landings that ensure that the TAC is not exceeded. Estimated annual bycatches in the shrimp fishery equate to less than 1% of the total landings for all primary species. UoC 3 For the main primary species in UoC3, redfish, information is available to support the strategy for managing redfish. SG60 and SG80 are met, but redfish bycatches are not recorded by species and therefore it is not possible to evaluate with a high degree of certainty whether the strategy is achieving its objective. The SG100 is not met. For minor primary species in UoC3, Greenland halibut and herring, the SG60 and SG80 are met by default. Information is available to support the strategy for managing primary species and to evaluate with a high degree of certainty that bycatches of the minor primary species are not impacting on the stocks in UoC3. The SG 100 is met. UoCs 1, 2 & 4 There are no main primary species in the fishery in UoCs 1, 2 & 4, so the SG60 and SG80 are met by default. Information is available to support the strategy for managing primary species, and to evaluate with a high degree of certainty that bycatches of the primary species are not impacting on the stocks in these UoCs. The SG 100 is met.
References		Benoît, H. P. and Allard, J. 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 Bourdages, H., and Marquis, M.C. 2019. Assessment of northern shrimp stocks in the Estuary and Gulf of St. Lawrence in 2017: commercial fishery data. DFO Can. Sci. Advis. Sec. Res. Doc. 2018/056. iv + 99 p. DFO, 2018c. Assessment of Northern Shrimp stocks in the Estuary and Gulf of St. Lawrence in 2017. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2018/015. Isaksen, B. and Solvdal, A.V. 1997. Selection and survival in the Norwegian shrimp trawl fisheries. Proceedings of the 7th Russian/Norwegian Symposium: Gear Selection and Sampling Gears. Murmansk, 23-24 June 1997. Richards, A. and Hendrickson, L. 2006. Effectiveness of the Nordmore grate in the Gulf of Maine northern shrimp fishery. Fisheries Research 81(1): 100-106.

OVERALL PERFORMANCE INDICATOR SCORE:	**UoC 1 – SFA 8 (Esquiman)** **All elements 100**	**100**
	UoC 2 – SFA 9 (Anticosti) **All elements 100**	**100**
	UoC 3 – SFA 10 (Sept Iles) **Redfish 80** **Greenland halibut 100** **Herring 100**	**95**
	UoC 4 – SFA 12 (Estuary) **All elements 100**	**100**

CONDITION NUMBER (if relevant):	**UoC 1 – SFA 8 (Esquiman)**	**N/A**
	UoC 2 – SFA 9 (Anticosti)	**N/A**
	UoC 3 – SFA 10 (Sept Iles)	**N/A**
	UoC 4 – SFA 12 (Estuary)	**N/A**

PI 2.2.1 – Secondary species outcome

PI 2.2.1		**The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit.**		
Scoring Issue		SG 60	SG 80	SG 100
a	Main secondary species stock status			
	Guide post	Main Secondary species are **likely** to be within biologically based limits. OR If below biologically based limits, there are measures in place expected to ensure that the UoA does not hinder recovery and rebuilding.	Main secondary species are **highly likely** to be above biologically based limits OR If below biologically based limits, there is either **evidence of recovery** or a **demonstrably effective partial strategy** in place such that the UoA does not hinder recovery and rebuilding. AND Where catches of a main secondary species outside of biological limits are considerable, there is either evidence of recovery or a, demonstrably effective strategy in place between those MSC UoAs that also have considerable catches of the species, to ensure that they collectively do not hinder recovery and rebuilding.	There is a **high degree of certainty** that main secondary species are within biologically based limits.
	Met?	**N/A (All UoCs)**	**N/A (All UoCs)**	**N/A (All UoCs)**
	Justification	All UoCs There are no main secondary species in the fishery in all UoCs, so this scoring issue is not scored according to the MSC Interpretations Page: https://mscportal.force.com/interpret/s/article/P2-species-outcome-PIs-scoring-when-no-main-or-no-minor-or-both-PI-2-1-1-1527262009344 (Note – if there were any main species, RBF would be triggered and this PI would be scored using PSA)		
b	**Minor secondary species stock status**			
	Guide post			Minor secondary species are highly likely to be above biologically based limits. OR

				If below biologically based limits', there is evidence that the UoA does not hinder the recovery and rebuilding of secondary species
	Met?			**<u>UoC 1</u>** **Capelin N** **<u>UoC 2</u>** **Capelin N** **4S herring N** **White barracudina N** **Pink glass shrimp N** **<u>UoC 3</u>** **Capelin N** **4S herring N** **White barracudina N** **Other shrimp-like spp. N** **<u>UoC 4</u>** **Capelin N** **White barracudina N**
	Justification	<u>All UoCs</u> There are minor secondary species caught in all UoCs of the fishery, and these secondary species should be considered as data-deficient as there are no stock status reference points available (MSC CRv2.0, 7.7.6, Table 3) for those species in the Estuary and Gulf of St. Lawrence region. Paragraph 7.7.6.5 requires that the Risk-Based Framework (RBF) should be used to evaluate scoring elements that are data-deficient. The secondary species identified for all the UoCs should therefore be scored using the RBF. However, PF4.1.4 states that "The team may elect to conduct a PSA on "main" species only when evaluating PI 2.1.1 or 2.2.1", and this is the approach taken in this assessment as all secondary species caught in all UoCs were designated as minor secondary species. PF 5.3.2 is therefore applied and the scores for this SI are capped at 80.		
References		https://mscportal.force.com/interpret/s/article/P2-species-outcome-PIs-scoring-when-no-main-or-no-minor-or-both-PI-2-1-1-1527262009344 DFO. 2017a. Assessment of the Quebec North Shore (Division 4S) herring stocks in 2016. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2017/027. https://waves-vagues.dfo-mpo.gc.ca/Library/4061492x.pdf DFO, 2018c. Assessment of Northern Shrimp stocks in the Estuary and Gulf of St. Lawrence in 2017. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2018/015. DFO. 2018j. Assessment of the Estuary and Gulf of St. Lawrence (Divisions 4RST) Capelin Stock in 2017. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2018/037. https://waves-vagues.dfo-mpo.gc.ca/Library/40726228.pdf		

OVERALL PERFORMANCE INDICATOR SCORE:	**UoC 1 – SFA 8 (Esquiman)** **Capelin 80**	**80**
	UoC 2 – SFA 9 (Anticosti) **Capelin 80**	**80**

	4S herring 80 White barracudina 80 Pink glass shrimp 80	
	UoC 3 – SFA 10 (Sept Iles) Capelin 80 4S herring 80 White barracudina 80 Other shrimp-like species 80	**80**
	UoC 4 – SFA 12 (Estuary) Capelin 80 White barracudina 80	**80**
CONDITION NUMBER (if relevant):	**UoC 1 – SFA 8 (Esquiman)**	**N/A**
	UoC 2 – SFA 9 (Anticosti)	**N/A**
	UoC 3 – SFA 10 (Sept Iles)	**N/A**
	UoC 4 – SFA 12 (Estuary)	**N/A**

PI 2.2.2 – Secondary species management strategy

PI 2.2.2		There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch.		
Scoring Issue		SG 60	SG 80	SG 100
a	**Management strategy in place**			
	Guide post	There are **measures** in place, if necessary, which are expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be within biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a **partial strategy** in place, if necessary, for the UoA that is expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be within biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a **strategy** in place for the UoA for managing main and minor secondary species.
	Met?	**Y (All UoCs – all elements)**	**Y (All UoCs – all elements)**	**Y (All UoCs – all elements)**
	Justification	All UoCs There are no main secondary species for the fishery in all UoCs, so there is no requirement for measures or a partial strategy to maintain stocks of main secondary species at levels highly likely to be above the PRI. SG 60 and SG 80 are met by default. There is an overall strategy for the UoA for managing all the minor secondary species caught in the 4 UoCs – capelin, 4S herring, white barracudina, pink glass shrimp and other shrimp-like species. There is a DFO-wide policy on managing bycatch, and the Integrated Fisheries Management Plan (IFMP) for the Estuary and Gulf of St. Lawrence shrimp fishery set outs the strategies and tactics for minimising any impact on bycatch species. There is limited entry of vessels in the fishery, an annual TAC, a minimum mesh size and the use of a Nordmore separator grid in the trawl has been mandatory since 1993. The use of a second net (or pouch) over the sorting grate to retain large fish streamed out by the grate is prohibited during the fishing season. The IFMP includes a protocol for closing 10-min longitude by 10-min latitude grid squares when bycatch exceeds a specified level. Fishermen use 30cm toggle chains to keep nets off the bottom which reduces the catch of demersal and benthic species, and will actively try to avoid areas with high bycatch rates as there is no commercial value for bycatch species and high bycatches require increased time sorting catches. All these measures constitute a strategy for minimising the impact of the fishery on all primary species, and as individuals of all non-target species caught in the trawl may be released back to sea immediately, fishing practice is focussed on minimising any bycatch. The SG 100 is met for all elements (secondary species) in all UoCs.		
b	Management strategy evaluation			
	Guide post	The measures are considered **likely** to work, based on plausible argument (e.g. general experience, theory or	There is **some objective basis for confidence** that the measures/partial strategy will work, based on some information directly	**Testing** supports **high confidence** that the partial strategy/strategy will work, based on information directly about the UoA and/or species involved.

		comparison with similar UoAs/species).	about the UoA and/or species involved.	
	Met?	**Y (All UoCs – all elements)**	**Y (All UoCs – all elements)**	**Y (All UoCs – all elements)**
	Justification	The key element of the strategy for minimising bycatch in the trawl fishery is the use of the Nordmore sorting grate (or grid) which has been mandatory in the Estuary and Gulf of St. Lawrence shrimp fishery since 1993, and there is evidence that such sorting or separator grids are highly effective in reducing bycatches in fisheries for *Pandalus borealis* (e.g. Richards & Hendrickson, 2006; Isaksen & Solvdal, 1997). The use of a second net (or pouch) over the sorting grate is prohibited during the fishing season ensuring that no large fish are retained. The mandatory use of a separator grid, a minimum mesh size, toggle chains to keep nets off the bottom and a protocol for closing areas in which bycatch rates are high, provide objective confidence that bycatch rates in the shrimp trawl fishery will be low, and that the restrictions on fishing effort and an annual TAC should result in low overall bycatches in the trawl fishery. Observer sampling shows that bycatch (primary and secondary) species constitute less than 5% of the total catch in all four UoCs, and total catches estimated per species in these bycatches represent less than 1% of the estimate of their respective biomass in the DFO survey. There is information directly from the fishery that there is high confidence that the strategy for managing the impact of the UoA on secondary species is working. SG 60, 80 and 100 are met for all elements (secondary species) in all UoCs.		
c	Management strategy implementation			
	Guide post		There is **some evidence** that the measures/partial strategy is being **implemented successfully**.	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a).
	Met?		**Y (All UoCs – all elements)**	**<u>UoC 1</u>** **Capelin Y** **<u>UoC 2</u>** **Capelin Y** **4S herring N** **White barracudina N** **Pink glass shrimp Y** **<u>UoC 3</u>** **Capelin Y** **4S herring N** **White barracudina N** **Other shrimp-like spp. Y** **<u>UoC 4</u>** **Capelin Y** **White barracudina N**
	Justification	All elements of the strategy for minimising bycatch have been implemented successfully. Monitoring and enforcement activities demonstrate that the separator grid is used on all vessels, fishing effort is limited and TACs are not exceeded in any of the UoCs. Data from the observer programme demonstrate that bycatch rates of secondary species are very low in all UoCs. The SG 80 is met for all elements.		

		UoC 1 For capelin, the strategy appears to be achieving its overall objective as stocks are highly likely to be above biologically based limits. The SG 100 is met for capelin stocks. UoC 2 As for UoC 1, the SG100 is met for capelin. For 4S herring there has been no significant recruitment since 2005. It cannot be concluded therefore that the strategy is achieving its overall objective as the 4S herring stock is not likely to be above biologically based limits. The SG100 is not met. For white barracudina, it cannot be concluded that the strategy is achieving its overall objective because there is no information on white barracudina stock status, and therefore it is not possible to conclude that the stock is above biologically based limits or that the UoA is not having some measurable impact on the stock. The SG 100 is not met. For pink glass shrimp the strategy is achieving its overall objective because the annual bycatch of pink glass shrimp is low in UoC 2 and the species is widely distributed across the whole Gulf of St. Lawrence. The SG 100 is met. UoC 3 As described above, the SG 100 is met for capelin but SG100 is not met for 4S herring and white barracudina. For other shrimp-like species, the strategy is achieving its objective because the total catch of all other shrimp species is only 3 tonnes and so the UoC is not impacting on those shrimp stocks or hindering their recovery. The SG100 is met. UoC 4 As described above, the SG 100 is met for capelin but SG100 is not met for white barracudina.		
d	Shark finning			
	Guide post	It is **likely** that shark finning is not taking place.	It is **highly likely** that shark finning is not taking place.	There is a **high degree of certainty** that shark finning is not taking place.
	Met?	**Not relevant (All UoCs)**	**Not relevant (All UoCs)**	**Not relevant (All UoCs)**
	Justification	No sharks are caught in the fishery in all UoCs, so this scoring issue is not scored.		
e	Review of alternative measures to minimise mortality of unwanted catch			
	Justification	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of **unwanted** catch of main secondary species.	There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of **unwanted** catch of main secondary species and they are implemented as appropriate.	There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of **unwanted** catch of all secondary species, and they are implemented, as appropriate.
	Met?	**Y (All UoCs – all elements)**	**Y (All UoCs – all elements)**	**N (All UoCs – all elements)**
	Guide post	There are no main secondary species to consider, therefore SG 60 and 80 are met by default. Non-target species are not retained in the Estuary and Gulf of St. Lawrence shrimp fishery and therefore all bycatch can be considered to be unwanted catch. The IFMP for the shrimp fishery is regularly reviewed, and elements of the harvest strategy are reviewed by DFO on an annual basis in consultation with stakeholders at EGSAC. For example, on-board mechanical devices to separate bycatch have recently been trialled and have been		

		demonstrated to reduce the time required to sort the bycatch, and to produce cleaner and better quality landings, and are therefore likely to reduce mortality of unwanted bycatch. Whilst such studies on bycatch are carried out and reviewed regularly, the assessment team found no evidence that a biennial review of measures to minimize the catch of all minor secondary species is carried out biennially. SG 100 is not met.
References		https://mscportal.force.com/interpret/s/article/P2-species-outcome-PIs-scoring-when-no-main-or-no-minor-or-both-PI-2-1-1-1527262009344 DFO. 2017a. Assessment of the Quebec North Shore (Division 4S) herring stocks in 2016. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2017/027. https://waves-vagues.dfo-mpo.gc.ca/Library/4061492x.pdf DFO, 2018c. Assessment of Northern Shrimp stocks in the Estuary and Gulf of St. Lawrence in 2017. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2018/015. DFO. 2018j. Assessment of the Estuary and Gulf of St. Lawrence (Divisions 4RST) Capelin Stock in 2017. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2018/037. https://waves-vagues.dfo-mpo.gc.ca/Library/40726228.pdf Isaksen, B. and Solvdal, A.V. 1997. Selection and survival in the Norwegian shrimp trawl fisheries. Proceedings of the 7th Russian/Norwegian Symposium: Gear Selection and Sampling Gears. Murmansk, 23-24 June 1997. Richards, A. and Hendrickson, L. 2006. Effectiveness of the Nordmore grate in the Gulf of Maine northern shrimp fishery. Fisheries Research 81(1): 100-106.	
OVERALL PERFORMANCE INDICATOR SCORE:	**UoC 1 – SFA 8 (Esquiman)** **Capelin 95**	**95**
	UoC 2 – SFA 9 (Anticosti) **Capelin 95** **4S herring 90** **White barracudina 90** **White glass shrimp 95**	**90**
	UoC 3 – SFA 10 (Sept Iles) **Capelin 95** **4S herring 90** **White barracudina 90** **Other shrimp-like species 95**	**90**
	UoC 4 – SFA 12 (Estuary) **Capelin 95** **White barracudina 90**	**90**
CONDITION NUMBER (if relevant):	**UoC 1 – SFA 8 (Esquiman)**	**N/A**
	UoC 2 – SFA 9 (Anticosti)	**N/A**
	UoC 3 – SFA 10 (Sept Iles)	**N/A**
	UoC 4 – SFA 12 (Estuary)	**N/A**

PI 2.2.3 – Secondary species information

PI 2.2.3		**Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species.**		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts on main secondary species			
	Guide post	Qualitative information is **adequate to estimate** the impact of the UoA on the main secondary species with respect to status. OR **If RBF is used to score PI 2.2.1 for the UoA:** Qualitative information is adequate to estimate productivity and susceptibility attributes for main secondary species.	Some quantitative information is available and **adequate to assess** the impact of the UoA on main secondary species with respect to status. OR **If RBF is used to score PI 2.2.1 for the UoA:** Some quantitative information is adequate to assess productivity and susceptibility attributes for main secondary species.	Quantitative information is available and **adequate to assess with a high degree of certainty** the impact of the UoA on main secondary species with respect to status.
	Met?	**N/A (All UoCs)**	**N/A (All UoCs)**	**N/A (All UoCs)**
	Justification	All UoCs There are no main secondary species for the fishery in all UoCs, so this scoring issue is not scored.		
b	**Information adequacy for assessment of impacts on minor secondary species**			
	Guide post			Some quantitative information is adequate to estimate the impact of the UoA on minor secondary species with respect to status.
	Met?			**UoC 1** **Capelin Y** **UoC 2** **Capelin Y** **4S herring Y** **White barracudina N** **Pink glass shrimp Y** **UoC 3** **Capelin Y** **4S herring Y** **White barracudina N** **Other shrimp-like spp. Y** **UoC 4**

				Capelin Y **White barracudina N**
	Justification	There is quantitative information from the observer programme on the total annual bycatch of all minor secondary species caught in each of the four UoCs. The target for observer coverage is 5% distributed among the various shrimp fishing areas (SFAs). DFO Science provided the assessment team with information on the percentage observer coverage - calculated as (number of fishing hours covered by the at-sea observer / total number of fishing hours) x 100 for each UoC for each year since 2000. The average observer coverage from 2013 to 2017 was 4.0% in Esquiman (SFA 8, UoC 1), 5.1% in Anticosti (SFA 9, UoC 2), 5.5% in Sept-Iles (SFA 10, UoC 3) and 4.4% in Estuary (SFA 12, UoC 4). A study of the representativeness of observer coverage in several Gulf of St. Lawrence fisheries concluded that observer coverage in the shrimp fishery was essentially randomly distributed in the fishery and therefore representative of the overall fishery. There is good information on landings of some secondary species in the Gulf of St. Lawrence and estimated annual bycatches in the shrimp fishery equate to significantly less than 1% of the total landings for minor secondary species for which good landings data are available. <u>UoC 1</u> For capelin, there is adequate information available from the observer programme and from landings data to conclude that the shrimp fishery has negligible impact on stock status of capelin. SG 100 is met. <u>UoC 2</u> For capelin there is adequate information available from the observer programme and from landings data to conclude that the shrimp fishery has negligible impact on stock status of capelin. SG 100 is met for capelin. For 4S herring, estimated annual bycatch in UoC 2 is 21 tonnes and the total landings of herring from the 4S stock was 4,000 tonnes in 2016 which provides sufficient quantitative information to estimate the impact of the UoA on herring stock status. The SG100 is met. For white barracudina, there is not sufficient information on stocks in the Gulf of St. Lawrence to conclude whether or not the shrimp fishery has any impact on stock status, so SG100 is not met for white barracudina. For pink glass shrimp, there is adequate information available from the observer programme and on its distribution and abundance in the Gulf of St. Lawrence to conclude that the shrimp fishery has negligible impact on stock status of pink glass shrimp. SG 100 is met. <u>UoC 3</u> As described above, capelin and 4S herring meet the SG 100, but white barracudina does not meet the SG 100. For other shrimp-like species, the very low total catch rate of all other shrimp species is sufficient to conclude that the *Pandalus borealis* fishery has negligible impact on the stocks of these other shrimp species. The SG100 is met. <u>UoC 4</u> As described above, capelin and 4S herring meet the SG 100, but white barracudina does not meet the SG 100.		
c	Information adequacy for management strategy			
	Guide post	Information is adequate to support **measures** to manage **main** secondary species.	Information is adequate to support a **partial strategy** to manage **main** secondary species.	Information is adequate to support a **strategy** to manage **all** secondary species, and **evaluate** with a **high degree of certainty** whether the strategy is **achieving its objective**.
	Met?	**Y (All UoCs)**	**Y (All UoCs)**	**<u>UoC 1</u>** **Capelin Y**

				<u>UoC 2</u> **Capelin Y** **4S herring Y** **White barracudina N** **Pink glass shrimp Y** **<u>UoC 3</u>** **Capelin Y** **4S herring Y** **White barracudina N** **Other shrimp-like spp. Y** **<u>UoC 4</u>** **Capelin Y** **White barracudina N**
	Justification	There are no main secondary species in the fishery in all UoCs, so the SG 60 and SG80 are met by default. There is good information collected from the observer programme over many years of the estimated annual bycatch of all secondary species in all UoCs. There is good information on landings of some secondary species in the Gulf of St. Lawrence and estimated annual bycatches in the shrimp fishery equate to significantly less than 1% of the total landings for minor secondary species for which good landings data are available. There are empirical data on the efficiency of the separator grid in *Pandalus borealis* fisheries, and accurate monitoring of landings that ensure that the TAC is not exceeded. <u>UoC 1</u> For capelin, there is good information on bycatches in the shrimp fishery, accurate landings data and regular assessments of stock status which provide adequate information to support the strategy and to evaluate with a high degree of certainty that bycatches of capelin are not impacting on the stocks and therefore confirming that the strategy is achieving its objective. The SG 100 is met. <u>UoC 2</u> For both capelin and 4S herring, there is good information on bycatches in the shrimp fishery, accurate landings data and regular assessments of stock status which provide adequate information to support the strategy and to evaluate with a high degree of certainty that bycatches of capelin and herring are not impacting on the stocks and therefore confirming that the strategy is achieving its objective. The SG 100 is met. For white barracudina there is not sufficient information on stock status to evaluate with a high degree of certainty whether the strategy is achieving its objective. The SG100 is not met. For pink glass shrimp, there is good information on bycatches in the shrimp fishery and sufficient information on distribution of the species across the Gulf of St. Lawrence to evaluate with a high degree of certainty that bycatches of pink glass shrimp are not impacting on the stocks and therefore confirming that the strategy is achieving its objective. The SG 100 is met. <u>UoC 3</u> As described above, capelin and 4S herring meet the SG 100, but white barracudina does not meet the SG100. The estimated bycatch of all other shrimp species is 3 tonnes and therefore this very low bycatch level of all species combined is sufficient information to support the strategy and evaluate with a high degree of certainty that bycatches of other shrimp species are not impacting on the stocks and therefore confirming that the strategy is achieving its objective. The SG 100 is met.		

		UoC 4 As described above, capelin and 4S herring meet the SG100, but white barracudina does not meet the SG100.
References		Benoît, H. P. and Allard, J. 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 Bourdages, H., and Marquis, M.C. 2019. Assessment of northern shrimp stocks in the Estuary and Gulf of St. Lawrence in 2017: commercial fishery data. DFO Can. Sci. Advis. Sec. Res. Doc. 2018/056. iv + 99 p. DFO. 2017a. Assessment of the Quebec North Shore (Division 4S) herring stocks in 2016. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2017/027. https://waves-vagues.dfo-mpo.gc.ca/Library/4061492x.pdf DFO, 2018c. Assessment of Northern Shrimp stocks in the Estuary and Gulf of St. Lawrence in 2017. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2018/015. DFO. 2018j. Assessment of the Estuary and Gulf of St. Lawrence (Divisions 4RST) Capelin Stock in 2017. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2018/037. https://waves-vagues.dfo-mpo.gc.ca/Library/40726228.pdf Isaksen, B. and Solvdal, A.V. 1997. Selection and survival in the Norwegian shrimp trawl fisheries. Proceedings of the 7th Russian/Norwegian Symposium: Gear Selection and Sampling Gears. Murmansk, 23-24 June 1997. Richards, A. and Hendrickson, L. 2006. Effectiveness of the Nordmore grate in the Gulf of Maine northern shrimp fishery. Fisheries Research 81(1): 100-106.
OVERALL PERFORMANCE INDICATOR SCORE:	**UoC 1 – SFA 8 (Esquiman)** **Capelin 100**	**100**
	UoC 2 – SFA 9 (Anticosti) **Capelin 100** **4S herring 100** **White barracudina 80** **Pink glass shrimp 100**	**95**
	UoC 3 – SFA 10 (Sept Iles) **Capelin 100** **4S herring 100** **White barracudina 80** **Pink glass shrimp 100**	**95**
	UoC 4 – SFA 12 (Estuary) **Capelin 100** **White barracudina 80**	**90**
CONDITION NUMBER (if relevant):	**UoC 1 – SFA 8 (Esquiman)**	**N/A**
	UoC 2 – SFA 9 (Anticosti)	**N/A**
	UoC 3 – SFA 10 (Sept Iles)	**N/A**
	UoC 4 – SFA 12 (Estuary)	**N/A**

PI 2.3.1		**The UoA meets national and international requirements for the protection of ETP species** **The UoA does not hinder recovery of ETP species**		
Scoring Issue		SG 60	SG 80	SG 100
a	Effects of the UoA on population/stock within national or international limits, where applicable			
	Guide post	Where national and/or international requirements set limits for ETP species, the effects of the UoA on the population/stock are known and **likely** to be within these limits.	Where national and/or international requirements set limits for ETP species, the **combined effects of the MSC UoAs** on the population/stock are known and **highly likely** to be within these limits.	Where national and/or international requirements set limits for ETP species, there is a **high degree of certainty** that the **combined effects of the MSC UoAs** are within these limits.
	Met?	**Not relevant (All UoCs – all elements)**	**Not relevant (All UoCs – all elements)**	**Not relevant (All UoCs – all elements)**
	Justification	All UoCs There are 7 ETP species designated under SARA and Appendix 1 of CITES that could be present in the Estuary and Gulf of St. Lawrence and could therefore potentially be caught in the trawl fishery for shrimps – northern wolffish, spotted wolffish, leatherback turtle, blue whale, North Atlantic right whale (NARW), fin whale, beluga whale and great white shark. Of these species, there are occasional captures of northern and spotted wolffish, but there are no recorded interactions between leatherback turtle, any whale species or great white shark with the trawl fishery for shrimps. There are no national or international limits set for wolffish. The only species for which there may be national or international limits in the Gulf of St. Lawrence is NARW. There is a formal recovery plan implemented for NARW, the objectives of which could be interpreted as signifying that the Canadian national limit for the rebuilding of the NARW population is a zero-take. However, Objective 2 of the Recovery Strategy for NARW (Brown *et al*., 2009) is to, “Reduce [i.e., not ‘prevent’] mortality and injury as a result of fishing gear interactions (entanglement and entrapment)”, suggesting that there is no formally agreed Canadian national limit. This is relevant because in 2017 an aggregation of over 100 individual NARW was present in the Southern Gulf of St. Lawrence and an unprecedented mortality event occurred during which 18 NARW were reported to have been found dead. Another MSC UoA, the Southern Gulf of St. Lawrence snow crab fishery was implicated in a number of the fatal and non-fatal entanglements, and the snow crab fishery has since been suspended from MSC certification. Furthermore, despite the direct mortalities caused by the fishery it has continued to operate, albeit within a much more restrictive management regime, suggesting that the “zero-take” limit provides an analysis of risk rather than a nationally set limit. There are no recorded interactions of NARW with the shrimp trawl fishery or indeed any trawl fisheries in the Gulf of St. Lawrence and the geographical distribution of the shrimp fishery does not overlap with NARW sightings. MSC certification reports for other fisheries in the region have considered the impact of the Southern Gulf of St. Lawrence snow crab fishery in relation to this PI, but they are all static gear (trap) fisheries which could potentially cause entanglements of NARW. A recent study investigating methods for minimising		

		potential mortalities of NARW through interactions with fishing gear did not even consider trawl fisheries (Brillant *et al*., 2017). Given the following reasons: ○ there are no records of any interactions of the Gulf of St. Lawrence shrimp trawl fishery with NARW; ○ the shrimp fishery does not overlap with the NARW sightings and mortalities in the Southern Gulf of St. Lawrence; ○ there is some doubt over whether there are any formal national limits for NARW; and, ○ the only ETP species in the Gulf that are caught in the shrimp trawl fishery do not have any national or international limits, the assessment team concluded that there is no requirement to score this PI and the scoring for component 2.3 on ETP species will therefore be restricted to interactions with the two wolffish species.		
b	Direct effects			
	Guide post	Known direct effects of the UoA are likely to not **hinder recovery** of ETP species.	Known direct effects of the UoA are **highly likely** to not **hinder recovery** of ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP species.
	Met?	**Y (All UoCs – all elements)**	**Y (All UoCs – all elements)**	**Y (All UoCs – all elements)**
	Justification	All UoCs The observer data for 2013 to 2017 show that there was a record of Northern wolffish caught in 2017 in the Sept-Iles area (SFA 10 / UoC 3), but not in any of the previous years, and there were no records of Northern wolffish caught in the other three SFAs/UoCs from 2013-2017. There were also records of spotted wolffish caught in the Esquiman area (SFA 8 / UoC 1) in 2016 and in the Anticosti area (SFA 9 / UoC 2) in 2015, but not in any of the other years between 2013 and 2017. There were no records of spotted wolffish caught in Sept-Iles (UoC 3) or Estuary (UoC 4) from 2013-2017. From these observer programme data, the assessment team concluded that there is potential for both Northern and spotted wolffish to be captured in any of the UoCs, and therefore the scoring of this PI relates to all UoCs. Wolffish are often released live and studies show that survival rates are high. There is a recovery plan in place for wolffish species and all species have shown signs of stock recovery in the last decade with increases in relative abundance and distribution in most areas surveyed. There is a high degree of confidence therefore that there are no direct effects of the UoA on wolffish populations. The SG 60, 80 and 100 are met for both Northern and spotted wolffish.		
c	Indirect effects			
	Guide post		Indirect effects have been considered and are thought to be **highly likely** to not create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the fishery on ETP species.
	Met?		**Y (All UoCs – all elements)**	**Y (All UoCs – all elements)**

	Justification	All UoCs Indirect effects of the shrimp fishery are likely to be related to disturbances or alterations of the seabed by fishing gear or to biomass removal by the fishery, affecting prey availability for ETP species. Wolffishes tend to prefer rocky ground which is avoided by shrimp trawls, and the rare recording of both Northern and spotted wolffish in the observer programme in the 4 UoCs, suggests that the shrimp trawl fishery does not overlap with the main habitat of northern and spotted wolffish. There is a high degree of confidence therefore that there are no significant detrimental indirect effects of the shrimp fishery on Northern and spotted wolffish. The SG 80 and 100 are met for both elements.
References		Bourdages, H., and Marquis, M.C. 2019. Assessment of northern shrimp stocks in the Estuary and Gulf of St. Lawrence in 2017: commercial fishery data. DFO Can. Sci. Advis. Sec. Res. Doc. 2018/056. iv + 99 p. Brillant, S.W., Wimmer, T., Rangeley, R.W. and Taggart, C.T., 2017. A timely opportunity to protect North Atlantic right whales in Canada. Mar. Policy. 81:160-166. Brown, M.W., Fenton, D., Smedbol, K., Merriman, C., Robichaud-Leblanc, K., and Conway, J.D. 2009. Recovery Strategy for the North Atlantic Right Whale (*Eubalaena glacialis*) in Atlantic Canadian Waters [Final]. Species at Risk Act Recovery Strategy Series. Fisheries and Oceans Canada. vi + 66p. DFO. 2013b. Report on the Progress of Implementation of the Recovery Strategy for Northern Wolffish (*Anarhichas denticulatus*) and Spotted Wolffish (*Anarhichas minor*), and Management Plan for Atlantic Wolffish (*Anarhichas lupus*) in Canada for the Period 2008-2013. Species at Risk Act Recovery Strategy Report Series. Fisheries and Oceans Canada, Ottawa. vi + 16 pp. Grant, S.M., W. Hiscock, and P. Brett. 2005. Mitigation of capture and survival of wolfish captured incidentally in the Grand Bank yellowtail flounder otter trawl fishery. Centre for Sustainable Aquatic Resources, Marine Institute of Memorial University of Newfoundland, Canada. P-136, xii + 68 p. Kulka, D., C. Hood and J. Huntington. 2007. Recovery Strategy for Northern Wolffish (*Anarhichas denticulatus*) and Spotted Wolffish (*Anarhichas minor*), and Management Plan for Atlantic Wolffish (*Anarhichas lupus*) in Canada. Fisheries and Oceans Canada: Newfoundland and Labrador Region. St. John's, NL. x + 103 pp.

