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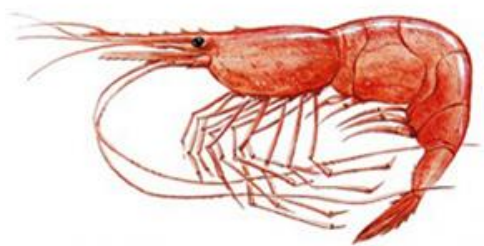
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Marine Stewardship Council Fisheries Assessments

Canada Scotian Shelf Northern Prawn trawl and trap



Second Surveillance Report

Conformity Assessment Body (CAB)	LRQA
Assessment team	Paul Knapman, Julian Addison and William (Bill) Galbraith
Fishery client	Association of Seafood Producers, L'Association Coopérative Des Pêcheurs, Northsyde Processing Ltd
Assessment type	Second Surveillance Audit
Date	August 2022

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1 Assessment Data Sheet

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Team leader

Principle 1

Principle 2

Principle 3

Paul Knapman
Julian Addison
Paul Knapman
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2 Executive summary

This report outlines the findings of the 2nd annual surveillance audit of the Canada Scotian Shelf Northern Prawn Trawl and Trap Fishery. The scope of the certified fishery and therefore of this surveillance is specified in the Units of Certification (UoC) set out below:

UoC 1

Species:	Northern Prawn/Northern Shrimp (<i>Pandalus borealis</i>)
Stock:	Scotian Shelf Northern Shrimp
Geographical area:	Eastern Scotian Shelf in Shrimp Fishing Areas (SFA) 13, 14, 15
Harvest method:	Otter trawl
Client group:	Association of Seafood Producers L'Association Coopérative Des Pêcheurs De L'île Ltée Northsyde Processing Ltd
Eligible Fishers:	All Canadian vessels licenced to fish for shrimp using otter trawl landing to the client group members
Other Eligible Fishers:	All Canadian vessels licenced to fish for shrimp using otter trawl in SFA 13, 14, 15

UoC 2

Species:	Northern Prawn/Northern Shrimp (<i>Pandalus borealis</i>)
Stock:	Scotian Shelf Northern Shrimp
Geographical area:	Eastern Scotian Shelf in Shrimp Fishing Areas (SFA) 13, 14, 15
Harvest method:	Shrimp trap – wire mesh, baited traps
Client group:	Chedabucto Bay Shrimp Trap Association
Other Eligible Fishers:	All Canadian vessels licenced to fish for shrimp using shrimp trap in SFA 13, 14, 15

The trawl fishery was initially certified in August 2008.

The first re-assessment of the trawl fishery was conducted under the requirements of MSC CR version 1.2. The fishery was re-certified in February 2014.

The trap fishery was included in the second re-assessment of the trawl fishery. The fisheries were assessed against MSC FCR version 2.0 and recertified on 4th September 2019.

Two conditions of certification were applied to each fishery. The trawl fishery conditions relate to a partial habitat strategy in order to mitigate risk to Vulnerable Marine Ecosystems (VME) and an occasional external review of the management system. The trap conditions relate to the cumulative effect of MSC certified fisheries on North Atlantic Right Whale (NARW) and an occasional external review of the management system. The trawl fishery condition related to a partial habitat strategy to mitigate risk to Vulnerable Marine Ecosystems (VME) was closed at this audit.

Three recommendations for each fishery were made by the Assessment Team. Whilst not obligatory, the client is encouraged to act upon these within the spirit of the certification. Actions related to these recommendations were undertaken within the audit reporting period and are described.

The purpose of the annual Surveillance Report is fourfold:

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1. to establish and report on whether or not there have been any material changes to the circumstances and practices affecting the original assessment of the fishery;
2. to monitor the progress made to improve those practices that have been scored as below “good practice” (a score of 80 or above) but above “minimum acceptable practice” (a score of 60 or above) – as captured in any “conditions” raised at the assessment or subsequent audit stage;
3. to monitor any actions taken in response to any (non-binding) “recommendations” made at the assessment or subsequent audit stage;
4. to re-score any Performance Indicators (PIs) where practice or circumstances have materially changed during the intervening year, focusing on those PIs that form the basis of any “conditions” raised.

For a complete picture, this report should be read in conjunction with the Public Certification Report for this fishery assessment which can be found at: <https://fisheries.msc.org/en/fisheries/canada-scotian-shelf-northern-prawn-trawl-and-trap/@assessments>

The audit was announced on the MSC website on 13th May 2022 and a remote off-site audit took place on 17th June 2022.

The audit was carried out according to the MSC Fisheries Certification Requirements version 2.0 using version 2.2 of the MSC Fisheries Certification Process.

The following was inspected during the audit:

- The scientific base of information and stock assessment;
- Changes to the fishery and its management, e.g., legislation and regulations;
- Changes and updates on ecosystem issues;
- Changes to personnel involved with the science, management and industry;
- Compliance;
- Harmonisation with other MSC certified fisheries;
- Any changes that might affect traceability within the fishery and conformity with regulations; and,
- Progress against the conditions of certification.

Prior to the site visit the client provided a submission which included minutes and materials associated with the Eastern Scotian Shelf Shrimp Advisory Committee; total allowable catch (TAC) and catch data; stock assessment reports; correspondence from DFO Maritimes - referred to as a “material change letter” - related to the management of the fishery and the MSC 2nd annual audit of the fishery; a DFO compliance report for the fishery. This information is available on request from Lloyd’s Register.

The audit team concluded that based on the information they were provided with there were no changes in the status of the fisheries that would have a material impact on the scoring of any of the Performance Indicators. The fisheries therefore continue to meet the requirements of the MSC Standard, and that MSC Certification should continue.

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3 Report details

3.1 Surveillance information

Table 1. Surveillance information

1	Fishery name																													
	Canada Scotian Shelf Northern Prawn Trawl and Trap																													
2	Unit(s) of Assessment (UoA)																													
	<div><div><div>UoA 1</div><table><tr><td>Species:</td><td>Northern Prawn / Northern Shrimp (<i>Pandalus borealis</i>)</td></tr><tr><td>Geographical area:</td><td>Eastern Scotian Shelf</td></tr><tr><td>Method of capture:</td><td>Otter trawl</td></tr><tr><td>Stock:</td><td>Eastern Scotian Shelf Northern Prawn / Shrimp Shrimp Fishing Areas 13, 14, 15</td></tr><tr><td>Management System:</td><td>Canadian Department of Fisheries and Oceans led management, through Dartmouth, Nova Scotia, supported by an Advisory Committee.</td></tr><tr><td>Client Group:</td><td>Association of Seafood Producers L'Association Coopérative Des Pêcheurs De L'île Ltée. Northsyde Processing Ltd.</td></tr></table><table><tr><td>Eligible Fishers:</td><td>All Canadian vessels licenced to fish for shrimp using otter trawl in SFA 13, 14, 15</td></tr></table></div><div><div>UoA 2</div><table><tr><td>Species:</td><td>Northern Prawn / Northern Shrimp (<i>Pandalus borealis</i>)</td></tr><tr><td>Geographical area:</td><td>Eastern Scotian Shelf</td></tr><tr><td>Method of capture:</td><td>Shrimp trap – wire mesh, baited traps</td></tr><tr><td>Stock:</td><td>Eastern Scotian Shelf Northern Prawn / Shrimp Shrimp Fishing Areas 13, 14, 15</td></tr><tr><td>Management System:</td><td>Canadian Department of Fisheries and Oceans led management, through Dartmouth, Nova Scotia, supported by an Advisory Committee.</td></tr><tr><td>Client Group:</td><td>Chedabucto Bay Shrimp Trap Association</td></tr></table><table><tr><td>Other Eligible Fishers:</td><td>All Canadian vessels licenced to fish for shrimp using shrimp trap in SFA 13, 14, 15</td></tr></table></div></div>		Species:	Northern Prawn / Northern Shrimp (<i>Pandalus borealis</i>)	Geographical area:	Eastern Scotian Shelf	Method of capture:	Otter trawl	Stock:	Eastern Scotian Shelf Northern Prawn / Shrimp Shrimp Fishing Areas 13, 14, 15	Management System:	Canadian Department of Fisheries and Oceans led management, through Dartmouth, Nova Scotia, supported by an Advisory Committee.	Client Group:	Association of Seafood Producers L'Association Coopérative Des Pêcheurs De L'île Ltée. Northsyde Processing Ltd.	Eligible Fishers:	All Canadian vessels licenced to fish for shrimp using otter trawl in SFA 13, 14, 15	Species:	Northern Prawn / Northern Shrimp (<i>Pandalus borealis</i>)	Geographical area:	Eastern Scotian Shelf	Method of capture:	Shrimp trap – wire mesh, baited traps	Stock:	Eastern Scotian Shelf Northern Prawn / Shrimp Shrimp Fishing Areas 13, 14, 15	Management System:	Canadian Department of Fisheries and Oceans led management, through Dartmouth, Nova Scotia, supported by an Advisory Committee.	Client Group:	Chedabucto Bay Shrimp Trap Association	Other Eligible Fishers:	All Canadian vessels licenced to fish for shrimp using shrimp trap in SFA 13, 14, 15
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3	Date certified	Date of expiry																												
	5 th August 2008 (re-certified 4 th September 2019)	3 rd March 2025																												
4	Surveillance level and type																													
	Level 4 – Offsite surveillance audit																													

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5	Surveillance number	
	2nd Surveillance	X
6	Surveillance team leader	
	<p>Paul Knapman – Team Lead and Principle 2 Specialist</p> <p>Paul is an independent consultant based in Halifax, Nova Scotia, Canada. Paul began his career in fisheries 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 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.</p> <p>Paul was appointed Head of the largest 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; acting as the lead authority for the largest marine protected area in England.</p> <p>Paul moved to Canada in 2005 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.</p> <p>Paul began working on MSC assessments in 2008 and in 2012 became head of a Conformity Assessment Body focusing on MSC fisheries and chain of custody assessments.</p> <p>Paul returned to fisheries consultancy in 2015 and continues to work on MSC assessments. He has been involved as a lead assessor, team member and technical advisor/reviewer for more than 60 different fisheries in the MSC programme.</p> <p>Paul has passed MSC training and has no Conflict of Interest in relation to this fishery. Full CV available upon request</p>	
Team Leader Experience	Paul has completed a number of MSC assessment as TL and meets all Fishery TL Qualification and Competency Criteria under MSC FCP v2.2 Table PC1 and MSC GCR v2.4.1 Table 1.	
7	Surveillance team members	
	<p>Julian Addison – Principle 1 Specialist</p> <p>Dr Julian Addison is an independent fisheries consultant with over 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 also worked as a visiting scientist at DFO in Halifax, Nova Scotia and at NMFS in Woods Hole, Massachusetts where he experienced shellfish management approaches in North America. For four years he was a member of the Scientific Committee and the UK delegation to the International Whaling Commission providing scientific advice to the UK Commissioner. He has worked extensively with ICES and most recently 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</p>	

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	<p>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 over 40 MSC full assessments of crustacean and mollusc fisheries worldwide which use a wide range of stock assessment methodologies and fishing gears. He has also undertaken MSC pre-assessments in Europe, North America, Asia and Australia and over 100 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. Other recent work includes a review of the stock assessment model for blue crabs in Chesapeake Bay, USA, and an assessment of three Alaskan crab fisheries under the FAO-based Responsible Fisheries Management scheme.</p> <p>Julian has passed MSC training and has no Conflict of Interest in relation to this fishery. Full CV available upon request.</p> <p>William (Bill) Galbraith – Principle 3 Specialist</p> <p>Bill holds a Bachelor of Arts (Honours) and a Masters of Natural Resources Management both from the University of Manitoba. He has over 20 years of experience working with inland freshwater commercial fishers/associations/co-operatives (predominately First Nation and Indigenous), communities, Chief and Councils, fish buyers, food service providers, federal and provincial governments, and other key stakeholders (including NGOs, recreational angling groups and commercial tourism outfitters) throughout the entire fisheries management and regulatory systems. Bill possesses extensive knowledge of the inland freshwater fisheries resources of the Province of Manitoba and the legislative and compliance process which governs their management and allocation amongst all resource users. Through a decade of experience working as the Provincial Commercial Fishing Program Manager and Manager of the Sustainable Fisheries Unit, he served as the provincial Lead in the development and implementation of activities required to secure and maintain sustainable fisheries certification standards and management practices.</p> <p>Bill now serves as the Lead of the Government of Canada's Strategic Partnerships Initiative (SPI) funded Inland Indigenous Commercial Fisheries Initiative (IICFI) in both the Provinces of Manitoba and Saskatchewan; as well as, pathfinder for commercial fisheries development and strategic partnership, including sustainable fisheries and traceability certification, for Manitoba's Indigenous inland freshwater commercial fisheries, while serving as the Senior Natural Resources Management Officer for the Federal Department of Indigenous Services Canada (Manitoba).</p> <p>Bill has passed MSC training and has no Conflict of Interest in relation to this fishery. Full CV available upon request.</p>
Local Context	<p>English is widely spoken in Canada</p> <p>Both Paul and Julian have had assignments in the region in the last 10 years.</p>
Traceability	Paul, Julian, and Bill completed the MSC traceability module in the last 3 years.
RBF	Julian has completed the RBF training.
8	Audit/review time and location
	The audit took place the w/c 13 th of June 2022 by remote calls
9	Assessment and review activities
	All relevant data, progress on the Client Action Plan and progress on the 4 open conditions

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3.2 Background

3.2.1 Purpose of this surveillance

The purpose of this surveillance is to:

1. establish and report on whether or not there have been any material changes to the circumstances and practices, i.e., the fisheries operation and management – including legislation and regulations; and, scientific information - including stock assessment and the ecosystem, affecting the original complying assessment of the Canada Scotian Shelf Northern Prawn Trawl and Trap Fishery;
2. report on whether there have been changes in key personnel within the science / fisheries management structure and within the industry that could affect the certification;
3. report on changes that might affect traceability of MSC certified product within the fishery;
4. monitor the progress made against any “conditions” raised and described in the [Public Certification Report](#) and in the corresponding Action Plan drawn up by the client;
5. to re-score any PIs where practice or circumstances have materially changed during the intervening year, focusing on those PIs that form the basis of any “conditions”.