OVERALL PERFORMANCE INDICATOR SCORE:	**UoC 1 – SFA 8 (Esquiman)** **Northern wolffish 100** **Spotted wolffish 100**	**100**
	UoC 2 – SFA 9 (Anticosti) **Northern wolffish 100** **Spotted wolffish 100**	**100**
	UoC 3 – SFA 10 (Sept Iles) **Northern wolffish 100** **Spotted wolffish 100**	**100**
	UoC 4 – SFA 12 (Estuary) **Northern wolffish 100** **Spotted wolffish 100**	**100**

CONDITION NUMBER (if relevant):	**UoC 1 – SFA 8 (Esquiman)**	**N/A**
	UoC 2 – SFA 9 (Anticosti)	**N/A**
	UoC 3 – SFA 10 (Sept Iles)	**N/A**
	UoC 4 – SFA 12 (Estuary)	**N/A**

PI 2.3.2 – ETP species management strategy

PI 2.3.2		**The UoA has in place precautionary management strategies designed to:** • **meet national and international requirements;** • **ensure the UoA does not hinder recovery of ETP species.** **Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species.**		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place (national and international requirements)			
	Guide post	There are **measures** in place that minimise the UoA-related mortality of ETP species, and are expected to be **highly likely to achieve** national and international requirements for the protection of ETP species.	There is a **strategy** in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to be **highly likely to achieve** national and international requirements for the protection of ETP species.	There is a **comprehensive strategy** in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to **achieve above** national and international requirements for the protection of ETP species.
	Met?	**Not relevant (All UoCs – all elements)**	**Not relevant (All UoCs – all elements)**	**Not relevant (All UoCs – all elements)**
	Justification	All UoCs There are no national or international limits set for wolffish, and therefore this SI is not scored.		
b	Management strategy in place (alternative)			
	Guide post	There are **measures** in place that are expected to ensure the UoA does not hinder the recovery of ETP species.	There is a **strategy** in place that is expected to ensure the UoA does not hinder the recovery of ETP species.	There is a **comprehensive strategy** in place for managing ETP species, to ensure the UoA does not hinder the recovery of ETP species
	Met?	**Y (All UoCs – all elements)**	**Y (All UoCs – all elements)**	**Y (All UoCs – all elements)**
	Justification	All UoCs Recovery strategies and action plans are in place for all ETP species in Canadian waters that are listed within the SARA database. For the Northern and spotted wolffish, this mandates fishing vessels to carry out restricted commercial fishing activities that may incidentally kill, harm, harass, or capture the northern and spotted wolffish, including post-capture release strategies to maximise survival, training in identifying ETP species and recording of captures in SARA log books. The SG100 is met for both Northern and spotted wolffish.		
c	Management strategy evaluation			
	Guide post	The measures are **considered likely** to work,	There is an **objective basis for confidence** that the	The strategy / comprehensive strategy is

		based on **plausible argument** (e.g., general experience, theory or comparison with similar fisheries/species).	measures / strategy will work, based on **information** directly about the fishery and/or the species involved.	mainly based on information directly about the fishery and/or species involved, and a **quantitative analysis** supports **high confidence** that the strategy will work.
	Met?	**Y (All UoCs – all elements)**	**Y (All UoCs – all elements)**	**Y (All UoCs – all elements)**
	Justification	All UoCs For Northern and spotted wolffish the strategy is based upon information directly from the fishery, where training has been given in identification of ETP species, recording in SARA log books is mandatory and post-capture release protocols have been introduced. Empirical evidence suggests that the survival rate of released wolffish is high, and Northern and spotted wolffish species have shown signs of stock recovery in the last decade with increases in relative abundance and distribution in most areas surveyed. The SG 60, 80 and 100 are met for both Northern and spotted wolffish.		
d	Management strategy implementation			
	Guide post		There is some **evidence** that the measures / strategy is being implemented successfully.	There is **clear evidence** that the strategy / comprehensive strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) or (b).
	Met?		**Y (All UoCs – all elements)**	**N (All UoCs – all elements)**
	Justification	All UoCs For Northern and spotted wolffish there is some evidence that the strategy is being implemented successfully as the shrimp trawl fishery does not overlap the rocky ground favoured by wolffish thereby minimising interactions, fishing effort is tightly controlled under the shrimp IFMP, skippers have been given formal training in identification of ETP species, mandatory recording of interactions with wolffish in SARA log books are made by vessels and evidence from vessel skippers and observer programmes demonstrates that post-capture release protocols are being followed with wolffish being successfully released alive. The SG 80 is met for both Northern and spotted wolffish. Interactions with both northern and spotted wolffish are very rare in the shrimp fishery as evidenced from the observer programme data, but it is not clear that there is 100% monitoring of interactions by fishers in the SARA log books. SG 100 is not met for both Northern and spotted wolffish.		
e	Review of alternative measures to minimize mortality of ETP species			
	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species.	There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate.	There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality ETP species, and they are implemented, as appropriate.

	Met?	**Y (All UoCs – all elements)**	**Y (All UoCs – all elements)**	**N (All UoCs – all elements)**
	Justification	All UoCs For both Northern and spotted wolffish, there are no directed fisheries, and essentially all bycatches in the shrimp fishery are unwanted mortalities. A recovery strategy for wolffish was published on the SARA registry in 2008 and a progress report covering the years 2007 to 2012 was published by DFO (2013). Progress included the identification of critical habitat for wolffish and there is regular review of the SARA log books to determine the proportion of post-capture released wolffish that survive. The Estuary and Gulf of St. Lawrence IFMP states that recording of captures of ETP species in both the survey and commercial gear will be monitored regularly. Any changes in the pattern of captures will be addressed through the regular reviews of the IFMP that are undertaken in conjunction with the EGSAC. The SG 60 is met as there are reviews and 80 is met as there are regular reviews of measures to minimise mortality, but the reviews are not biennial, so the SG 100 is not met.		
References		Bourdages, H., and Marquis, M.C. 2019. Assessment of northern shrimp stocks in the Estuary and Gulf of St. Lawrence in 2017: commercial fishery data. DFO Can. Sci. Advis. Sec. Res. Doc. 2018/056. iv + 99 p. DFO. 2013b. Report on the Progress of Implementation of the Recovery Strategy for Northern Wolffish (*Anarhichas denticulatus*) and Spotted Wolffish (*Anarhichas minor*), and Management Plan for Atlantic Wolffish (*Anarhichas lupus*) in Canada for the Period 2008-2013. Species at Risk Act Recovery Strategy Report Series. Fisheries and Oceans Canada, Ottawa. vi + 16 pp. Grant, S.M., W. Hiscock, and P. Brett. 2005. Mitigation of capture and survival of wolfish captured incidentally in the Grand Bank yellowtail flounder otter trawl fishery. Centre for Sustainable Aquatic Resources, Marine Institute of Memorial University of Newfoundland, Canada. P-136, xii + 68 p. Kulka, D., C. Hood and J. Huntington. 2007. Recovery Strategy for Northern Wolffish (*Anarhichas denticulatus*) and Spotted Wolffish (*Anarhichas minor*), and Management Plan for Atlantic Wolffish (*Anarhichas lupus*) in Canada. Fisheries and Oceans Canada: Newfoundland and Labrador Region. St. John's, NL. x + 103 pp.		
OVERALL PERFORMANCE INDICATOR SCORE:		**UoC 1 – SFA 8 (Esquiman)** **Northern wolffish 90** **Spotted wolffish 90**		**90**
		UoC 2 – SFA 9 (Anticosti) **Northern wolffish 90** **Spotted wolffish 90**		**90**
		UoC 3 – SFA 10 (Sept Iles) **Northern wolffish 90** **Spotted wolffish 90**		**90**
		UoC 4 – SFA 12 (Estuary) **Northern wolffish 90** **Spotted wolffish 90**		**90**

CONDITION NUMBER (if relevant):	**UoC 1 – SFA 8 (Esquiman)**	**N/A**
	UoC 2 – SFA 9 (Anticosti)	**N/A**
	UoC 3 – SFA 10 (Sept Iles)	**N/A**
	UoC 4 – SFA 12 (Estuary)	**N/A**

PI 2.3.3 – ETP species information

PI 2.3.3		**Relevant information is collected to support the management of UoA impacts on ETP species, including:** • **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.**		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts			
	Guide post	Qualitative information is **adequate to estimate** the UoA related mortality on ETP species. OR If RBF is used to score PI 2.3.1 for the UoA: Qualitative information is **adequate to estimate productivity and susceptibility** attributes for ETP species.	Some quantitative information is **adequate to assess** the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species. OR If RBF is used to score PI 2.3.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for ETP species.	Quantitative information is available to assess with a high degree of certainty the **magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status** of ETP species.
	Met?	**Y (All UoCs – all elements)**	**Y (All UoCs – all elements)**	**N (All UoCs – all elements)**
	Justification	All UoCs There is quantitative information available from SARA logbooks, observer reports and survey data on the capture of both Northern and spotted wolffish in the shrimp fishery. There is information on northern and spotted wolffish abundance from demersal longline surveys and multi-species DFO RV trawl surveys. There is sufficient information to assess UoA-related mortality of Northern and spotted wolffish and therefore whether the fishery is a threat to the recovery of populations. The SG 60 and 80 are met for both wolffish species. The level of observer coverage is approximately 5% in the shrimp fishery across the four UoCs, but records of either Northern or spotted wolffish being captured in the shrimp fishery are extremely rare, and therefore raising up observer programme records to the whole fleet introduces a level of uncertainty surrounding the estimate of total catches of wolffish in the shrimp fishery. It is therefore not possible to assess with a high degree of certainty the magnitude of the impacts, mortalities and injuries caused by the shrimp fishery and the consequence for the status of wolffish species. The SG100 is not met for both northern and spotted wolffish.		
b	Information adequacy for management strategy			
	Guide post	Information is adequate to support **measures** to manage the impacts on ETP species.	Information is adequate to measure trends and support a **strategy** to manage impacts on ETP species.	Information is adequate to support a **comprehensive strategy** to manage impacts, minimize mortality and injury of ETP species,

				and evaluate with a **high degree of certainty** whether a strategy is achieving its objectives.
	Met?	**Y (All UoCs – all elements)**	**Y (All UoCs – all elements)**	**N (All UoCs – all elements)**
	Justification	All UoCs Information on capture of Northern and spotted wolffish in the shrimp fishery is collected through SARA log books, an observer programme and annual stock surveys using commercial fishing gear. Information on abundance of Northern and spotted wolffish is available from regular demersal longline surveys and multi-species DFO RV trawl surveys. The information is therefore adequate to measure trends in wolffish captures and support the strategy to manage the impacts of the UoA. The SG 60 and 80 are met for both Northern and spotted wolffish. It is not clear that all information on interactions with northern and spotted wolffish is rigorously recorded on the SARA log books, and there are some uncertainties generated in the raising of observer programme records of wolffish captures to providing estimates of the total catches of wolffish in the shrimp fishery. The SG 100 is not met therefore for Northern and spotted wolffish.		
References		Bourdages, H., and Marquis, M.C. 2019. Assessment of northern shrimp stocks in the Estuary and Gulf of St. Lawrence in 2017: commercial fishery data. DFO Can. Sci. Advis. Sec. Res. Doc. 2018/056. iv + 99 p. DFO. 2013b. Report on the Progress of Implementation of the Recovery Strategy for Northern Wolffish (*Anarhichas denticulatus*) and Spotted Wolffish (*Anarhichas minor*), and Management Plan for Atlantic Wolffish (*Anarhichas lupus*) in Canada for the Period 2008-2013. Species at Risk Act Recovery Strategy Report Series. Fisheries and Oceans Canada, Ottawa. vi + 16 pp. Grant, S.M., W. Hiscock, and P. Brett. 2005. Mitigation of capture and survival of wolfish captured incidentally in the Grand Bank yellowtail flounder otter trawl fishery. Centre for Sustainable Aquatic Resources, Marine Institute of Memorial University of Newfoundland, Canada. P-136, xii + 68 p. Kulka, D., C. Hood and J. Huntington. 2007. Recovery Strategy for Northern Wolffish (*Anarhichas denticulatus*) and Spotted Wolffish (*Anarhichas minor*), and Management Plan for Atlantic Wolffish (*Anarhichas lupus*) in Canada. Fisheries and Oceans Canada: Newfoundland and Labrador Region. St. John's, NL. x + 103 pp.		

OVERALL PERFORMANCE INDICATOR SCORE:	**UoC 1 – SFA 8 (Esquiman)** **Northern wolffish 80** **Spotted wolffish 80**	**80**
	UoC 2 – SFA 9 (Anticosti) **Northern wolffish 80** **Spotted wolffish 80**	**80**
	UoC 3 – SFA 10 (Sept Iles) **Northern wolffish 80** **Spotted wolffish 80**	**80**
	UoC 4 – SFA 12 (Estuary)	**80**

	Northern wolffish 80 **Spotted wolffish 80**	
CONDITION NUMBER (if relevant):	**UoC 1 – SFA 8 (Esquiman)**	**N/A**
	UoC 2 – SFA 9 (Anticosti)	**N/A**
	UoC 3 – SFA 10 (Sept Iles)	**N/A**
	UoC 4 – SFA 12 (Estuary)	**N/A**

PI 2.4.1 – Habitats outcome

PI 2.4.1		The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates.		
Scoring Issue		SG 60	SG 80	SG 100
a	Commonly encountered habitat status			
	Guide post	The UoA is unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	The UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	There is evidence that the UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.
	Met?	**All UoCs – Y**	**All UoCs – Y**	**All UoCs – Y**
	Justification	Based on the requirements of MSC FCR SA3.13.2, the characteristics of the commonly encountered habitats being assessed for the shrimp trawl fishery are described in Table 20 and summarised as: Pelite, sandy pelite / gravelly, sandy pelite found in Channels and their slopes in the Gulf of St. Lawrence at depths between 200 – 300 m. The MSC definitions of required probability are: “unlikely = < 40th percentile”; “highly unlikely = < 30th percentile”; “evidence of highly unlikely = < 20th percentile”. MSC require assessment teams to interpret “serious or irreversible harm” as changes caused by the UoA that would fundamentally alter the capacity of the habitat to maintain its structure and function such that the habitat would be unable to recover at least 80% of its structure and function within 5-20 years if fishing were to cease entirely. No direct studies of shrimp trawl impact on habitats used by shrimp have been conducted in the fishery area, but a number of studies have been undertaken to assimilate information that can be used to identify the effects of shrimp trawling in the Gulf of St. Lawrence. While most of these focus on the potential impact of fishing on species considered to be vulnerable to mobile fishing gears (soft corals and sponges) (DFO, 2012b; Lévesque 2012; Moritz et al., 2015), the impact on habitats is considered to be low to moderate with recovery for soft bottoms, around 5 years (DFO, 2012b; Yesson et al., 2016). Therefore, it is considered that the shrimp trawl fishery is unlikely (SG 60) to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm. Savard (2012) and DFO (2012b), DFO (2015) (as reported in Acoura 2015) have undertaken spatial analysis of the “footprint” of the trawl fishing activity. In the first instance, all the available fishing effort data was analysed from 1982 and it was concluded that, depending on the year, between 4,000 and 8,000 km^2 of seabed contact was made by the shrimp trawl fleets, which is 4-8% of the “shrimp habitat”, which corresponds with the commonly encountered habitat. In 2015, an update of the footprint was undertaken using the most recent surveys and fishing effort information (as reported in Acoura 2015). The results indicate that Northern shrimp stocks in the Estuary and Gulf of St. Lawrence are distributed over more than 95,000 km^2; 95% of the biomass is distributed over less than 45,000 km^2; approximately 6,400 km^2 of seabed is trawled annually; and, 47% of the fishing effort is deployed in an area of 1,850 km^2. This equates to approximately 7% of the shrimp habitat / commonly encountered habitat. This is a conservative figure as there will very likely be overlap of trawl tracks through the fishing season. This leaves large areas un-trawled or in recovery from previous trawling.		

		With approximately 7% of the commonly encountered habitat being affected by the shrimp trawl fishery and the inference from trawl impact studies conducted elsewhere, it is concluded that not only is it highly unlikely (SG 80) there is also evidence that the shrimp trawl fishery is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm, thereby meeting the SG 100.		
b	VME habitat status			
	Guide post	The UoA is unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	The UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	There is evidence that the UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.
	Met?	**All UoCs – Y**	**All UoCs – Y**	**All UoCs – Y**
	Justification	In the case of VMEs, MSC FCR v 2.0 SA3.13.4.1 requires assessment teams to interpret "serious or irreversible harm" as reductions in habitat structure and function below 80% of the unimpacted level. DFO has identified Significant Benthic Areas (SBAs) in the Gulf of St. Lawrence, i.e. areas that contain sponges (Porifera) and/or sea pens (Pennatulacea) as a dominant and defining features (Kenchington et al., 2016) (also see Vulnerable Marine Ecosystems (VMEs) and the UoA in section 7.4.1). These are the equivalent of VMEs (DFO 2017e). The surface areas of these SBAs/VMEs in the Gulf of St. Lawrence bioregion are estimated as being: Sea Pen 15,111 km^2 Sponge 19,090 km^2 A significant proportion of the SBAs have been protected using Conservation Area designations (see Figure 45) while others remain subject to on-going review and consideration of the operational implementation of DFOs Policy on Managing the Impacts of Fishing on Sensitive Benthic Areas (DFO, 2009b) and Coral and Sponge Conservation Strategy for Eastern Canada (DFO, 2015). Therefore, the SG 60 is considered to be met. SBAs/VMEs with concentrations of sponges and sea pen (as identified in Kenchington et al (2016) and DFO (2017c)) likely overlap with the shrimp trawl fishery. While there is no information on the extent of the sponge or sea pen SBA/VME prior to fishing having first started, analysis estimates that 8.4% and 12.7% of the sponge and sea pen SBA/VME within the Gulf of St. Lawrence bioregion overlaps with the shrimp trawl fishery (Koen-Alonso et al, 2018) (see Table 21). Given the overlap of sponge and sea pen SBAs/VMEs is such as to not compromise the 80% of the unimpacted level of the SBAs/VMEs, it is concluded the SG 80 is met and there is evidence that it is highly unlikely, that the shrimp trawl fishery reduces structure and function of the VME habitats to a point where there would be serious or irreversible harm, thereby meeting the SG 100.		
c	**Minor habitat status**			
	Guide post			There is **evidence** that the UoA is highly unlikely to reduce structure and function of the minor habitats to a point where

				there would be serious or irreversible harm.
	Met?			**All UoCs – N**
	Justification	The minor habitats (i.e. not commonly encountered habitats or VME) have not been identified for the shrimp trawl fishery and so the SG 100 has not been met.		
References		Acoura 2015, Second annual surveillance report for the Gulf of St. Lawrence Northern Shrimp Trawl Fishery https://fisheries.msc.org/en/fisheries/gulf-of-st-lawrence-northern-shrimp-trawl-fishery/@@assessments DFO 2009b. Policy to Manage the Impacts of Fishing on Sensitive Benthic Areas http://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/benthi-back-fiche-eng.htm DFO 2012b. 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. http://waves-vagues.dfo-mpo.gc.ca/Library/347471.pdf DFO 2017c. Delineation of Significant Areas of Coldwater Corals and Sponge-Dominated Communities in Canada's Atlantic and Eastern Arctic Marine Waters and their Overlap with Fishing Activity. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2017/007. DFO 2017e, Guidance on the level of protection of significant areas of coldwater corals and sponge dominated communities in Newfoundland and Labrador waters. CSAS, Sci. Res. 2017/030 http://waves-vagues.dfo-mpo.gc.ca/Library/40625722.pdf DFO, 2015. Coral and Sponge Strategy for Eastern Canada. http://www.dfo-mpo.gc.ca/oceans/publications/cs-ce/index-eng.html Kenchington, E., Beazley, L., Lirette, C., Murillo, F.J., Guijarro, J., Wareham, V., Gilkinson, K., Koen Alonso, M., Benoît, H., Bourdages, H., Sainte-Marie, B., Treble, M., and T. Siferd. 2016. Delineation of coral and sponge significant benthic areas in Eastern Canada using kernel density analyses and species distribution models. DFO Can. Sci. Advis. Sec. Res. Doc. 2016/093. vi + 178 p. http://waves-vagues.dfo-mpo.gc.ca/Library/40577806.pdf Koen-Alonso, M. C. Favaro, N. Ollerhead,H. Benoît H. Bourdages, B. Sainte-Marie, M. Treble, K. Hedges; E. Kenchington, C. Lirette, M. King S. Coffen-Smout, and J. Murill, 2018. Analysis of the overlap between fishing effort and Significant Benthic Areas in Canada's Atlantic and Eastern Arctic marine waters. Canadian Science Advisory Secretariat (CSAS) Res. Doc. 2018/015 http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ResDocs-DocRech/2018/2018_016-eng.html Lévesque, M., L. Savard, C. Moritz and P. Archambault. 2012. Assessment of the potential impacts of northern shrimp (Pandalus borealis) trawl fishing on benthic habitats in the Estuary and northern Gulf of St. Lawrence. Can. Sci. Adv. Sec. Res. Doc. 2012/094: ii + 28 pp. http://waves-vagues.dfo-mpo.gc.ca/Library/347269.pdfDFO, 2017e Moritz C. D. Gravel L. Savard C. W. McKindsey J.-C. Brêthes P. Archambault 2015, No more detectable fishing effect on Northern Gulf of St Lawrence benthic invertebrate ICES Journal of Marine Science https://academic.oup.com/icesjms/article/72/8/2457/2459097 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. Can. Sci. Adv. Sec. Res. Doc. 2012/005: ii + 70 pp. http://waves-vagues.dfo-mpo.gc.ca/Library/347091.pdf Yesson C, Fisher J, Gorham T, Turner CJ, Hammeken Arboe N, Blicher ME & Kemp KM (2016) The impact of trawling on the epibenthic megafauna of the West Greenland shelf. ICES Journal of Marine Science. https://doi:10.1093/icesjms/fsw206		

OVERALL PERFORMANCE INDICATOR SCORE:	**UoC 1 – SFA 8 (Esquiman)**	**95**
	UoC 2 – SFA 9 (Anticosti)	**95**
	UoC 3 – SFA 10 (Sept Iles)	**95**
	UoC 4 – SFA 12 (Estuary)	**95**
CONDITION NUMBER (if relevant):	**UoC 1 – SFA 8 (Esquiman)**	**N/A**
	UoC 2 – SFA 9 (Anticosti)	**N/A**
	UoC 3 – SFA 10 (Sept Iles)	**N/A**
	UoC 4 – SFA 12 (Estuary)	**N/A**

PI 2.4.2 – Habitats management strategy

PI 2.4.2		**There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats.**		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are **measures** in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a **partial strategy** in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a **strategy** in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats.
	Met?	**All UoCs - Y**	**All UoCs - N**	**All UoCs - N**
	Justification	The MSC FCR v 2.0, SA3.14.2.3, states that, "*In scoring issue (a) at the SG60 level, "measures" for a UoA that encounters VMEs shall include, at least, the following points:* *a. Requirements to comply with management measures to protect VMEs (e.g., designation of closed areas);* *b. Implementation by the UoA of precautionary measures to avoid encounters with VMEs, based on commonly accepted move-on rules.* MSC guidance with respect to scoring issue (a) at the SG 60 level (GSA3.14.2.3) states that, "*At the SG60 level, commonly accepted move-on rules can be used as "Measures". These may be rules that are used for the same gear in other situations or in other areas of the world but that have not been specifically designed for the UoA's gear and/or encountered VMEs.*" SA3.14.2.2, states that, "*In scoring issue (a) at the SG80 level, the "partial strategy" for a UoA that encounters VMEs shall include, at least, the following points:* *a. Requirements to comply with management measures to protect VMEs (e.g., designation of closed areas).* *b. Implementation by the UoA of precautionary measures to avoid encounters with VMEs, such as scientifically based, gear- and habitat- specific move-on rules or local area closures to avoid potential serious or irreversible harm on VMEs.* MSC guidance with respect to scoring issue (a) at the SG 80 level (GSA3.14.2.2) states that, "*In the absence of a comprehensive management plan that takes all fishing activities into account, MSC UoAs cannot necessarily assume that their impacts, while unlikely to cause serious and irreversible harm on their own (and therefore potentially meeting the SG80 level under the outcome PI 2.4.1), will not contribute to a cumulative impact that is serious and irreversible to VMEs.* *Therefore, the MSC will expect these MSC UoAs to take appropriate action within measures/strategies to avoid impacting VMEs. Given the complexity of undertaking an impact assessment on VMEs, the MSC expects that most UoAs will choose to apply the simpler approach of avoiding VMEs.* *… A common precautionary response to the presence of VMEs is to develop avoidance measures (e.g., move-on rules) with the intention that the UoA is able to avoid any further encounter with VMEs or potential VMEs. This response ensures that serious and irreversible harm is avoided.*" The MSC FCR v 2.0, SA3.14.2.1, states that, "*In scoring issue (a) at the SG100 level, the "strategy" for a UoA that encounters VMEs shall include a comprehensive management plan that is supported by a comprehensive impact assessment that determines that all fishing activities will not cause serious or irreversible harm to VMEs"*		

		MSC guidance with respect to scoring issue (a) at the SG 100 level (GSA3.14.2.1) states that, "*UoAs may qualify for a higher score on this PI if they have a comprehensive management plan that is supported by a comprehensive impact assessment that determines that all fishing activities will not cause serious or irreversible harm to VMEs… Some damage to VMEs is acceptable as long as overall serious or irreversible harm to structure and function is avoided. If a strategy chooses not to afford complete protection to all VMEs in an area, this decision should include an impact assessment to demonstrate that serious or irreversible harm is avoided and that VMEs are not impacted more than 20% of their unimpacted levels."* As part of meeting a previous condition of certification related to this PI and SI, in 2015, the client conducted a preliminary assessment of the potential level of risk to sensitive benthic habitats and species from shrimp trawling. The assessment concluded that the risk level was moderate to high and that the shrimp fishery overlapped with areas where soft corals and sponges are found. As such the client concluded that a "partial strategy[4]" was necessary. The outcome of this work coincided with the development and implementation of DFOs Coral and Sponge Conservation Strategy for Eastern Canada (DFO 2015), the formation of a DFO Québec Region Working Group on fishery impacts on sponge and coral areas and new work on the distribution of corals and sponges (Murillo et al, 2016; Kenchington et al, 2016). Given the overlap between the client's response to the MSC condition of certification and the development of the DFO Coral and Sponge Conservation Strategy and supporting research, the combined work resulted in a habitat partial strategy being adopted by EGSAC and included as an appendix in the updated IFMP (DFO, 2018a). In 2017, following collaboration between DFO Québec, Gulf and the Newfoundland and Labrador regions and extensive consultation with the fishing industry on 20 areas where significant concentrations of soft corals and sponges had been identified (http://www.qc.dfo-mpo.qc.ca/golfe-gulf/coraux-eng.html), 11 coral and sponge conservation areas were established (see Figure 45), resulting in the prohibition of all bottom contacting fishing gear within them. Recent published research (DFO, 2017e, Koen-Alonso et al, 2018) shows that the shrimp trawl fishery overlaps with sponge and sea pen SBAs/VMEs (see Figures 9 and 10) impacting approximately 8.4% and 12.7% of the estimated sponge and sea pen SBA/VME, respectively, within the Gulf of St. Lawrence, bioregion. By comparing the 11 coral and sponge conservation areas in Figure 45 and the overlap of the shrimp trawl fishery in Figure 43 and Figure 44, it appears that the closures do not coincide with where the shrimp trawl fishery generally operates and so the overlap of the trawl fishery with SBAs/VMEs will continue if current fishing patterns remain the same. Therefore, at present, there are no management measures in place to mitigate potential or actual interactions between the shrimp trawl fishery and some sponge and sea pen SBAs/VMEs. As a direct result of the requirements set out in MSC FCR v2.0 to ensure protection and minimal impact of the UoA on VMEs, and, in the absence of DFO management requirements to have scientific or precautionary measures in place to avoid encounters with SBAs/VMEs, the fishery client has developed, with the support of the shrimp harvesters, "Move-on Protocols" (see Habitat Policy and management in the UoA in section 7.4.1 and Appendix 2). These have been based on the NAFO developed and implemented "move-on" rule as set out in Article 22, of the NAFO Conservation and Enforcement Measures "Provisions in case of an encounter with VME indicator species" (NAFO, 2019).

[4] In MSC terms, a "partial strategy" is represents a cohesive arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome and an awareness of the need to change the measures should they cease to be effective. It may not have been designed to manage the impact on that component specifically

		The "Gulf of St. Lawrence Northern Shrimp Trawl Fishery Move-on Protocols" became effective as of August 2019. In summary, they require that if, in 1 tow: 7 Kgs of sea pens; and/or 60 Kgs of other live coral; and/or 300 Kgs of sponges are caught then the vessel should cease fishing and move at least 2 nautical miles from their location before re-commencing fishing. The encounter is also recorded and forwarded to the client representative. As a result, it is concluded that the SG 60 is met as there are measures in place, i.e. closed areas to protect VME and move-on rules, that are expected to achieve the Habitat Outcome 80 level of performance. The SG 80 is not met as the precautionary measures to avoid encounters and potential serious or irreversible harm on VME are not yet scientifically based.		
b	Management strategy evaluation			
	Guide post	The measures are **considered likely** to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/habitats).	There is some **objective basis for confidence** that the measures/partial strategy will work, based on **information directly about the UoA and/or habitats** involved.	**Testing** supports **high confidence** that the partial strategy/strategy will work, based on **information directly about the UoA and/or habitats** involved.
	Met?	**All UoCs - Y**	**All UoCs - N**	**All UoCs - N**
	Justification	The following lists the habitat information that is known or being gathered about the UoA and the actions that are being taken: • Surficial sediments have been identified and mapped; • Geospatial mapping of habitats and fishing effort (Koen-Alonso, 2018) (on-going); • Implementation of DFOs Coral and Sponge Conservation Strategy for Eastern Canada and protected areas network in the Gulf of St Lawrence (Figure 45) (on-going); • The identification and delineation of SBAs (which are considered to be the equivalent of VMEs) (DFO, 2017e) (on-going); and • Work on the development of guidance on the protection of SBAs (e.g. Koen-Alonso et al. 2018, DFO, 2017e) (on-going). The above indicates a step-wise approach toward the development of a partial strategy/strategy designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats. The approach is considered likely to work based on the general experience, to date, with respect to the adherence to no fishing in protected areas and the adoption of similar "move-on rules" in fisheries operating in the NAFO Regulatory Area. As a result, the SG 60 is met. The assessment team recognises that the implementation of the of DFOs Coral and Sponge Conservation Strategy for Eastern Canada (DFO, 2015) and SeBA Policy (DFO, 2009b) is an on-going process and measures to avoid encounters with identified SBAs/VMEs are likely in the future. In the meantime, the new "move-on protocols" have not yet been tested in the fishery, nor developed on a scientific basis and so there is no objective basis for confidence that the measure will work. Therefore the SG 80 is not met.		
c	Management strategy implementation			
	Guide post		There is **some quantitative evidence** that the measures/partial strategy is	There is **clear quantitative evidence** that the partial strategy/strategy is being implemented successfully

			being implemented successfully.	and is achieving its objective, as outlined in scoring issue (a).
	Met?		**All UoCs - N**	**All UoCs - N**
	Justification	The gathering and presentation of information to support the Habitat Management Strategy, i.e. geospatial mapping of habitats and fishing intensity; the designation of Conservation Areas (see Figure 45); and, the on-going work on informing and developing the application of the Policy on Managing the Impacts of Fishing on Sensitive Benthic Areas (DFO, 2009b), e.g. the review and publication on the delineation of SBAs and overlap of fishing with SBAs (Kenchington et al, 2016; Koen Alonso et al, 2018), provides excellent quantitative evidence. However, in the absence of measures or a partial strategy to avoid encounters with VMEs the SG 80 is not met.		
d	**Compliance with management requirements and other MSC UoAs'/non-MSC fisheries' measures to protect VMEs**			
	Guide post	There is **qualitative evidence** that the UoA complies with its management requirements to protect VMEs.	There is **some quantitative evidence** that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.	There is **clear quantitative evidence** that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.
	Met?	**All UoCs - Y**	**All UoCs - N**	**All UoCs - N**
	Justification	The UoAs approach to managing the protection of VMEs has been to identify and establish 11 Coral and Sponge Conservation Areas (See Figure 45) where fishing with bottom contacting gears is prohibited. Monitoring to ensure that no vessels encroach and fish within these areas is facilitated through the requirement for all shrimp trawlers to have operating VMS. The VMS reports the vessel position every 30 minutes. If a vessel is approaching one of these areas C & P will contact the vessel to ensure they move away. C & P will also use aerial surveillance and at-sea patrols to monitor and deter vessels from fishing in these areas (M. Picard pers. comm.). In addition to closed areas to protect VMEs, MSC requirements state that, to achieve a conditional minimum for this PI, "…*precautionary measure to avoid encounters with VMEs, based on commonly accepted move-on rules*", need to be in place.		