Three recommendations were made by the Assessment Team at the last assessment. Whilst not obligatory, the client is encouraged to act upon these within the spirit of the certification and so the Audit Team also take the opportunity at the audit to report on whether any action has been taken against these.

3.2.2 The Fishery

The Canada Scotian Shelf Northern Prawn Trawl Fishery was re-certified on 4th September 2019. The Shrimp Trap Fishery was also assessed and certified for the first time and became a part of the certification. The following background information is taken from the [Public Certification Report](#) and includes updates provided by the client and DFO at this years remote audit site visit.

The Trawl Fishery

The Northern shrimp fishery off Eastern Nova Scotia, or SFA 13, 14 and 15 (see Figure 1) began in the mid 1970s but the resource was underutilized because of non-selectivity of the gear, i.e., fishers were unable to operate within allowable groundfish bycatch limits. In 1991, the introduction of a groundfish separator grate (called the Nordmore Grate) in the trawls eliminated the bycatch problem (see Figure 2), allowing the fishery to develop further.

The fishery currently consists of 28 inshore (Maritimes Region) mobile gear licences mostly < 65' length overall (LOA), and 14 mid-shore (Gulf Region) licences 65 - 100' LOA. Eight licences are active in the Maritimes Region and 7 in the Gulf Region. In 2021 14 trap licences were issued but only 1 was active (Suzette Soomai (DFO) pers. comm.).

All mobile licenses have been under Individual Transferable Quotas (ITQs) since 1998. The annual TAC in SFA 13-15 is distributed as three units with quota shared between the Maritimes Region based mobile fleet (69.5%), the Gulf based mobile fleet (22.5%) and the shrimp trap fleet (8%). Each vessel then has its own share of the quota. Quota is transferable between vessels and fleets but arrangements can only be made on a seasonal and temporary basis.

The fishery operates year-round, from April 1st – March 31st, but has traditionally been mainly a spring fishery (75% or more of the quota is being taken in May and June), however over the last couple of years the Gulf fleet has started to fish in July and August (Suzette Soomai (DFO) pers. comm.).

Shrimp trawlers work the muddy bottoms using otter trawls with a minimum mesh size of 40 mm, and a Nordmore grate minimum bar spacing of 25 mm. Fishers fit either bobbins or rubber discs to the groundrope, which is linked to the leading lower edge of the net by vertical toggle chains. The latter enables the net to 'fly' clear of the bottom so that flatfish disturbed by the groundrope can pass below the net entrance. Because of high fishing costs and relatively low prices, shrimp fishers search out areas with the largest *P. borealis* and the highest catch rates, mainly in depths from 150 - 400 m. Large shrimp tend to be females that have previously spent several years (1 – 4) as males prior to transitioning to females. Fishing may take place all day round, but catch rates are usually lowest at night and highest during the day.

Most of the mobile activity in SFA 13-15 is concentrated in four deep water areas, known as the Louisbourg, Misaine and Canso holes and the Bad Neighbour Shoals. These areas are located in SFAs 13, 14 and 15 (see Figure 3).

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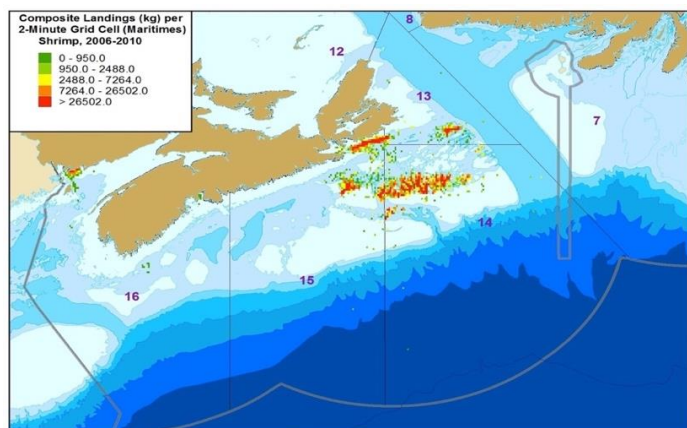


Figure 1. Shrimp Fishing Areas (SFA) 13, 14, 15, 16, showing a five-year composite (2006 – 2012) of shrimp trawl and trap landings (Source DFO 2016).

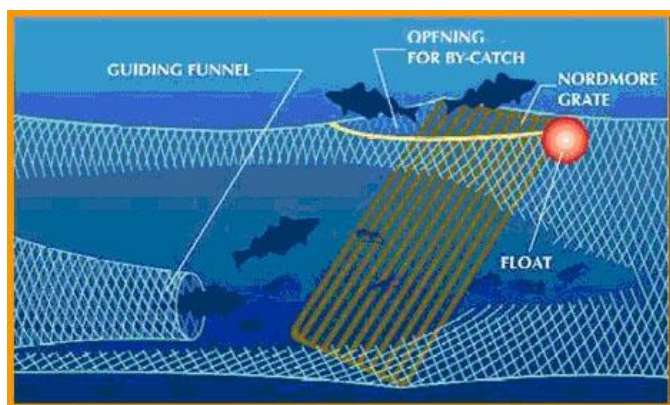


Figure 2. Nordmore separator grate for reducing bycatch in shrimp trawls. Source: DFO (2018)

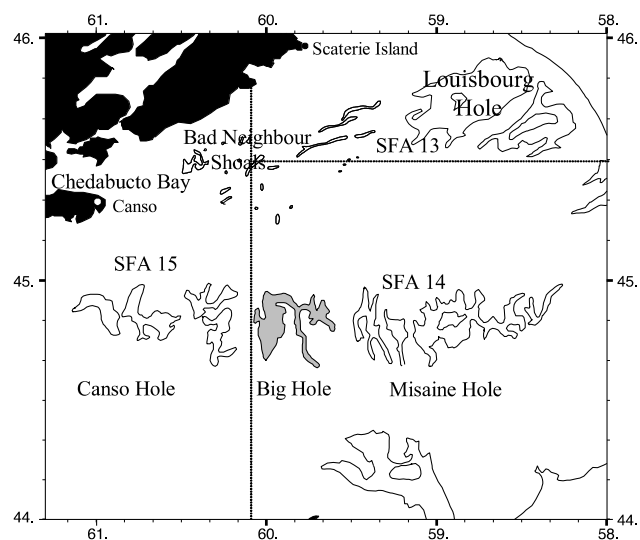


Figure 3 The main fishing areas for the Scotian Shelf shrimp trawl fishery: The Louisbourg, Misaine and Canso holes and Bad Neighbour Shoals (DFO, 2016)

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The Trap Fishery

The client representative reported that the trap fishery had not been commercially operational for the last two years, i.e., 2021 and 2022, owing to Covid-19 related issues, the loss of their buyer in 2020 and no alternate found and the high price of bait. Therefore, the harvester association for the shrimp trap fishery will withdraw from the MSC certification. DFO however informed the surveillance team during its meeting that withdrawal from MSC certification by the trap fishery will not change the department's current management framework.

3.3 Principle 1

The fishery operates under the Scotian Shelf Shrimp (*Pandalus borealis*) Integrated Fisheries Management Plan (IFMP) (DFO, 2016). The harvest strategy consists of a series of management regulations designed to safeguard the stock and to minimise the impact of the fishery on the wider ecosystem, a comprehensive monitoring programme and a robust control and enforcement regime.

Reference points and Harvest Control Rules (HCRs) for the ESS shrimp 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). The precautionary application of reference points for the Eastern Scotian Shelf (EES) shrimp includes a Limit Reference Point (LRP) and Upper Stock Reference (USR), which are 30% and 80%, respectively, of the average Spawning Stock Biomass (SSB) maintained during the high productivity period of the modern fishery (2000–2010). A maximum removal reference point of 20% female exploitation (actual catch/SSB) is used to help guide management decisions (Hardie *et al.*, 2018). An exploitation rate of 20% is considered to be highly precautionary because this is lower than the assumed annual natural mortality rate of 25-33%.

In line with these reference points, the key harvest control is that the annual total allowable catch (TAC) will be based upon an exploitation rate dependent on the state of the stock in relation to the LRP and USR. When SSB is above the USR, the TAC must be set at a level to ensure that the exploitation rate does not exceed 20%, there will be gradual changes of exploitation rate when the SSB is in between the USR and the LRP, and the TAC will be set at zero (i.e., the fishery will be closed) when SSB is below the LRP.

The annual TAC advice is based upon the annual stock assessment updates. The TAC was first reached in 1994, when individual Shrimp Fishing Area (SFA) quotas were removed. Since that time, the TAC had fluctuated between 3,100 – 5,500 mt, mostly in response to the influence of strong recruitment events (large year classes) on spawning stock and fishable biomass. Following a TAC of 4,500 mt in 2014 and 2015, the TAC was reduced by 28% in 2016 to 3,250 mt in response to declining biomass resulting from the loss of the previously abundant 2007-08 year class, and was further reduced by 20% in 2017 to 2,600 mt, the lowest level since 1992 (Figure 4). Following the updated stock assessment in 2017, it was recommended that the TAC in 2018 be maintained at the current level of 2,600 mt in order to conserve more of the remaining SSB until the 2013 year class began to undergo sex transition in 2017-2018. A status quo TAC of 2,600 mt remained in place for the 2019, 2020 and 2021 fishing seasons, but following the most recent stock assessment in December 2021 (see below), the TAC was reduced to 2,300 mt for 2022. The trap fishery in Chedabucto Bay has an 8% allocation of the quota, i.e., 184 mt in 2022, although reductions in fishing activity due to the Covid-19 pandemic, problems with sourcing bait and loss of markets for the trap fishery have resulted in the trap fishery landing <1 mt in 2021.

Assessment of the status of the ESS shrimp stock is based upon analysis of both fishery-dependent and fishery-independent data. All trawling vessels are fitted with a satellite Vessel Monitoring System (VMS), there is 100% monitoring of landings through the Dockside Monitoring Programme (DMP) for the trawl fishery, with a target of 20% coverage for the trap fishery, although in recent years the coverage rate has averaged 35-40% in the trap fishery. Vessel landings are recorded and an additional record is provided through a shrimp weighout slip completed by the buyer. All vessels must complete and submit log books on a trip-by-trip basis. The log books from trawling vessels provide two Catch Per Unit Effort (CPUE) series, an unstandardized series from Gulf vessels, and a standardised series from all commercial Scotian Shelf vessels using a Generalised Linear Model (GLM) model for which the variables are year, month, area and vessel. There is an observer programme in both the trawl and trap fisheries which provides information on CPUE and size and sex composition of the shrimps, although the trap fishery has virtually ceased to operate since last year's surveillance audit. Annually, approximately 50 port samples from the trawl fishery are analysed for size, sex and egg developmental stage. Vessels in the trap fishery (when operational) are also required to provide regular catch samples which are analysed for biological characteristics. The fishery-independent DFO/Industry shrimp stock survey is carried out annually in June using a commercial vessel with a standard shrimp trawl. The survey gear also

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incorporates a small mesh bag – referred to as a ‘belly-bag’ - which is attached to the main trawl to obtain an estimate of abundance of small shrimp. The survey provides estimates of annual biomass and bootstrapped confidence intervals for survey CPUE and abundance, and population abundance (numbers) at length (mm carapace length - CL) and maturity stage (males, primiparous and multiparous females). The belly-bag sample provides an estimate of shrimp of < 12 mm carapace length and is therefore considered to be an index of recruitment. The eSonar system used in the stock survey has temperature and depth logging capabilities. Shrimp survey bottom temperatures are determined throughout each shrimp survey set with a continuous temperature recorder attached to the headline of the trawl and sea surface temperatures are calculated from satellite data as average temperatures within defined rectangles encompassing the shrimp holes.