7.5 The Gulf of St. Lawrence Northern Shrimp Scotian Trawl Fishery has adopted "move-on protocols" (see DFO Letter of support

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Direction régionale de la gestion des pêches
Région du Québec

Regional Fisheries Management Branch
Quebec Region

Classif. sécurité / Secu

Québec, January 31, 2020

Votre réf. /Your

Notre réf. /Our

M. Derek Butler, Association of Seafood Producers
M. Brian Bezeau, L'Association Coopérative des Pêcheurs de L'Ile Ltée.
M. Jean-Paul Gagné, Association Québécoise de l'Industrie de la Pêche.
M. Fernand Brideau, Produits Belle-Baie Ltée

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

Sirs,

The Department of Fisheries and Oceans (DFO) has taken note of the proposed acti plan that you have prepared in response to the two conditions identified by assessment committee for the MSC re-certification of the Gulf of St. Lawrence shri fishery. DFO applauds the industry's commitment to the sustainability of the Gulf of Lawrence shrimp fishery.

We believe that the proposed action plan meets the requirements expressed by assessment committee in its preliminary report.

With regard to the first condition, we are confident that the implementation of elements identified in your action plan to put in place a strategy that will ensure that shrimp fishery does not pose a risk of serious or irreversible harm to the habitats will complementary to DFO's *Sustainable Fisheries Framework* initiatives, particularly w respect to the application of the *Policy for Managing the Impacts of Fishing on Sensi Benthic Areas* and the implementation of the *Coral & Sponge Conservation Strategy Eastern Canada*.

DFO intends to begin the review of the *Coral & Sponge Conservation Strategy Eastern Canada* in 2020-2021. As well, as part of its integrated management plann process for the Gulf of St. Lawrence shrimp fishery, DFO will update, as appropriate, results of the analysis of the risk posed by the shrimp fishery to cold-water coral sponge-dominated communities. It should be noted that a partial strategy has alre been put in place in the 2017 shrimp fishery to ensure that the risk of serious damag sensitive benthic habitat and communities is minimized and maintained. This strategy

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		Appendix 2 Client submission). While the new “move-on protocols” have not yet been tested, there is some qualitative evidence to show vessels do not fish in protected areas, thereby, complying with management requirements to protect VMEs and, therefore, meeting the SG 60. Quantative evidence that the UoA complies with the new move-on protocols is not yet available, and so the SG 80 is not met. Since multiple fisheries may operate in the same area, the net impact on a given VME will result from the cumulative effects from all fisheries interacting within it. MSC FCR v 2.0 SA3.14.3 requires that the cumulative impact of MSC certified fisheries on VMEs is taken into account at the SG 80 and 100. There are a number of other fisheries operating in the Gulf of St. Lawrence that have been MSC certified or are in assessment – see Table 33. These fisheries may overlap with the shrimp trawl fishery however as this SI has scored below SG 80 the cumulative impacts on VMEs has not been evaluated at this point. If an SG 80 score is considered appropriate in future surveillance audits this aspect of VME scoring will be evaluated.
References		DFO 2009b. Policy to Manage the Impacts of Fishing on Sensitive Benthic Areas http://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/benthi-back-fiche-eng.htm DFO 2017c. Delineation of Significant Areas of Coldwater Corals and Sponge-Dominated Communities in Canada's Atlantic and Eastern Arctic Marine Waters and their Overlap with Fishing Activity. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2017/007. http://www.dfo-mpo.gc.ca/csas-sccs/Publications/SAR-AS/2017/2017_007-eng.html DFO 2017e, Guidance on the level of protection of significant areas of coldwater corals and sponge dominated communities in Newfoundland and Labrador waters. CSAS, Sci. Res. 2017/030 http://waves-vagues.dfo-mpo.gc.ca/Library/40625722.pdf DFO 2018a, Integrated Fishery Management Plan for the Northern Shrimp in the Estuary and Gulf of St. Lawrence (Areas 8, 9, 10 and 12) (*Pandalus borealis)* DFO, 2015. Coral and Sponge Strategy for Eastern Canada. http://www.dfo-mpo.gc.ca/oceans/publications/cs-ce/index-eng.html Kenchington, E., Beazley, L., Lirette, C., Murillo, F.J., Guijarro, J., Wareham, V., Gilkinson, K., Koen Alonso, M., Benoît, H., Bourdages, H., Sainte-Marie, B., Treble, M., and T. Siferd. 2016. Delineation of coral and sponge significant benthic areas in Eastern Canada using kernel density analyses and species distribution models. DFO Can. Sci. Advis. Sec. Res. Doc. 2016/093. vi + 178 p. http://waves-vagues.dfo-mpo.gc.ca/Library/40577806.pdf Koen-Alonso, M. C. Favaro, N. Ollerhead,H. Benoît H. Bourdages, B. Sainte-Marie, M. Treble, K. Hedges; E. Kenchington, C. Lirette, M. King S. Coffen-Smout, and J. Murill, 2018. Analysis of the overlap between fishing effort and Significant Benthic Areas in Canada's Atlantic and Eastern Arctic marine waters. Canadian Science Advisory Secretariat (CSAS) Res. Doc. 2018/015 http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ResDocs-DocRech/2018/2018_016-eng.html Murillo, F.J., Kenchington, E., Beazley, L., Lirette, C., Knudby, A., Guijarro, J., Benoît, H., Bourdages, H., Sainte-Marie, B. 2016. Distribution Modelling of Sea Pens, Sponges, Stalked Tunicates and Soft Corals from Research Vessel Survey Data in the Gulf of St. Lawrence for Use in the Identification of Significant Benthic Areas. Can. Tech. Rep. Fish. Aquat. Sci. 3170: vi + 132 p. http://waves-vagues.dfo-mpo.gc.ca/Library/364125.pdf
	UoC 1 – SFA 8 (Esquiman)	**60**

OVERALL PERFORMANCE INDICATOR SCORE:	**UoC 2 – SFA 9 (Anticosti)**	**60**
	UoC 3 – SFA 10 (Sept Iles)	**60**
	UoC 4 – SFA 12 (Estuary)	**60**
CONDITION NUMBER (if relevant):	**UoC 1 – SFA 8 (Esquiman)**	**1**
	UoC 2 – SFA 9 (Anticosti)	**2**
	UoC 3 – SFA 10 (Sept Iles)	**3**
	UoC 4 – SFA 12 (Estuary)	**4**

PI 2.4.3 – Habitats information

PI 2.4.3		Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat.		
Scoring Issue		SG 60	SG 80	SG 100
a	Information quality			
	Guide post	The types and distribution of the main habitats are **broadly understood**. OR If CSA is used to score PI 2.4.1 for the UoA: Qualitative information is adequate to estimate the types and distribution of the main habitats.	The nature, distribution and **vulnerability** of the main habitats in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA. OR If CSA is used to score PI 2.4.1 for the UoA: Some quantitative information is available and is adequate to estimate the types and distribution of the main habitats.	The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats.
	Met?	**All UoCs - Y**	**All UoCs - Y**	**All UoCs - N**
	Justification	"Commonly encountered" and/or "Vulnerable Marine Ecosystems (VME)", are considered to be "main habitats" (MSC FCR v 2.0 SA3.13.3). The geomorphology and bathymetry of the Gulf of St. Lawrence has been extensively mapped (e.g. Dufour et al., 2010, Loring and Nota, 1973). The commonly encountered habitats for the trawl fishery have been identified by plotting fishing effort, taken from vessel reporting records over bathymetric and surficial sediment layers. This shows that the trawl fishery targets its efforts upon a mixture of pelite, sandy pelite and gravelly, sandy pelite which correspond with deep channels and channel slopes (see Figures 5 and 6). These habitats have been described by Moritz et al., (2012) and are summarised in Table 20. An estimate of the total habitat suitable for fishable concentrations of shrimp was initially undertaken in 2012 (DFO, 2012b) and Savard (2012)) and was updated in 2015 (reported in Acoura, 2015) using the most recent surveys and fishing effort information. The results indicate that Northern shrimp stocks in the Estuary and Gulf of St. Lawrence are distributed over more than 95,000 km^2; 95% of the biomass is distributed over less than 45,000 km^2; approximately 6,400 km^2 of seabed is trawled annually; and, 47% of the fishing effort is deployed in an area of 1,850 km^2. This equates to approximately 7% of the shrimp habitat / commonly encountered habitat. No direct studies of shrimp trawl impact on habitats used by shrimp have been conducted in the fishery area, but a number of studies have been undertaken to assimilate information that can be used to identify the effects of shrimp trawling in the Gulf of St. Lawrence. While most of these focus on the potential impact of fishing on species considered to be vulnerable to mobile fishing gears (soft corals and sponges) (DFO, 2012b; Lévesque 2012; Moritz et al., 2015), the impact on habitats is considered to be low to moderate with recovery for soft bottoms, around 5 years (Yesson et al 2016). Using species distribution models and kernel density estimation based on observations from trawl surveys, video/photographic research surveys, and records from fisheries observer programs, DFO have identified "ecologically and biologically significant cold-		

		water coral or sponge-dominated regional habitats", termed "Significant Benthic Areas (SBAs)" (Kenchington et al. 2016, DFO 2017e). In so doing, these areas have been mapped and delineated. Therefore, the nature, distribution (SG 60) and vulnerability (SG 80) of the main habitats in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA. However, it is not clear that the distribution of all habitat types is known over their range, so SG 100 is not met.		
b	Information adequacy for assessment of impact			
	Guide post	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. OR **If CSA is used to score PI 2.4.1 for the UoA:** Qualitative information is adequate to estimate the consequence and spatial attributes of the main habitats.	Information is adequate to allow for identification of the main impacts of the UoA on the main habitats, and there is reliable information on the spatial extent of interaction and on the timing and location of use of the fishing gear. OR **If CSA is used to score PI 2.4.1 for the UoA:** Some quantitative information is available and is adequate to estimate the consequence and spatial attributes of the main habitats.	The physical impacts of the gear on all habitats have been quantified fully.
	Met?	**All UoCs - Y**	**All UoCs - Y**	**All UoCs - N**
	Justification	The operation of shrimp trawl gear in this fishery has been described in detail with an emphasis on potential impacts on bottom habitats (Grant, 2012). Bottom contact is primarily via the trawl doors and footrope (rigged with rockhopper gear which would roll over bottom fauna); the trawl netting "flies" off bottom. Impacts of trawls on soft bottom habitats (mud and mud-sand) are generally known from studies in the Gulf of St. Lawrence and elsewhere (e.g. Mortitz et al. 2015, Lévesque 2012, DFO, 2012b, Yesson, 2016). Reliable information on spatial and temporal interaction of the gear with bottom habitats is available from logbooks and VMS monitoring. Information on spatial distribution of the fishery is published in stock assessment and status documents (e.g. DFO 2018c, Koen-Alonso et al., 2018). Information is adequate to broadly understand (SG 60) and it is sufficient to allow for identification of the main impacts of the UoA on the main habitats, and, there is reliable information on the spatial extent of interaction and on the timing and location of use of the fishing gear, SG 80 is met. Although physical impacts have been estimated and are known generally, these have not been quantified fully and so the SG 100 is not met.		
c	Monitoring			

	Guide post		Adequate information continues to be collected to detect any increase in risk to the main habitats.	Changes in habitat distributions over time are measured.
	Met?		**All UoCs - Y**	**All UoCs - N**
	Justification	Fishing activity will be monitored on a continuing basis by VMS, logbooks (elogbooks) and observers. DFO annual surveys will continue. Annual reports and a review of the Coral and Sponge Conservation Strategy for Eastern Canada (DFO, 2015) will take place in 2020. Therefore, adequate information continues to be collected to detect any increase in risk to the main habitats, thereby meeting the SG 80. No evidence was presented to show that changes in habitat distribution over time are measured, so SG 100 is not met.		
References		Acoura 2015, Second annual surveillance report for the Gulf of St. Lawrence Northern Shrimp Trawl Fishery https://fisheries.msc.org/en/fisheries/gulf-of-st-lawrence-northern-shrimp-trawl-fishery/@@assessments DFO 2017c. Delineation of Significant Areas of Coldwater Corals and Sponge-Dominated Communities in Canada's Atlantic and Eastern Arctic Marine Waters and their Overlap with Fishing Activity. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2017/007. http://www.dfo-mpo.gc.ca/csas-sccs/Publications/SAR-AS/2017/2017_007-eng.html DFO 2018c. Assessment of Northern Shrimp stocks in the Estuary and Gulf of St. Lawrence in 2017. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2018/015. http://publications.gc.ca/collections/collection_2018/mpo-dfo/fs70-6/Fs70-6-2018-015-eng.pdf DFO, 2015. Coral and Sponge Strategy for Eastern Canada. http://www.dfo-mpo.gc.ca/oceans/publications/cs-ce/index-eng.html DFO. 2012b. 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. http://waves-vagues.dfo-mpo.gc.ca/Library/347471.pdf Dufour, R., H. Benoît, M. Castonguay, J. Chassé, Laure Devine, P. Galbraith, M. Harvey, P. Larouche, S. Lessard, B. Petrie, L. Savard, C. Savenkoff, L. St.-Amand and M. Starr. 2010. Ecosystem status and trends report: estuary and Gulf of St. Lawrence ecozone. Can. Sci. Adv. Sec. Res. Doc. 2010/030: v + 187 pp. http://www.dfo-mpo.gc.ca/csas-sccs/publications/resdocs-docrech/2010/2010_030-eng.htm Grant, S. M. 2012. Otter Trawl Impacts on Benthic Habitats and Communities in the Northern Shrimp Fishery on the Newfoundland-Labrador Shelf (SFA's 5, 6, and 7) and Eastern Scotian Shelf (SFA's 13, 14, and 15): The Fishery, Trawling Impacts, and Vulnerable Marine Ecosystems. Centre for Sustainable Aquatic Resources, Memorial University of Newfoundland and Labrador, 65 pp Kenchington, E., Beazley, L., Lirette, C., Murillo, F.J., Guijarro, J., Wareham, V., Gilkinson, K., Koen Alonso, M., Benoît, H., Bourdages, H., Sainte-Marie, B., Treble, M., and T. Siferd. 2016. Delineation of coral and sponge significant benthic areas in Eastern Canada using kernel density analyses and species distribution models. DFO Can. Sci. Advis. Sec. Res. Doc. 2016/093. vi + 178 p. http://waves-vagues.dfo-mpo.gc.ca/Library/40577806.pdf Lévesque, M., L. Savard, C. Moritz and P. Archambault. 2012. Assessment of the potential impacts of northern shrimp (Pandalus borealis) trawl fishing on benthic habitats in the Estuary and northern Gulf of St. Lawrence. Can. Sci. Adv. Sec. Res. Doc. 2012/094: ii + 28 pp. http://waves-vagues.dfo-mpo.gc.ca/Library/347269.pdf		

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PI 2.5.1 – Ecosystem outcome

PI 2.5.1		The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function.		
Scoring Issue		SG 60	SG 80	SG 100
a	Ecosystem status			
	Guide post	The UoA is **unlikely** to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The UoA 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.	There is **evidence** that the UoA 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.
	Met?	**All UoCs - Y**	**All UoCs - Y**	**All UoCs - Partial**
	Justification	The MSC defines 'key' ecosystem elements as the features of an ecosystem considered as being most crucial to giving the ecosystem its characteristic nature and dynamics, and are considered relative to the scale and intensity of the fishery. They are features most crucial to maintaining the integrity of its structure and functions and the key determinants of the ecosystem resilience and productivity (SA3.16.3, MSC 2014). In this regard, the assessment considers the Estuary and Gulf of St. Lawrence to be the 'ecosystem' for the shrimp trawl fishery. In turn, two key ecosystem elements could potentially be impacted by the trawl fishery – trophic relationships (removal of shrimp as a forage species) and benthic biodiversity and community structure (impact of trawl on the non-catch component). **Trophic relationships** The rationale for the limit reference point and removal rate reference, are intended to ensure that shrimp biomass is maintained at a level which will maintain forage for predators. Therefore, the UoA is considered unlikely to disrupt this key element underlying ecosystem structure and function to a point where there would be a serious or irreversible harm, thereby meeting the SG 60. The catch monitoring system, based on logbooks, observers (5% target per year, for the shrimp trawl fleet) and dockside monitoring (100% for the trawl fleet) ensures that catches are consistent with the limit reference point and removal rate reference. Therefore, the UoA is considered highly unlikely to disrupt this key element underlying ecosystem structure and function to a point where there would be a serious or irreversible harm, thereby meeting the SG 80. There has been no indication of changes in productivity in the Gulf of St. Lawrence ecosystems due to ecosystem changes caused by this fishery, other factors having been considered more important in driving recent ecosystem changes in this area (Savenkoff et al., 2007). Therefore, there is evidence that the UoA is highly unlikely to disrupt this key element underlying ecosystem structure and function to a point where there would be a serious or irreversible harm. This fulfills the requirements of the SG 100. **Impacts on benthic biodiversity and community structure** The trawl fishery operates on certain areas within relevant depth and temperature ranges, where the target species concentrates, leaving a substantial portion of the benthic communities associated with the habitat, unimpacted in any given year. The fishery is also highly selective with low-levels of bycatch species. Therefore, the UoA is considered		

		unlikely to disrupt this key element underlying ecosystem structure and function to a point where there would be a serious or irreversible harm, thereby meeting the SG 60. Analysis of VMS and logbook data indicate that approximately: 7% of the commonly encountered habitat; 8.4% of sponge SBAs/VME; and, 12.7% of sea pen SBAs/VME may be affected by the shrimp trawl fishery (Koen-Alonso et al, 2018). 8,571 km^2 of the 34,205 km^2 of sponge and sea pen has been protected from bottom impacting fishing gears by closed areas. Therefore, it is considered highly unlikely that the shrimp trawl fishery disrupts this key element underlying ecosystem structure and function to a point where there would be serious or irreversible harm, thereby meeting the SG 80. Given there is some evidence to indicate a relatively small proportion of the habitat is impacted by the fishery and a large prortion of the habitat has been protected a partial score of 90 is given. There is insufficient evidence to justify that the SG 100 is met.
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OVERALL PERFORMANCE INDICATOR SCORE:	**UoC 1 – SFA 8 (Esquiman)**	**90**
	UoC 2 – SFA 9 (Anticosti)	**90**
	UoC 3 – SFA 10 (Sept Iles)	**90**
	UoC 4 – SFA 12 (Estuary)	**90**
CONDITION NUMBER (if relevant):	**UoC 1 – SFA 8 (Esquiman)**	**N/A**
	UoC 2 – SFA 9 (Anticosti)	**N/A**
	UoC 3 – SFA 10 (Sept Iles)	**N/A**
	UoC 4 – SFA 12 (Estuary)	**N/A**

PI 2.5.2 – Ecosystem management strategy

PI 2.5.2		There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function.		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are **measures** in place, if necessary which take into account the **potential impacts** of the fishery on key elements of the ecosystem.	There is a **partial strategy** in place, if necessary, which takes into account **available information and is expected to restrain impacts** of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	There is a **strategy** that consists of a **plan**, in place which contains measures to **address all main impacts of the UoA** on the ecosystem, and at least some of these measures are in place.
	Met?	**All UoCs - Y**	**All UoCs - Y**	**All UoCs - N**
	Justification	Two key ecosystem elements have been identified as being potentially impacted by the fishery – trophic relationships (removal of shrimp as a forage species) and benthic biodiversity and community structure (non-catch impact of trawl passage). **Trophic relationships** The Limit Reference Point (LRP) and Removal Reference are intended to maintain shrimp abundance at levels which will allow this species to fulfill its role in the ecosystem, including in predator-prey relationships (DFO, 2011). The LRP is set at a level based on a previous ecosystem status during which shrimp played a role in trophic relationships, while the removal reference is set at a level consistent with that in a wide range of other pandalid fisheries in which trophic relationships have been maintained. Therefore, there are measures in place, which take into account the potential impacts of the fishery on this key element of the ecosystem, thereby meeting th SG 60. The measures (principally TACs) maintain fishing mortality at levels which will allow shrimp to fulfill its role in the ecosystem, including in predator-prey relationships. The TACs are set by taking into account available stock status, environmental data and catch data. Therefore, the measures are effective at implementing the partial strategy (i.e., partial strategy = cohesive arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome and an awareness of the need to change the measures should they cease to be effective. It may not have been designed to manage the impact on that component specifically (MSC FCR v 2.0 Table SA8)). Therefore, the SG 80 is met. The partial strategy to protect trophic relationships does not meet the definition of a “strategy” (MSC FCR v 2.0 Table SA8) as there is no provision to modify the LRP or removal reference if it appears that trophic relationships are compromised. Therefore the SG 100 is not met. **Impacts on benthic biodiversity and community structure** With respect to impacts on biodiversity and community structure, the spatial and temporal distribution of fishing effort, while not aimed at managing ecosystem impact, has the effect of reducing impacts. The distribution of high shrimp concentrations, mean fishermen restrict their operations to certain soft-bottom areas where shrimp are concentrated, such that substantial areas of benthic communities are left unimpacted. Furthermore, fishing is concentrated in certain months of the year such that benthic communities have some time to recover from impacts. Therefore, there are measures in place, which take into account		

		the potential impacts of the fishery on this key element of the ecosystem, thereby meeting th SG 60. In relation to the impact of the fishery on benthic biodiversity and communities, DFO have introduced 11 coral and sponge conservation areas in the Estuary and Gulf of St. Lawrence, prohibiting bottom contacting fishing. In addition to these measures, various others are in place which constitute a partial strategy to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function, i.e. fishing effort is restricted through licenses, there are seasonal closures and catch limits. Fishing is restricted to a small proportion of the total area of distribution of shrimp. Monitoring through log books, VMS and observers (as set out in the Conservation Harvesting Plan and the licence conditions) allows identification of any change in fishing area which might change the nature of the impact of the shrimp fishery on ecosystem structure and function. The monitoring of fishing activity in conjunction with the DFO annual summer survey allows an analysis of the overlay of fishing activity with sensitive ecosystem and community features. The IFMP for the shrimp fishery includes management objectives specifically designed to minimize the impacts of fishing on the ecosystem. In particular the shallow-water habitats that are favourable to the establishment of highly diversified benthic communities (Lévesque et al. 2012) do not sustain significant densities of shrimp which are found primarily in the deep-water mass located under the cold intermediate layer (Savard, 2012). The risk of shrimp fishing causing harm to these shallow-water benthic communities is negligible. The maximum annual footprint of fishing represents less than 8% of the commonly encountered habitat. In 2018, DFO announced new management measures to minimize the risk of interactions with marine mammals, particularly North Atlantic right whales. DFO requires that interactions with marine mammals are reported. It will be mandatory for all fishing licence holders to report any incident to DFO and to report all lost gear (DFO, 2018n). In combination, the above meets the MSC definition of a partial strategy. Therefore, the SG 80 is met. The SG 100 is not met as a strategy is not in place that clearly defines mechanisms for the modification of fishing practices in the light of the identification of unacceptable impacts.		
b	Management strategy evaluation			
	Guide post	The **measures** are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ ecosystems).	There is **some objective basis for confidence** that the measures/partial strategy will work, based on some information directly about the UoA and/or the ecosystem involved	**Testing** supports **high confidence** that the partial strategy/strategy will work, based on information directly about the UoA and/or ecosystem involved
	Met?	**All UoCs - Y**	**All UoCs - Y**	**All UoCs - N**
	Justification	**Trophic relationships** 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 (Mortitz et al. 2015, Lévesque 2012, DFO, 2012b) and thus are considered likely to work (SG 60 is met). There has been no indication from the work on ecosystem changes in the Gulf of St. Lawrence that fishery removals of shrimp are a significant factor in ecosystem changes (see references in 2.5.3 below). Therefore, there is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the UoA and the ecosystem, thereby meeting the SG 80. Owing to the lack of testing in the UoA, the SG 100 is not met. **Impacts on benthic biodiversity and community structure**		

		Leaving significant areas of the main habitats unimpacted by fishing, protecting large areas recognised as being vulnerable to fishing impacts and, the seasonal nature of the fishery, which allows time for recovery between fishing periods, are considered to be appropriate means of reducing trawl impacts on seabed communities (SG 60). Impacts of trawls on soft bottom habitats (mud and mud-sand) are generally known from studies in the Gulf of St. Lawrence and elsewhere (DFO, 2012b; Savard, 2012; Acoura, 2015). Therefore, there is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the trawl fishery and the ecosystem involved, thereby meeting the SG 80. Owing to the lack of testing in the UoA, the SG 100 is not met.		
c	**Management strategy implementation**			
	Guide post		There is **some evidence** that the measures/partial strategy is being **implemented successfully**.	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a).
	Met?		**All UoCs - Y**	**All UoCs - Y**
	Justification	**Trophic relationships** TACs (the principal measure for implementing the strategy to protect trophic relationships) are adhered to in this fishery, based on a comprehensive catch monitoring and surveillance and protection system. Thus the SG 80 is met. These are reviewed each year by DFOs Conservation and Protection Division and presented at the EGSAC (EGSAC, 2018). This provides clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a), thereby meeting SG 100. **Impacts on benthic biodiversity and community structure** Coral and sponge conservation areas have been designated in the Gulf of St. Lawrence (see Figure 45) to protect fragile and sensitive species. These areas are closed to bottom contacting fishing gears. Thus the SG 80 is met. These areas contribute to Canada's commitment to domestic and international marine conservation targets of protecting 5% of Canada's marine and coastal areas by 2017 and 10 % by 2020. The protection of benthic species diversity and community structure are afforded by these areas and are monitored. The use of VMS, aerial surveillance, observers and off-shore vessel fishery patrols contribute to the monitoring of these areas. All of the above provides evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a), thereby meeting the 100.		
References		Acoura 2015, Second annual surveillance report for the Gulf of St. Lawrence Northern Shrimp Trawl Fishery https://fisheries.msc.org/en/fisheries/gulf-of-st-lawrence-northern-shrimp-trawl-fishery/@@assessments DFO 2011. Reference points consistent with the precautionary approach for northern shrimp in the estuary and Gulf of St. Lawrence. Can. Sci. Adv. Sec. Sci. Adv. Rep. 2011/062: 9 pp http://waves-vagues.dfo-mpo.gc.ca/Library/344979.pdf DFO 2018n. Notice to Fish Harvesters. https://inter-l01.dfo-mpo.gc.ca/applications/opti-opei/notice-avis-detail-eng.php?pub_id=1491&todo=view&type=1&region_id=4&sub_type_id=5&species=702&area=1858 EGSAC, 2018. Estuary and Gulf Shrimp Advisoy Committee, minutes of the February 2018 meeting.		