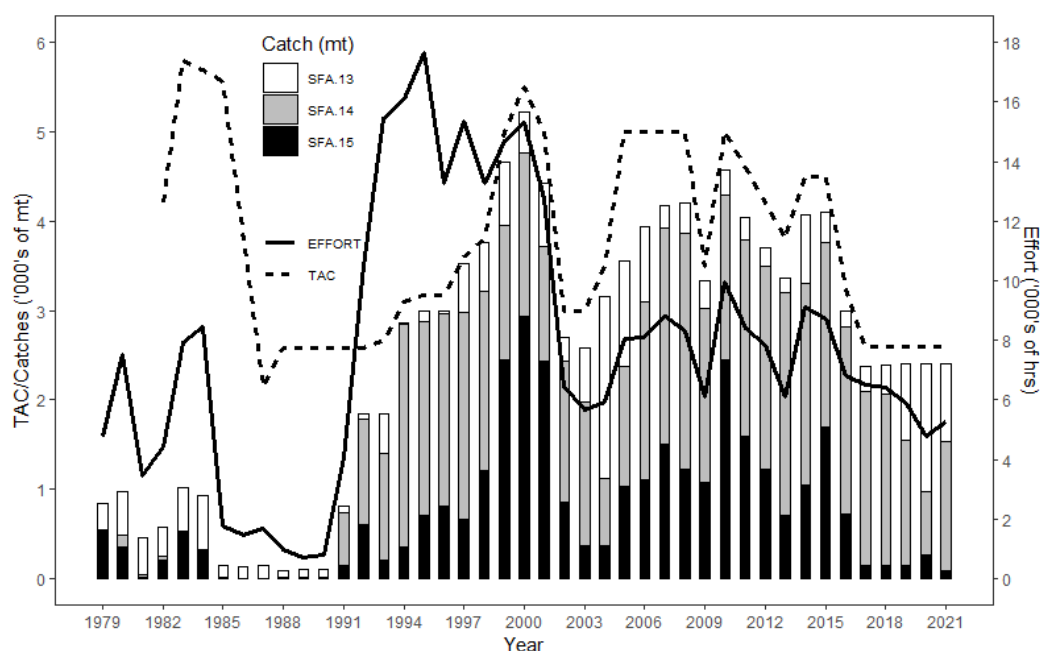


Figure 4. History of Eastern Scotian Shelf Shrimp catches per Shrimp Fishing Area (SFA) (13, 14, and 15), Total Allowable Catch (TAC) (thousands of mt), and effort (thousands of hours), from 1979–2021. Effort and catches for 2021 represent data available as of November 19, 2021. (Source: DFO, 2022)

In addition to the evaluation of SSB and exploitation rate in relation to reference points, and the subsequent setting of TACs in line with HCRs, the overall assessment of stock status is also based on the interpretation of a series of stock indicators using a traffic-light approach (TLA) using information from the annual surveys, CPUE indices from log book data, and catch sampling from the commercial fisheries (Koeller *et al.*, 2000). The stock indicators used in the TLA are grouped into four stock characteristics: abundance, productivity, fishing mortality and the ecosystem. This holistic multiple indicator approach considers the current value of each indicator relative to its time series and summarises individual indicators into the four stock characteristics, as well as in an overall stock summary index. The default boundaries between the ‘traffic lights’ colours for the indicators were arbitrarily taken as the 33rd and 66th percentiles of the data in the series. Indices are generally provided for all SFAs combined, although interpretation of the overall index is based on an evaluation of whether or not trends in individual SFAs corroborate the index trend across the entire survey area. Details of these indices, the underlying rationales for their choice and their interpretation can be found in Hardie *et al* (2018), who describe the TLA as a tool for displaying, summarising and synthesising a large number of relevant yet disparate data sources into a consensus opinion on the health of the stock.

The multiple indicator approach is necessary because shrimp stock dynamics are driven primarily by environmental factors such as water temperature and by predator abundance. It is difficult therefore to define a fixed value for maximum sustainable yield (MSY) and management must respond rapidly to changes in environmental factors and predator abundance, particularly for stocks such as those on the Scotian Shelf which are at the southern edge of the species distribution and therefore may be more vulnerable to sudden changes in environmental factors. The difficulty

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in defining a fixed MSY for shrimp stocks is a key reason why the stock assessment currently does not incorporate the use of analytical stock assessment models.

A fully peer-reviewed stock assessment of the ESS shrimp stock is undertaken biennially and in interim years, science advice is provided as a stock status update. In addition, a Framework meeting is scheduled to take place approximately every five years the purpose of which is to thoroughly review and critically assess the background information and the stock assessment methodology for the ESS shrimp stock. The most recent framework review took place in April 2015 (Hardie *et al.*, 2018), which confirmed that the indicator-based framework was appropriate for this stock, rather than a population model-based framework that is unlikely to be informative because of the low exploitation rate and the impact of environmental factors on stock abundance. A full assessment took place in 2018, but due to the impact of COVID-19 on work plans, and the plan to conduct a Framework review and Assessment in the fall of 2021, the stock status for 2020 and advice for management of the 2021 fishery was provided as a Science Response Process (DFO, 2021b). A full stock assessment took place in December 2021, the results of which are presented in DFO (2022).

The Public Certification Report (PCR) for the ESS shrimp fishery (Knapman and Addison, 2020) described declining stock biomass with spawning stock biomass being in the cautious zone below the USR because the abundant 2007-2008 year classes were reaching or had reached the end of their lifespan. As described in the 1st annual surveillance audit report (Knapman and Addison, 2021), the updated stock assessment for 2020 showed that the ESS shrimp stock was still low in 2018, but had since increased primarily because the strong 2013 year class, although slow growing, had recruited to the fishery (DFO, 2021a). CPUE data from the annual DFO/Industry shrimp stock survey increased significantly in 2019 and 2020 since the low levels observed in 2016 to 2018, but decreased in 2021 to the lowest level in the times series since 2002 (DFO, 2022), and although this trend of significant increase followed by decrease in 2021 is mirrored in the standardized commercial fishery data from the trawl fishery, the decline in 2021 is not so marked for the commercial data (Figure 5). The survey CPUE data are extrapolated to total biomass using the swept area method, and SSB is the key stock indicator for this fishery. As reported in the 1st annual surveillance audit report (Knapman and Addison, 2021), following low levels of SSB in 2016 to 2018, the stock recovered to be above the USR and therefore in the healthy zone for 2019 and 2020. However, the estimate of SSB decreased by 29% from the 2020 estimate of 18,403 mt in 2020 to 13,041 mt in 2021 and it is now below the USR of 14,558 mt (DFO, 2022). Based on the precautionary approach, the ESS shrimp stock is considered to be in the Cautious Zone (Figure 6). Despite the observed decline in SSB in 2021, the precautionary TAC in this fishery ensured that the exploitation rate has remained below the maximum removal reference point of 20% female exploitation (Figure 6). At the site visit, DFO Science reported that the June 2022 DFO-Industry survey had just been completed, and preliminary observations from the survey suggested that stock biomass was at similar levels to the estimate in 2021.

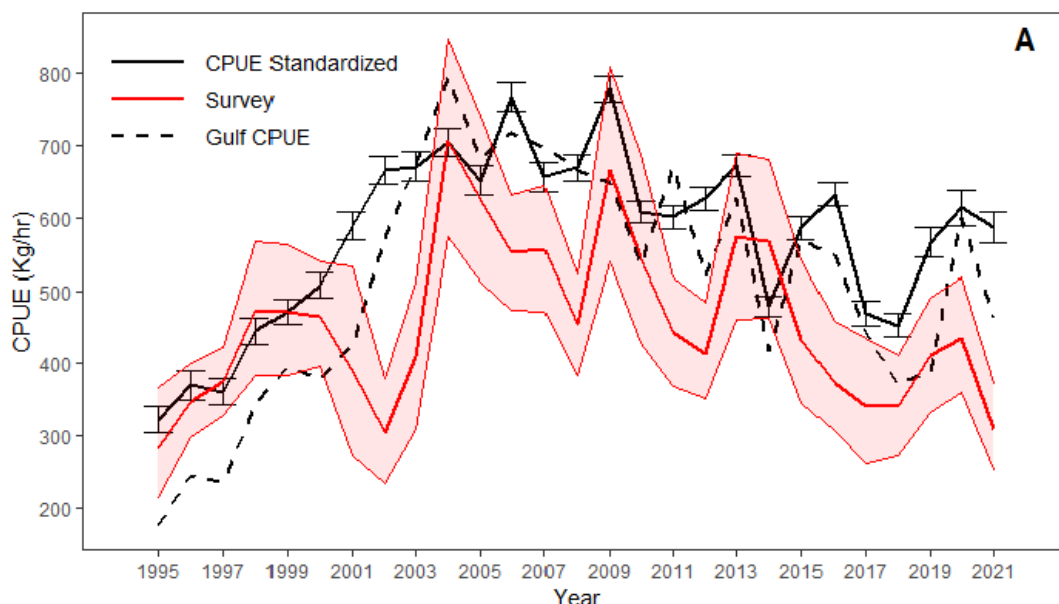


Figure 5. DFO-Industry survey stratified Catch Per Unit Effort (CPUE) (red line), standardized commercial CPUE with 95% confidence intervals (black line), and unstandardized Gulf vessel CPUE (black dotted line) from 1993–2021. (Source: DFO, 2022)

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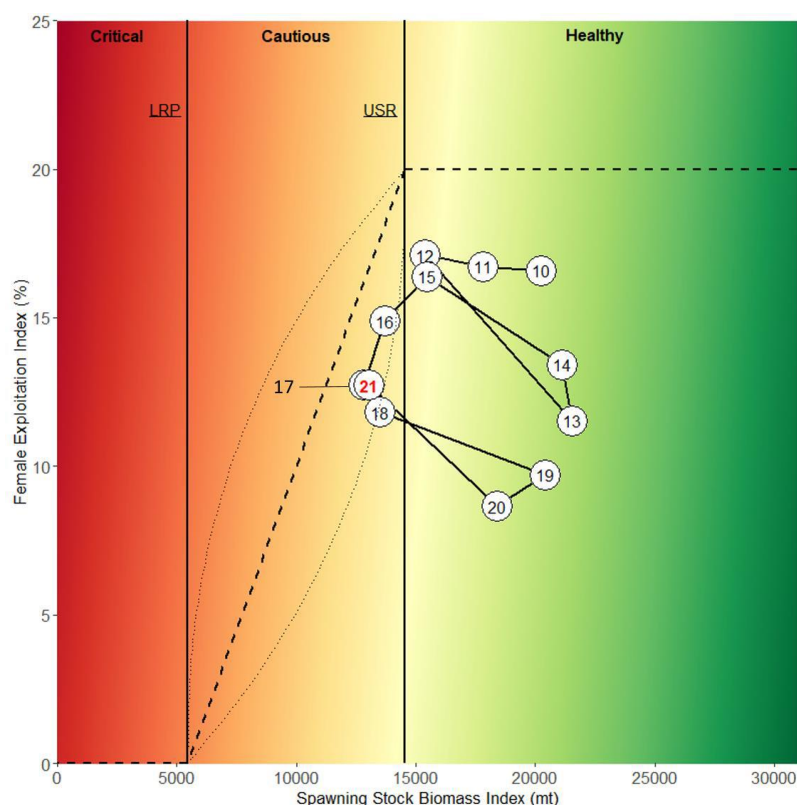


Figure 6. Graphical representation of the precautionary approach for Eastern Scotian Shelf Shrimp. The dotted lines in the Cautious Zone represent a range of management actions possible, depending on whether the stock is stable, increasing or decreasing, or on trends in other indicators of stock or ecosystem health. (Source: DFO, 2022).

Modal analysis of length frequency data from the annual DFO-Industry survey provide estimates of year-class strength (Table 2). DFO (2022) notes that the interpretation of year-class strength and longevity can be complicated by a number of factors, including: the low catchability of shrimp younger than Age 4; the strong influence of growth rate on the catchability of Age 4 shrimp; difficulty in distinguishing and assessing year-classes after Age 3; and changing longevities and natural mortalities associated with environmental or density dependent influences. In addition, the tendency of a single year-class, especially relatively large ones such as 2001, 2007-2008 and 2013, to change sex over a number of years, makes it difficult to distinguish them from adjacent year-classes. Predicting the future success of the fishery from the time trends in population numbers-at-size estimated from the annual surveys (Table 2) can therefore be difficult. The recruitment pulse of 2013 resulted in the maturation of a large spawning stock biomass, but the 2012–2015 year-classes have now reached the end of their life expectancy. Belly-bag index (Age 1 abundance) values for 2016 and 2017 were the lowest in the time series, suggesting future poor recruitment contributions (

Table 2). However, the values since 2018 show an increase in recruitment relative to 2016-2017 and suggest better contributions in the next four years. The 2021 estimate was 244 million shrimp, which is comparable to the last three years, and is near the long-term average (286 million);

Table 2). The abundance index for both Age 2 and Age 4 shrimp increased in 2021, which is consistent with the higher belly-bag Age 1 abundance index values found in 2020 (i.e., 2019 year class) and 2018 (i.e., 2017 year class). The moderate overall abundance of Age 1 and Age 2 shrimp observed in the 2021 survey is consistent with the decreasing SSB and increasing temperature indices observed since 2019. Data from both the survey and commercial catches

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provide evidence of high abundance of large females in the shrimp stock with a high mean maximum length index from the trawl survey, an observed increase in the mean female size indicator in port samples and the second highest value in the time series of mean length-at-sex transition in 2021 (DFO, 2022).