	DFO. 2012b. 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. http://waves-vagues.dfo-mpo.gc.ca/Library/347471.pdf Koen-Alonso, M. C. Favaro, N. Ollerhead,H. Benoît H. Bourdages, B. Sainte-Marie, M. Treble, K. Hedges; E. Kenchington, C. Lirette, M. King S. Coffen-Smout, and J. Murill, 2018. Analysis of the overlap between fishing effort and Significant Benthic Areas in Canada's Atlantic and Eastern Arctic marine waters. Canadian Science Advisory Secretariat (CSAS) Res. Doc. 2018/015 http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ResDocs-DocRech/2018/2018_016-eng.html Lévesque, M., L. Savard, C. Moritz and P. Archambault. 2012. Assessment of the potential impacts of northern shrimp (Pandalus borealis) trawl fishing on benthic habitats in the Estuary and northern Gulf of St. Lawrence. Can. Sci. Adv. Sec. Res. Doc. 2012/094: ii + 28 pp. http://waves-vagues.dfo-mpo.gc.ca/Library/347269.pdf Moritz C. D. Gravel L. Savard C. W. McKindsey J.-C. Brêthes P. Archambault 2015, No more detectable fishing effect on Northern Gulf of St Lawrence benthic invertebrate ICES Journal of Marine Science https://academic.oup.com/icesjms/article/72/8/2457/2459097 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. Can. Sci. Adv. Sec. Res. Doc. 2012/005: ii + 70 pp. http://waves-vagues.dfo-mpo.gc.ca/Library/347091.pdf

OVERALL PERFORMANCE INDICATOR SCORE:	**UoC 1 – SFA 8 (Esquiman)**	**85**
	UoC 2 – SFA 9 (Anticosti)	**85**
	UoC 3 – SFA 10 (Sept Iles)	**85**
	UoC 4 – SFA 12 (Estuary)	**85**
CONDITION NUMBER (if relevant):	**UoC 1 – SFA 8 (Esquiman)**	**N/A**
	UoC 2 – SFA 9 (Anticosti)	**N/A**
	UoC 3 – SFA 10 (Sept Iles)	**N/A**
	UoC 4 – SFA 12 (Estuary)	**N/A**

PI 2.5.3 – Ecosystem information

PI 2.5.3		There is adequate knowledge of the impacts of the UoA on the ecosystem.		
Scoring Issue		SG 60	SG 80	SG 100
a	Information quality			
	Guide post	Information is adequate to **identify** the key elements of the ecosystem.	Information is adequate to **broadly understand** the key elements of the ecosystem.	
	Met?	**All UoCs - Y**	**All UoCs - Y**	
	Justification	Dufour and Ouellet (2007) and Dufour et al., (2010) are examples of comprehensive reviews of the Northern Gulf of St. Lawrence marine ecosystem that help support a broad understanding of the key elements of the ecosystem. Therefore the SG 60 is met. Trophic structure and function are relatively well known as a result of a series of studies, both specifically on shrimp (Savenkoff et al., 2006) and more generally on the trophic system and changes over recent decades (Savenkoff et al., 2007). 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. Productivity patterns (primary, secondary, higher-level) in the Northern Gulf of At. Lawrence have been well described in the general ecosystem descriptions cited (Dufour and Ouellet, 2007, Dufour et al., 2010). Geographical, seasonal and interannual patterns are covered in these publications. 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 et al (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 et al., 2000; Savenkoff et al*.,* 2007). 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 *et al.,* reviews cited (see also Savenkoff et al., 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 et al., 2007), although the changes also took place coincident with a period of low temperatures in the late 1980s and early 1990s (Dufour et al., 2010). Since 2013, the situation has been reversing: the abundance and biomass of invertebrates sampled in the annual DFO survey in August is decreasing, while those of groundfish, mainly redfish, are increasing. Estimated predation by redfish on Northern shrimp has increased by a factor of six over the past two years (DFO, 2018c). As a result of these studies, there is a good broad understanding of the key elements of the Northern Gulf of St. Lawrence ecosystem, thereby meeting the SG 80.		
b	Investigation of UoA impacts			
	Guide post	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information,	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information,	Main interactions between the UoA and these ecosystem elements can be inferred from existing

		but **have not been investigated** in detail.	and **some have been investigated in detail**.	information, and **have been investigated in detail**.
	Met?	**All UoCs - Y**	**All UoCs - Y**	**All UoCs - N**
	Justification	With respect to trophic interactions, impacts on trophic relationships can be inferred from existing comprehensive information on trophic relationships in the Northern Gulf of St. Lawrence (Savenkoff et al., 2007), and on removals by the fishery (e.g. DFO, 2018c). 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, 2012; NEFMC, 2011) and on the available information on benthic biodiversity in the fishery area (Desrosiers et al., 2000; CDEENA, n.d.), and from assessments of potential harm to these communities from shrimp trawling (DFO, 2012b; Lévesque et al., 2012). Therefore, the SG 60 is met. 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 et al., 2007). As a result, the main impacts of the UoA on the key ecosystem elements can be inferred from existing information, and some have been investigated in detail, thereby meeting the SG 80. Some of the interactions have not been investigated in detail, for example, non-catch impacts of the trawl gear on bottom species and communities. Therefore, the SG 100 is not met.		
c	Understanding of component functions			
	Guide post		The main functions of the components (i.e., P1 target species, primary, secondary and ETP species and Habitats) in the ecosystem are **known**.	The impacts of the UoA on P1 target species, primary, secondary and ETP species and Habitats are identified and the main functions of these components in the ecosystem are **understood**.
	Met?		**All UoCs - Y**	**All UoCs - Y**
	Justification	The main functions of the Northern shrimp, primary, secondary and ETP species and habitats are known from the studies of trophic systems and productivity relationships (Savenkoff et al., 2007; CDEENA, n.d.; Dufour and Ouellet, 2007; Dufour et al., 2010). Therefore, the SG 80 is met. Information on the impacts of the trawl shrimp fishery on the components has been summarised for PIs 2.1 to 2.4 above. Based on that information it can be concluded that: • the impact on primary and secondary species is ecologically negligible, since removals of these species are very small relative to overall population sizes; • removals would not hinder rebuilding or recovery of these species if this was necessary; • there is no take of ETP species; and, • it is highly unlikely that the methods of fishing are causing serious or irreversible harm to habitats.		

		Therefore, the impacts of the shrimp trawl fishery on Northern shrimp, primary, secondary and ETP species and habitats are identified and the main functions of these components in the ecosystem are understood, thereby meeting the SG 100.		
d	• Information relevance			
	Guide post		Adequate information is available on the impacts of the UoA on these components to allow some of the main consequences for the ecosystem to be inferred.	Adequate information is available on the impacts of the UoA on the components **and elements** to allow the main consequences for the ecosystem to be inferred.
	Met?		**All UoCs - Y**	**All UoCs - Y**
	Justification	Information on the impacts of the trawl shrimp fishery on the components has been summarised in PIs 2.1 to 2.4 above. Based on that information it can be concluded that: • the impact on primary and secondary species is ecologically negligible, since removals of these species are very small relative to overall population sizes; • removals would not hinder rebuilding or recovery of these species if this was necessary; • there is no impact on ETP species, since none are taken in the fishery; and • it is highly unlikely that the fishery is causing serious or irreversible harm to habitats. Therefore is it considered that adequate information is available on the impacts of the UoA on these components to allow some of the main consequences for the ecosystem to be inferred. With respect to potential impact on trophic relationships, removals of target species are very well known in relation to estimates of population abundance, such that exploitation rates can be estimated (DFO 2018a). Information on trophic structures in the fishery area suggests that shrimp are a relatively minor component of trophic webs (Dufour et al., 2010). Therefore, adequate information is available on the impacts of the UoA on the components and elements to allow the main consequences for the ecosystem to be inferred, thereby meeting SG 100.		
e	• Monitoring			
	Guide post		Adequate data continue to be collected to detect any increase in risk level.	Information is adequate to support the development of strategies to manage ecosystem impacts.
	Met?		**All UoCs - Y**	**All UoCs - N**
	Justification	Information is regularly collected which would permit detecting increase in risk level. Observers continue to collect information on amounts of bycatch species (including ETP species). Observer coverage targets have been a minimum of 5%. The distribution of the fishery continues to be monitored by logbooks and VMS, and is reported on regularly, such that distribution of effort in relation to habitats and ecosystems can be monitored. Catch of the target species is well monitored, such that potential impact of removal of this species on trophic relationships can be assessed. There has been regular reporting on ecosystem status and trends in the stock assessments and updates (DFO, 2018c).		

		Therefore, adequate data continue to be collected to detect any increase in risk level, thereby meeting the SG 80. Information is not adequate to support the development of strategies to manage ecosystem impacts and so the SG 100 is not met.
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OVERALL PERFORMANCE INDICATOR SCORE:	**UoC 1 – SFA 8 (Esquiman)**	**90**
	UoC 2 – SFA 9 (Anticosti)	**90**
	UoC 3 – SFA 10 (Sept Iles)	**90**
	UoC 4 – SFA 12 (Estuary)	**90**
CONDITION NUMBER (if relevant):	**UoC 1 – SFA 8 (Esquiman)**	**N/A**
	UoC 2 – SFA 9 (Anticosti)	**N/A**
	UoC 3 – SFA 10 (Sept Iles)	**N/A**
	UoC 4 – SFA 12 (Estuary)	**N/A**

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7.6 Principle 3

7.6.1 Principle 3 background

The intent of Principle 3 (P3) is to ensure that there is an institutional and operational framework appropriate to the size and scale of the UoAs for implementing Principles 1 and 2, and that this framework is capable of delivering sustainable fisheries in accordance with the outcomes articulated in these Principles.

In the following sections a description of the broad, high-level context of the fishery management system and the fishery specific management system is provided with the intent of supporting the scoring rationales used in 7.6.2 of this report. The headings of each section reflect the themes covered in the scoring issues (SI) within each P3 Performance indicator (PI).

Area of operation of the UoA

The Gulf of St. Lawrence Northern Shrimp Trawl Fishery is undertaken wholly within the Canadian 200 mile Exclusive Economic Zone (EEZ). The fishery takes place within the DFO established Shrimp Fishing Areas (SFAs) 8, 9, 10 and 12 (see Figure 2).

Jurisdiction

Within the Canadian EEZ, the responsibility for the management of fisheries resides with the federal government. The federal Minister of Fisheries and Oceans (DFO) has the ultimate responsibility for the fishery and his/her authority is delegated to officials through the organisational structure of the DFO. The Fisheries and Aquaculture Branch for the DFO Québec Region, in collaboration with DFO administrative regions in Newfoundland and Labrador and the Gulf, which includes Prince Edward Island (PEI), New Brunswick (NB) and part of Nova Scotia (NS).

Legal and policy framework

The legislative authority for the management of seacoast and inland fisheries in Canada falls under the jurisdiction of the Parliament of Canada pursuant to the Constitution Act, 1867 (Government of Canada 1867).

There are several pieces of legislation that apply to fishing, the major one being the Fisheries Act, 1985 (as amended). This Act grants wide discretionary authority to the Minister of Fisheries and Oceans and provides for the enactment of regulations respecting the management of the fishery. The Ministers authority is delegated to officials through the organisational structure of DFO.

The Act has recently been reviewed as part of the Government of Canada's Review of Environmental and Regulatory Processes. Eight key areas were reviewed:

1. Provisions to modernize the Fisheries Act
2. Reconciliation with Indigenous peoples
3. Fish and fish habitat protection provisions
4. Enforcement provisions
5. Fisheries management provisions
6. Provisions to create a fisheries management order power
7. Biodiversity protection provisions
8. Cetaceans in captivity provisions

The regulations that support the changes to the Act are still under development and pending approval through the Canada Gazette process.

In the meantime, the Atlantic Fishery Regulations, 1985 and the Fishery (General) Regulations are the main regulatory instruments governing the fisheries of eastern Canada. Section 35(1) of the Constitution Act, 1982 (Government of Canada 1982) recognises and affirms existing Aboriginal and treaty rights and any legislation governing the fishery may not infringe on those rights.

In addition to the legislative framework, there are a number of policy initiatives that have been developed to guide decision-making in the management of fisheries in Canada.

Relevant legislative instruments and policy documents are outlined in Table 23.

Table 23. Principal Acts and policy documents

Principal Acts and Policy Documents	Description
The Fisheries Act, 1985 (as amended)	Provides absolute discretion to the Minister for the management of fisheries and for the establishment of fishing licences, regulations, reporting requirements, powers of fishery officers, protection of fish habitat and pollution prevention.
The Atlantic Fishery Regulations, 1985	Prescribes conditions for the operation of the fishery including seasons, closures, management and conservation measures, etc. Variation Orders are used to alter conditions and to shorten or lengthen the fishing season as appropriate.
The Fishery (General) Regulations 1993	Provides for the issue of licences and the authority to specify conditions in a fishing licence, e.g. allocations, vessel monitoring systems, hail-in/hail-out requirement, observer coverage, dockside monitoring, etc.
The Species at Risk Act (SARA) 2002	Authorizes actions aimed at managing species of special concern, preventing the extirpation or extinction of endangered marine species, or promoting their recovery.
The Oceans Act 1996	Prescribes the Canadian oceans management strategy, including sustainable development, the precautionary approach, the implementation of integrated management of marine activities and the designation of Marine Protected Areas (MPAs).
The Aboriginal Fisheries Strategy (DFO 1992)	Seeks to provide for the effective management and regulation of fishing by Aboriginal groups through the negotiation of mutually acceptable and time-limited fisheries agreements between DFO and Aboriginal groups.
Atlantic Fisheries Policy Review – A Policy Framework for the Management of Fisheries on Canada's Atlantic Coast (DFO 2004)	Presents objectives to guide decision-making in Atlantic fisheries. It places conservation of the resource as the priority, sets the path for greater industry self-reliance, establishes transparent rules-based processes for decision-making and encourages a greater role for resource users and others.
Sustainable Fisheries Framework (SFF) (DFO 2009a)	Focuses on the need to incorporate the precautionary and ecosystem approaches to fishery management.
Policy to Manage the Impacts of Fishing on Sensitive Benthic Areas (DFO, 2009b)	Highlights approaches that Canada will take in protecting bentic ecosystems that have either already been fished or in 'frontier' fisheries were opportunities for fishing in new areas might arise owing to climate change or improved fishing technologies.
Policy on Managing Bycatch (DFO 2013)	Aims to address and take account of total catch, including retained and non-retained species bycatch in all fisheries management plans.

Canada is also required to comply with constitutional legislation such as the Charter of Rights and Freedoms, The Financial Administration Act and the Canadian Environmental Assessment Act, among others. There is also a large body of common law, such as administrative and aboriginal law, which has a major effect on DFO's programs and activities

The regulations noted in Table 23 create the legal framework for the management, licensing and registration of participants of fisheries in Canada. They also provide an administrative and court sanction system with fines ranging from relatively low levels to as high as hundreds of thousands of dollars and even jail time in extreme cases. The court also has the discretion to forfeit catch and equipment upon conviction.

Resolution of disputes

Regional managers of DFO have a particular role to play in brokering solutions on policy related disputes, with most unresolved disputes being referred to DFOs Regional Director General (RDG) or the Fisheries Minister, for a decision. Generally, DFO avoids legal disputes by obtaining legal advice before the implementation of programs, activities or policies to ensure compliance with applicable legislation prior to implementation.

At the fishery specific level, the Estuary and Gulf of St. Lawrence Shrimp Advisory Committee (EGSAC) (see Consultation, roles and Responsibilities in Section 7.6.1) provides a forum for consultation, discussion and resolving disputes. An issue or dispute with wider implications can be added to the agenda for plenary discussion, or, if necessary for further review by a working group of the committee.

Serious issues unresolved by this process, including those with high level implications, can be referred upwards to, in succession, the level of DFOs Regional Director General (RDG) of the Québec, Newfoundland and Labrador and Gulf Regions; 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.

Generally, DFO avoids legal disputes by obtaining legal advice before the implementation of programs, activities or policies to ensure compliance with applicable legislation prior to implementation. However, unresolved disputes within the Canadian fisheries management system can, and have been, taken through the Canadian judicial system. Under the Fisheries Act, the Federal Courts Act (1985) provides a mechanism for someone to challenge decisions of administrative bodies or tribunals and be provided with a hearing before a justice of the court.

While no significant disputes within the Gulf of St. Lawrence Northern Shrimp Fishery that have needed to use this mechanism were reported to the assessment team, some of the more notable cases within the Canadian fisheries management system which have, include: the “Sparrow”, “Marshall” and “Larocque” decisions. The Sparrow decision (1990) resolved that aboriginal groups have a right to fish for food, societal and ceremonial purposes and that this use-right is surpassed only by conservation of the resource. The Marshall Decision (1999) stated that Treaties signed in 1760 and 1761 by Mi’kmaq and Maliseet communities include a communal right to hunt, fish and gather in pursuit of a moderate livelihood. This decision essentially gave First Nations in the Maritime Provinces the right to fish commercially. The Larocque Decision (2006) outlawed the use of resource allocations to pay for services provided to, or on behalf of, government without the approval of Parliament. The Fisheries Act was amended (Bill C-38, June 2012) creating a new section (10) that authorizes the Minister of Fisheries and Oceans to allocate fish for the purpose of financing Scientific and Fisheries Management activities under Joint Project Agreements.

Respect of rights

The Constitution Act 1982 (Government of Canada, 1982) recognizes and confirms aboriginal and treaty rights of the aboriginal peoples of Canada, including the guarantee of legal rights to fish for food and livelihood. This section has been litigated and confirmed by the Supreme Court on several occasions and constitutes a formal commitment to the rights of aboriginal peoples. Disputes regarding aboriginal fishing rights have been fairly resolved (R.v Sparrow, R.v Marshall) (Supreme Court of Canada, 1985) and have led to current policy initiatives that ensures the protection of aboriginal rights, namely the “Aboriginal Fisheries Strategy” (DFO 1992) which is aimed at ensuring that aboriginal entitlements are respected in the development of fisheries management regimes for aboriginal peoples.

The DFO has facilitated a buy out and transfer process to provide First Nations with shrimp trawl licenses. Five First Nations from Québec and two from New Brunswick have since participated in the fishery.

Consultation, roles and responsibilities

At a national level, DFO undertakes consultations on national policy and legislative issues and these are advertised on the DFO website http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/comm/consultation-eng.htm. DFO also conducts regional consultation on national and regional policy initiatives. These are also posted on DFO regional websites, e.g. http://www.glf.dfo-mpo.gc.ca/gulf/consultations/home; http://www.nfl.dfo-mpo.gc.ca/NL/Consultations; http://www.glf.dfo-mpo.gc.ca/Home

At the fishery specific level, the fishery is managed via a co-management approach. In SFA 8 - 12, the industry advisory body is the EGSAC.

The EGSAC is the main mechanism for consultation for the shrimp fishery in the Estuary and 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 an economist, a DFO biologist and an adviser from Conservation and Protection Program. The Fisheries Management Regional Directorate in the Québec Region, is responsible for overall coordination, consultation and management of the Committee.

The EGSAC advises the Minister 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 EGSAC, working groups may be formed with specific duties, as needed.

EGSAC has a general meeting every two years, normally in the first week of February, although the committee can be convened, if required, between the normal 2 year period. Subcommittees can meet more regularly, depending on needs and mandate.

Long term and fishery specific objectives

Fish stock conservation and other ecosystem sustainability objectives stem from Canadian legislation such as: the Fisheries Act, Ocean's Act and Species at Risk Acts, and policy initiatives such as: the Atlantic Fisheries Policy Review and Sustainable Fisheries Framework.

The Atlantic Fisheries Policy Review provides objectives to guide decision-making in Atlantic fisheries. It places conservation of the resource as the priority, sets the path for greater industry self-reliance, establishes transparent rules-based processes for decision-making and encourages a greater role for resource users and others (DFO 2004).

The precautionary and ecosystem approaches are required to be incorporated into all fishery management decisions while protecting biodiversity and fisheries habitat by virtue of the Sustainable Fisheries Framework (DFO 2009a).

The "Policy on Managing the Impacts of Fishing on Sensitive Benthic Areas" requires the mitigation of the impacts of fishing on sensitive benthic areas or avoidance of impacts of fishing that are likely to cause serious or irreversible harm to sensitive marine habitat, communities and species (DFO 2009b).

"The Policy on Managing Bycatch" (DFO, 2008a) is intended to ensure that Canadian fisheries are managed in a manner that supports the sustainable harvesting of aquatic species and that minimizes the risk of fisheries causing serious or irreversible harm to bycatch species; and to account for total catch, including retained and non-retained bycatch.

In addition, the Species at Risk Act (SARA) requires protective efforts to ensure recovery of species protected by the Act.

These broad policy guidelines and requirements of SARA are implemented through fisheries specific objectives that are outlined in Integrated Fisheries Management Plans (IFMPs).

The Northern Shrimp Estuary and Gulf of St. Lawrence IFMP (DFO, 2018a) reflects the policy guidelines set out in the above, with four overarching management objectives and associated subsets:

- Sustainable shrimp fishing
  - Help maintain the abundance of stocks in the healthy zone
  - Studying the predation of Northern shrimp by groundfish, particularly redfish
  - Studying the impact of environmental change on the Northern shrimp

- Fishery's impact on the ecosystem
  - Assess the risk of shrimp trawls causing serious damage to the habitat and vulnerable bentic communities
  - Contribute to the protection marine and coastal areas
  - Assess the risk of the shrimp fishery causing serious harm to non-target stocks
  - Monitor the interactions of the fishery with species at risk
  - Modernise fishing operations monitoring tools
- Governance of the fishery
  - Reviewing administrative guidelines
  - Insure the harmonious use of the fishing grounds
- Econominc prosperity of the fishery
  - Facilitating fleet restructuring and profitability
  - Promote the active participation of First Nations communities and the development of their capacities
  - Collaborating on eco-certification work
  - Facilitate the development of sustainable fishing gears
  - Facilitate the improvement of catch quality

The fishery specific decision-making process

Within different sections of the IFMP (DFO, 2018a) it is possible to piece together the decision making process. Legally speaking, the Minister of Fisheries 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. However, in reality the Minister delegates the authority for some approvals to national or regional staff but continues to retain final authority for fisheries management.

The EGSAC provides advice to DFO through the committee meeting. Taking this advice into consideration, decisions are then made at the Regional Director-General level. As the fleet is based across different DFO regions, recommendations put forward to senior management within DFO include input from both the Gulf and Newfoundland and Labrador Regions.

DFOs Resource Management and Aboriginal Affairs in Québec City provide the secretarial function of the EGSAC and coordinates (with the help of the other two DFO regions) the EGSAC internal activities. EGSAC meetings are usually biennial, although they can be more regular if required. EGSAC sub-committee meetings, i.e. committees established to focus on particular issues and report back to the main Committee, may meet more frequently.

EGSAC membership is set at:

- First Nations
  - 7 representing each of the bands with an interest in the fishery
- Québec
  - 7 from the harvesting sector
  - 2 processing sector
  - 1 Provincial government
- New Brunswick
  - 4 from the harvesting sector
  - 2 processing sector
  - 1 Provincial government
- Newfoundland and Labrador
  - 3 from the harvesting sector
  - 2 processing sector
  - 1 Provincial government
- Prince Edward Island
  - 3 from the harvesting sector
  - 2 processing sector

    - 1 Provincial government

- Nova Scotia
    - 1 from the harvesting sector
    - 1 Provincial government

- Federal Government
    - Chair: Regional Director, Fisheries Management Regional Directorate, Québec Region
    - Secretary: Advisor, Resource and Aboriginal Affairs, Québec Region

As well as the specified membership, others regularly attend and provide presentations and information to inform the discussion on specific agenda items, e.g. Resource Management (Gulf and Newfoundland and Labrador Regions), Conservation and Protection, Aboriginal Affairs.

Observers are able to attend and particiapte. If they wish to speak, they must do so through a representative at the table. Any requests to table and/or present documents for consideration must be made in writing to the committee secretariat 15 business days before the meeting.

DFO also convenes meetings as part of the Regional Advisory Process (RAP) to review science and provide advice and recommendations to management. Advice on the status of the Gulf shrimp stocks is requested annually by DFO and industry to help determine a TAC that is consistent with the IFMP. Science advice for the management of the shrimp stock is provided as a fully peer-reviewed stock assessment at an inclusive RAP meeting on a biennial basis. In interim years, science advice is provided as a stock status update and published as a DFO Science Response.

The current report provides information on the stock status for 2017 and advice for management of the 2018 fishery. The proceedings, participants and reports from the RAP are published on the DFO website, e.g. http://www.dfo-mpo.gc.ca/csas-sccs/Publications/Pro-Cr/2018/2018_013-eng.html

The IFMP explicitly refers to the approach Canada takes with respect to applying the precautionary approach for commercial species and specifically Northern shrimp in SFA 8 -12. Also, it includes a sections explaining how DFO intends to implement an ecosystem approach to managing fisheries (DFO, 2018a).

Monitoring, control and surveillance

DFO's Conservation and Protection Division (C & P) supports conservation and sustainability of the Gulf of St. Lawrence Northern Shrimp Fishery through the delivery of their surveillance, inspection and enforcement program. The IFMP has a section dedicated to a "Compliance Plan" within which it describes the approach of management and enforcement, including:

- Promoting compliance with laws and regulations through education and shared stewardship;
- Inspection, monitoring and surveillance activities,
- Management of major case/special investigation in relation to complex compliance issues; and
- Compliance and enforcement program capacity.

The IFMP states the amount of patrolling time allocated to a particular fishery is based largely on risk assessment for the resource and may vary from one year to another based on set priorities. At the site visit, C & P confirmed that the shrimp fishery is considered to be a relatively low risk fishery and, as a result, C & P mainly focus on the catch, compliance with conditions of license and landings (M. Picard, pers. comm.).

With respect to monitoring catch, the at-sea observer program is considered to be important as it provides the only independent data source of the at-sea catch composition. The target of 5% observer coverage was achieved except for Newfoundland where 2.5% and 3.6% was achieved in 2016 and 2017, respectively. The shortfall was a result of the lack of availability of observers through the third party observer companies. The target continues to be 5% (DFO, 2018c).

The dockside monitoring program is the primary means of monitoring shrimp landings. Fishery officers check shrimp harvester compliance with the conditions of licence related to dockside monitoring by performing direct audits of landings or by checking compliance with requirements related to hail-ins and estimates of catches at sea.

Quota compliance within the four SFAs is monitored and there is a mandatory single fishing area per trip condition (unless accompanied by an observer).

In the IFMP and, as confirmed at the site visit, C & P ensures compliance with fishing areas through VMS and its aerial surveillance program. During surveillance flights, shrimp vessels are identified and their position checked to ensure their fishing licences are valid. Any reports of fishing in closed areas (smallfish protocol areas or marine protected areas) can be quickly checked via VMS and aerial surveillance. It was also reported that VMS information can and has been successfully used to prosecute area infractions (M. Picard, pers. comm.).

C & P are also involved with gear conflict situations, either acting as brokers to disputes or, where necessary, ensuring specified gear areas are adhered to. This appears to largely be an issue between the snow crab and shrimp fishery where, at certain times of the year, access to a fishing area may become an issue. By and large, these disputes are dealt with through voluntary agreement (M. Picard, pers. comm.).

An appendix within the IFMP provides a summary of the compliance monitoring with respect to enforcement effort (Fishery Officer patrol hours), warnings issues, charges laid, charges pending and charges not approved.

Regulatory framework and 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 Conservation Harvest Plan (CHP), which specifies the:

- Start date for the season (usually 1 April) and closed date (usually 31 December)
- Regulatory measures that apply for shrimp fishing and the catch of species at risk
- TACs agreed for each SFA that year
- Resulting tonnage distributed to each fleet (all areas), prior to any quota reconciliation, and prior to allocation among individuals according to their licence share.

Regulatory Measures

Regulation of fishing effort

- 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 - A TAC is set for each SFA in conformity with:

- Scientific advice on stock status (determined by the stock status indicator relative to reference points);
- The application of the harvest rule, taking into account industry advice;
- The application of a TAC adjustment recommended by the industry.

Regulation of individual transferable quotas (ITQ)**:**

- 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;
- Mandatory use of a DFO approved VMS that must transmit at a frequency of 30 minutes;
- Mandatory requirement to hail in and out;
- 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 a mandatory requirement to complete a log book at sea. The use of an electronic logbook (Elog) is optional in 2018 and will be mandatory as of 2019 for fishermen in Québec and New-Brunswick.
- Vessels can only fish in one area per trip, unless an observer is on board;
- 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.

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

- Prescribed minimum trawl mesh size of 40 mm;
- Mandatory use of the Nordmore Grate with specified bar spacing (minimum 19 mm, maximum 25 mm) and attachment rules. Use of a double liner over the grate is forbidden during the season;
- Conditional use of on-board mechanical devices intended to separate bycatch from the catch of shrimp *Pandalus borealis* ;
- Northern wolfish, spotted wolfish and leatherback turtle must be returned immediately 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 85 mm must be returned to the water immediately and carefully;
- Closing protocols for undersized Greenland halibut, cod and redfish (triggered by a pre-determined average catch rate of of undersized halibut and redfish);
- An industry funded, at-sea observers' coverage rate of at least 5%. Vessels are obliged to carry observers if requested;
- Fishermen are required to report any lost gear to DFO in order to help identify the need to increase efforts to recover them, thereby reducing the risk of whale entanglements;
- Provide information regarding all interactions with a marine mammal including: bycatch, collisions and all sightings of entangled marine mammals that occur during fishing expeditions, in order to comply with the implementation of the US Marine Mammals Protection Act (MMPA) regulations.

Regulation of the impact of shrimp trawling on sensitive benthic areas:

- All fishing activities that use bottom-contact gear are forbidden in specified coral and sponge conservation areas.

Management evaluation

The IFMP (DFO, 2018a) includes an appendix that shows progress toward attaining the management objectives (as set out in Long term and fishery specific objectives in section 7.6.1 above) based on performance indicators. This is updated biennially following the EGSAC meeting.

Table 24. Examples of fishery objectives for the Estuary and Gulf of St. Lawrence Northern shrimp fishery and the performance indicators used to evaluate progress toward their achievement (DFO, 2018a)

Objective: Sustainable shrimp fishing	
Sub-objective: Help maintain the abundance of stocks in the healthy zone	
Performance indicator	**Results**
The stock status indicators remained in the healthy zone	2000 to 2016: The four stock indicators remain in the healthy zone
The TACs are adjusted with the decision rules	2017: Decision rules applied: • Estuary (12) : -15% • Sept-Îles (10) : -15% • Anticosti (9) : -15% • Esquiman (8) : 0%
The individual quotas and distribution of the TACs amongst shrimp-fishing zones are respected	Respect of quotas in 2016: • Estuary (12) : 100.34% • Sept-Îles (10) : 93.45% • Anticosti (9) : 83.63% • Esquiman (8) : 22.68%
Progress is being made in the acquisition of new knowledge	2015 to 2017: Update of Strategic Research Plan 2017: Research Document 2017/002: Preliminary results from the groundfish and shrimp multidisciplinary survey in August 2016 in the Estuary and northern Gulf of St. Lawrence.

Objective: Sustainable shrimp fishing	
Sub-objective: Help maintain the abundance of stocks in the healthy zone	
Performance indicator	**Results**
	2016: Research Document 2016/004: Preliminary results from the groundfish and shrimp multidisciplinary survey in August 2015 in the Estuary and northern Gulf of St. Lawrence. 2015: Research Documents 2015/032: Physical Oceanographic Conditions in the Gulf of St. Lawrence in 2014. 2015/013: Chemical and Biological Oceanographic Conditions in the Estuary and Gulf of St. Lawrence during 2013. 2014: Research Document 2014/041: A model for simulating harvest strategies to evaluate the effects of changes in assessment frequency: An application to Northern Shrimp.

Objective: Minimizing the fishery's impact on the ecosystem	
Sub-objective: Assess the risk of the shrimp fishery causing serious harm to non-targeted species stocks	
Performance indicator	**Results**
The magnitude of bycatch is assessed using the At-Sea Observer Program	Science Advisory Report 2012/066 : Importance of bycatch in the northern shrimp fishery in the Estuary and northern Gulf of St. Lawrence
Progress is being made in the acquisition of new knowledge	2014: Research Document 2014/051: Assessment of Northern Shrimp stocks in the Estuary and Gulf of St. Lawrence in 2013: commercial fishery data. Science Response 2014/022: Advice on an acceptable level of Greenland Halibut catches in the Gulf of St. Lawrence for the 2014–2015 fishing season 2012: Research Document 2012/151: Bycatch in the Estuary and Gulf of St. Lawrence Northern shrimp fishery.
The bycatch protocol is applied	2016: 13 grids were closed, 3 of which were reopened following the application of the bycatch protocol
The mitigation measures are respected during fishing activities	2016: 1 fishing activity in closed grid.

The EGSAC also provides opportunity to review aspects of the management of the shrimp fishery and discuss any issues/concerns and make recommendations to DFO on the management of the fishery.

With respect to external review, the Parliament of Canada has two committees related to Fisheries and Oceans: The Standing Committee on Fisheries and Oceans of the House of Commons and the Senate Standing Committee on Fisheries and Oceans of the Senate. Both committees regularly review different aspects of fishery management in Canada and publish reports with their findings and conclusions. To date, the Gulf of St. Lawrence Northern Shrimp Fishery has not been the subject of review by either committee.

The Canadian Auditor General has, on an ad-hoc basis, reviewed fisheries related issues, although this has not happened since 2009 when the protection of fish habitat was reviewed (OAGC 2009).