Table 2. Minimum survey population numbers-at-age from modal analysis. Numbers x 10⁶. Average and median are based on data from 2002–2020. (Source: DFO, 2022)

Age	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average (2002– 2020)	Median (2002– 2020)
1 ¹	22	796	288	112	83	267	272	279	244	286	205
2	211	26	495	17	166	37	68	72	154	160	109
3	302	119	501	193	581	361	195	368	462	565	368
4	1,157	613	690	1,304	1,468	822	392	522	583	1,183	1,083
5+	4,091	4,673	2,956	3,076	1,734	2,231	3,155	3,000	2,109	3,115	3,076
TOTAL	5,783	6,227	4,930	4,702	4,032	3,718	4,082	4,241	3,552	5,232	4,930
Age 4+ Males ²	2,960	3,831	2,270	2,931	1,859	1,966	2,273	2,137	1,611	2,694	2,319
Primiparous ³	699	706	521	664	453	433	435	573	398	780	699
Multiparous ⁴	1,611	1,545	1,143	897	973	921	1,111	1,091	927	1,034	1,111
Total Females	2,310	2,251	1,664	1,561	1,426	1,354	1,546	1,664	1,325	1,814	1,664

¹ Belly-bag. Time series began in 2002.

² Total population, less ages 2 and 3 males, transitionals (i.e., males that will potentially change to females the following year), and females.

³ Primiparous Northern Shrimp includes transitionals and are the group of females entering the SSB.

⁴ Multiparous Northern Shrimp identifies the group of females that are already contributing to the SSB.

As noted above, the overall assessment of stock status is also based on the interpretation of a series of stock indicators using a traffic-light approach (TLA). The time series of all the stock indicators in the TLA are presented in Figure 7 and are grouped into four stock characteristics - abundance, productivity, fishing effects and ecosystem characteristics. Individual indicators were then grouped into categories of Abundance, Production, Fishing Effects, and Ecosystem characteristics, as well as an overall mean summary indicator (Figure 8). (It should be noted that the overall mean indicator for each characteristic is a simple average of all constituent indicators with no weighting applied to those indicators which might be considered as more important indices of stock health.)

Abundance characteristics vary annually, but the overall abundance characteristic decreased in 2021 after three years of steady increases, and it remains in the red zone (Figure 8), whereas productivity characteristics have been improving since 2018, with the overall productivity index now in the amber zone due to recent strong recruitments and a low predation index (Figure 7, Figure 8), although redfish which are an important predator of shrimp have been increasing in abundance in recent years (DFO, 2022). Fishing effects characteristics have improved significantly in the last few years due mainly to the reduction in exploitation rates and female size indicators show increases from 2020 values and reflect the delay in the contribution of smaller shrimp into the SSB. Individual fishing effects characteristics continue to be in the green or amber zone (Figure 7). Ecosystem characteristics continue primarily in the red zone (Figure 7) because both bottom and spring sea-surface temperatures are rising, and warmer temperatures are detrimental to shrimp production and shrimp are generally more abundant in areas of cooler bottom temperatures. The summary indicators for all characteristics declined in 2021 resulting in the overall mean summary indicator decreasing in 2021 (Figure 8), which suggests that shrimp stock health is negatively influenced, reflecting the decline of the SSB stock indicator into the cautious zone (Figure 6). It should be stressed that these are auxiliary stock indicators which provide a wider assessment of the shrimp stock status in comparison with the estimated SSB and exploitation rate, and whilst

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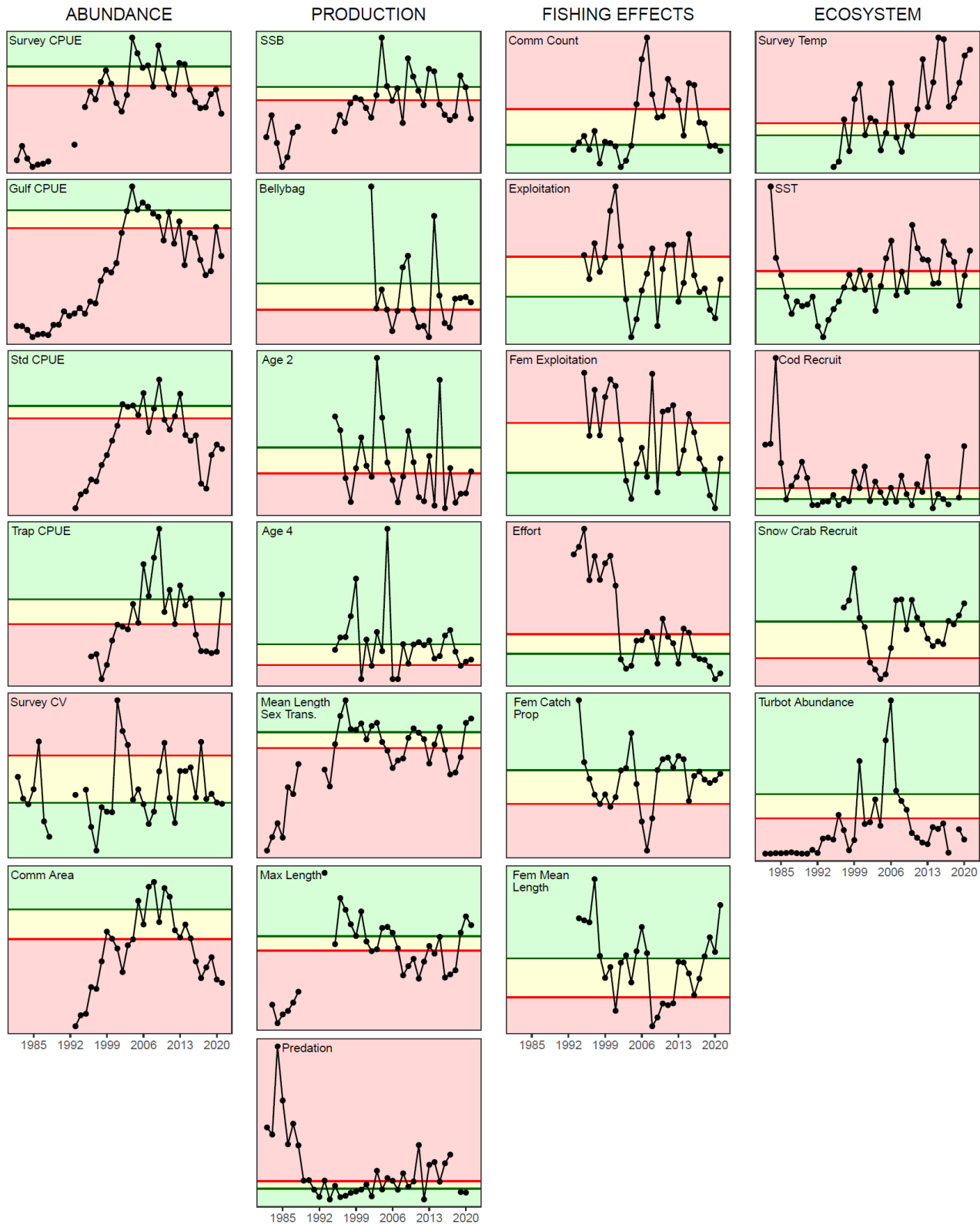
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they may help in evaluating the overall stock status, they are not used quantitatively in harvest control rules to set TACs or trigger other management actions.



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Figure 7. Time series of individual Shrimp indicators. Full description of indicators can be found in Hardie et al., 2018). (Source: DFO, 2022)

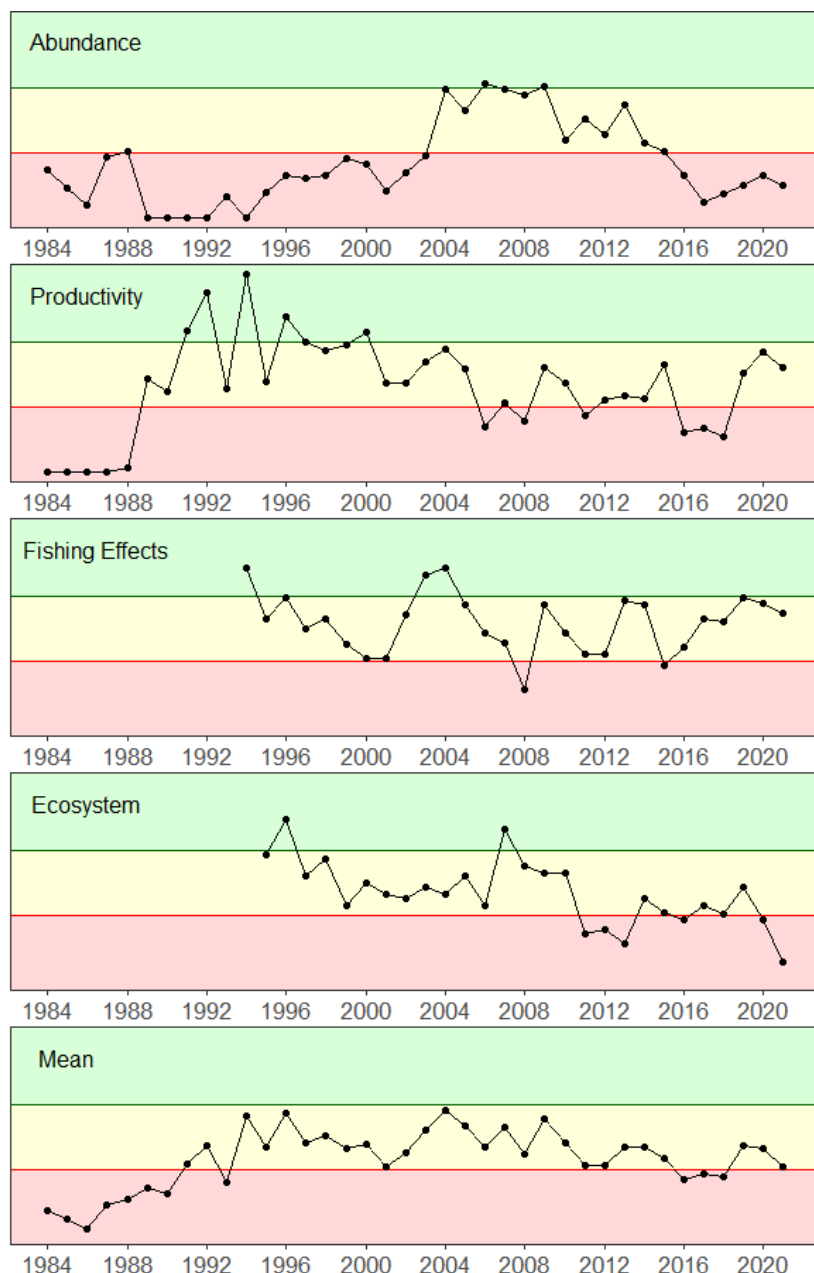


Figure 8. Time series of all available indicators grouped into four characteristics (top four panels) and the mean (overall) indicator (bottom panel) from 1984–2021. Thresholds between red, yellow, and green are at the 33rd and 66th percentile of the 2000–2010 data series for each indicator. (Source: DFO, 2022)

The audit team reviewed the most recent assessment of ESS shrimp stock status (DFO, 2022) in relation to the scoring of Performance Indicator 1.1.1. The key stock indicator of SSB dropped into the cautious zone in 2021, but the indicator has been in the healthy zone for 8 of the last 12 years (Figure 6), sometimes at a much higher level than the USR, and therefore the decline in 2021 appears to be part of the normal stock fluctuations driven by variation in recruitment. In addition, the latest DFO-Industry stock survey demonstrated that the belly-bag index (Age 1 abundance) since 2018 has been relatively high (Table 2) suggesting better contributions of stronger year classes in the next four years (DFO, 2022). The audit team concluded that the shrimp stock is fluctuating around a level consistent with MSY, and therefore there is no requirement to revise the scoring for PI 1.1.1.

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With the next DFO Framework on the ESS shrimp fishery now planned for September 2022, Manon Cassista-Da Ros and colleagues in DFO Science are developing a surplus production model which incorporates a spatial component and includes terms for both temperature and predation levels. This research is being conducted alongside similar work on SFAs 4-6 further north off the coasts of Newfoundland and Labrador. Evidence from survey and commercial fisheries data suggest that colder water conditions may have a positive influence on juvenile recruitment. Belly-bag Age 1 abundance indices since 2018 highlight consistent recruitment from the 2017–2020 year classes and are consistent with the expectation that lower temperature conditions are promoting favorable recruitment (DFO, 2022). Large fluctuations in bottom water temperatures may also be associated with the cyclical recruitment pattern experienced since the early 1990s and both spring sea-surface temperatures and June survey bottom temperatures increased in 2021 relative to 2020 (DFO, 2022). Northern Shrimp has substantial value as a forage species, so the fishery must not threaten the conservation of other species for which it is an important food source (DFO, 2022). Increases in abundance of redfish and silver hake, both of which prey on shrimps, have been observed in recent years, but to date there has been no clear link observed between predator abundance and shrimp prey abundance in SFAs 13-15 which can be used to parameterise models. The outcome of this modelling work could have significant implications for management of the shrimp fishery as the harvest control rules are based upon reference points that were determined from the average SSB maintained during the high productivity period of the modern fishery (2000–2010) and the temperature regime and levels of predator abundance may be very different now in comparison with that earlier period.

There are two other current wider geographical research initiatives that will inform the next Framework. Firstly, the ESS shrimp fishery has been chosen as a case study to develop ecosystem-based assessment of stock health and ecosystem-informed advice through the incorporation of temperature and predation indices into a modelling analysis to provide improved information on changes in stock biomass, and the work by DFO Science described above will inform this research initiative. Secondly, the Panomics project has been collecting samples of *Pandalus borealis* across its distribution in order to provide updated information on population structure and spatial management of *Pandalus borealis*. Early results from this project which included samples taken from SFAs 13-15 suggested some genetic differentiation both between and within SFAs.

3.4 Principle 2

3.4.1 Habitat Protection

During the surveillance audit, the team learned that the Eastern Canyons Marine Refuge has been recently created. The Eastern Canyons Marine Refuge is a 44,000 Km² swath of ocean running from the edge of the continental shelf near Sable Island to Canada's exclusive economic zone more than 300 Km offshore.



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Figure 9. Location of the newly designated Eastern Canyons Marine Refuge.

Source : www.cbc.ca/news/canada/nova-scotia/huge-area-off-ns-declared-marine-refuge-1.6481700.

According to information provided on the DFO's Marine Protected Areas and Eastern Canyons Conservation Area webpages, the refuge:

- contains a variety of coral species, including significant areas of large gorgonian coral concentrations (species of *Paragorgia*, *Primnoa*, *Keratoisis*, *Lophelia pertusa* and others) that provide diverse habitat for many species, such as groundfish (e.g., redfish and Atlantic halibut); and,
- protects a large, deep-water frontier area, which is a marine area without history of fishing in Canadian waters, interpreted to be waters deeper than 2000 m, and has little if any information on benthic features and any fishing impacts on such features.

As Eastern Canyons is a conservation measure being designated under the *Fisheries Act* using a policy intended to protect vulnerable benthic areas and deep-sea communities from the impacts of fishing, the following prohibitions will be imposed:

- bottom contact fishing activities that have the potential to impact the conservation features of the area. Therefore, all bottom-contact fisheries — including trawls, traps, and longlines — will be prohibited inside the marine refuge, with the exception of bottom longline gear that is permitted within a small zone provided the fishing vessels have at-sea observers onboard.

DFO Maritimes have produced an information item on marine spatial planning and marine conservation in the Maritimes Region see Figure 10.

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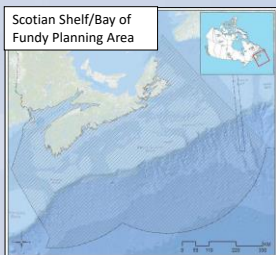
Marine Spatial Planning in the Maritimes Region

WHAT IS IT? Marine Spatial Planning (MSP) is an internationally recognized process that strives to ensure that marine spaces are collaboratively managed to support social, economic and conservation goals. MSP is being carried out in four marine areas across Canada, including the Scotian Shelf/Bay of Fundy planning area. MSP includes engaging government agencies, First Nations, Indigenous organizations, stakeholders and communities to build a collective understanding of the planning area, develop decision-support tools and a marine atlas, and design a marine spatial plan to support and better coordinate decision making.

MSP GOVERNANCE

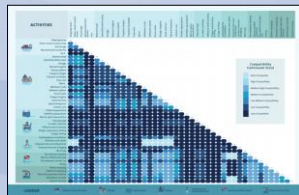
The federal departments responsible for undertaking MSP in Canada include Fisheries and Oceans Canada (DFO), Natural Resources Canada (NRCan), Transport Canada, and Environment and Climate Change Canada (ECCC). DFO is the lead department for MSP, with responsibilities for leadership in the establishment of collaborative governance, integration of science and data, data infrastructure to support MSP, and spatial analysis and planning activities.

Within DFO, the Marine Planning and Conservation Program is leading this process and is responsible for developing a marine spatial plan for the planning area by March 2024. The MSP process will provide ongoing opportunities to promote collaborative planning and management of ocean activities with Provinces, First Nations, Indigenous organizations, industry and others.



DECISION-SUPPORT TOOLS

Through MSP, DFO is developing a range of decision-support tools that will be widely available to support proactive planning and to better inform decisions regarding location, timing and the suitability of activities in the planning area. Spatial and non-spatial tools are being created, or further developed, to allow for improved analysis of ocean information to better inform sector-based decision-making. These include:



Ocean Use Conflict Analysis (OUCA): A scoring exercise to determine compatibility among human activities in marine spaces and assess potential conflict (e.g. fishing, aquaculture, oil and gas, etc.)

Strategic Ecosystem/Activity Compatibility Assessment Tool (SEACAT): A high level examination of the planning area to determine compatibility between human activities and ecosystem components. This tool has a wide range of applications, including risk assessments, new developments, and sector expansion plans.

MARINE ATLAS

A marine atlas is being created to display the types and spatial extent of a wide range of human activities and ecological features found in the three Atlantic planning areas. The atlas is envisioned to be a publicly available online web mapping application to enable data discovery and exploration that will cover all of Eastern Canada. The atlas will support sector-based decision making by providing the most current spatial data available.

Example ecological data layers:

- Kernel density analysis of coral and sponges
- Priority areas for cetacean monitoring in the Northwest Atlantic
- Spatial representation of fish and invertebrate functional groups considered in MPA Network Design in the Scotian Shelf/Bay of Fundy bioregion (in development)

Example human use data layers:

- Jurisdictional layers such as fisheries management zones
- Fish landings map of various species and gear types that will show important commercial fishing areas while respecting confidentiality
- Marine shipping lanes, vessel density, and ballast water exchange areas

FOR MORE INFORMATION

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You can also visit our website or follow us on social media

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April 2022



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Marine Conservation in the Maritimes Region

Marine Protected Areas (MPAs)

Around the world, MPAs are recognized as a valuable tool for protecting marine ecosystems and achieving a better balance between human use and conservation in our oceans. In Canada, MPAs are established under a variety of legislation, including by Fisheries and Oceans Canada through the *Oceans Act* for the conservation of marine species, habitats, and ecosystems. They provide many benefits for Canadians, from environmental to social and cultural contributions. MPAs contribute to the Government of Canada's marine conservation targets, such as protecting 25% of coastal and ocean waters by 2025, and 30% by 2030.

There are currently 14 *Oceans Act* MPAs across Canada, comprising over 350,000 km² or roughly 6% of Canada's marine and coastal areas. MPAs may allow some current and future activities depending on their impacts to the ecological features being protected.

The three MPAs in the Maritimes Region are: The Gully, Musquash Estuary, and St. Anns Bank.



Heliometra glacialis (marine species)

St. Anns Bank MPA

Location: East of Cape Breton Island, Nova Scotia

Approximate size km²: 4,364 km²

Date of Designation: June 2017

Eastern Shore Islands AOI

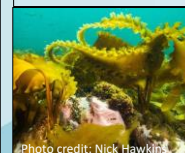


Photo credit: Nick Hawkin

Areas of Interest (AOIs) and Other Effective Area-Based Conservation Measures (OECMs)

A marine area is identified as an AOI when it is under consideration to become a MPA. OECMs, such as selected fisheries management measures, help protect important species and their habitats, and to date have focused on unique and significant aggregations of corals and sponges. Such areas are called Marine Refuges and they contribute to Canada's marine conservation targets. As of April 25, 2019, these measures represent approximately 283,365 km² and 4.93% of protected marine territory in Canada. The Maritimes Region is currently advancing two new AOIs for MPA designation, and one proposed Marine Refuge, which were identified in 2018: Eastern Shore Islands AOI, Fundian Channel-Browns Bank AOI, and Eastern Canyons Marine Refuge.

Marine Conservation Network Development

A process is underway in the Maritimes Region to develop a conservation network plan for the coastal and offshore waters of the Scotian Shelf/Bay of Fundy Bioregion that will conserve the health of our waters and support sustainable fisheries, coastal communities, and other ocean activities.

Quick Facts:

- The conservation network will include individual sites of various shapes, sizes, and protection levels – each with its own conservation objectives
- Certain types of fishing and other low-impact activities, such as eco-tourism or recreational boating, are often allowed to continue in MPAs and other conservation areas
- Existing protected areas are important components of the bioregional network.
- These will contribute to Canada's national network of MPAs, which will be composed of 13 networks in total
- Work on the draft conservation network design includes engagement with government partners, First Nations and Indigenous organizations, stakeholders and coastal communities with the goal of releasing a network plan in 2024.

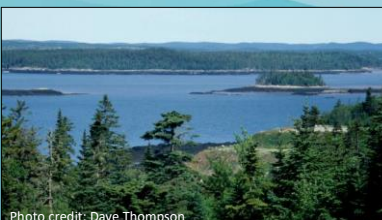


Photo credit: Dave Thompson

Musquash Estuary MPA

Location: Bay of Fundy, New Brunswick

Approximate size km²: 7 km²

Date of Designation: December 2006

The Gully MPA

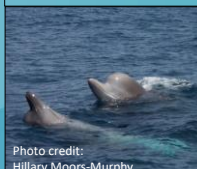


Photo credit: Hillary Moors-Murphy

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April 2022



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Figure 10. DFO “Backgrounders” published in April 2022 on Marine Spatial Planning and Marine Conservation in the Maritimes Region (Source: Scott Coffen-Smout, DFO)

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3.4.2 ETP Species Interactions - North Atlantic Right Whale (*Eubalaena glacialis*)

The North Atlantic Right Whale (NARW) is listed as Endangered under the Canadian federal Species at Risk Act (SARA). In 2021, the [North Atlantic Right Whale Consortium](#) announced that the estimated NARW population in 2020 was 336, an 8% drop from the 2019 estimate of 366 whales. In the past 10 years, the species has declined by 30%. Fishing gear entanglement and vessel strikes are the biggest human-induced threat to the species.

Canada has a [suite of fisheries management measures and initiatives in place in Atlantic Canada and Quebec to prevent entanglements](#) many of these were introduced in response to an unprecedented NARW mortality event in 2017 in the southern Gulf of St. Lawrence when 12 NARW were killed, 2 of which were confirmed as being caused by entanglement in snow crab gear which were either identified or thought to have been used in the southern Gulf of St. Lawrence snow crab trap fishery (CFA 12). In addition to the mortalities, 5 entanglements were reported the same year.

Since the 2017 entanglement and mortality event, there was zero NARW mortality reported in 2018, 9 NARW mortalities reported in 2019 and zero NARW mortality reported in Canadian waters in both 2020 and 2021 (Figure 11).