7.6.2 Principle 3 Performance Indicator scores and rationales

PI 3.1.1 – Legal and/or customary framework

PI 3.1.1		**The management system exists within an appropriate legal and/or customary framework which ensures that it:** • **Is capable of delivering sustainability in the UoA(s); and** • **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.**		
Scoring Issue		SG 60	SG 80	SG 100
a	Compatibility of laws or standards with effective management			
	Guide post	There is an effective national legal system **and a framework for cooperation** with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2	There is an effective national legal system **and organized and effective cooperation** with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2	There is an effective national legal system and **binding procedures governing cooperation with other parties** which delivers management outcomes consistent with MSC Principles 1 and 2.
	Met?	**All UoCs - Y**	**All UoCs - Y**	**All UoCs - Y**
	Justification	Within Canada's EEZ, there is a well-established legislative framework. The Fisheries Act 1985), provides the legislative basis for the implementation of regulations, e.g. The Atlantic Fishery Regulations 1985 and Fishery (General) Regulations 1993, which, amongst other things, provide the prescription of conditions for the operation of the shrimp fishery, in a manner consistent with MSC Principle 1. The Species at Risk Act 2002 and the Oceans Act 1996 provide the framework for implementing domestic management in a manner consistent with MSC Principle 2. These laws and regulations are implemented nationally and regionally, as appropriate, through the federal department, Fisheries and Oceans Canada (DFO). DFO's national Headquarters are in Ottawa with 6 geographic regions spanning the country: Pacific, Central and Arctic, Quebec, Gulf, Maritimes, Newfondland and Labrador. Therefore the SG 60 is met. The federal Minister of Fisheries and Oceans has the ultimate responsibility for the fishery and his/her authority is delegated to officials through the organizational structure of DFO, i.e. there is a formal and binding system for the cooperation between national entities at the federal and regional level, which delivers management outcome consistent with MSC Principles 1 and 2. Therefore, the SG 80 is met. Internationally Canada is a signatory to the FAO Code of Conduct, United Nations Convention on the Law of the Sea (UNCLOS) and United Nations Fisheries Agreement (UNFA) and is also a member of several Regional Fisheries Management Organisations (RFMOs), e.g. Northwest Atlantic Fisheries Organization (NAFO), Interantional Commission for the Conservation of Tunas (ICCAT). As such, Canada is bound by procedures and governing cooperation with other international parties and organisations that, where required, are transposed at a national level. Therefore, it is considered that the legal framework for the management of Canadian fisheries provides an effective national legal system and binding procedures governing cooperation with other parties, which deliver management outcomes consistent with MSC Principles 1 and 2, thereby meeting SG 100.		

b	Resolution of disputes			
	Guide post	The management system incorporates or is subject by law to a **mechanism** for the resolution of legal disputes arising within the system.	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 UoA.	The management system incorporates or is 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**.
	Met?	**All UoCs - Y**	**All UoCs - Y**	**All UoCs - Y**
	Justification	The Federal Courts Act 1985, provides a mechanism for parties to challenge decisions of administrative bodies or tribunals and receive a hearing before a justice of the court. Therefore, the SG 60 is met. Hearings are open to the public and media are therefore considered to be transparent (SG 80). The system has been tested and proven to be effective on several occasions, for example, in 1990 at the Supreme Court of Canada (SCC), "The Sparrow Decision" resolved that aboriginal groups have a right to fish for food, societal and ceremonial purposes and that this use-right is surpassed only by conservation of the resource. Thus, the requirements of SG 80 and SG 100 are met, i.e. the management system incorporates and is subject by law to a transparent mechanism for the resolution of legal disputes that is appropriate to the context of the fishery (SG 80), and has been tested and proven to be effective (SG 100).		
c	Respect for rights			
	Guide post	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.	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.	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.
	Met?	**All UoCs - Y**	**All UoCs - Y**	**All UoCs - Y**
	Justification	The Constitution Act 1982 (Government of Canada 1982) recognizes and confirms aboriginal and treaty rights of the aboriginal peoples of Canada, including the guarantee of legal rights to fish for food and livelihood. This section has been litigated and confirmed by the Supreme Court on several occasions and constitutes a formal commitment to the rights of aboriginal peoples. Disputes regarding aboriginal fishing rights have been fairly resolved (R.v Sparrow, R.v Marshall) (Supreme Court of Canada 1985) and have led to current policy initiatives that ensures the protection of aboriginal rights, namely the "Aboriginal Fisheries Strategy" (DFO 1992) which is aimed at ensuring that aboriginal entitlements are respected in the development of fisheries management regimes for aboriginal peoples. In response to the "Marshall Decision", in January 2000, the DFO launched the Marshall Response Initiative to negotiate interim fisheries agreements, giving First Nations increased and immediate access to the commercial fishery.		

		In 2000, after buying back 6 Québec licences, First Nations from Gesgapegiag, Gespeg, Listuguj and Viger Maliseet gained access to the shrimp fishery. In New Brunswick, First Nations from Eel River Bar and Red Bank gained access in 2004, after buying back two licences of this region. Finally, the Innu Takuaikan Uashat Mak Mani-Utenam community obtained a first licence in 2003 and a second in 2008. In 2011, DFO bought back allocations that were given to Gespeg First Nation and to Viger Meliseet, who already had a fishing licence (DFO, 2018a). Five First Nations from Québec and two from New Brunswick have since participated in the Gulf of St. Lawrence shrimp fishery with fishing licences issued under the Aboriginal Communal Fishing Licences Regulations. Through their participation in the commercial fishery and the training programs in place, participating First Nations have the opportunity to increase employment and economic benefits for their community. Therefore, the management system has a mechanism to not only, "generally respect" (SG 60) and "observe" (SG 80) it "formally commits" 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, thereby meeting SG 100.
References		Aboriginal Communal Fishing Licences Regulations SOR/93-332 http://laws-lois.justice.gc.ca/eng/regulations/SOR-93-332/ Atlantic Fishery Regulations (1985) http://laws-lois.justice.gc.ca/eng/regulations/sor-86-21/index.html DFO (1992) The Aboriginal Fisheries Strategy http://www.dfo-mpo.gc.ca/fm-gp/aboriginal-autochtones/afs-srapa-eng.htm DFO 2018a, Integrated Fishery Management Plan for the Northern Shrimp in the Estuary and Gulf of St. Lawrence (Areas 8, 9, 10 and 12) (*Pandalus borealis)* FAO Code of Conduct for Responsible Fisheries (1995) http://www.fao.org/docrep/005/v9878e/v9878e00.HTM Fisheries Act (1985) http://laws-lois.justice.gc.ca/PDF/F-14.pdf Fishery (General) Regulations (1993) http://laws-lois.justice.gc.ca/PDF/SOR-93-53.pdf Marshall Decision (1999) https://en.wikipedia.org/wiki/R_v_Marshall Northwest Atlantic Fisheries Organization (NAFO) https://www.nafo.int Oceans Act (1996) http://laws-lois.justice.gc.ca/PDF/O-2.4.pdf Sparrow Decision https://scc-csc.lexum.com/scc-csc/scc-csc/en/item/609/index.do Species at Risk Act (2002) http://laws-lois.justice.gc.ca/PDF/S-15.3.pdf The Federal Courts Act (1985) http://laws-lois.justice.gc.ca/eng/acts/F-7/ The International Convention for the Conservation of Atlantic Tunas https://www.iccat.int/en/ United Nations Convention on the Law of the Sea (UNCLOS) (1982) http://www.un.org/Depts/los/convention_agreements/texts/unclos/unclos_e.pdf United Nations Fisheries Agreement (UNFA) (1995) http://www.un.org/depts/los/convention_agreements/convention_overview_fish_stocks.htm

OVERALL PERFORMANCE INDICATOR SCORE:	**UoC 1 – SFA 8 (Esquiman)**	**100**
	UoC 2 – SFA 9 (Anticosti)	**100**
	UoC 3 – SFA 10 (Sept Iles)	**100**

	UoC 4 – SFA 12 (Estuary)	**100**
CONDITION NUMBER (if relevant):	**UoC 1 – SFA 8 (Esquiman)**	**N/A**
	UoC 2 – SFA 9 (Anticosti)	**N/A**
	UoC 3 – SFA 10 (Sept Iles)	**N/A**
	UoC 4 – SFA 12 (Estuary)	**N/A**

PI 3.1.2 – Consultation, roles and responsibilities

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**		
Scoring Issue		SG 60	SG 80	SG 100
a	Roles and responsibilities			
	Guide post	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are **generally understood**.	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.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are **explicitly defined and well understood for all areas** of responsibility and interaction.
	Met?	**All UoCs - Y**	**All UoCs - Y**	**All UoCs - Y**
	Justification	The IFMP (DFO, 2018a) describes the organisations and individuals involved in the management process and sets out their functions roles and responsibilities so they are generally understood, thereby meeting the SG 60. The management process involves the monitoring and gathering of scientific information to support scientific advice and the presentation of this scientific advice to an advisory forum: The “Framework Process” is the mechanism whereby DFO science assesses the assumptions and data inputs underlying the management of the fishery. The Regional Assessment Process (RAP) is the process, guided by the Framework, for coalescing scientific advice that then feeds into management decisions. Sources of uncertainty are addressed in the RAP and taken into consideration when deciding management advice, which governs the harvest strategy. The RAP includes peer review and is open to participants other than those directly involved in the management or prosecution of the fishery. The Estuary and Gulf Shrimp Advisory Committee (EGSAC) is the main body for both industry and the DFO to work collaboratively on the management of the shrimp trawl fishery. The Committee’s membership, roles and responsibilities are set out in a terms of reference (DFO 2018a). The Committee is chaired by DFO and, aside from the representation of most divisions of DFO, membership of EGSAC is made up of industry stakeholders that include: shrimp harvesters; processors; representatives from New Brunswick, PEI, Québec, Nova Scotia and Newfoundland and Labrador provincial governments. Observers are able to attend and speak via a committee member. Any requests to table and/or present documents for consideration must be made in writing 15 busines days before the meeting. Therefore, organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for not just “key” (SG 80) but “all” areas of responsibility and interaction, thereby meeting the SG 100.		

b	Consultation processes			
	Guide post	The management system includes consultation processes that **obtain relevant information** from the main affected parties, including local knowledge, to inform the management system.	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.	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**.
	Met?	**All UoCs - Y**	**All UoCs - Y**	**All UoCs - N**
	Justification	National, regional and fishery specific consultations take place within the management system. National, regional and fishery specific consultations are regularly published on the DFO website (http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/comm/consultation-eng.htm) with the intent of obtaining relevant information, including local knowledge from all affected and interested parties (SG 60). DFO also demonstrates through their website the input and consideration of local knowledge and information obtained from consultations, e.g. the following link presents information that was provided to DFO following the consultation on proposed amendments to the Fisheries Act http://dfo-mpo.gc.ca/campaign-campagne/fisheries-act-loi-sur-les-peches/index-eng.html. With respect to fishery specific consultation, the EGSAC serves as the primary consultation mechanism for involving the various stakeholders in this fishery in developing and enforcing the IFMP. The mandate of the committee is to provide recommendations to the Minister of Fisheries and Oceans on management measures aimed at conservation and sustainable use of this fishery resource, in particular, by contributing to developing a multi-year IFMP, rules for setting TACs based on the precautionary approach; regulatory amendments, enforcement, licence policies, seasons, protection of benthic zones; control of the fishing effort and restrictions; bycatch conservation plans, and development activities. (DFO, 2018a – terms of reference). Minutes of EGSAC meetings (EGSAC, 2018) demonstrates consideration of the information and local knowledge obtained, e.g. 2017 stock assessment and TAC advice, MPA network planning. Therefore, the management system is considered to include consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information obtained, thereby meeting the SG 80. The SG 100 is not met as there was not evidence to show that the management system demonstrates how information is used or not used.		
c	Participation			
	Guide post		The consultation process **provides opportunity** for all interested and affected parties to be involved.	The consultation process provides **opportunity and encouragement** for all interested and affected parties to be involved, and

				facilitates their effective engagement.
	Met?		**All UoCs - Y**	**All UoCs - Y**
	Justification	Through DFO national and regional websites, consultation are widely available and are considered to provide opportunity and encouragement for all interested and affected parties to be involved (SG 80), e.g.: http://www.glf.dfo-mpo.gc.ca/gulf/consultations/home; http://www.nfl.dfo-mpo.gc.ca/NL/Consultations; http://www.glf.dfo-mpo.gc.ca/Home Evidence through feedback provided on, "what we heard" links, e.g http://dfo-mpo.gc.ca/habitat/fa-lp/consultation-eng.htm suggests effective engagement. Minutes of the EGSAC provide evidence that the fishery specific consultation process provides opportunity and encouragement for all interested and affected parties, and facilitates their effective engagement (EGSAC, 2018). Therefore, the consultation process is considered to provide opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement, thereby meeting the SG 100.		
References		DFO 2018a, Integrated Fishery Management Plan for the Northern Shrimp in the Estuary and Gulf of St. Lawrence (Areas 8, 9, 10 and 12) (*Pandalus borealis)* EGSSAC 2018, Minutes of Estuary Shrimp Advisory Committee Meeting, February 6-7, 2018.		

OVERALL PERFORMANCE INDICATOR SCORE:	**UoC 1 – SFA 8 (Esquiman)**	**95**
	UoC 2 – SFA 9 (Anticosti)	**95**
	UoC 3 – SFA 10 (Sept Iles)	**95**
	UoC 4 – SFA 12 (Estuary)	**95**
CONDITION NUMBER (if relevant):	**UoC 1 – SFA 8 (Esquiman)**	**N/A**
	UoC 2 – SFA 9 (Anticosti)	**N/A**
	UoC 3 – SFA 10 (Sept Iles)	**N/A**
	UoC 4 – SFA 12 (Estuary)	**N/A**

PI 3.1.3 – Long term objectives

PI 3.1.3		The management policy has clear long-term objectives to guide decision-making that are consistent with MSC fisheries standard, and incorporates the precautionary approach.		
Scoring Issue		SG 60	SG 80	SG 100
a	Objectives			
	Guide post	Long-term objectives to guide decision-making, consistent with the MSC fisheries standard and the precautionary approach, are **implicit** within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC fisheries standard and the precautionary approach are **explicit** within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC fisheries standard and the precautionary approach, are **explicit** within **and required by** management policy.
	Met?	**All UoCs - Y**	**All UoCs - Y**	**All UoCs - Y**
	Justification	Fish stock conservation and other ecosystem sustainability objectives stem from Canadian legislation such as the Fisheries Act, Ocean's Act and Species at Risk Act, and policy initiatives such as the Atlantic Fisheries Policy Review and Sustainable Fisheries Framework, e.g.: The Fisheries Act provides absolute discretion to the Minister for the management of fisheries and, in so doing, section 6 of the Act explicitly requires the Minister to consider fisheries management objectives before a regulation is made. The Oceans Act (section 35-2) explicitly requires the Minister to ensure clearly identified objectives are set for marine protected areas. The Species at Risk Act (section 46) explicitly requires the Minister to report on the progress toward meeting recovery objectives of ETP species. The Atlantic Fisheries Policy Review provides objectives to guide decision-making in Atlantic fisheries. It places conservation of the resource as the priority, sets the path for greater industry self-reliance, establishes transparent rules-based processes for decision-making and encourages a greater role for resource users and others (DFO 2004). The "Policy to Manage the Impacts of Fishing on Sensitive Benthic Areas" requires the mitigation of the impacts of fishing on sensitive benthic areas or avoidance of impacts of fishing that are likely to cause serious or irreversible harm to sensitive marine habitat, communities and species (DFO 2009b). The "Policy on Managing Bycatch" is intended to ensure that Canadian fisheries are managed in a manner that supports the sustainable harvesting of aquatic species and that minimizes the risk of fisheries causing serious or irreversible harm to bycatch species; and to account for total catch, including retained and non-retained bycatch. Requirements and procedures for new fisheries are outlined in "The Emerging Species Policy". A cornerstone of the policy is the establishment of a scientific base with which stock responses to new fishing pressures can be assessed (DFO 2008b). The Aboriginal Fisheries Strategy was developed to implement the Supreme Court of Canada decision that aboriginal people have a right to fish for food, social and ceremonial purposes, a right that takes priority, after conservation, over other users of the resource. The policy seeks to provide stability where DFO manages the fishery and where land claims settlements have not already put a fisheries management regime in place (DFO 1992).		

		The precautionary and ecosystem approaches are required to be incorporated into all fishery management decisions while protecting biodiversity and fisheries habitat by virtue of the "Sustainable Fisheries Framework" (DFO 2009a). These Acts and broad policy guidelines are implemented through fisheries specific objectives that are outlined in fisheries management plans. Therefore, it is considered that clear long-term objectives that implicitly (SG 60) and explicitly (SG 80) guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are required by the management policy, thereby meeting the requirements of SG 100.
References		DFO (1992) The Aboriginal Fisheries Strategy http://www.dfo-mpo.gc.ca/fm-gp/aboriginal-autochtones/afs-srapa-eng.htm DFO (2004) Atlantic Fisheries Policy Review http://www.dfo-mpo.gc.ca/fm-gp/policies-politiques/afpr-rppa/framework-cadre-eng.htm DFO (2008a) The Policy on Managing Bycatch http://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/bycatch-policy-prise-access-back-fiche-eng.htm DFO (2008b) The Emerging Species Policy http://www.dfo-mpo.gc.ca/fm-gp/policies-politiques/efp-pnp-eng.htm DFO (2009a) Sustainable Fisheries Framework http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/overview-cadre-eng.htm DFO (2009b) Policy to Manage the Impacts of Fishing on Sensitive Benthic Areas http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/benthi-back-fiche-eng.htm

OVERALL PERFORMANCE INDICATOR SCORE:	**UoC 1 – SFA 8 (Esquiman)**	**100**
	UoC 2 – SFA 9 (Anticosti)	**100**
	UoC 3 – SFA 10 (Sept Iles)	**100**
	UoC 4 – SFA 12 (Estuary)	**100**
CONDITION NUMBER (if relevant):	**UoC 1 – SFA 8 (Esquiman)**	**N/A**
	UoC 2 – SFA 9 (Anticosti)	**N/A**
	UoC 3 – SFA 10 (Sept Iles)	**N/A**
	UoC 4 – SFA 12 (Estuary)	**N/A**

PI 3.2.1 – Fishery-specific objectives

PI 3.2.1		The fishery-specific management system has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2.		
Scoring Issue		SG 60	SG 80	SG 100
a	Objectives			
	Guide post	**Objectives**, which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are **implicit** within the fishery-specific management system.	**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-specific management system.	**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-specific management system.
	Met?	**All UoCs - Y**	**All UoCs - Y**	**All UoCs - Partial**
	Justification	Stock conservation and other sustainability objectives for the fishery stem from Canadian legislative and evolving policy developments such as the Ocean's and Species at Risk Acts, the Atlantic Fisheries Policy Review, the Aboriginal Fisheries Strategy and Sustainable Fisheries Framework. The IFMP reflects the policy objectives set out in these documents with four overarching objectives (SG 60) with multiple short and long term (SG 80) objectives as sub-sets, for managing the Gulf of St. Lawrence Northern Shrimp Trawl Fishery. These are consistent with achieving the outcomes of MSC's Principles 1 and 2 (SG 60) and are reflected in the harvest strategy (PI 1.2.1) for the shrimp stocks and management partial strategies/startegies for primary, secondary, ETP, habitat and ecosystems: • Sustainable shrimp fishing ○ Help maintain the abundance of stocks in the healthy zone ○ Studying the predation of Northern shrimp by groundfish, particularly redfish ○ Studying the impact of environmental change on the Northern shrimp • Fishery's impact on the ecosystem ○ Assess the risk of shrimp trawls causing serious damage to the habitat and vulnerable benthic communities ○ Contribute to the protection marine and coastal areas ○ Assess the risk of the shrimp fishery causing serious harm to non-target stocks ○ Monitor the interactions of the fishery with species at risk ○ Modernise fishing operations monitoring tools • Governance of the fishery ○ Reviewing administrative guidelines ○ Insure the harmonious use of the fishing grounds • Econominc prosperity of the fishery ○ Facilitating fleet restructuring and profitability ○ Promote the active participation of First Nations communities and the development of their capacities ○ Collaborating on eco-certification work ○ Facilitate the development of sustainable fishing gears ○ Facilitate the improvement of catch quality		

		The progress toward attaining the objectives is monitored using performance indicators (see Management evaluation in section 7.6.1 for examples or Appendix 1 of the IFMP (DFO, 2018a)) From the above, it is concluded that measurable 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-specific management system, thereby meeting the SG 80 and part of the SG 100. Therefore a partial score of 90 is given. The SG 100 is not met as the objectives are not defined in such a way that shows how the performance against the objective can be measured.
References		DFO (1992) The Aboriginal Fisheries Strategy http://www.dfo-mpo.gc.ca/fm-gp/aboriginal-autochtones/afs-srapa-eng.htm DFO (2004) Atlantic Fisheries Policy Review http://www.dfo-mpo.gc.ca/fm-gp/policies-politiques/afpr-rppa/framework-cadre-eng.htm DFO (2009a) Sustainable Fisheries Framework http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/overview-cadre-eng.htm DFO 2018a, Integrated Fishery Management Plan for the Northern Shrimp in the Estuary and Gulf of St. Lawrence (Areas 8, 9, 10 and 12) (*Pandalus borealis)* Oceans Act (1996) http://laws-lois.justice.gc.ca/PDF/O-2.4.pdf Species at Risk Act (2002) http://laws-lois.justice.gc.ca/PDF/S-15.3.pdf
OVERALL PERFORMANCE INDICATOR SCORE:	**UoC 1 – SFA 8 (Esquiman)**	**90**
	UoC 2 – SFA 9 (Anticosti)	**90**
	UoC 3 – SFA 10 (Sept Iles)	**90**
	UoC 4 – SFA 12 (Estuary)	**90**
CONDITION NUMBER (if relevant):	**UoC 1 – SFA 8 (Esquiman)**	**N/A**
	UoC 2 – SFA 9 (Anticosti)	**N/A**
	UoC 3 – SFA 10 (Sept Iles)	**N/A**
	UoC 4 – SFA 12 (Estuary)	**N/A**

PI 3.2.2 – Decision-making processes

PI 3.2.2		**The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery.**		
Scoring Issue		SG 60	SG 80	SG 100
a	Decision-making processes			
	Guide post	There are some decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives.	There are **established** decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.	
	Met?	**All UoCs - Y**	**All UoCs - Y**	
	Justification	While the Minister of Fisheries and Oceans is the final arbiter of decisions, his/her authority is delegated to officials through the organisational structure of DFO, in this instance, the Regional Director General (RGD) of the Quebec Region of DFO in coordination with his/her peers in the Gulf and Newfoundland and Labrador DFO regions. Their decisions are informed by consultations and recommendations made by DFO science and in the EGSAC and guided by the fishery specific objectives for the fishery (SG 60). The Framework Process (DFO, 2009c) is the mechanism whereby DFO science assesses the assumptions and data inputs underlying the management of the fishery. The Regional Advisory Process (RAP) is the process established in Canada on which science advice to government is founded. Based on principles of rigour and impartiality; openness and transparency, and within which science inputs is drawn from a wide range of source, including local/traditional ecological knowledge. Sources of uncertainty, i.e. absence of adequate scientific information, are addressed in the RAP and taken into consideration when deciding management advice, which governs the harvest strategy. The RAP includes peer review and is open to participants other than those directly involved in the management or prosecution of the fishery. The EGSAC is the forum for discussion of issues related to the management and development of the fishery. The Committee reviews all available information including scientific advice and provides input for the content of the annual management plan, including but not limited to advice on the TAC, regulatory, conservation, compliance and licencing issues. The shrimp fishery overlaps with the snow crab and Greenland halibut fishery and so issues of shared use are discussed and resolutions made in the EGSAC forum. Through consultation and liaison the fleets and DFO aim to work toward Working Groups can also be set up to discuss specific issues and report back to the Committee. The EGSAC seeks to work on a consensus basis (EGSAC, 2018). Recommendations based on consultation with EGSAC, are considered in the decision making process. Where parties are not satisfied with the decisions by DFO, they have the right to redress through the Federal Court of Appeal system. As a result, it is considered that there are established decision-making processes that result in measures and strategies to achieve the fishery specific objectives, thus meeting the SG 80 requirements.		
b	Responsiveness of decision-making processes			
	Guide post	Decision-making processes respond to **serious issues**	Decision-making processes respond to **serious and**	Decision-making processes respond to **all 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.	**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.	identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
	Met?	**All UoCs - Y**	**All UoCs - Y**	**All UoCs - N**
	Justification	The fishery specific decision-making process is set out in the IFMP (DFO, 2018a) and described in SI (a) above. The EGSAC meetings are where details of the past season's fishery are reviewed, scientific advice received, any serious (SG 60) and other important issues (SG 80) identified, management proposals made and consensus sought on management measures for the following fishing season. Minutes of the meetings are provided (EGSAC, 2018). Working groups can also be established to discuss specific issues and report back to the Committee with recommendations. Recommendations and advice from the advisory committee and any related RAP are taken into account by DFO when making fishery specific management decisions (SG 60 and SG 80). The Minister or his/her delegated officials generally adhere to recommendations. Therefore, the decision making process is considered to 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, thereby meeting the SG 80. The SG 100 is not met as it cannot be said that decision-making processes respond to <u>all</u> issues identified in relevant research, monitoring, evaluation and consultation.		
c	Use of precautionary approach			
	Guide post		Decision-making processes use the precautionary approach and are based on best available information.	
	Met?		**All UoCs - Y**	
	Justification	The precautionary approach is required for all fisheries as a matter of policy as outlined in the "Sustainable Fisheries Framework" (DFO 2009a). The IFMP (DFO, 2018a) includes a section on the precautionary approach and describes how different factors, including the changing environment and the important ecosystem role that shrimp fulfils are taken into account in the stock assessment process. The precautionary approach is implemented during the stock assessment (DFO, 2018b), which compares exploitation rate to a removal reference value, and defines stock status using limit and upper reference points for spawning biomass, and during TAC setting, which takes account of the main indicator stock status calculated from the male and female indices obtained from the summer commercial fishery and the DFO research survey. Harvest guidelines are established according to the main indicator and its position in relation to the stock status classification zones (healthy, cautious, critical). The precautionary approach adopted in the fishery aims to maintain a constant exploitation rate when the stock is in the healthy zone (DFO, 2018a).		

		Monitoring of quota uptake and by-catch levels are based on the best available information from log books, dockside monitoring, and observer reports. Decisions about closed areas and conservation zones are based on an assessment of risk using the best available information on the distribution of sensitive habitats and species, the distribution and intensity of the shrimp fishing footprint, and the precautionary concept of avoiding irreversible harm. As a result, the SG 80 is met as, decision-making processes use the precautionary approach and are based on best available information.		
d	Accountability and transparency of management system and decision-making process			
	Guide post	Some information on the fishery's performance and management action is generally available on request to stakeholders.	**Information on the fishery's performance and management action is available on request**, and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.	Formal reporting to all interested stakeholders **provides comprehensive information on the fishery's performance and management actions** and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
	Met?	**All UoCs - Y**	**All UoCs - Y**	**All UoCs - N**
	Justification	The EGSAC is where details of the past season's fishery are presented and reviewed; any issues identified; scientific advice received; management proposals made; and, consensus sought on management measures for the following fishing season. Representatives of organisations directly involved in the fishery participate at the committee meetings. Minutes of the meetings are provided to participants (e.g. EGSAC, 2018) or to non-participants upon request from DFO (B. Morin, pers. comm.) (SG 60 and 80). The assessment team noted that within the EGSAC terms of reference, it states that the minutes of the meetings will be published on the DFO website, however, upon review the minutes were not found. As set out in the terms of reference, EGSAC is established on 6 "Guiding Principles": Transparency, Responsibility, Inclusive Representation, Effectiveness, Efficiency, Consensus. Under the principle of "Responsibility" it is stated that, "The Department must inform participants of the extent to which their opinions or comments were taken into consideration and of why and how decisions are made.". The minutes of the EGSAC meeting of February 2018 reflect this, e.g. they show a response to questions related to the frequency of VMS reporting, thereby meeting the SG 80. Evidence of providing comprehensive information on fishery performance of the shrimp trawl and trap fishery to all interested stakeholders was not available and so the SG 100 is not met.		
e	Approach to disputes			
	Guide post	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	The management system or fishery is attempting to comply in a timely fashion with judicial decisions	The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial

		repeatedly violating the same law or regulation necessary for the sustainability for the fishery.	arising from any legal challenges.	decisions arising from legal challenges.
	Met?	**All UoCs - Y**	**All UoCs - Y**	**All UoCs - Y**
	Justification	There have been no legal challenges to the Gulf of St. Lawrence Northern Shrimp Trawl Fishery (M. Morin, pers. comm.) and the assessment team did not hear any concerns or see evidence of a disrespect or defiance of the law by DFO repeatedly violating the same law or regulation necessary for the sustainability for the fishery (SG 60). Legal disputes within fisheries in Canada are adjudicated through the Canadian judicial process. The legal and policy framework has been tested on several occasions and shown to be effective in relation to fisheries related issues, “Larocque”, “Sparrow” and “Marshall” decisions. These decsions resulted in changes within The Canadian fisheries management system and within this fishery, e.g. the Marshall decision led to the Aboriginal Fisheries Strategy (DFO 1992) and resulted in fishing licences in this fishery being granted to First Nation communities (see PI 3.1.1 c above) (SG 80). DFO request agenda items from the EGSAC members prior to the meetings thereby providing opportunity for concerns and issues to be raised in a proactive way. The advisory process and the EGSAC are considered to help mitigate disputes and legal challenges. Therefore, the management system is considered to proactively avoid legal disputes and implements judicial decisions arising from legal challenges, thereby meeting the SG 100.		
References		DFO 2009c A Fishery Decision-Making Framework Incorporating the Precautionary Approach http://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/precaution-eng.htm DFO 2018a, Integrated Fishery Management Plan for the Northern Shrimp in the Estuary and Gulf of St. Lawrence (Areas 8, 9, 10 and 12) (*Pandalus borealis*) DFO. 2018b. Assessment of Northern Shrimp stocks in the Estuary and Gulf of St. Lawrence in 2017. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2018/015. EGSAC 2018, Minutes of Estuary and Gulf Shrimp Advisory Committee Meeting, February 6, 2018. Larocque Decision 2006, http://www.dfo-mpo.gc.ca/fm-gp/policies-politiques/fish-allocation-finance-poisson-eng.htm Marshall Decision 1999 https://en.wikipedia.org/wiki/R_v_Marshall Sparrow Decision 1990. https://scc-csc.lexum.com/scc-csc/scc-csc/en/item/609/index.do		

OVERALL PERFORMANCE INDICATOR SCORE:	**UoC 1 – SFA 8 (Esquiman)**	**85**
	UoC 2 – SFA 9 (Anticosti)	**85**
	UoC 3 – SFA 10 (Sept Iles)	**85**
	UoC 4 – SFA 12 (Estuary)	**85**

CONDITION NUMBER (if relevant):	**UoC 1 – SFA 8 (Esquiman)**	**N/A**
	UoC 2 – SFA 9 (Anticosti)	**N/A**
	UoC 3 – SFA 10 (Sept Iles)	**N/A**
	UoC 4 – SFA 12 (Estuary)	**N/A**

PI 3.2.3 – Compliance and enforcement

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.		
Scoring Issue		SG 60	SG 80	SG 100
a	MCS implementation			
	Guide post	Monitoring, control and surveillance **mechanisms** exist, and are implemented in the fishery and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance **system** has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A **comprehensive** monitoring, control and surveillance system has been implemented in the fishery and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.
	Met?	**All UoCs - Y**	**All UoCs - Y**	**All UoCs - Y**
	Justification	DFO's Conservation and Protection Division (C & P) is responsible for supporting conservation and sustainability of the shrimp trawl fishery. Through the delivery of their surveillance, inspection and enforcement program C & P ensures compliance with measures in place to manage the fishery (SG 60). Coastguard patrols are used to monitor boundary lines and closed areas, as well as provide a platform from which C & P Fisheries Officers can conduct at-sea boarding to inspect catch records, gear specifications, monitor fishing activity, assess species composition and check weights. Monitoring and surveillance is supported by aerial surveillance, satellite monitoring (Vessel Monitoring System - VMS) and at-sea observers. This is coordinated by C & P regional offices in Quebec (SG 80). The scientific data related to catch and effort, and any biological sampling that is conducted at sea is used by the C & P Division to monitor compliance with respect to incidental catch of SARA listed species. Shore-based Fisheries Officers also work with dockside monitors to ensure the integrity of species identification and reported catch weights. The IFMP has a section dedicated to compliance and an Appendix which provides an enforcement summary for the fishery between 2010 and 2016 in the form of a table with fishery officer patrol hours, warnings issued, charges laid charges pending and charges not approved. MSC annual audit teams have been provided with an update on enforcement activity. No significant issues or systematic non-compliance have been identified. Most of the violations are administrative, e.g. failure to have on board licence conditions. An administrative and court-based sanction framework is outlined in the Fisheries Act and regulations with court based prosecution for serious offences through the Canadian Criminal Code (1985). Upon conviction maximum penalties of $500,000 and up to two years in jail may be imposed along with forfeiture of catch and equipment at the discretion of the court. DFO Quebec publishes the fines imposed for breaches in regulations on their regional website: http://www.dfo-mpo.gc.ca/media/charges-inculpations/que-eng.htm. No fines were published in relation to the shrimp trawl fishery and no convictions were reported at the site visit. It is considered that 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. The SG 100 is therefore met.		
b	Sanctions			
	Guide post	Sanctions to deal with non-compliance exist and there is some evidence that they are applied.	Sanctions to deal with non-compliance exist, **are consistently applied** and thought to provide effective deterrence.	Sanctions to deal with non-compliance exist, are consistently applied and **demonstrably** provide effective deterrence.
	Met?	**All UoCs - Y**	**All UoCs - Y**	**All UoCs - N**
	Justification	An administrative and court-based sanction framework is outlined in the Fisheries Act and regulations with court based prosecution for serious offences through the Canadian Criminal Code (1985). Upon conviction, maximum penalties of $500,000 and up to two years in jail may be imposed along with forfeiture of catch and equipment at the discretion of the court. DFO Quebec publishes the fines imposed for breeches in regulations on their regional website: http://www.dfo-mpo.gc.ca/media/charges-inculpations/mar-eng.htm. Therefore, sanctions to deal with non-compliance exist and there is some evidence to show they are applied, meeting the SG 60. Annual MSC audits have reviewed enforcement and compliance (2015-2018) and no significant issues have been raised. DFO's C & P division confirmed that while there is no quantitative information on the effectiveness of enforcement (e.g., likelihood of violators being prosecuted and convicted) or the deterrent value of the sanction system, the sanctions were considered to be consistently applied. Furthermore, the low number of offences over the last 5 years, is thought to indicate an effective deterrent. The assessment team consider that sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence within the fishery, thereby meeting the SG 80. The SG 100 is not met as it is not considered possible to demonstrably show that sanctions provide an effective deterrent.		
c	Compliance			
	Guide post	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.	**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.	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.
	Met?	**All UoCs - Y**	**All UoCs - Y**	**All UoCs - N**
	Justification	Fishers are generally thought to comply with the management system (SG 60) and evidence provided by C & P at annual audits during the course of the existing certification (2015-2018) show that no significant issues or systematic non-compliance have been identified. The C & P reports show low numbers of violations (1-2 per year) all of which have been administrative, e.g. failure to have on board licence conditions. C & P have also reported at previous audits that the shrimp trawl fishery is considered to be a low risk fishery with respect to non-compliance (SG 80).		