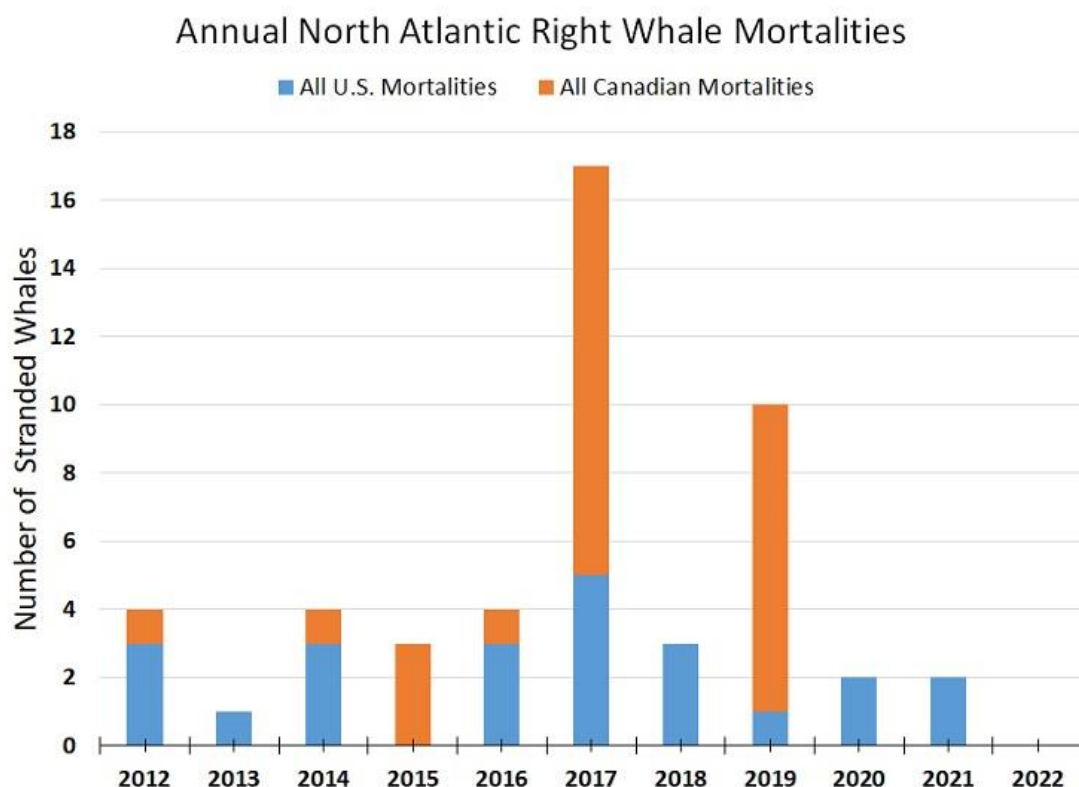


Figure 11. Annual North Atlantic right whale mortalities for the 2012-2021 period, in U.S. (blue) and Canada (orange). Source: <https://www.fisheries.noaa.gov/national/marine-life-distress/2017-2022-north-atlantic-right-whale-unusual-mortality-event>

Among the 9 dead NARW reported in 2019, 7 were reported in the Gulf of St. Lawrence and 2 in the vicinity of Cape Breton; and among these 9 mortalities, 7 were detected in June and 2 in July (Pettis *et al.*, 2020).

Five necropsies were performed following the 7 June mortalities. 4 mortalities were attributed to vessel strikes (Pettis *et al.*, 2020). Preliminary results for the other three were inconclusive.

According to DFO, none of the NARW found dead in Canadian waters had fresh entanglements scars and for now there is no confirmation that mortalities in Canadian waters were caused by entanglement in fishing gears (Pettis *et al.*, 2020).

No entanglement was reported in Canadian waters in 2020 (Pettis *et al.*, 2021).

In 2021, 2 NARW mortalities were detected, matching the number of detected mortalities in 2020. The causes of death, both of which were detected in U.S. waters, were attributed to a vessel strike and a chronic entanglement. The one

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confirmed entanglement related mortality was detected in U.S. waters, however, the origin of the entangling gear remains unclear.

There were 5 active entanglement/entrapment cases reported between 01 January 2021 – 31 December 2021, of which 3 were new. Of the three newly entangled whales (with attached gear) detected in 2021, 2 were in U.S. waters and one in Canadian waters. After multiple disentanglement efforts in Cape Cod Bay and the Gulf of St. Lawrence, one of these whales was re-sighted, still entangled, in the southeast U.S. in December 2021 with a calf. The other two whales, both of which have entanglements that are considered life threatening, have not yet been re-sighted.

Whale #3560 Entangled with gear. Partially disentangled, removed ~300ft of line. Re-sighted multiple times between May and August 2021 in the Gulf of St. Lawrence and additional rope was removed. The whale was re-sighted 10/24/2021 in Southern New England and again on 12/02/2021 off the coast of Georgia with a calf. Two short lengths of line (less than a body length) anchored in the mouth remains on the whale with a possibility of an embedded wrap in forward part of rostrum.

Whale #4615 Whale seen gear free hours prior to initial entanglement sighting. Whale engaged in head raises, tail slashes/flicks, and rolling for much of the sighting. Active bleeding observed at areas where rope was contacting the body was also noted, all suggesting that the entanglement was relatively recent and that the whale was dealing with heavy gear. Telemetry buoy attached. Re-sighted next day still entangled but not since.

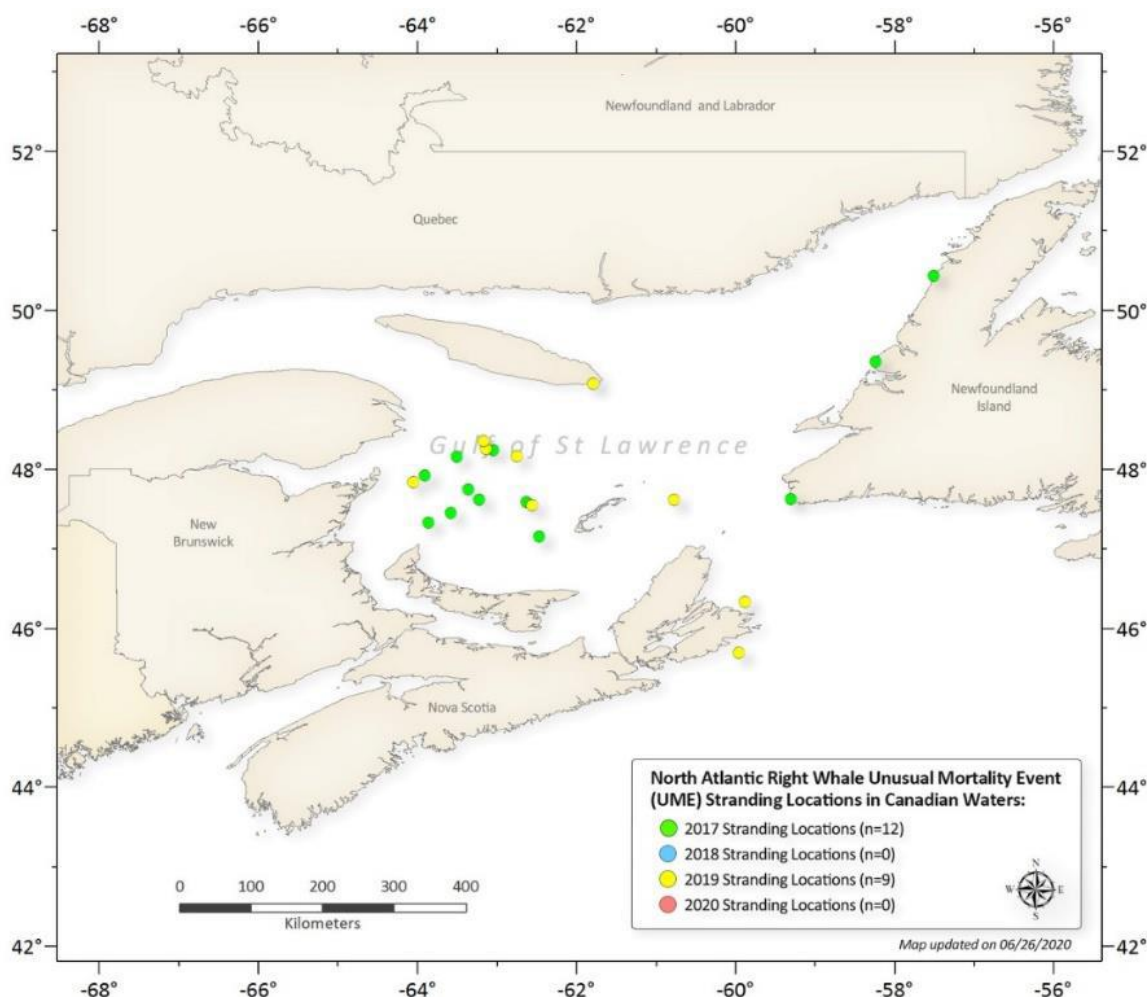


Figure 12. Map of NARW mortalities in Canada for the 2017-2020 period.

Source: <https://www.fisheries.noaa.gov/national/marine-life-distress/2017-2022-north-atlantic-right-whale-unusual-mortality-event>

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New England Aquarium NARW entanglement research

As part of two other MSC annual audits ([The AQIP Snow Crab Trap Fishery](#) and the [AQIP Gulf of St. Lawrence Greenland Halibut Fixed Gear Fisheries](#)) researchers from the New England Aquarium (NEA) provided supporting information and input which is relevant to the Canada Scotian Shelf Northern Prawn Trap Fishery. This included the latest US NARW stock assessment report (NOAA 2021) and a paper on the cryptic (unobserved) mortality of NARW (Pace *et al.* 2021). Both the stock assessment report and Pace *et al.* (2021) state that the total human-induced mortality is not known or is vastly underreported or unobserved. Pace *et al.* (2021) show that for the period of 2010-2017, the probability of detecting a whale carcass was 29% (with two standard errors of 2.8%). Inferences drawn from the work published in Pace *et al.* 2021 are summarized in the discussion including:

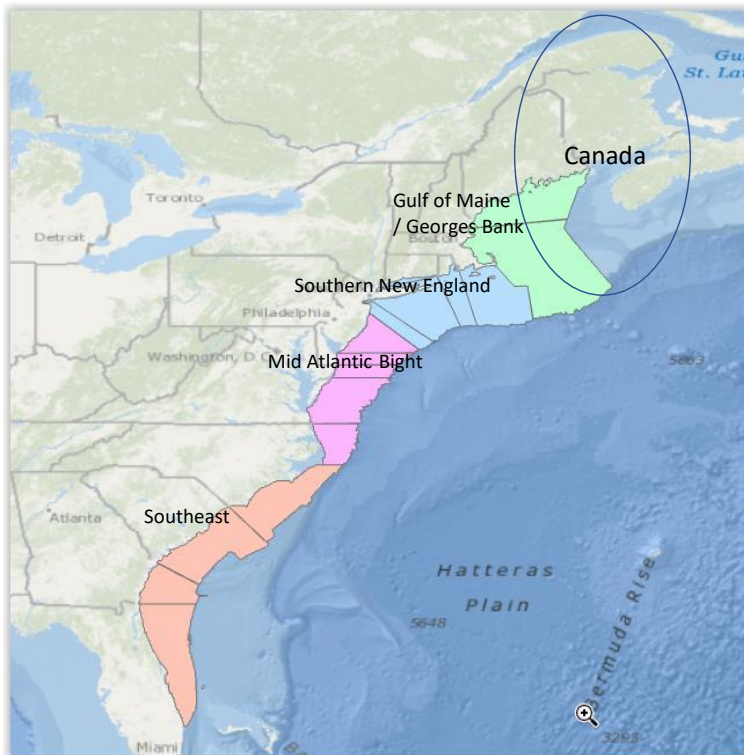
- “There is a striking mismatch between the causes of serious injuries observed in living whales and the causes of mortality revealed in necropsies of dead whales;” and,
- “...the disparity in observed rates of serious injury by cause suggests that cryptic deaths due to entanglements significantly outnumbers cryptic deaths from vessel collisions or other causes.”

In addition, the location of where the majority of entanglements have occurred is not known because:

- cases with attached gear have not been adequately marked; and,
- the majority of cases result in entanglement wounds only but these can have lethal and sublethal impacts.

Amy Knowlton, (Senior Scientist, NEA) provided a Powerpoint presentation outlining the NEA work on whale entanglement data and developing a better approach to understanding where entanglement occurs (Knowlton *et al.* 2020). In summary, despite gear marking requirements, of the 1,712 entanglement events documented in the period between 1980 and 2019, only 136 cases (8%) had attached gear and only a subset of those could be traced back to origin. Because such a small fraction of detected entanglements has gear closely observed or retrieved, it is considered likely that many more potentially serious injuries and mortalities resulting from entanglements will remain unattributed despite the new gear marking requirements.

By documenting the last known date of pre-injury and date of detection with injury or gear entanglement within a specified timeframe, their work has shown it is possible to determine which region(s) whales likely moved through within which the injury/entanglement took place. Five regions were identified:



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Figure 13. The five regions within which entanglement may occur. The US regions are based on NMFS management regions. The Canadian region includes the Bay of Fundy, Scotian Shelf and Gulf of St. Lawrence (Knowlton, *et al* 2020).

Using 1,530 entanglements events with a known time frame, the researchers constructed the following graphic:

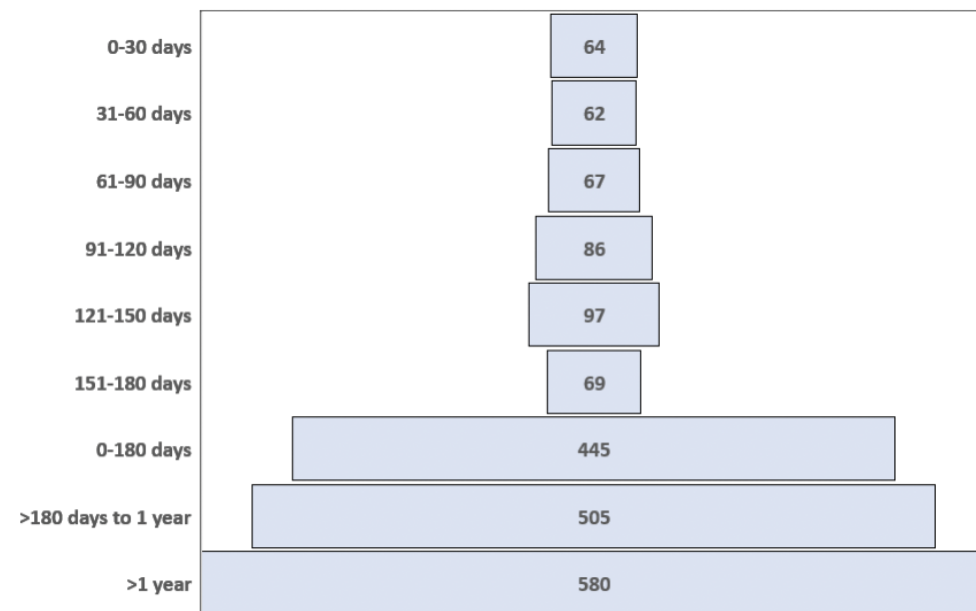


Figure 14. The number of entanglement events within a known time frame between 1980 and 2019 (Knowlton, *et al* 2020).

The following assumptions were used:

- If the pre-injury/detection regions were the same (and there were no additional sightings in between those dates), assumed whale stayed in that region
- If the whale was a calf when detected with an injury and there were no sightings of it pre-injury, assume it was born in the southeast US calving ground and acquired injuries between calving ground and area where first detected with injury
- If whale was seen in an area in winter or spring and another area further north in summer or fall (and no other sightings in between), assume it did not go south before it went north
- If whale was seen in an area in summer or fall and another area further south in winter or spring (and no other sightings in between), assume it did not go north before it went south
- Each case was reviewed manually and allocation areas assigned based on these assumptions
- For all cases with gear attached, reviewed NOAA gear reports to see if gear was linked back to a region

Using 180 days as a reference period within which a whale was seen before and after an injury / entanglement a breakdown of regional entanglements was calculated (an additional 4 cases were added to the total following new information, making a total number of 449 entanglements):

Table 3. The number of entanglement events within 180 days within which a whale was seen before and after injury / entanglement by region (Knowlton, *et al*. 2020).

Region	Entanglements
Canada	145
Gulf of Maine / Georges Bank	162
Southern New England	45
Mid Atlantic Bight	33
Southeast	64

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This data was further refined to show the likelihood of an entanglement occurring within 1, 2 or ≥ 3 regions:

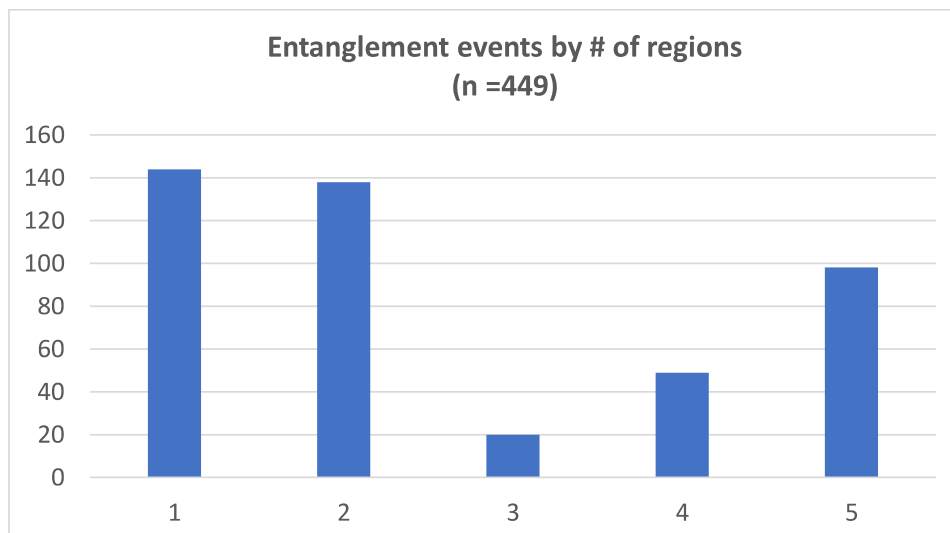


Figure 15. The estimated likelihood of an entanglement occurring within 1, 2 or ≥ 3 regions (Knowlton, *et al.* 2020).

Table 4. The estimated likelihood of an entanglement occurring within 1, 2 or ≥ 3 regions (Knowlton, *et al.* 2020).

# Entanglements known to have occurred in 1 region	
Region	Entanglements
Canada	55
Gulf of Maine / Georges Bank	55
Southern New England	3
Mid Atlantic Bight	0
Southeast	31
# Entanglements known to have occurred in 2 regions	
Regions	Entanglements
Canada to Gulf of Maine	131
Gulf of Maine to Southern New England	7
Southern New England to Mid Atlantic Bight	0
Mid Atlantic Bight to Southeast	0

The research showed the 10-year trend for entanglements by country (i.e., US and Canada) (Figure 16) and the change in severity of injury pre and post 2010 (when the distribution of NARW changed). Figure 17 (Panel A) shows that minor entanglement injuries were most frequent prior to 2010, whereas, in the 2010-2019 period, the frequency of severe entanglements increased with a notable increase detected in Canada, increasing from 3 to 23 cases (Panel B). Severe cases in the US increased from 8 to 14 cases during the two time periods. The unknown country of origin remains high in both time periods.

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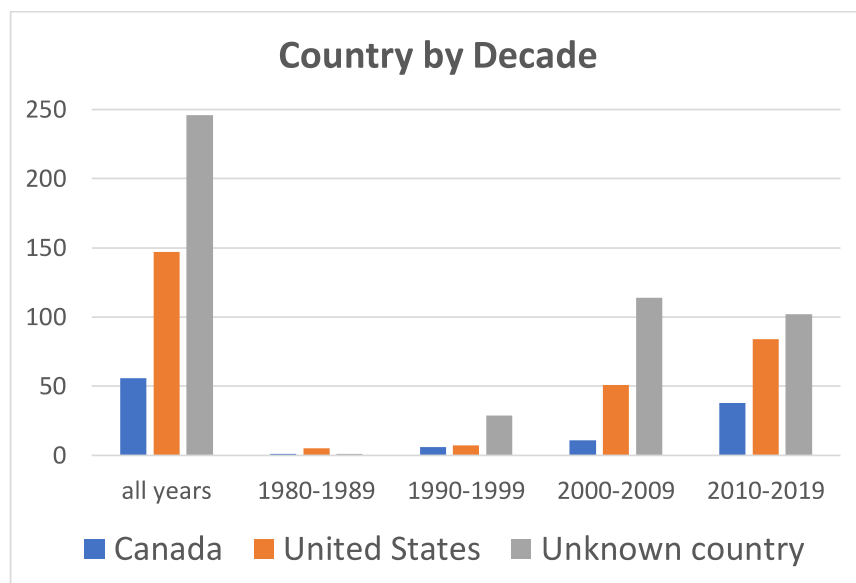


Figure 16. 10-year trend in entanglements for Canada and the US, with unassigned countries referred to as “Unknown country”. (Knowlton, *et al.* 2020).

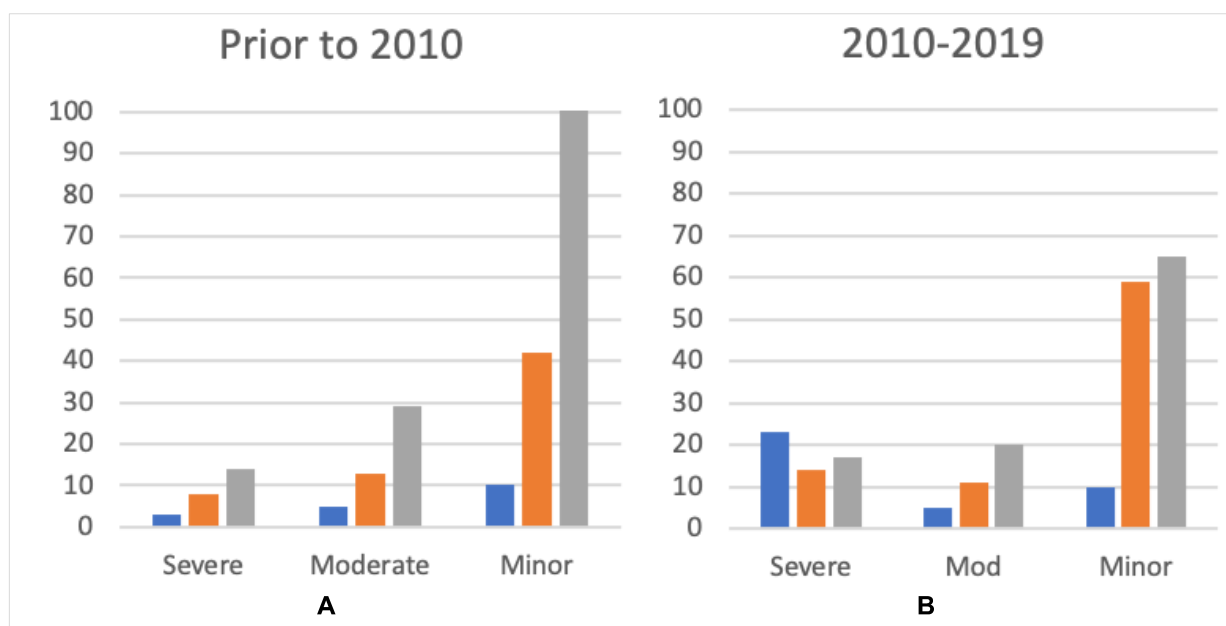


Figure 17. The change in severity of injury pre (A) and post (B) 2010, when the distribution of NARW changed. (Knowlton, *et al.* 2020).

This approach provides valuable insights into where entanglements may be occurring. It suggests that the Gulf of Maine and Canada present the highest level of risk based on allocations and adjacent regions assessments. Southeast US also shows a relatively high level of risk based on assessment of events known to have occurred in a given area. The increase in severe entanglements in the 2010-2019 time period has increased for both countries with a higher increase for Canada.

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3.4.3 Changes in the fisheries operation and management, including legislation and regulations

There were no reported changes in the management system with respect to both the trawl and trap fishery. However, the following regulatory changes were confirmed to be implemented during the 2022 commercial fishing season:

- **Interim TAC for 2022:** DFO informed the Audit Team that the Total Allowable Catch (TAC) remained at 2,600t for the 2019, 2020, and 2021 fishing seasons. However, given the 2021 stock assessment results, the TAC has been reduced to 2,300 t for the 2022 fishing season. The Record of Discussion of the Eastern Scotian Shelf Shrimp Advisory Committee (ESSSAC) meeting of January 24, 2022, showed that the Atlantic Canadian Mobile Shrimp Association (ACMSA) accepted a reduced TAC of 2,300t for the 2022 fishing season; however, some license holders note the absence of data from at-sea observers in 2021, due to reasons related to the pandemic and scheduling issues related to the at-sea observer companies, as a possible gap that could have influenced the science advice since there was no catch verification at sea. As a result, DFO and ACMSA committed to hold discussions on finding solutions to the problem of scheduling observers to trips or finding alternative options apart from the at-sea observer companies.
- **2022 License Conditions:** Firstly, the section related to “Species at Risk reporting” (Section 11.9) and “SARA authorization” (Part 14) were removed since no SARA logs were required by the shrimp fishery. DFO Science indicated that due to the use of the Nordmore grate and traps there was no risk presented to wolffish and leatherback turtles. Secondly, a Crew Registry requirement was added to the conditions of license for the trap fleet where license holders or their approved Designated Operators must maintain a record of crew members on board the vessel.

The Audit Team was informed that all Canadian shrimp fisheries are now in the “Exempt” category of the NOAA’s List of Foreign Fisheries on the US Marine Mammal Protection Act (US MMPA) data portal. This exemption reclassification however will not be confirmed until published by NOAA in November 2022. As a result, the Eastern Scotian Shelf shrimp is permitted to export to the US since the information provided on the trawl fishery has met the comparability findings with other shrimp fisheries in the US with regard to risk of harm to marine mammals.

Information provided in the Record of Discussion of the ESSSAC meeting of January 24, 2022, indicated that the revision of the Integrated Fishery Management Plan (IFMP) was paused from October 2021 to September 2022. This was due to the need of rescheduling the Science Framework and Assessment because of additional work required for modelling developments. It was further clarified during the 2nd surveillance meeting held on June 17, 2022, by DFO staff that work on revising the IFMP will likely not be completed by September 2022 and a new target date for completion still needs to be determined.