		Important information required to support the fishery is provided by the fishers, particularly through the completion of logbooks, which includes the quantity of fish caught and area of capture – all of which can be confirmed via dockside monitoring, VMS and observer reports. Commercial fishing catch and effort data have been collected since 1982 from shrimp harvesters' logbooks, plant purchase receipts and from the dockside landing verification program and contribute to the scientific stock assessments for Gulf shrimp. Therefore, there is some evidence exists to demonstrate fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery, thereby meeting the SG 80. The SG 100 is not met as further information and broader coverage of the fishery is necessary to demonstrate a high degree of confidence that fishers comply.		
d	Systematic non-compliance			
	Guide post		There is no evidence of systematic non-compliance.	
	Met?		**All UoCs - Y**	
	Justification	DFO compliance and enforcement reports indicate a high level of compliance within the fishery. No evidence of systematic non-compliance was provided. The SG 80 requirements are therefore met.		
References		DFO 2018a, Integrated Fishery Management Plan for the Northern Shrimp in the Estuary and Gulf of St. Lawrence (Areas 8, 9, 10 and 12) (*Pandalus borealis*) DFO. 2018b. Assessment of Northern Shrimp stocks in the Estuary and Gulf of St. Lawrence in 2017. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2018/015. MSC Annual audits 2015-2018		

OVERALL PERFORMANCE INDICATOR SCORE:	**UoC 1 – SFA 8 (Esquiman)**	**85**
	UoC 2 – SFA 9 (Anticosti)	**85**
	UoC 3 – SFA 10 (Sept Iles)	**85**
	UoC 4 – SFA 12 (Estuary)	**85**
CONDITION NUMBER (if relevant):	**UoC 1 – SFA 8 (Esquiman)**	**N/A**
	UoC 2 – SFA 9 (Anticosti)	**N/A**
	UoC 3 – SFA 10 (Sept Iles)	**N/A**
	UoC 4 – SFA 12 (Estuary)	**N/A**

PI 3.2.4 – Monitoring and management performance evaluation

PI 3.2.4		**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.**		
Scoring Issue		SG 60	SG 80	SG 100
a	Evaluation coverage			
	Guide post	There are mechanisms in place to evaluate **some** parts of the fishery-specific management system.	There are mechanisms in place to evaluate **key** parts of the fishery-specific management system	There are mechanisms in place to evaluate **all** parts of the fishery-specific management system.
	Met?	**All UoCs - Y**	**All UoCs - Y**	**All UoCs - Y**
	Justification	Biennial (and, when necessary more frequent) meetings of EGSAC provide an opportunity to monitor, review and evaluate not just “some” (SG 60) but “key” parts (SG 80) of the management system, e.g. stock status, the previous years fishing, effectiveness of closed areas. The EGSAC may also establish ad-hoc sub-committees or working groups to review and assess specific policy and management measures (DFO, 2018a), e.g. IFMP subcommittee which is tasked with ensuring annual follow-up of the IFMP action plan and other management measures affecting Gulf Shrimp fleets. The subcommittee can make recommendations to EGSAC for adjustments or new items to consider responding to the needs identified in the IFMP. Therefore, there are mechanisms in place to evaluate key parts of the fishery specific management system. SG 80 is met. DFO reviews and evaluates compliance and monitoring on a regular basis (DFO, 2018a and EGSAC 2018). The IFMP has a section on “Performance Review” which defines the indicators that enable assessment of progress towards achieving the stated management objectives. A list of qualitative and quantitative performance indicators have been identified and progress towards achieving them are reported in an Appendix of the IFMP every two years (DFO, 2018a). Therefore, the fishery has in place mechanisms to evaluate all parts of the management system, thereby meeting the SG 100.		
b	Internal and/or external review			
	Guide post	The fishery-specific management system is subject to **occasional internal** review.	The fishery-specific management system is subject to **regular internal** and **occasional external** review.	The fishery-specific management system is subject to **regular internal** and **external** review.
	Met?	**All UoCs - Y**	**All UoCs - N**	**All UoCs - N**
	Justification	Biennial (and, when necessary more frequent) meetings of EGSAC provide an opportunity to monitor, review and evaluate key parts of the management system. The EGSAC may also establish ad-hoc sub-committees or working groups to review and assess specific policy and management measures (DFO, 2018a). DFO also reviews and evaluates compliance and monitoring on a regular basis (DFO, 2018a and EGSAC 2018).		

		With respect to external review, Canadian fisheries are reviewed by a number of institutions, e.g. The House of Commons and the Senate's Standing Committees on Fisheries and Oceans. Also, the Canadian Auditor General has, on an ad-hoc basis, reviewed fisheries related issues (OAGC, 2009). However, the Gulf of St. Lawrence Shrimp Trawl Fishery has never been subject to an external review by either these Committees or the OAGC. The fishery-specific management system is therefore subject to regular internal review, thereby meeting the SG 60. However, while there are a number of institutions that undertake external reviews of Canadian fisheries, the Gulf of St. Lawrence Shrimp Trawl Fishery has never been subject to their, or any other, external review. Therefore, it cannot be said the fishery-specific management system is subject to occasional external review and so the SG 80 is not met.
References		DFO 2018a, Integrated Fishery Management Plan for the Northern Shrimp in the Estuary and Gulf of St. Lawrence (Areas 8, 9, 10 and 12) (*Pandalus borealis*) EGSAC 2018, Minutes of Estuary and Gulf Shrimp Advisory Committee Meeting, February 6, 2018. OAGC 2009. Protecting Fish Habitat. Chapter 1 in a report to Parliament by the Office of the Auditor General of Canada. http://oag-bvg.gc.ca/internet/docs/parl_cesd_200905_01_e.pdf

OVERALL PERFORMANCE INDICATOR SCORE:	**UoC 1 – SFA 8 (Esquiman)**	**70**
	UoC 2 – SFA 9 (Anticosti)	**70**
	UoC 3 – SFA 10 (Sept Iles)	**70**
	UoC 4 – SFA 12 (Estuary)	**70**
CONDITION NUMBER (if relevant):	**UoC 1 – SFA 8 (Esquiman)**	**5**
	UoC 2 – SFA 9 (Anticosti)	**6**
	UoC 3 – SFA 10 (Sept Iles)	**7**
	UoC 4 – SFA 12 (Estuary)	**8**

Principle 3 References

Aboriginal Communal Fishing Licences Regulations SOR/93-332 http://laws-lois.justice.gc.ca/eng/regulations/SOR-93-332/

Atlantic Fishery Regulations (1985) http://laws-lois.justice.gc.ca/eng/regulations/sor-86-21/index.html

Bill C-38, 2012, http://www.parl.ca/DocumentViewer/en/41-1/bill/C-38/royal-assent

Bill C-68, 2018. Amendment to the Fisheries Act http://www.parl.ca/Content/Bills/421/Government/C-68/C-68_1/C-68_1.PDF

Constitution Act 1982. http://laws-lois.justice.gc.ca/eng/Const/

DFO 1992 The Aboriginal Fisheries Strategy http://www.dfo-mpo.gc.ca/fm-gp/aboriginal-autochtones/afs-srapa-eng.htm

DFO 2004 Atlantic Fisheries Policy Review http://www.dfo-mpo.gc.ca/fm-gp/policies-politiques/afpr-rppa/framework-cadre-eng.htm

DFO 2008a The Policy on Managing Bycatch http://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/bycatch-policy-prise-access-back-fiche-eng.htm

DFO 2008b The Emerging Species Policy http://www.dfo-mpo.gc.ca/fm-gp/policies-politiques/efp-pnp-eng.htm

DFO 2009a. Sustainable Fisheries Framework http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/overview-cadre-eng.htm

DFO 2009b. Policy to Manage the Impacts of Fishing on Sensitive Benthic Areas http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/benthi-back-fiche-eng.htm

DFO 2009c. A Fishery Decision-Making Framework Incorporating the Precautionary Approach http://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/precaution-eng.htm

DFO 2010. Northern shrimp (SFAs) 0-7 and the Flemish Cap - Integrated Fisheries Management Plan. Date modified: 2010-05-19. http://www.dfo-mpo.gc.ca/fm-gp/peches- fisheries/ifmp-gmp/shrimp-crevette/shrimp-crevette-2007-eng.htm.

DFO 2013. Policy on Managing Bycatch http://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/bycatch-policy-prise-access-eng.htm

DFO 2018a. Integrated Fishery Management Plan for the Northern Shrimp in the Estuary and Gulf of St. Lawrence (Areas 8, 9, 10 and 12) (*Pandalus borealis)*

DFO 2018b. Assessment of Northern Shrimp stocks in the Estuary and Gulf of St. Lawrence in 2017. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2018/015. http://publications.gc.ca/collections/collection_2018/mpo-dfo/fs70-6/Fs70-6-2018-015-eng.pdf

EGSSAC 2018, Minutes of Estuary Shrimp Advisory Committee Meeting, February 6-7, 2018.

FAO Code of Conduct for Responsible Fisheries 1995
http://www.fao.org/docrep/005/v9878e/v9878e00.HTM

Federal Courts Act 1985 http://laws-lois.justice.gc.ca/eng/acts/F-7/

Fisheries Act 1985 (as amended). http://laws-lois.justice.gc.ca/PDF/F-14.pdf

Fishery (General) Regulations 1993. http://laws-lois.justice.gc.ca/PDF/SOR-93-53.pdf

https://www.aadnc-aandc.gc.ca/eng/1100100028614/1100100028615

International Convention for the Conservation of Atlantic Tunas https://www.iccat.int/en/

Intertek 2014, Public Certification Report of the Gulf of St. Lawrence Northern Shrimp Trawl Fishery https://fisheries.msc.org/en/fisheries/gulf-of-st-lawrence-northern-shrimp-trawl-fishery/@@assessments

Larocque Decision 2006 http://www.dfo-mpo.gc.ca/fm-gp/policies-politiques/fish-allocation-finance-poisson-eng.htm

Marshall Decision 1999 https://www.aadnc-aandc.gc.ca/eng/1100100028614/1100100028615

Northwest Atlantic Fisheries Organization (NAFO) https://www.nafo.int

OAGC 2009. Protecting Fish Habitat. Chapter 1 in a report to Parliament by the Office of the Auditor General of Canada. http://oag-bvg.gc.ca/internet/docs/parl_cesd_200905_01_e.pdf

Oceans Act 1996. http://laws-lois.justice.gc.ca/PDF/O-2.4.pdf

Sparrow Decision https://scc-csc.lexum.com/scc-csc/scc-csc/en/item/609/index.do

Species at Risk Act (SARA) 2002. http://laws-lois.justice.gc.ca/PDF/S-15.3.pdf

United Nations Convention on the Law of the Sea (UNCLOS) (1982)
http://www.un.org/Depts/los/convention_agreements/texts/unclos/unclos_e.pdf

United Nations Fisheries Agreement (UNFA) (1995)
http://www.un.org/depts/los/convention_agreements/convention_overview_fish_stocks.htm

8 Appendices

8.1 Assessment information

8.1.1 Previous assessments

This Gulf of St. Lawrence Northern Shrimp Trawl Fishery was re-assessed during 2013 against MSC CR v 1.2 and re-certified on 20th March 2014. The Public Certification Report concluded the following overall scores (Intertek, 2014):

Table 25. Overall scores achieved when the Gulf of St. Lawrence Northern Shrimp Trawl Fishery was re-assessed and re-certified in 2014.

MSC Principle	Fishery Performance
Principle 1: Sustainability of Exploited Stock	95.0
Principle 2: Maintenance of Ecosystem	88.3
Principle 3: Effective Management System	92.5

Three conditions of certification were placed on the trawl fishery. Table 26 below, shows each of the conditions, when they were closed, what actions resulted in their closure and their revised score.

In addition to the previous reassessment which concluded, a reassessment was announced on the 9th March 2018. This exceeded the 18 month period allowed from announcement to final report notification. As such this reassessment was stopped. This new assessment under V2.1 is based on the findings of the stopped reassessment as well as the previous reports.

Table 26. Summary of previous assessment conditions.

Condition	PI	Year closed	Justification – extracted from the rescoring table within the 2nd annual surveillance report
1. By the 3rd surveillance audit, the client must provide evidence that a partial strategy, if necessary, has been 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. 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, if necessary, will work, based on information directly about the fishery and/or habitats involved.	2.4.2 SIa	Year 4	An analysis of existing fisheries management measures that help mitigate the effect of the shrimp fishery on habitats highlighted the need for additional measures, particularly with regard to vulnerable and sensitive habitats and species. Following publication of DFO's Coral and Sponge Conservation Strategy for Eastern Canada, DFO announced the selection of 11 coral and sponge conservation areas in the Estuary and Gulf of St. Lawrence, and Québec Region Variation Order 2017-Q-104 prohibiting fishing in those 11 conservation areas took effect on 15 December 2017. In addition to the implementation of the closure to fishing of areas of sensitive habitat, various other elements are in place which constitute a partial strategy for ensuring that the fishery is highly unlikely to impact on habitat structure and function. Fishing effort is restricted through licenses, seasonal closures and catch limits. Fishing is restricted to a small proportion of the total area of distribution of shrimp, and shrimp vessels do not tend to fish in sensitive areas. In addition, monitoring through log books, VMS and observers (as set out in the Conservation Harvesting Plan and the licence conditions) allows identification of any change in fishing area which might change the nature of the impact of the shrimp fishery on habitat features. The monitoring of fishing activity in conjunction with the DFO annual summer survey allows an analysis of the overlay of fishing activity with sensitive habitat features. The Integrated Fishery Management Plan (IFMP) for the shrimp fishery in the Estuary and Gulf of St. Lawrence (EGSL) includes management objectives specifically designed to minimize the impacts of fishing on the habitat. The assessment team concluded that a partial strategy has been implemented to ensure that the fishery is highly unlikely to impact on habitat structure and function. SG80 is met.
	2.4.2 SIb		The partial strategy is expected to work because fishing is now prohibited in the most important concentrations of coldwater corals and sponges, information on coral and sponge bycatches in shrimp fishing gear from the at-sea observer program suggest that sea pens (soft corals) and sponges are observed in only 0.7% and 0.3% of tows respectively, controls on fishing effort help ensure that

Condition	PI	Year closed	Justification – extracted from the rescoring table within the 2nd annual surveillance report
			unperturbed habitats are not exploited, and enforcement activities will ensure that there is compliance with the management measures, The SG80 is met.
	2.4.2 SIc		There is evidence from at-sea observer sampling and current enforcement activities that there is compliance with management measures, and the newly-implemented closure of the most important concentrations of coldwater corals and sponges has ensured that the avoidance of these areas by shrimp fishing vessels has now been formalised through the prohibition of shrimp fishing in those areas. The SG80 is met.

Condition	PI	Year closed	Justification – extracted from the rescoring table within the 2nd annual surveillance report
2. By the 4th surveillance audit, the client must provide evidence that a partial strategy, if necessary, has been successfully implemented which 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. 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).	2.5.2 SIa	Year 4	The potential impact of removal shrimp on availability of prey for predators was considered in setting the limit reference point at a level which allowed 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. This represents a partial strategy for managing the impact of the fishery on prey abundance. In relation to the impact of the fishery on benthic biodiversity and communities, a detailed analysis has been carried out by DFO to assess and manage risk to sensitive benthic communities. DFO announced the selection of 11 coral and sponge conservation areas in the Estuary and Gulf of St. Lawrence, and Québec Region Variation Order 2017-Q-104 prohibiting fishing in those 11 conservation areas took effect on 15 December 2017. In addition to the implementation of the closure to fishing of areas of sensitive habitat and communities, various other elements are in place which constitute a partial strategy to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function. Fishing effort is restricted through licenses, seasonal closures and catch limits. Fishing is restricted to a small proportion of the total area of distribution of shrimp, and shrimp vessels do not tend to fish in sensitive areas. Monitoring through log books, VMS and observers (as set out in the Conservation Harvesting Plan and

Condition	PI	Year closed	Justification – extracted from the rescoring table within the 2nd annual surveillance report
			the licence conditions) allows identification of any change in fishing area which might change the nature of the impact of the shrimp fishery on ecosystem structure and function. The monitoring of fishing activity in conjunction with the DFO annual summer survey allows an analysis of the overlay of fishing activity with sensitive ecosystem and community features. The IFMP for the shrimp fishery includes management objectives specifically designed to minimize the impacts of fishing on the ecosystem. In particular the shallow-water habitats that are favourable to the establishment of highly diversified benthic communities (Lévesque *et al*. 2010) do not sustain significant densities of shrimp which are found primarily in the deep-water mass located under the cold intermediate layer (Savard and Nozères, 2012). The risk of shrimp fishing causing harm to these shallow-water benthic communities is negligible. The maximum annual footprint of fishing represents less than 8% of all habitat types deeper than 150 m (95,213 km2; Dutil *et al*., 2011) leaving most of the deeper water area unperturbed by the shrimp fishery. The risk of shrimp fishing posing a risk of serious or irreversible harm to these benthic communities in the deeper waters is not significant, considering that 92% of the area is unperturbed by shrimp fishing. Moritz *et al*. (2015) did not detect any significant effect of the shrimp fishery on the species richness over the short (4 years), medium (10 years) and long term (20 years). They concluded that current trawling activities have little or no impact on the habitat and the communities they support. DFO announced new management measures to minimize the risk of interactions with marine mammals, particularly northern right whales. DFO requires that interactions with marine mammals are reported. It will be mandatory for all fishing licence holders to report any incident to DFO and to report all lost gear. Based on the evidence described above, the assessment team concluded that a partial strategy has now been implemented to ensure that the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function. The SG80 is met.
	2.5.2 SIb		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

Condition	PI	Year closed	Justification – extracted from the rescoring table within the 2nd annual surveillance report
			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. In relation to the potential impact of the shrimp fishery on benthic biodiversity and communities, the partial strategy was developed with recent information from the Vessel Monitoring System (VMS), the annual DFO research survey, the at-sea observer program and the reported presence of right whales in the Gulf. This information demonstrates that shrimp fishing in the highly diversified shallow water benthic communities is minimal, and that shrimp fishing occurs in less than 8% of all habitat types deeper than 150 m in the Gulf of St. Lawrence. The impact of shrimp fishing will be reduced with management measures aimed at reducing the bycatch, at protecting 11 conservation areas by prohibiting all types of fishing and at minimizing risks of interactions with marine mammals. The SG80 is met.
	2.5.2 SIc		The partial strategy is expected to work because controls on fishing effort and the patterns of fishing in the shrimp fishery ensure that shrimp fishing in the highly diversified shallow water benthic communities is minimal, shrimp fishing occurs in only 8% of the deep water communities, shrimp fishing is prohibited in 11 coral and sponge conservation areas, and management measures reduce the unwanted catch of fish such as cod, Greenland halibut and redfish, and minimise interactions with marine mammals such as right whales. Enforcement activities will ensure that there is compliance with the management measures. The SG80 is met.
	2.5.2 SId		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. In relation to the potential impact of the shrimp fishery on benthic biodiversity and communities, there is evidence from at-sea observer sampling and current enforcement activities that there is compliance with management measures, and the lack of shrimp fishing in high diversity benthic communities is reflected in the results of the study of Moritz *et al*. (2015) that did not detect any significant effect of the shrimp fishery on the species richness over the short (4 years), medium (10

Condition	PI	Year closed	Justification – extracted from the rescoring table within the 2nd annual surveillance report
			years) and long term (20 years). The newly-implemented closure of the most important concentrations of coldwater corals and sponges has ensured that the avoidance of these areas by shrimp fishing vessels has now been formalised through the prohibition of shrimp fishing in those areas. The SG80 is met.

Condition	PI	Year closed	Justification – extracted from the rescoring table within the 2nd annual surveillance report
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.	3.2.4	Year 2	Appendix 6, of the Integrated Fisheries Management Plan (DFO 2016), is titled, “Strategic Research Plan”. It highlights the scientific research associated with two main themes: 1. Shrimp productivity and their sustainable harvest; 2. The fishery’s impact on the ecosystem. Under these themes there are “sub-topics” under which are short descriptions and/or references related to recent and on-going research that are intended to under pin management of the fishery. Research results are widely disseminated in a timely fashion, and are widely and publicly available through the IFMP. This does not yet appear on the DFO website but is available on request to stakeholders. There is evidence that a research plan is disseminated, and 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. Revised score 100

8.1.2 Small-scale fisheries

Table 27. Small scale fisheries

Unit of Assessment (UoA)	Percentage of vessels with length <15m	Percentage of fishing activity completed within 12 nautical miles of shore
1	0	100
2	0	100
3	0	100
4	0	100

8.2 Evaluation processes and techniques

8.2.1 Site visits

An off-site visit was conducted the week of 11th November.

A conference call was held with the client representative and representatives from DFO, Québec Region.

No other stakeholders contacted the assessment team or Lloyd's Register prior to the site visit.

The assessment team sought information on the key aspects associated with the MSC Principles and traceability.

The following table identifies who participated in the off-site visit information gathering exercise:

Name	Organisation	Role
11th November l 2019 – Telephone Conference		
Paul Knapman	Lloyd's Register	Assessor on behalf of Lloyd's Register
Julian Addison	Lloyd's Register	Assessor on behalf of Lloyd's Register
Derek Butler	Association of Seafood Producers	Representing the client group
Jérôme Beaulieu	DFO	Resource Management, Québec Region
Magalie Hardy	DFO	Resource Management, Québec Region

8.2.2 Evaluation techniques

This assessment of the Gulf of St. Lawrence Northern Shrimp Trawl Fishery was conducted using the FCR v 2.01, and with the MSC Full Assessment Reporting Template v 1.0. The default assessment tree was adopted, with no changes made to the text of any default Performance Indicator (PI).

There are some secondary species caught in the trawl fishery which can be designated as data-deficient, and therefore MSC FCP 2.1 Table 3 and 7.7.3.5 states that these scoring elements should be assessed using the risk-based framework (RBF). However, PF4.1.4 states that "The team may elect to conduct a PSA on "main" species only when evaluating PI 2.1.1 or 2.2.1", and this was the approach taken in the previous assessment as all secondary species caught in the fishery were designated as minor secondary species. The RBF was previously not used to score any of the PIs, however as a new assessment is beginning LR are announcing RBF in case any new information comes to light that may affect this decision.

8.3 Peer Review reports

8.4 Peer Reviewer A

8.4.1 General Comments

Question	Yes/No	Peer Reviewer Justification (as given at initial Peer Review stage). Peer Reviewers should provide brief explanations for their 'Yes' or 'No' answers in this table, summarising the detailed comments made in the PI and RBF tables.	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)
Is the scoring of the fishery consistent with the MSC standard, and clearly based on the evidence presented in the assessment report?	Yes	Comments regarding dismissal of "combined effects of the MSC UoAs" in PIs 2.3.1 and 2.3.2 may have minor but inconsequential implications for scoring. Otherwise, the scoring is very well founded.	Response to this comment on "combined effects of the MSC UoAs" is provided under PIs 2.3.1 and 2.3.2.
Are the condition(s) raised appropriately written to achieve the SG80 outcome within the specified timeframe? [Reference: FCP v2.1, 7.18.1 and sub-clauses]	Yes	The rationale provided in Table 28 for the Condition (numbered 1-4 for each of the 4 UoAs) related to PI 2.4.2 clearly explains the deficiency as it relates to each of the 4 SIs. The condition spells out the evidence that will be required by the 4th annual audit and the milestones lay out a clear plan for fulfilling the condition over that period. The rationale provided in Table 29 for the Condition (numbered 5-8) related to PI 3.2.4 clearly explains the deficiency as it relates to SIb. The condition spells out the evidence that will be required by the 3rd annual audit and the milestones lay out a clear plan for fulfilling the condition over that timeframe.	No response required

Optional: General Comments on the Peer Review Draft Report (including comments on the adequacy of the background information if necessary)		The background sections provide a very comprehensive summary/overview of relevant information for the fishery and each of the 3 principles. There are no major concerns, however, the team should consider comments provided re PIs 1.1.1 and 1.1.2 and possibly expand rationales to more explicitly reflect realities related to the MSY concept in general in the context of ecosystem change as well as the very limited capacity of management to maintain stocks fluctuating around "MSY" under such circumstances. The very real possibility that reference points will need to be re-evaluated over the re-certification period should be clearly pointed out. The team should also better explain dismissal of "combined effects of the MSC UoAs" in PIs 2.3.1 and 2.3.2 rationales. The copy of the PRDR reviewed highlights (in yellow) places where minor editing should be considered. It is noted that there are 4 independent lists of references, which is a bit unusual. In the case of several DFO documents for a particular year, the 1st should be lettered a. Note that in the fishery overview and P3 lists, the IFMP is cited as DFO 2018, whereas in the P1 list it is cited as DFO 2018b and in the P2 list as DFO 2018a. This creates a bit of distraction that might be avoided by alerting the reader up front. Note also in the 7.1 table the 10s for some UoAs for all PIs that score 100. This is noted in comments for the affected PIs.	The assessment team thanks the peer reviewer for these additional general comments. The comments relating to the MSY concept in the context of changing environmental conditions, and the need to consider "the combined effects of the MSC UoAs" when evaluating the potential impact of the fishery on ETP species are considered under the relevant Performance Indicators. Thank you for highlighting the minor edits. These have been taken into account. A note has been added with respect to notifying the reader of the reference lists. Where several DFO documents from the same year are referenced, the first reference is now lettered 'a'. The typos in Table 7.1 have been corrected.

8.4.2 PI Specific Comments

PI	PI Information	PI Scoring	PI Condition	Peer Reviewer Justification (as given at initial Peer Review stage)	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)	CAB Response Code
1.1.1	Yes	Yes	NA	In the sense that SSB is at a level that would support strong recruitment under favourable ecosystem conditions, SIa meeting SG100 may be reasonable enough. However, with ecosystem being the main recruitment driver and given the pronounced downward trend in each UoC, that degree of certainty is tenuous and possibly misleading. That these UoCs are likely headed the way of UoC 3 shouldn't be obscured. Suggesting that the LRP is a level from which these populations have "demonstrably recovered" is also a bit misleading. It really isn't a Brecovery as such but, rather, a low level from which historically populations increased driven by ecosystem shift, as opposed to an actual recovery from a low level to which they had declined.The rationale needs more context.	The assessment team agrees with the peer reviewer that there is some uncertainty in recruitment levels in both the short and long term because the key drivers of recruitment appear to be water temperature and predator abundance. Along with an additional factor creating uncertainty in the main stock indicator highlighted by the other peer reviewer, the rationale has been revised and SIa has been rescored at 80 for all UoCs. The text relating to demonstrable recovery of populations has been revised.	Accepted (non-material score reduction)
1.1.1	Yes	Yes	NA	The SIb rationale should provide some consideration of the fact that the conventional Bmsy concept, based on equilibrium yield, does not apply. When ecosystem is such a strong recruitment driver, it is more meaningful to consider MSY in the context of the production regime prevailing at the time. Keeping these populations fluctuating around MSY, as more or less defined by the reference points, is beyond the capacity of any management regime.	The rationale for SIb has been expanded to note that the concept of a fixed value of MSY to which the harvest strategy should be aiming is not really tenable in the context of a fishery where recruitment is driven primarily by environmental factors such as water temperature and predator abundance. MSY is therefore more likely to vary with the production regime in place at the time. Whilst the management regime is clearly responding by reducing catches to levels consistent with current production, such a highly precautionary harvest strategy may not be able to maintain stocks at a level that was observed previously if the production regime has changed.	Accepted (no score change)

1.1.2	Yes	Yes	NA	Invoking 1.1.2, rather than raising a condition, is a more reasonable approach. However, expectations with respect to prospects for rebuilding need to be tempered with the reality reflected in 1.1.1 comments above. The management regime is clearly responding by reducing catches to levels consistent with current production.	A caveat has been added to the rationale noting that whilst any rebuilding strategy must be based upon a highly precautionary harvest strategy, it may not be able to rebuild stocks to a level that was observed previously if the production regime has changed.	Accepted (no score change)
1.2.1	Yes	Yes	NA	Re SIa, SG100 rationale, some caveats based on 1.1.1 comments above should be considered.	A similar caveat to that provided under PIs 1.1.1 and 1.1.2 has been added to the rationale.	Accepted (no score change)
1.2.2	Yes	Yes	NA	SG 100 rationales for SIs a and b include the kind of caveats suggested above for 1.2.1 - maybe expand a bit? For SI c, the rationale doesn't really provide any distinction between SGs 80 and 100. The SG 100 portion seems to be confusing the MSY-related consideration with the exploitation level being achieved.	The rationales for SIa and SIb have been expanded, and the rationale for SIc has been revised.	Accepted (no score change)
1.2.3	Yes	Yes	NA	No further comment.	No reponse needed.	
1.2.4	Yes	Yes	NA	The SG 100 portion of SIa rationale recognizes the possible need to re-evaluate reference points. It might be worth including SA2.2.7 from the MSC FCR for context. The main stock status indicator represents a combination of the CPUE and trawl survey indices. In the CPUE time series (Fig. 13), 95% CIs are provided for 1 of the 4 UoCs (presumably they are available for all) and in the survey time series (Fig. 14) they are provided for all 4 UoCs - there's probably no reason why CIs couldn't be provided for the combined stock status indicator. While this might not achieve SG 100 for SIc, it would provide a meaningful measure of some of the uncertainty.	A reference to FCR SA2.2.7 has been added to the rationale for SIa. The assessment team agrees with the peer reviewer that it would be instructive to provide confidence intervals for the main stock status indicator and has made a recommendation to that effect. (Confidence intervals are provided for all the UoCs for the fishery index in Figure 13 - the intervals are just narrow for UoCs 2 to 4.)	Accepted (no score change)
2.1.1	Yes	Yes	NA	Note in 7.1 table (p.23), the 10s for UoCs 2 and 3 should be 100s.	The errors in Table 7.1 have been corrected. The formatting of the table was such that the additional zero was obscured. The table has been reformatted.	Accepted (no score change)
2.1.2	Yes	Yes	NA	No further comment.	No reponse needed.	

2.1.3	Yes	Yes	NA	Note in 7.1 table (p.23), the 10s for UoCs 2, 3 and 4 should be 100s.	The errors in Table 7.1 have been corrected. The formatting of the table was such that the additional zero was obscured. The table has been reformatted.	Accepted (no score change)
2.2.1	Yes	Yes	NA	No further comment.	No reponse needed.	
2.2.2	Yes	Yes	NA	No further comment.	No reponse needed.	
2.2.3	Yes	Yes	NA	No further comment.	No reponse needed.	
2.3.1	No (scoring implications unknown)	No (scoring implications unknown)	NA	Reading SA3.10 suggests that SIa cannot simply be dismissed as "Not relevant" if national and/or international limits are in place (as with NARW) even if chances of interaction in shrimp fishing are very low. And "combined effects of the MSC UoAs" need to be considered in SI b and c even if there are no national or international limits. Some consideration and explanation of the foregoing is needed to justify the scoring. Also, note in 7.1 table (p.23), the 10s for UoCs 2-4 are intended to be 100s.	We agree with the peer reviewer that the rationale for SIa requires more explanation. The only species for which there may be national or international species in the Gulf of St. Lawrence is NARW. There is a formal recovery plan implemented for NARW, the objectives of which could be interpreted as signifying that the Canadian national limit for the rebuilding of the NARW population is a zero-take. However Objective 2 of the Recovery Strategy for NARW (Brown et al., 2009) is to, “Reduce [i.e., not ‘prevent’] mortality and injury as a result of fishing gear interactions (entanglement and entrapment)”, suggesting that there is no formally agreed Canadian national limit. This is relevant because in 2017 an aggregation of over 100 individual NARW was present in the southern Gulf of St. Lawrence and an unprecedented mortality event occurred during which 18 NARW were reported to have been found dead. Another MSC UoA, the Southern Gulf of St. Lawrence snow crab fishery was implicated in a number of the fatal and non-fatal entanglements, and the snow crab fishery has since been suspended from MSC certification. There are no recorded interactions of NARW with the shrimp trawl fishery or indeed any trawl fisheries in the Gulf of St. Lawrence and the geographical distribution of the shrimp fishery does not overlap with NARW sightings. MSC certification reports for other fisheries in the region have considered the impact of the Gulf of St. Lawrence snow crab fishery in relation to this PI, but they are all static gear (trap) fisheries which could potentially cause entanglements of NARW. A recent study investigating methods for minimising potential mortalities of NARW through interactions with fishing	Accepted (no score change)

					gear did not even consider trawl fisheries (Brillant et al., 2017). As there are no records of any interactions of the Gulf of St. Lawrence shrimp trawl fishery with NARW, the shrimp fishery does not overlap with the NARW sightings and mortalities in the Southern Gulf of St. Lawrence, there is some doubt over whether there are any formal national limits for NARW, and the only ETP species in the Gulf that are caught in the shrimp trawl fishery do not have any national or international limits, the assessment team concluded that there is no requirement to score this PI and the scoring for component 2.3.1 on ETP species will therefore be restricted to interactions with the two wolffish species. The rationale has been amended to that effect. There is no requirement to consider "combined effects of the MSC UoAs" for scoring issues b and c, so the rationales for these scoring issues have not been modified. The errors in Table 7.1 have been corrected.	
2.3.2	No (scoring implications unknown)	No (scoring implications unknown)	NA	2.3.1 comment above needs to be considered for SIa.	See response to comment on PI 2.3.1 above.	Not accepted (no score change)
2.3.3	Yes	Yes	NA	No further comment.	No reponse needed.	
2.4.1	Yes	Yes	NA	No further comment.	No reponse needed.	
2.4.2	Yes	Yes	Yes	Note: According to FCP7.17.7.4, if SG80 is not met for all SIs then no SI can be scored at SG100.	The Assessment Team have checked the scoring of this PI and no SI is scored higher than 60. The reviewer may have also misread FCP7.17.7.4 as this section refers to the scoring when all the SG 80 scoring issues are met.	Not accepted (no score change)
2.4.3	Yes	Yes	NA	No further comment.	No reponse needed.	
2.5.1	Yes	Yes	NA	No further comment.	No reponse needed.	
2.5.2	Yes	Yes	NA	No further comment.	No reponse needed.	
2.5.3	Yes	Yes	NA	No further comment.	No reponse needed.	
3.1.1	Yes	Yes	NA	Note in 7.1 table (p.23), the 10s for UoCs 2-4 should be100s.	The errors in Table 7.1 have been corrected. The formatting of the table was such that the additional zero was obscured. The table has been reformatted.	Accepted (no score change)
3.1.2	Yes	Yes	NA	No further comment.	No reponse needed.	

3.1.3	Yes	Yes	NA	Note in 7.1 table (p.23), the 10s for UoCs 2-4 should be 100s.	The errors in Table 7.1 have been corrected. The formatting of the table was such that the additional zero was obscured. The table has been reformatted.	Accepted (no score change)
3.2.1	Yes	Yes	NA	No further comment.	No reponse needed.	
3.2.2	Yes	Yes	NA	No further comment.	No reponse needed.	
3.2.3	Yes	Yes	NA	No further comment.	No reponse needed.	
3.2.4	Yes	Yes	Yes	See note for 2.4.2 above.	Taking into account the Assessment Team's comment in 2.4.2 above, we think the reviewer is saying that if a SI is not scored higher than 80 for any SI then no SI can score 100. The Assessment team have re-read FCP 7.17 Scoring and do not think this is the case.	Not accepted (no score change)

8.5 Peer Reviewer B

8.5.1 General Comments

Question	Yes/No	Peer Reviewer Justification (as given at initial Peer Review stage). Peer Reviewers should provide brief explanations for their 'Yes' or 'No' answers in this table, summarising the detailed comments made in the PI and RBF tables.	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)
Is the scoring of the fishery consistent with the MSC standard, and clearly based on the evidence presented in the assessment report?	Yes	The overall assessment is clear with scoring consistent with MSC standards and based on the evidence presented	No response required.
Are the condition(s) raised appropriately written to achieve the SG80 outcome within the specified timeframe? [Reference: FCP v2.1, 7.18.1 and sub-clauses]	Yes	The conditions raised are appropriately written to achieve SG80.	No response required.
Optional: General Comments on the Peer Review Draft Report (including comments on the adequacy of the background information if necessary)	N/A	The PRDR is comprehensive and provides adequate background information to assist in evaluating the fishery	No response required.

8.5.2 PI Specific Comments

PI	PI Information	PI Scoring	PI Condition	Peer Reviewer Justification (as given at initial Peer Review stage)	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)	CAB Response Code
1.1.1	Yes	No (non-material score reduction expected)	NA	It is not clear there is high degree of certainty that the stock is above the PRI. The assessment is based on the combined survey and standardised fishery index, however in recent years there are different trends apparent between the two indices. The survey index is close to record-low levels while the fishery index is at much higher levels. If the survey index reflects the true status of the stock then the stock status may be in a worse condition than indicated by the combined indicator.	The assessment team agrees with the peer reviewer that there is some uncertainty underlying the main stock indicator for two of the UoCs - UoC 2 Anticosti and UoC 4 Estuary - because the survey and fishery indices show different trends in recent years. Coupled with some other issues raised by the other peer reviewer, the rationale has been revised and SIa has been rescored at 80 for all UoCs.	Accepted (non-material score reduction)
1.1.2	Yes	Yes	NA	Scoring agreed	No response needed.	
1.2.1	Yes	Yes	NA	Scoring agreed	No response needed.	
1.2.2	Yes	No (no score change expected)	NA	SIb: The difference between the survey and fishery indices is a source of uncertainty that should be discussed. There are no confidence limits provided for the combined index (Fig. 17)	The difference in trends between the survey and fishery indices has now been included within the rationale for SIb. A recommendation has been made under PI 1.2.4 to provide confidence intervals for the main stock indicator.	Accepted (no score change)
1.2.3	Yes	Yes	NA	Scoring agreed	No response needed.	
1.2.4	Yes	Yes	NA	Scoring agreed	No response needed.	
2.1.1	Yes	No (scoring implications unknown)	NA	Redfish is described as 'less resilient' (p.86) and Sept-iles (UoC 3) has redfish at 3.1% of total catch weights (Table 13) so should this be considered as main primary?	Redfish has been redesignated as a main primary species for UoC 3 and therefore scored separately from the minor primary species where necessary. This has resulted in some minor reductions in overall score for UoC 3 as the requirements to meet SG100 are higher for main species than for minor species. Some similar minor reductions in scores have resulted for PIs 2.1.2 and 2.1.3.	Accepted (non-material score reduction)
2.1.2	Yes	Yes	NA	Scoring agreed	No response needed.	
2.1.3	Yes	Yes	NA	Scoring agreed	No response needed.	
2.2.1	Yes	Yes	NA	Scoring agreed	No response needed.	
2.2.2	Yes	Yes	NA	Scoring agreed	No response needed.	
2.2.3	Yes	Yes	NA	Scoring agreed	No response needed.	
2.3.1	Yes	Yes	NA	Scoring agreed	No response needed.	

2.3.2	Yes	Yes	NA	Scoring agreed	No response needed.	
2.3.3	Yes	Yes	NA	Scoring agreed	No response needed.	
2.4.1	Yes	Yes	NA	Scoring agreed	No response needed.	
2.4.2	Yes	Yes	Yes	Scoring agreed	No response needed.	
2.4.3	Yes	Yes	NA	Scoring agreed	No response needed.	
2.5.1	Yes	Yes	NA	Scoring agreed	No response needed.	
2.5.2	Yes	Yes	NA	Scoring agreed	No response needed.	
2.5.3	Yes	Yes	NA	Scoring agreed	No response needed.	
3.1.1	Yes	Yes	NA	Scoring agreed	No response needed.	
3.1.2	Yes	Yes	NA	Scoring agreed	No response needed.	
3.1.3	Yes	Yes	NA	Scoring agreed	No response needed.	
3.2.1	Yes	No (no score change expected)	NA	The report indicates that 'SG 100 is not considered to be met as some of the objectives are not considered to be well defined'. It would be useful to specify which objectives are not well defined	The Assessment team have clarified this point by revising the text to say, "The SG 100 is not met as the objectives are not defined in such a way that shows how the performance against the objective can be measured."	Accepted (no score change)
3.2.2	Yes	Yes	NA	Scoring agreed	No response needed.	
3.2.3	Yes	Yes	NA	Scoring agreed	No response needed.	
3.2.4	Yes	Yes	Yes	Scoring agreed	No response needed.	

8.6 Stakeholder input

To be completed at Public Certification Report

No stakeholder input was received following the publication of the ACDR.

Stakeholders are once again encouraged to review the PCDR and scoring (and responses to previous input where relevant) presented in this assessment and use the Stakeholder Input Form to provide evidence to the team of where changes to scoring are still necessary.

8.7 Conditions

Note: MSC require that if conditions are raised in the re-assessment, the CAB shall include an explanation of:

a) If and how any of the new conditions relate to previous conditions raised in the previous assessment or surveillance audits; and,
b) If and why any conditions that were raised and then closed in the previous assessment are being raised again in the reassessment.

Eight conditions have been raised related to PI 2.4.2 and 3.2.4 (multiple UoAs).

While neither of the conditions relate to previous conditions raised at the last re-assessment it is noted that there was a condition related to PI 2.4.2, however, that assessment used an earlier version of the standard, i.e. MSC CR v1.3, which does not include consideration of VMEs. It is this new aspect that has resulted in a habitat related condition for the trawl fishery.

Table 28. Condition 1 – 4 (for each UoA)

Performance Indicator	**PI 2.4.2 - There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats.**
Score	**60**
Rationale	**SG 80, SI(a): There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.** As part of meeting a previous condition of certification related to this PI and SI, in 2015, the client conducted a preliminary assessment of the potential level of risk to sensitive benthic habitats and species from shrimp trawling. The assessment concluded that the risk level was moderate to high and that the shrimp fishery overlapped with areas where soft corals and sponges are found. As such the client concluded that a "partial strategy[5]" was necessary. The outcome of this work coincided with the development and implementation of DFOs Coral and Sponge Conservation Strategy for Eastern Canada (DFO 2015), the formation of a DFO Québec Region Working Group on fishery impacts on sponge and coral areas and new work on the distribution of corals and sponges (Murillo et al, 2016; Kenchington et al, 2016). Given the overlap between the client's response to the MSC condition of certification and the development of the DFO Coral and Sponge Conservation Strategy and supporting research, the combined work resulted in a habitat partial strategy being adopted by EGSAC and included as an appendix in the updated IFMP (DFO, 2018a). In 2017, following collaboration between DFO Québec, Gulf and the Newfoundland and Labrador regions and extensive consultation with the fishing industry on 20 areas where significant concentrations of soft corals and sponges had been identified (http://www.qc.dfo-mpo.gc.ca/golfe-gulf/coraux-eng.html), 11 coral and sponge conservation areas were established (see Figure 45), resulting in the prohibition of all bottom contacting fishing gear within them. Recent published research (DFO, 2017e, Koen-Alonso et al, 2018) shows that the shrimp trawl fishery overlaps with sponge and sea pen SBAs/VMEs (see Figures 9 and 10) impacting approximately 8.4% and 12.7% of the estimated sponge and sea pen SBA/VME, respectively, within the Gulf of St. Lawrence, bioregion. By comparing the 11 coral and sponge conservation areas in Figure 45 and the overlap of the shrimp trawl fishery in Figure 43 and Figure 44, it appears that the closures do not

[5] In MSC terms, a "partial strategy" is represents a cohesive arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome and an awareness of the need to change the measures should they cease to be effective. It may not have been designed to manage the impact on that component specifically

coincide with where the shrimp trawl fishery generally operates and so the overlap of the trawl fishery with SBAs/VMEs will continue if current fishing patterns remain the same. Therefore, at present, there are no management measures in place to mitigate potential or actual interactions between the shrimp trawl fishery and some sponge and sea pen SBAs/VMEs.

As a direct result of the requirements set out in MSC FCR v2.0 to ensure protection and minimal impact of the UoA on VMEs, and, in the absence of DFO management requirements to have scientific or precautionary measures in place to avoid encounters with SBAs/VMEs, the fishery client has developed, with the support of the shrimp harvesters, “Move-on Protocols” (see Habitat policy and management in the UoA in Section 7.4.1 and Appendix 2). These have been based on the NAFO developed and implemented “move-on” rule as set out in Article 22, of the NAFO Conservation and Enforcement Measures “Provisions in case of an encounter with VME indicator species” (NAFO, 2019).

The "Gulf of St. Lawrence Northern Shrimp Trawl Fishery Move-on Protocols” became effective as of August 2019. In summary, they require that if, in 1 tow: 7 Kgs of sea pens; and/or 60 Kgs of other live coral; and/or 300 Kgs of sponges are caught then the vessel should cease fishing and move at least 2 nautical miles from their location before re-commencing fishing. The encounter is also recorded and forwarded to the client representative.

As a result, it is concluded that the SG 60 is met as there are measures in place, i.e. closed areas to protect VME and move-on rules, that are expected to achieve the Habitat Outcome 80 level of performance. The SG 80 is not met as the precautionary measures to avoid encounters and potential serious or irreversible harm on VME are not yet scientifically based.

SG 80, SI(b): There is some objective basis for confidence that the measures/partial strategy will work, based on information directly about the UoA and/or habitats involved

The following lists the habitat information that is known or being gathered about the UoA and the actions that are being taken:

- Surficial sediments have been identified and mapped;
- Geospatial mapping of habitats and fishing effort (Koen-Alonso, 2018) (on-going);
- Implementation of DFOs Coral and Sponge Conservation Strategy for Eastern Canada and protected areas network in the Gulf of St Lawrence (Habitat policy and management in the UoA in Section 7.4.1 and Appendix 2 and Figure 45) (on-going);
- The identification and delineation of SBAs (which are considered to be the equivalent of VMEs) (DFO, 2017e) (on-going); and
- Work on the development of guidance on the protection of SBAs (e.g. Koen-Alonso et al. 2018, DFO, 2017e) (on-going).

The above indicates a step-wise approach toward the development of a partial strategy/strategy designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats. The approach is considered likely to work based on the general experience, to date, with respect to the adherence to no fishing in protected areas and the adoption of similar “move-on rules” in fisheries operating in the NAFO Regulatory Area. As a result, the SG 60 is met.

The assessment team recognises that the implementation of the of DFOs Coral and Sponge Conservation Strategy for Eastern Canada (DFO, 2015) and SeBA Policy (DFO, 2009a) is an on-going process and measures to avoid encounters with identified

	SBAs/VMEs are likely in the future. In the meantime, the new "move-on protocols" have not yet been tested in the fishery, nor developed on a scientific basis and so there is no objective basis for confidence that the measure will work. Therefore the SG 80 is not met. **SG 80, SI(c): There is some quantitative evidence that the measures/partial strategy is being implemented successfully.** The gathering and presentation of information to support the Habitat Management Strategy, i.e. geospatial mapping of habitats and fishing intensity; the designation of Conservation Areas (see Figure 45); and, the on-going work on informing and developing the application of the Policy on Managing the Impacts of Fishing on Sensitive Benthic Areas (DFO, 2009a), e.g. the review and publication on the delineation of SBAs and overlap of fishing with SBAs (Kenchington et al, 2016; Koen Alonso et al, 2018), provides excellent quantitative evidence. However, in the absence of measures or a partial strategy to avoid encounters with VMEs the SG 80 is not met. **SG 80, SI(d): There is some quantitative evidence that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.** Since multiple fisheries may operate in the same area, the net impact on a given VME will result from the cumulative effects from all fisheries interacting within it. MSC FCR v 2.0 SA3.14.3 requires that the cumulative impact of MSC certified fisheries on VMEs is taken into account at the SG 80 and 100. There are a number of other fisheries operating in the Gulf of St. Lawrence that have been MSC certified or are in assessment – see Table 33. These fisheries may overlap with the shrimp trawl fishery however as this SI has scored below SG 80 the cumulative impacts on VMEs has not been evaluated at this point. If an SG 80 score is considered appropriate in future surveillance audits this aspect of VME scoring will be evaluated. The UoAs approach to managing the protection of VMEs has been to identify and establish 11 Coral and Sponge Conservation Areas (See Figure 45) where fishing with bottom contacting gears is prohibited. Monitoring to ensure that no vessels encroach and fish within these areas is facilitated through the requirement for all shrimp trawlers to have operating VMS. The VMS reports the vessel position every 30 minutes. If a vessel is approaching one of these areas C & P will contact the vessel to ensure they move away. C & P will also use aerial surveillance and at-sea patrols to monitor and deter vessels from fishing in these areas (M. Picard pers. comm.). In addition to closed areas to protect VMEs, MSC requirements state that, to achieve a conditional minimum for this PI, "…*precautionary measure to avoid encounters with VMEs, based on commonly accepted move-on rules*", need to be in place. The Gulf of St. Lawrence Northern Shrimp Scotian Trawl Fishery has adopted "move-on protocols" (see Habitat policy and management in the UoA in Section 7.4.1 and Appendix 2). While the new "move-on protocols" have not yet been tested, there is some qualitative evidence to show vessels do not fish in protected areas, thereby, complying with management requirements to protect VMEs and, therefore, meeting the SG 60. Quantative evidence that the UoA complies with the new move-on protocols is not yet available, and so the SG 80 is not met.
Condition	By the fourth annual audit the client shall provide evidence that there is: • A partial strategy in place that is expected to achieve the Habitat Outcome 80 level of performance or above. • Some objective basis for confidence that the measures/partial strategy will work, based on information directly about the UoA and/or habitats involved

	• Some quantitative evidence that the measures/partial strategy is being implemented successfully • Some quantitative evidence that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant
Milestones	**At the first audit** the client will provide evidence that they have entered into discussions with DFO and/or academic institutes on developing and implementing scientifically based precautionary measures to avoid encounters and potential serious or irreversible harm on VMEs. This milestone is an incremental step toward fulfilling the condition. Its successful completion will not result in a change of score to the PI; the score will remain at 60. **At the second audit** the client shall: 1. Provide evidence on the progress they have made on scientifically based precautionary measures to avoid encounters and potential serious or irreversible harm on VMEs; and; 2. Provide some objective basis for confidence that the measures being developed will work, based on information directly about the UoA and/or habitats involved. This milestone is an incremental step toward fulfilling the condition. Successful completion of point 2 will result in a revised score of 65. **At the third audit** the client shall: 1. Provide evidence on the implementation of the scientifically based precautionary measures and to avoid encounters and potential serious or irreversible harm on VMEs. This milestone is an incremental step toward fulfilling the condition. Its successful completion will not result in a change of score to the PI; the score will remain at 65. **At the fourth audit** the client shall: 1. Provide evidence that scientifically based precautionary measures to avoid encounters and potential serious or irreversible harm on VMEs are in place within the fishery, thereby demonstrating there is a partial strategy that is expected to achieve the Habitat Outcome 80 level of performance or above; 2. Provide quantitative evidence that the measures/partial strategy is being implemented successfully; and, 3. Provide quantitative evidence that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant. This will result in the rescoring of this PI to at least 80.
Client action plan	1. At first surveillance audit the CAB will be provided with evidence that the client group has entered into discussions with DFO and/or academic institutes on developing and implementing scientifically based precautionary measures to avoid encounters and potential serious or irreversible harm on VMEs. To accomplish this the client will undertake to: • With the support of other participating parties and in consultation with harvesting representatives, will define the research activities to be undertaken, the planned timeframe for completion of this research, and report on outcome of research findings.

	2. By the second surveillance audit the CAB will be provided with evidence regarding the progress the client group has made on development of scientifically based precautionary measures to avoid encounters and potential serious or irreversible harm on VMEs. Further, it will be demonstrated that there is an objective basis for confidence that the measures being developed will work, based on information directly about the UoA and/or habitats involved. To accomplish this the client will undertake to: • Gather evidence, specific to the UoA and/or relevant habitat, regarding scientific research conducted, present status of measures being considered and their anticipated outcome. • Inform and discuss with DFO and industry stakeholders research findings, and discuss modifications to adopted move-on protocols or additional voluntary measures to be undertaken to protect identified habitats. • Provide to the CAB a progress report detailing consultations, scientific review findings, research plans and status. Further, provide a rationale to demonstrate that the measures being developed can work. 3. By the third surveillance audit the client will provide evidence regarding the implementation of the scientifically based precautionary measures to avoid encounters and potential serious or irreversible harm on VMEs. To accomplish this the client will undertake to: • Working in conjunction with DFO and/or industry stakeholders, the client will develop and implement appropriate measures, using scientifically based precautionary measures, to avoid encounters and potential serious or irreversible harm on VME's. • The client, in consultation with regulators and stakeholders, will develop a quantitative means to monitor and report on effectiveness and compliance to the measures undertaken. 4. By the fourth surveillance audit the CAB will be provided evidence that scientifically based precautionary measures to avoid encounters and potential serious or irreversible harm on VMEs are in place within the fishery. Provide quantitative evidence that the measures/partial strategy is being implemented successfully. Provide quantitative evidence that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant. To accomplish this the client will undertake to: • Documentary evidence will be provided regarding either regulatory changes or voluntary measures taken, based on scientifically based precautionary measures, to avoid encounters and potential serious or irreversible harm on VMEs are in place within the fishery. • Evidence regarding the effectiveness of and compliance to measures implemented by DFO/industry, including other measures implemented by other fisheries, will be provided.
Consultation on condition	Please see section 8.9 – DFO support letter

Table 29. Condition 5- 8 (for each UoA)

Performance Indicator	**PI 3.2.4** - 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 80, SI (b):** The fishery-specific management system is subject to regular internal and occasional external review.
Score	75
Rationale	Biennial (and, when necessary more frequent) meetings of EGSAC provide an opportunity to monitor, review and evaluate key parts of the management system. The EGSAC may also establish ad-hoc sub-committees or working groups to review and assess specific policy and management measures (DFO, 2018). DFO also reviews and evaluates compliance and monitoring on a regular basis (DFO, 2018 and EGSAC 2018). With respect to external review, Canadian fisheries are reviewed by a number of institutions, e.g. The House of Commons and the Senate's Standing Committees on Fisheries and Oceans. Also, the Canadian Auditor General has, on an ad-hoc basis, reviewed fisheries related issues (OAGC, 2009). However, the Gulf of St. Lawrence Shrimp Trawl Fishery has never been subject to an external review by either these Committees or the OAGC. The fishery-specific management system is therefore subject to regular internal review, thereby meeting the SG 60, however, while there are a number of institutions that undertake external reviews of Canadian fisheries, the Gulf of St. Lawrence Shrimp Trawl Fishery has never been subject to their, or any other, external review. Therefore, it cannot be said the fishery-specific management system is subject to occasional external review and so the SG 80 is not met.
Condition	By the third annual audit the client shall provide evidence that the Gulf of St. Lawrence Shrimp Trawl Fishery management system is subject to regular internal and occasional external review.
Milestones	**At the first audit** the client will provide evidence in the form of minutes and/or meeting reports showing discussion on how it will initiate and adopt an occasional external review of the shrimp trawl fishery management system. This milestone is an incremental step toward fulfilling the condition. Its successful completion will not result in a change of score to the PI; the score will remain at 75. **At the second audit** the client shall provide evidence in the form of minutes and/or meeting reports showing how an occasional external review of the shrimp trawl fishery management system will be adopted. This milestone is an incremental step toward fulfilling the condition. Its successful completion will not result in a change of score to the PI; the score will remain at 75. **At the third audit** the client shall provide evidence that the shrimp trawl fishery management system is subject to occasional external review and the review has or will be initiated and completed within four years of the re-certification date of the fishery. Successful completion of this and the previous milestones will demonstrate that the Gulf of St. Lawrence Shrimp Trawl Fishery management system is subject to regular internal and occasional external review This will result in the rescoring of this PI to at least 80.
Client action plan	**1**. At first surveillance audit the CAB will be provided with evidence in the form of minutes and/or meeting reports showing discussion on how it will initiate and adopt an occasional external review of the shrimp trawl fishery management system.

	To accomplish this the client will undertake to: • In consultation with DFO and/or industry stakeholders develop and discuss options on how an external review may be conducted, by whom, and the frequency of subsequent external reviews. • Provide written evidence regarding on the status of progress (e.g. meeting minutes, correspondence). **2**. At second surveillance audit the CAB will be provided with evidence in the form of minutes and/or meeting reports showing how an occasional external review of the shrimp trawl fishery management system will be adopted. To accomplish this the client will undertake to: • The client, in consultation with DFO, will initiate an external review of the fishery management system. • The client, in consultation with DFO, will discuss external review findings and determine a process regarding how findings/recommendations will be considered. • In consultation with DFO and industry stakeholders define how an external review will be adopted. • Provide written evidence regarding outcome of considerations (e.g. meeting minutes, correspondence). **3**. At third surveillance audit the CAB will be provided with evidence that the shrimp trawl fishery management system is subject to occasional external review and the review has or will be initiated and completed within four years of the re-certification date of the fishery. To accomplish this the client will undertake to: 1. The client will provide documentary evidence of agreement with DFO and industry stakeholders regarding a commitment to have occasional external review, and the frequency of these reviews.
Consultation on condition	Please see section 8.9 – DFO support letter

8.8 Client Action Plan

CLIENT ACTION PLAN
Gulf of St. Lawrence Shrimp Trawl Fisheries
December 2019

This Action Plan submitted by the Client Group is in response to conditions identified at the site visit and subsequent scoring in November 2019. The Client Group (client) acknowledges that it must enter a written contract with an accredited MSC certification body to meet the specific conditions as described below within the timelines that will be agreed in the "Action Plan for Meeting the Condition for Continued Certification" that is to be approved by Lloyd's Register.

A draft Client Action Plan was submitted to the client group and DFO by the Managing Client (Association of Seafood Producers, ASP) September 2019. Consultations with the client group and DFO has resulted in this Final Client Action Plan submitted to Lloyd's Register in December 2019.

Following are the stated conditions as provided in the Client and Peer Review Draft Report of December 2019. There are two conditions per 4 Units of Certification (i.e. 8 conditions overall) for the fishery, for performance indicators 2.4.2 and 3.2.4, that are addressed in this Action Plan.

Condition 1: **2.4.2** - There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats.

Condition

By the fourth annual audit the client shall provide evidence that there is:

- A partial strategy in place that is expected to achieve the Habitat Outcome 80 level of performance or above.
- Some objective basis for confidence that the measures/partial strategy will work, based on information directly about the UoA and/or habitats involved.
- Some quantitative evidence that the measures/partial strategy is being implemented successfully.

Some quantitative evidence that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant

Milestones

Year 1: The client will provide evidence that they have entered into discussions with DFO and/or academic institutions on developing and implementing scientifically based precautionary measures to avoid encounters and potential serious or irreversible harm on VMEs.

Year 2: The client shall:

1. Provide evidence on the progress they have made on scientifically based precautionary measures to avoid encounters and potential serious or irreversible harm on VMEs; and,
2. Provide some objective basis for confidence that the measures being developed will work, based on information directly about the UoA and/or

habitats involved.

Year 3: The client shall provide evidence on the implementation of the scientifically based precautionary measures and to avoid encounters and potential serious or irreversible harm on VMEs.

Year 4: The client shall:

1. Provide evidence that scientifically based precautionary measures to avoid encounters and potential serious or irreversible harm on VMEs are in place within the fishery, thereby demonstrating there is a partial strategy that is expected to achieve the Habitat Outcome 80 level of performance or above;
2. Provide quantitative evidence that the measures/partial strategy is being implemented successfully; and,
3. Provide quantitative evidence that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.

Condition 1 Action Plan

1. At **first surveillance audit** the CAB will be provided with evidence that the client group has entered into discussions with DFO and/or academic institutes on developing and implementing scientifically based precautionary measures to avoid encounters and potential serious or irreversible harm on VMEs.

   To accomplish this the client will undertake to:

   - With the support of other participating parties and in consultation with harvesting representatives, will define the research activities to be undertaken, the planned timeframe for completion of this research, and report on outcome of research findings.

2. By the **second surveillance audit** the CAB will be provided with evidence regarding the progress the client group has made on development of scientifically based precautionary measures to avoid encounters and potential serious or irreversible harm on VMEs. Further, it will be demonstrated that there is an objective basis for confidence that the measures being developed will work, based on information directly about the UoA and/or habitats involved.

   To accomplish this the client will undertake to:

   - Gather evidence, specific to the UoA and/or relevant habitat, regarding scientific research conducted, present status of measures being considered and their anticipated outcome.

   - Inform and discuss with DFO and industry stakeholders research findings, and discuss modifications to adopted move-on protocols or additional voluntary measures to be undertaken to protect identified habitats.

- Provide to the CAB a progress report detailing consultations, scientific review findings, research plans and status. Further, provide a rationale to demonstrate that the measures being developed can work.

3. By the **third surveillance audit** the client will provide evidence regarding the implementation of the scientifically based precautionary measures to avoid encounters and potential serious or irreversible harm on VMEs.

   To accomplish this the client will undertake to:

   - Working in conjunction with DFO and/or industry stakeholders, the client will develop and implement appropriate measures, using scientifically based precautionary measures, to avoid encounters and potential serious or irreversible harm on VME's.

   - The client, in consultation with regulators and stakeholders, will develop a quantitative means to monitor and report on effectiveness and compliance to the measures undertaken.

4. By the **fourth surveillance audit** the CAB will be provided evidence that scientifically based precautionary measures to avoid encounters and potential serious or irreversible harm on VMEs are in place within the fishery. Provide quantitative evidence that the measures/partial strategy is being implemented successfully. Provide quantitative evidence that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.

   To accomplish this the client will undertake to:

   - Documentary evidence will be provided regarding either regulatory changes or voluntary measures taken, based on scientifically based precautionary measures, to avoid encounters and potential serious or irreversible harm on VMEs are in place within the fishery.
   - Evidence regarding the effectiveness of and compliance to measures implemented by DFO/industry, including other measures implemented by other fisheries, will be provided.

Condition 2:	**3.2.4** - 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.

Condition	By the third annual audit the client shall provide evidence that the Gulf of St. Lawrence Shrimp Trawl Fishery management system is subject to regular internal and occasional external review.
Milestones	**Year 1:** The client will provide evidence in the form of minutes and/or meeting reports showing discussion on how it will initiate and adopt an occasional external review of the shrimp trawl fishery management system. **Year 2:** The client shall provide evidence in the form of minutes and/or meeting reports showing how an occasional external review of the shrimp trawl fishery management system will be adopted. **Year 3:** The client shall provide evidence that the shrimp trawl fishery management system is subject to occasional external review and the review has or will be initiated and completed within four years of the re-certification date of the fishery.

Condition 2 Action Plan

1. At **first surveillance audit** the CAB will be provided with evidence in the form of minutes and/or meeting reports showing discussion on how it will initiate and adopt an occasional external review of the shrimp trawl fishery management system.

   To accomplish this the client will undertake to:

   - In consultation with DFO and/or industry stakeholders develop and discuss options on how an external review may be conducted, by whom, and the frequency of subsequent external reviews.
   - Provide written evidence regarding on the status of progress (e.g. meeting minutes, correspondence).

2. At **second surveillance audit** the CAB will be provided with evidence in the form of minutes and/or meeting reports showing how an occasional external review of the shrimp trawl fishery management system will be adopted.

   To accomplish this the client will undertake to:

   - The client, in consultation with DFO, will initiate an external review of the fishery management system.

- The client, in consultation with DFO, will discuss external review findings and determine a process regarding how findings/recommendations will be considered.
- In consultation with DFO and industry stakeholders define how an external review will be adopted.
- Provide written evidence regarding outcome of considerations (e.g. meeting minutes, correspondence).

3. At **third surveillance audit** the CAB will be provided with evidence that the shrimp trawl fishery management system is subject to occasional external review and the review has or will be initiated and completed within four years of the re-certification date of the fishery.

   To accomplish this the client will undertake to:

   1. The client will provide documentary evidence of agreement with DFO and industry stakeholders regarding a commitment to have occasional external review, and the frequency of these reviews.

8.9 DFO Letter of support

Pêches et Océans Canada | Fisheries and Oceans Canada

Direction régionale de la gestion des pêches
Région du Québec

Regional Fisheries Management Branch
Quebec Region

Classif. sécurité / Security

Québec, January 31, 2020

Votre réf. /Your ref.

Notre réf. /Our ref.

M. Derek Butler, Association of Seafood Producers
M. Brian Bezeau, L'Association Coopérative des Pêcheurs de L'Ile Ltée.
M. Jean-Paul Gagné, Association Québécoise de l'Industrie de la Pêche.
M. Fernand Brideau, Produits Belle-Baie Ltée

Subject: DFO's response to the action plan proposed by clients requesting MSC re-certification of the Gulf of St. Lawrence shrimp fishery

Sirs,

The Department of Fisheries and Oceans (DFO) has taken note of the proposed action plan that you have prepared in response to the two conditions identified by the assessment committee for the MSC re-certification of the Gulf of St. Lawrence shrimp fishery. DFO applauds the industry's commitment to the sustainability of the Gulf of St. Lawrence shrimp fishery.

We believe that the proposed action plan meets the requirements expressed by the assessment committee in its preliminary report.

With regard to the first condition, we are confident that the implementation of the elements identified in your action plan to put in place a strategy that will ensure that the shrimp fishery does not pose a risk of serious or irreversible harm to the habitats will be complementary to DFO's *Sustainable Fisheries Framework* initiatives, particularly with respect to the application of the *Policy for Managing the Impacts of Fishing on Sensitive Benthic Areas* and the implementation of the *Coral & Sponge Conservation Strategy for Eastern Canada*.

DFO intends to begin the review of the *Coral & Sponge Conservation Strategy for Eastern Canada* in 2020-2021. As well, as part of its integrated management planning process for the Gulf of St. Lawrence shrimp fishery, DFO will update, as appropriate, the results of the analysis of the risk posed by the shrimp fishery to cold-water coral and sponge-dominated communities. It should be noted that a partial strategy has already been put in place in the 2017 shrimp fishery to ensure that the risk of serious damage to sensitive benthic habitat and communities is minimized and maintained. This strategy, as

Canada

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well as DFO's Gulf shrimp research plan, may be updated to reflect the results of research undertaken as part of your action plan.

With regard to the second condition concerning the internal and external review processes of the management system, DFO will have to undertake an assessment of available resources, priorities and opportunities in order to ensure the implementation of this condition, which is common to several eco-certified fisheries or fisheries in the process of eco-certification.

In closing, it should be noted that DFO is seeking the support of all stakeholders in the Gulf shrimp fishery, and particularly the harvesting sector, in the efforts to support the delivery of your action plan. In this regard, we invite you to maintain ongoing discussions with the harvesting sector.

I hope you will find this to your satisfaction and I ask you to accept the expression of my best wishes.

Maryse Lemire
Regional Director, Fisheries Management
DFO, Quebec Region

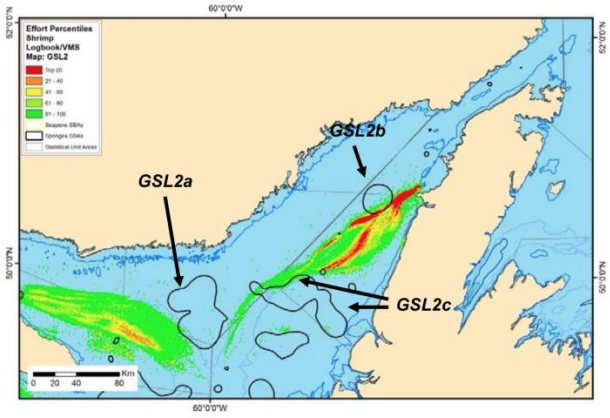
c.c. Mr. Jérôme Beaulieu, Senior advisor, Resource Management, DFO-Québec
Mr. Jean Picard, Director, Resource Management and Aboriginal Affairs, DFO-Québec
Ms Corinne Pomerleau, Director, Demersal and Benthic Sciences Division, DFO-Quebec
Ms Jackey Richard, Director, Fisheries and Aquaculture Management, DFO-Gulf Region
Mr. Tony Blanchard, Director, Fisheries and Aquaculture Management, DFO-Newfoundland and Labrador Region

Appendix 2 Client submission

The Gulf of St. Lawrence Northern Shrimp Trawl Fishery Move-on Protocols

Significant Benthic Areas
Move-On Protocol
April 2019

DFO published in 2018 a document titled Analysis of the overlap between fishing effort and Significant Benthic Areas in Canada's Atlantic and Eastern Arctic marine waters. This document details fishing overlap and intensity of fishing overlap within defined Significant Benthic Areas (SBAs). The shrimp trawl fishery in Esquiman overlaps with one identified SBA, below as GSL2b.



DFO defines a Significant Benthic Area (SBA) definition as follows:

> *"A Significant Benthic Area is a regional habitat that contains sponges, large and small gorgonian corals and/or sea pens as a dominant and defining feature."*

Further, DFO has agreed that these SBAs are the same as the Marine Stewardship Council's (MSC) definition of Vulnerable Marine Ecosystems (VMEs).

The Marine Stewardship Council (MSC) certification of the shrimp fishery requires, at a minimum, that precautionary measures to avoid encounters with potential or defined VMEs based on accepted move-on protocols that are implemented.

DFO has mapped SBAs throughout the region by type and overlaid reported fishing activity from 2005 and 2014. Subsequently, in December 2017, DFO created a number of marine refuges , effectively closing a number of areas to bottom contact fishing activities.

The following move-on protocol to address the MSC requirement for precautionary measures to avoid VME encounters has been developed for all vessels operating in the Esquiman shrimp trawl fishery.

Move-On Protocols
Esquiman Shrimp Trawl Fishery

This protocol[1] is developed to mitigate risk to where shrimp trawling overlaps identified Significant Benthic Areas (SBAs) as per Research Document 2018/015[2] identified by DFO. Further, adopting these protocols is expected to meet MSC version 2.0 requirements.

In one tow if you encounter:

- 7 kilos of sea pens; and/or
- 60 kilos of other live coral; and/or
- 300 kilos of sponges.

then make your next tow at least 2 nautical miles away and file a report.

Required Actions: The following actions are required by the Vessel Captain.

Vessel Captains will abide by all DFO-regulated area closures as specified in Conditions of License (e.g. marine refuges, juvenile fish, habitat, sensitive benthic areas or ecosystem protection).

Vessel Captains will:

- Apply the following definition for a SBA encounter when fishing in the DFO defined SBA:
  - ✓ An encounter with indicated SBA species is defined as catch per set (one trawl tow) of more than 7 kg of sea pens and/or 60 kg of other live coral and/or 300 kg of sponges.
- Quantify the catch of the species encountered (sea pens, other live corals, or sponges) by weighing or estimating the weight.
- If the quantity is higher than the encounter threshold defined above;
  - ✓ Cease fishing and move away at least 2 nautical miles from the endpoint of the tow/set in the direction least likely to result in further encounters. Captains shall use their best judgment based on all available sources of information.
  - ✓ Record and report the encounter by email at the end of the trip to pisces@ns.sympatico.ca Include the following information:
    - Date
    - NAFO area
    - Directed species (shrimp)
    - Position coordinates of the end point of the tow/set,
    - Quantity of sea pens/other live coral/sponges.

On a periodic basis, not to exceed 5 years, an evaluation will be undertaken of recorded encounters from the fishery in order to determine if any SBA concentrations in specific locations require any additional protection measures.

[1] Based on the NAFO's Conservation and Enforcement Measures (2017) Article 22 encounter thresholds and required actions, which are applicable to NAFO-regulated fishing activities in the NAFO Regulatory Area (outside Canada's 200-mile EEZ).

[2] Analysis of the overlap between fishing effort and Significant Benthic Areas in Canada's Atlantic and Eastern Arctic marine waters40701748, CSAS 2018/015.

Move-On Protocols
Esquiman Shrimp Trawl Fishery
On Board Reporting

Work Instructions

1. If you exceed the catch threshold, enter the specifics in one line of the following table.

2. At the end of the trip email this report to pisces@ns.sympatico.ca

Catch Threshold

7 kilos of sea pens and/or
60 kilos of other live coral and/or
300 kilos of sponges

If you catch this amount of more in one tow while fishing in a SBA, complete and submit this report.

Date (dd/mm/yy)	NAFO Area (1)	End of Set Latitude (dd.dddd)	End of Set Longitude (dd.dddd)	Seapens (Kilos)	Live Coral (Kilos)	Sponge (Kilos)
/ /		.	.			
/ /		.	.			
/ /		.	.			
/ /		.	.			
/ /		.	.			
/ /		.	.			
/ /		.	.			
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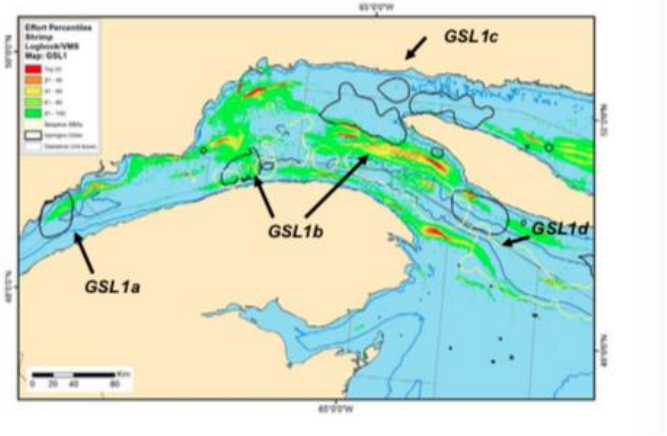
Zones benthiques significatives (SBA)

Protocoles de déménagement Pêche au chalut à crevettes proposé
Avril 2019

Le MPO a publié en 2018 un document intitulé Analyse du chevauchement entre l'effort de pêche et les zones benthiques importantes dans les eaux marines de l'Atlantique et de l'est de l'Arctique canadien. Ce document détaille le chevauchement et l'intensité du chevauchement de la pêche dans des zones benthiques significatives (SBA) définies. La pêche au chalut de crevette sur le plateau néo-écossais se chevauche avec deux ZSB identifiés, notamment:



Le MPO définit une définition de zone benthique importante (SBA) comme suit:

> « Une zone benthique importante est un habitat régional qui comprend des éponges, de grands et petits coraux de gorgones et / ou des pennatules comme caractéristique dominante et déterminante.»

De plus, le MPO a convenu que ces SBAs correspondent à la définition des écosystèmes marins vulnérables (VME) du Marine Stewardship Council (MSC).

La certification de la pêcherie de crevette par le Marine Stewardship Council (MSC) exige au minimum que des mesures de précaution soient prises pour éviter toute rencontre avec des VME potentiels ou définis en fonction de protocoles de transfert acceptés et mis en œuvre.

Le MPO a cartographié les zones de pêche critiques de la région par type et superposé les activités de pêche déclarées de 2005 à 2014. Par la suite, en décembre 2017, le MPO a créé un certain nombre de refuges marins, fermant effectivement un certain nombre de zones aux activités de pêche au contact inférieur.

Le protocole suivant pour répondre aux exigences du MSC en matière de mesures de précaution afin d'éviter les VME a été mis au point pour tous les navires opérant dans la pêcherie au chalut de crevette du Golfe du Saint Laurent.

Protocoles de déménagement

Pêche au chalut à crevettes du Golfe du Saint Laurent

Ce protocole[1] est conçu pour atténuer les risques de chevauchement du chalutage à la crevette dans les zones benthiques identifiées, conformément au document de recherche 2018/015[2] du MPO. En outre, l'adoption de ces protocoles devrait répondre aux exigences de la version 2.0 du MSC.

En un trait si vous rencontrez:

• 7 kilos de pennatules; et / ou
• 60 kilos d'autres coraux vivants; et / ou
• 300 kilos d'éponges,

votre prochain remorquage doit alors avoir lieu à au moins 2 milles marins et un rapport doit être déposé.

Actions requises: Les actions suivantes sont requises par le capitaine de navire.

Les capitaines de navire respecteront toutes les fermetures de zones réglementées par le MPO telles que spécifiées dans les Conditions de licence (par exemple, refuges marins, poissons juvéniles, habitat, zones benthiques sensibles ou protection de l'écosystème).

Les capitaines de navire devront:

- Appliquez la définition suivante pour une rencontre avec un SBA lorsque vous pêchez dans un SBA défini par le MPO:
  - Une rencontre avec les espèces SBA indiquées est définie comme une prise par ensemble (un chalut) de plus de 7 kg de pennatules et / ou 60 kg d'autres coraux vivants et / ou 300 kg d'éponges.

- Quantifiez les captures des espèces rencontrées (pennatules, autres coraux vivants ou éponges) en pesant ou en estimant le poids.

- Si la quantité est supérieure au seuil de rencontre défini ci-dessus;

  - Cessez de pêcher et éloignez-vous d'au moins 2 milles marins du point final du trait / ensemble dans la direction la moins susceptible d'entraîner de nouvelles rencontres. Les capitaines doivent utiliser leur meilleur jugement en se basant sur toutes les sources d'informations disponibles.

  - Enregistrez et signalez la rencontre par courriel à la fin du voyage à pisces@ns.sympatico.ca. Incluez les informations suivantes:

    - Date
    - Zone de l'OPANO
    - Espèce dirigée (crevette)
    - Coordonnées de position du point final du remorquage / set
    - Quantité de pennatules/ autres coraux vivants / éponges.

Sur une base périodique (ne dépassant pas 5 ans), une évaluation sera effectuée des contacts enregistrés de la pêcherie afin de déterminer si des concentrations de SBA dans des emplacements spécifiques nécessitent des mesures de protection supplémentaires.

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[1] Conformément à l'article 22 de la mesure de conservation et d'application de l'OPANO (2017), les seuils de rencontre et les actions requises s'appliquent aux activités de pêche réglementées par l'OPANO dans la zone réglementée par l'OPANO (à l'extérieur de la ZEE de 200 milles du Canada).

[2] Analyse du chevauchement entre l'effort de pêche et les zones benthiques importantes dans les eaux marines canadiennes de l'Atlantique et de l'est de l'Arctique canadien

Protocoles de déménagement

Pêche au chalut à crevettes du Golfe du Saint Laurent

Rapport à bord

Instructions

1. Si vous dépassez le seuil de capture, entrez les détails dans une ligne du tableau suivant.
2. À la fin du voyage, envoyez ce rapport par courriel à pisces@ns.sympatico.ca

Seuil de capture

7 kilos de stylos marins et / ou 60 kilos d'autres coraux vivants et / ou 300 kilos d'éponges

Si vous attrapez ce montant ou plus en un seul trait alors que vous pêchez dans une ZSB, remplissez et soumettez le présent rapport.

Date	Zone de OPANO	Latitude de fin de set	Fin de la longitude	Pennatules (kilos)	Coraux vivants (kilos)	Éponge (kilos)

8.10 Surveillance

Table 30. Fishery surveillance program

Surveillance level	Year 1	Year 2	Year 3	Year 4
Level 4	On-site surveillance audit	Off-site surveillance audit	Off-site surveillance audit	On-site surveillance audit & re-certification site visit

Table 31. Timing of surveillance audit

Year	Anniversary date of certificate	Proposed date of surveillance audit	Rationale
1	TBC	TBC	TBC

Table 32. Surveillance level rationale

Year	Surveillance activity	Number of auditors	Rationale
1	On-site audit	1 auditor on-site 1 auditor off-site	There will have been a gap of more than 12 months since the last site visit and, given the trap fishery has been assessed for the first time this will be the first surveillance audit for the fishery and so an on-site audit by at least one auditor is recommended.

8.11 Harmonised fishery assessments

MSC Fisheries Certification Requirements (FCR) v 2.0 states, "*The aim of harmonisation is to avoid the perversity that two essentially similar fisheries receive materially different scores (materially in the number, and text, of conditions, or in the overall outcome, whether a pass or a fail). Fisheries that are identical should receive identical scores. Any other result undermines the credibility of the MSC*".

MSC have also confirmed that harmonisation of similar fisheries using different versions of the default assessment tree, i.e. v 1.3 and v 2.0, should still take place where they are materially unchanged (MSC Interpretations webpage).

To ensure the all the overlapping MSC certified fisheries are harmonsied a comparison of the scores has been made. Table 33 lists the MSC certified / in-assessment / suspended fisheries that overlap with the Gulf of St. Lawrence Northern Shrimp Trawl Fishery.

The following interpretation has been used to determine the need for harmonisation between overlapping fisheries: https://mscportal.force.com/interpret/s/article/What-are-the-MSC-requirements-on-harmonisation-multiple-questions1527586957701

PIs / SIs	Harmonise?	Comments
All P1 PIs	Yes	P1 always considers the impacts of all fisheries on a stock, so any fisheries which have the same P1 species (stocks) should be harmonised.
PI 2.1.1a	Partially	For stocks that are 'main' in both UoAs, harmonise status relative to PRI (at SG60, 80 and 100), and if below PRI, harmonise cumulative impacts at SG80 (not at SG60).
PI 2.2.1a	Partially	For stocks that are 'main' in both UoAs, harmonise status relative to BBL (at SG60, 80 and 100), and if below BBL, harmonise cumulative impacts at SG80 (not at SG60).
PI 2.3.1a	Partially	Harmonise recognition of any limits applicable to both UoAs (at SG60, 80 and 100), and cumulative effects of the UoAs at SG80 and SG100 (not at SG60).
PI 2.4.1b	Partially	Harmonise recognition of VMEs where both UoAs operate in the same 'managed area/s' (as in SA3.13.5).
PI 2.4.2a,c	Partially	Harmonise scoring at SG100, since all fishery impacts are considered (not at SG60 or 80).
All P2 PIs	Yes, if ->	Two UoAs are identical in scope, even if the UoCs are different (e.g. separate clients).
PIs 3.1.1-3	Yes, if ->	Both UoAs are part of the same larger fishery or fleet, or have stocks in either P1 or P2 which are at least partially managed by the same jurisdiction/s (nation states, RFMOs or others) or under the same agreements. Harmonisation may sometimes be possible for those management arrangements that apply to both UoAs (noting the limitations accepted in GPB3).
PIs 3.2.1-4	Yes, if ->	Both UoAs have stocks within either P1 or P2 which are at least partially managed by the same jurisdiction/s (nation states, RFMOs or others) or under the same agreements. Harmonisation is needed for those management arrangements that apply to both UoAs, e.g. at the RFMO level but not the national level in the case of two separate national fleets both fishing the same regional stock.

Table 33. Overlapping fisheries

Fishery name	Certification status and date	Performance Indicators to harmonise
Gulf of St Lawrence Northern Shrimp Trawl	Under assessment – v2.01	Principle 1 – N/A target shrimp in different SFA Principle 2 – PI 2.1.1a; PI 2.3.1a; PI 2.4.1b; PI 2.4.2a/c Principle 3 – PI 3.1.x
Gulf of St.Lawrence Snow Crab Trap Fishery	Suspended – v2.0	N/A suspended
AQIP Gulf of St Lawrence Greenland Halibut and Atlantic Halibut Fixed Gear Fishery	In assessment - v2.0	Principle 2 – TBC Principle 3 – PI 3.1.x
Bay of Fundy, Scotian Shelf and Southern Gulf of St. Lawrence Lobster Trap	Certified 22 May 2015 – v1.3	Principle 3 – PI 3.1.x
Gaspésie Lobster Trap Fishery	Under re-assessment v2.01	Principle 2 – PI 2.1.1 a; PI 2.3.1a Principle 3 – PI 3.1.x
Prince Edward Island Lobster Trap Fishery	Certified 6th November 2014 – v1.3	Principle 3 – PI 3.1.x
Iles-de-la-Madeleine lobster	Certified 16th July 2013 – v2.0	Principle 2 – PI 2.1.1a; PI 2.3.1a Principle 3 – PI 3.1.x
AQIP snow crab trap	In assessment - v2.0	Principle 2 – TBC Principle 3 – PI 3.1.x
Canada 0AB 2+3KLMNO Greenland Halibut Bottom Trawl and Gillnet	Certified 5th December 2019 – v2.0	Principle 2 – PI 2.3.1a; PI 2.4.1b; PI 2.4.2a/c Principle 3 – PI 3.1.x
Canada 3LN redfish	Certified 22nd May 2017 - v1.3	Principle 3 – PI 3.1.x
Canada Atlantic halibut	Certified 16th May 2013 - v1.3	Principle 3 – PI 3.1.x
Canada northern and striped shrimp	Certified 24th June 2011 - v1.3	Principle 1 – N/A target shrimp in different SFA Principle 3 – PI 3.1.x
Canada/Newfoundland 3Ps cod	Suspended – v1.3	N/A suspended
Clearwater Seafoods Banquereau and Grand Bank Arctic surf clam Hydraulic Dredge	Certified 17th July 2012 - v1.3	Principle 3 – PI 3.1.x
Eastern Canada offshore scallop	Under re-assessment v2.01	Principle 2 – PI 2.3.1a; PI 2.4.1b; PI 2.4.2a/c Principle 3 – PI 3.1.x
Newfoundland & Labrador snow crab	Certified 16th April 2013 - v2.0	Principle 2 – PI 2.3.1a; PI 2.4.1b; PI 2.4.2a/c Principle 3 – PI 3.1.x
North West Atlantic Canada harpoon swordfish	Certified 18th June 2010 - v1.3	Principle 3 – PI 3.1.x

OCI Grand Bank yellowtail flounder trawl	Under re-assessment v2.01	Principle 2 – PI 2.3.1a; PI 2.4.1b; PI 2.4.2a/c Principle 3 – PI 3.1.x

Table 34. Harmonisation requirements

Supporting information	
Principle 1: The Canada northern and striped shrimp and Gulf of St Lawrence Northern Shrimp Trawl fisheries target Northern Shrimp (*Pandalus borealis*) in different Shrimp Fishing Areas (SFAs) which are treated and management as different stocks, therefore the MSC harmonisation requirements are not applied. **Principle 2:** Only fisheries under CR v2.0 / v.201 are considered when harmonising P2 apsects following guidance presented in https://mscportal.force.com/interpret/s/article/What-are-the-MSC-requirements-on-harmonisation-multiple-questions1527586957701. PI 2.1.1a – Indicated fisheries have Redfish (*Sebastes spp.*) classified as a primary main species. Scoring differences shown below. PI 2.3.1 a - Indicated fisheries have recorded interactions with Northern wolffish (*Anarhichas denticulatus*) and Spotted wolffish (*Anarchicas minor*). Scoring differences shown below. PI 2.4.1b – Indicated fisheries which are operating within NAFO subarea 3. Only Canada 0AB 2+3KLMNO Greenland Halibut Bottom Trawl and Gillnet, Newfoundland & Labrador snow crab and Gulf of St Lawrence Northern Shrimp Trawl classifiy Sponges and Seapens as VME. PI 2.4.2 a/c – As the Gulf of St Lawrence Northern Shrimp Trawl fishery, under assessment here has not scored any PI 2.4.2 SI above SG80 harmoinisation is not required because it's only at the SG 80 / 100 that other MSC UoAs considered. However scoring differences are shown below for reference. **Principle 3:** There are a number of fisheries which share aspects of the "Governance and Policy" component of Principle 3 (the PIs pre-fixed with 3.1), i.e. focusing on the high-level context of the fishery management system within the UoA. Seven have been assessed using MSC FCR v 1.3. In so doing, they include PI 3.1.4 that relates to incentives and subsidies, which is no longer included in FCR v 2.0.	
Was either FCP v2.1 Annex PB1.3.3.4 or PB1.3.4.5 applied when harmonising?	**No**
Date of harmonisation meeting	**N/A**
If applicable, describe the meeting outcome	
N/A	

Table 35. Scoring difference for Principle 2 PI 2.1.1a - Redfish (*Sebastes spp.*) primary main

Fishery	**PI 2.1.1a**
Gulf of St Lawrence Northern Shrimp Trawl	**80**
Iles-de-la-Madeleine lobster	**80**
Gaspésie Lobster Trap Fishery	**80**

Table 36. Scoring difference for Principle 2 PI 2.3.1a

Fishery	Northern wolffish (*Anarhichas denticulatus*)	Spotted wolffish (*Anarchicas minor*)
Gulf of St Lawrence Northern Shrimp Trawl	**N/A**	**N/A**
Gaspésie Lobster Trap Fishery	**N/A**	**N/A**
Iles-de-la-Madeleine lobster	**N/A**	**N/A**
Canada 0AB 2+3KLMNO Greenland Halibut Bottom Trawl and Gillnet	**N/A**	**N/A**
Eastern Canada offshore scallop	**N/A**	**N/A**
Newfoundland & Labrador snow crab	**N/A**	**N/A**
OCI Grand Bank yellowtail flounder trawl	**N/A**	**N/A**

Table 37. Scoring difference for Principle 2 PI 2.4.x

Fishery	VMEs identified	PI 2.4.1b	PI 2.4.2 a	PI 2.4.2 c
Gulf of St Lawrence Northern Shrimp Trawl	**Sea pens** **Sponges**	**100** **100**	**60** **60**	**60** **60**
Canada 0AB 2+3KLMNO Greenland Halibut Bottom Trawl and Gillnet	**Sea pens** **Sponges**	**80** **80**	**80** **80**	**80** **80**
Eastern Canada offshore scallop	**No VMEs**	**80**	**80**	**100**
Newfoundland & Labrador snow crab	**Sea pens** **Sponges**	**100** **100**	**100** **100**	**100** **100**
OCI Grand Bank yellowtail flounder trawl	**No VMEs**	**N/A**	**80**	**100**

Table 38. Scoring differences for Principle 3 PIs

Fishery	**PI 3.1.1**	**PI 3.1.2**	**PI 3.1.3**
Gulf of St Lawrence Northern Shrimp Trawl	**100**	**90**	**100**
AQIP Gulf of St Lawrence Greenland Halibut and Atlantic Halibut Fixed Gear Fishery	**Not available**	**Not available**	**Not available**
Bay of Fundy, Scotian Shelf and Southern Gulf of St. Lawrence Lobster Trap	**90**	**90**	**90**
Gaspésie Lobster Trap Fishery*	**>80**	**>80**	**>80**
Prince Edward Island Lobster Trap Fishery	**90**	**90**	**90**
Iles-de-la-Madeleine lobster	**85**	**100**	**100**

AQIP snow crab trap	**Not available**	**Not available**	**Not available**
Canada 0AB 2+3KLMNO Greenland Halibut Bottom Trawl and Gillnet	**90**	**90**	**100**
Canada 3LN redfish	**85**	**95**	**80**
Canada Atlantic halibut	**80**	**90**	**90**
Canada northern and striped shrimp	**95**	**95**	**100**
Clearwater Seafoods Banquereau and Grand Bank Arctic surf clam Hydraulic Dredge	**100**	**95**	**100**
Eastern Canada offshore scallop*	**>80**	**>80**	**>80**
Newfoundland & Labrador snow crab	**95**	**85**	**90**
North West Atlantic Canada harpoon swordfish	**85**	**90**	**80**
OCI Grand Bank yellowtail flounder trawl*	**>80**	**>80**	**>80**

*Fisheries under re-assesment only scoring ranges available at this time – please see ACDR for each fishery.

Table 39. Rationale for scoring differences

If applicable, explain and justify any difference in scoring and rationale for the relevant Performance Indicators (FCP v2.1 Annex PB1.3.6)
Principle 2: PI 2.1.1a – All fisheries have scored this SI at SG 80. PI 2.3.1 a - All fisheries have scored this SI as N/A as there are no national limits set. PI 2.4.1b – OCI Yellowtail flounder fishery occurs only partly in the NAFO Subarea 3. The two fisheries are spatially separated and the OCI fishery occurs discretely in shallow water on the top of the Grand Bank, where there are no VMEs. Additionally, the Eastern Canada Offshore Scallop fishry operates almost exclusively on banks off Nova Scotia, none on the Grand Bank and not in the Gulf of St Lawrence. Therefore, the two fisheries are also considered spatially separated. PI 2.4.2 a/c – As the Gulf of St Lawrence Northern Shrimp Trawl fishery, under assessment here has not scored any PI 2.4.2 SI above SG80, harmoinisation is not required because it's only at the SG 80 / 100 that other MSC UoAs considered. However scoring differences are shown below for reference **Principle 3**: There are no significant differences between the scores for all the fisheries such that a condition of certification has been applied in any of the fisheries and so it is confirmed that the Gulf of St. Lawrence Northern Shrimp Trawl Fishery is harmonised with other MSC certified fisheries in the region.
If exceptional circumstances apply, outline the situation and whether there is agreement between or among teams on this determination
N/A

8.12 Objection Procedure – delete if not applicable

To be added at Public Certification Report stage

The report shall include all written decisions arising from a 'Notice of Objection', if received and accepted by the Independent Adjudicator.

Reference(s): FCP v2.1 Annex PD