The client provided a DFO PowerPoint presentation on the development and implementation of the DFO Fishery Monitoring Policy as it pertains to the Eastern Scotian Shelf Shrimp Application. The PowerPoint presentation identified the following outcomes:

- Two Quality Assessment Tools (QAT) were completed. The QAT is designed to assess the dependability of a monitoring program. The two QATs used in the fishery are the Mobile Shrimp Monitoring Document and the Shrimp Trap Monitoring Document.
- The Risk Screening Tool (RST) is completed. The RST serves as a structured, qualitative review of the risks fisheries pose to a set of defined conservation targets, as well as compliance-related risk factors.
- To offer a dependable estimate of catches existing monitoring programs (i.e. logbooks) were assessed.
- It was concluded that the risk posed to the stock by fisheries is likely to be negligible under current monitoring and management frameworks.
- It has been determined that no additional monitoring beyond logbooks will be required for the shrimp fishery; resulting in no further work being prescribed.
- A gap analysis to compare finding from the two Tools with current monitoring programs will now be completed and presented as a case study to other DFO fisheries.

An update to an Ecosystem Approach to Fisheries Management (EAFM) was provided in the form of both a copy of the presentation given to the ESSSAC meeting held on January 24, 2022; as well as, verbal information given during the DFO audit meeting on June 17, 2022. According to information provided in the presentation, the vision for DFO’s National EAFM Initiative is to implement an EAFM throughout Canada that will integrate environmental variables (i.e.

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climate, oceanographic and ecological factors) into single-species stock assessments in order to improve fisheries management decisions. This national EAFM framework will be created through a national working group of scientists and fisheries managers, supported by Regional Working Groups; conducting case studies to evaluate the value of including ecosystem information in peer-reviewed stock assessments; and working group action items. Work on EAFM case studies, of which shrimp is one, is planned to continue over the next 3 years. In terms of Northern shrimp, environmental variables (i.e. strong relationship between shrimp productivity, ocean bottom temperature and predator abundance) are already being used in assessments; but further deliberation is needed to determine how to use this information more quantitatively. DFO will continue to receive feedback about case studies from scientists, managers, stakeholders, Indigenous groups and rights holders, and others. DFO plans to produce a National EAFM Framework by 2023 to help guide the broad implementation of EAFM in the department.

3.4.4 Compliance

DFO's Conservation and Protection (C & P) program provided an Enforcement Compliance Summary for 2020 and 2021 for the shrimp trawl fishery. In 2021, 26.25 hours of patrol time was dedicated to the shrimp trawl and trap fishery; compared to 8 hours in 2020. There were zero instances of any types of violations/occurrences reported during either 2020 or 2021.

3.4.5 Changes in key personnel within the fisheries management structure and within the industry

The client representative and DFO staff confirmed during the audit that they are not aware of any changes in key personnel within the industry or within the fishery management structure that would affect the fishery certification status.

3.4.6 Changes that might affect traceability of MSC certified product within the fishery

The client representative and DFO staff confirmed during the audit that they were not aware of any changes that might affect the traceability of MSC certified products with the trawl fishery. Since the Canada Scotian Shelf Northern Prawn Trap Fishery (UoC2) will be seeking to withdraw from MSC certification, traceability of MSC certified products within this fishery will no longer be a factor.

3.5 Version details

Table 5. Fisheries program documents versions

Document	Version number
MSC Fisheries Certification Process	Version 2.2
MSC Fisheries Standard	Version 2.01*
MSC General Certification Requirements	Version 2.4.1
MSC Surveillance Reporting Template	Version 2.1

* default assessment tree

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4 Results

4.1 Surveillance results overview

4.1.1 Summary of conditions

Table 6. Summary of conditions

Condition number	Condition	Performance Indicator (PI)	Status	PI original score	PI revised score
1 (Trap - UoA 2)	Evidence is required to show that the combined effects of the MSC UoAs on the North Atlantic Right Whale (NARW) population are known and highly likely to be within national limits.	2.3.1	Behind target	75	75
2 (Trawl – UoA 1)	Evidence is required to show: <ul style="list-style-type: none"> 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 protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant. 	2.4.2	Closed	60	80
3 (Trawl – UoA 1)	Evidence is required that the Scotian Shelf Shrimp Trawl Fishery management system is subject to regular internal and occasional external review.	3.2.4	On target	75	NA
4 (Trap - UoA 2)	Evidence is required to show that the Scotian Shelf Shrimp Trap Fishery management system is subject to regular internal and occasional external review.	3.2.4	On target	75	NA

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4.1.2 Total Allowable Catch (TAC) and catch data

Table 7. Total Allowable Catch (TAC) and catch data

UoA 1 Trawl Fishery

TAC	Year	2021	Amount	2,600 tonnes
UoA share of TAC	Year	2021	Amount	2,392 tonnes
UoA share of total TAC	Year	2021	Amount	2,392 tonnes
Total green weight catch by UoC	Year (most recent)	2021	Amount	2,367 tonnes
Total green weight catch by UoC	Year (second most recent)	2020	Amount	2,421 tonnes

UoA 2 Trap Fishery

TAC	Year	2021	Amount	2,600 tonnes
UoA share of TAC	Year	2021	Amount	208 tonnes
UoA share of total TAC	Year	2021	Amount	208 tonnes
Total green weight catch by UoC	Year (most recent)	2021	Amount	1 tonne
Total green weight catch by UoC	Year (second most recent)	2020	Amount	58 tonnes

4.1.3 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; 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.

Three non-binding recommendations were made with respect to four PIs:

- **UoC 1 and 2 – PI 1.2.4.** The assessment team recommends that the next Framework meeting is attended by one or more expert external reviewers.

Year 1 update

Manon Cassista-Da Ros (DFO Science) confirmed the hope is that last year's postponed Framework meeting will take place later this year (2021) and Eric Peterson (Department of Biology, McGill University) will participate as an external reviewer. Other DFO biologists from outside the DFO region are also expected to participate.

Year 2 update

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Due to Covid restrictions the proposed Framework has not yet taken place, but DFO Science confirmed that external reviewers are expected to be invited to the meeting.

- **UoC 1 and 2 – PI 2.1.3 and 2.2.3.** The assessment team recommends that a comparison is made between estimates of bycatch from fishers' log books with information collected during the observer programme.

Year 1 update

Manon Cassista-Da Ros confirmed the value in such a comparison and highlighted that the recording in logbooks of bycatch has been minimal or non-existent. As it was unclear whether this meant that there was no bycatch or whether fishers were not recording catches, further instructions for improved recording had been given to fishers. It was also confirmed that records from on-going at-sea observer trips indicate low levels of bycatch of less than 1%.

Year 2 update

Nothing to report

- **UoC 1 and 2 - PI 3.2.3.** The assessment team note that the IFMP states that in order to ensure information within the plan is up to date it is reviewed on an annual basis; therefore, the team recommend that reported enforcement activity should not be more than 2 years out of date.

Year 1 update

Suzette Soomai (DFO Resource Management) confirmed that the IFMP is being reviewed and will be based on the new IFMP template. The draft report will be made available to members of the ESSAC later this year with publication expected in late 2021 or early 2022.

Year 2 update

The science sections of the IFMP are being revised and finalised and the new IFMP is expected to be published in March 2023.

4.2 Re-scoring Performance Indicators

Condition 2 (PI 2.4.2 – Trawl Fishery, UoC 1) has been closed at this surveillance audit, and PI 2.4.2 re-scored, and so the overall Principle 2 score has been amended:

Table 8. Revised scoring table for UoC 1 – noting the change in score for PI 2.4.2.

Principle	Component	Performance Indicator (PI)		UoC 1
1	Outcome	1.1.1	Stock status	90
		1.1.2	Stock rebuilding	N/A
	Management	1.2.1	Harvest strategy	95
		1.2.2	Harvest control rules & tools	85
		1.2.3	Information & monitoring	90
		1.2.4	Assessment of stock status	85
2	Primary species	2.1.1	Outcome	95
		2.1.2	Management	90
		2.1.3	Information	100
	Secondary species	2.2.1	Outcome	80
		2.2.2	Management	90
		2.2.3	Information	80
	ETP species	2.3.1	Outcome	100

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3	Habitats	2.3.2	Management	90
		2.3.3	Information	80
		2.4.1	Outcome	100
		2.4.2	Management	80
		2.4.3	Information	80
		2.5.1	Outcome	90
	Ecosystem	2.5.2	Management	85
		2.5.3	Information	90
	Governance and policy	3.1.1	Legal & customary framework	100
		3.1.2	Consultation, roles & responsibilities	95
		3.1.3	Long term objectives	100
	Fishery specific management system	3.2.1	Fishery specific objectives	80
		3.2.2	Decision making processes	85
		3.2.3	Compliance & enforcement	95
		3.2.4	Monitoring & management performance evaluation	75

Table 9. Principle level scores

Principle	UoC 1
Principle 1 – Target species	89.2
Principle 2 – Ecosystem impacts	88.7
Principle 3 – Management system	91.0

4.3 Conditions

4.3.1 Closed Conditions

Within the last 24 months, the Audit Team members have worked on a number of MSC fisheries assessments and audits within the Atlantic region. It was noted that despite the same policy and regulatory framework, extensive mapping and modelling work and the introduction of areas closed to all fishing methods that may contact the seabed (e.g., DFO 2009a, DFO 2015, Beazley *et al* 2016, Guijarro *et al* 2016, Kenchington *et al* 2016, Murillo *et al* 2016, DFO 2017a; DFO 2017b, DFO 2020d, Koen-Alonso *et al* 2018), there have been different approaches and outcomes in the evaluation of PI 2.4.2. As a result, discussions were held between team members and a consensus was achieved. This has caused the Audit Team to re-evaluate the scoring of PI 2.4.2 for the Canada Scotian Shelf Northern Prawn Trawl Fishery as well as the Gulf of St. Lawrence Northern Shrimp Fishery.

In light of the above, the following sets out the revised evaluation and rescoring of PI 2.4.2 for the Canada Scotian Shelf Northern Prawn Trawl Fishery. Original justification text which is now redundant has been crossed out and new text inserted as **blue text**. To note, this PI was reviewed and new text inserted at the first surveillance audit to take account of the **MSC derogation 5**, the objective of which is for any fishery that has a partial management strategy in place that **YOUR FUTURE. OUR FOCUS.**

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protects and avoids vulnerable marine ecosystems (VMEs) and potential VMEs, then commonly accepted move-on rules are not required (at the SG 60 level).

It should be noted that the references to tables and figures within the scoring rationale relate to tables and figures within the original Public Certification Report (PCR).

Table 10. Revised evaluation table for PI 2.4.2 for the Scotian Shelf Northern Prawn Trawl Fishery.

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?	Trawl – Not scored Trap – Not scored	Trawl – N Y Trap – Y	Trawl – N Trap – N
	Justification	<p>On 5th November 2020, the MSC issued a derogation for scoring PI 2.4.2a which instructs CABs to assess the fishery against SG80 first and states, “If the fishery meets SG80, i.e. it has a partial management strategy in place that protects and avoids vulnerable marine ecosystems (VMEs), then the CAB does not have to assess the fishery against SG60 and the fishery does not have to implement commonly accepted move-on rules.”</p> <p>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:</p> <ul style="list-style-type: none"> 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. <p>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.</p> <p>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.</p> <p>... 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.”</p> <p>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</p>		

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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.
	<p>that is supported by a comprehensive impact assessment that determines that all fishing activities will not cause serious or irreversible harm to VMEs"</p> <p>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."</p> <p>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."</p> <p>Habitat management in Canadian waters is based on the Policy for Managing Impact of Fishing on Sensitive Benthic Areas (DFO 2009a). The policy outlines steps for both historically fished (defined as areas with a history of fishing by any gear type whose ecosystem impacts are considered similar to the potential impacts of a gear type being proposed for fishing) and frontier areas (defined as areas with no history of fishing in Canadian waters, specifically waters >2,000 m depth or areas in the Arctic where there is little information on benthic features).</p> <p>In historically fished areas, management measures to address potential impacts may include:</p> <ul style="list-style-type: none"> • Gear restrictions or modifications or substitutions to reduce contact with the benthos and seafloor. • Effort reduction. • Spatial management of effort (taking into account the spatial distribution of benthic habitat and communities). • Partial or total time and area closures to all or specific fishing gear; and • Higher levels of monitoring, control, and surveillance, including enhanced data collection and reporting, vessel monitoring and at sea observer requirements. <p>Trawl</p> <p>As part of meeting a previous condition of certification related to this PI and SI, in 2016, the Eastern Scotian Shelf Shrimp Advisory Committee (ESSSAC) developed and adopted a "Habitat Management Strategy" specifically for the shrimp trawl fishery.</p> <p>The Strategy outlines measures in place to ensure that habitat impacts are acceptable (notably TAC and seasonal limitation on fishing intensity), and methods for monitoring impacts (geospatial mapping of habitats and fishing intensity, the latter to be updated every two years), and confirmed that ESSSAC would review habitat impacts at its annual meetings and make decisions on additional measures if required. The Strategy also outlines the broader context for protection of benthic habitats on the Eastern Scotian Shelf including implementation of marine protected areas (MPAs) (these have been implemented specifically to protect VMEs – see Table 15), identification of Environmentally and Biologically Significant Areas, and ongoing research on habitat characterisation. Furthermore, the strategy recognised that DFO has put in place the Policy for Managing the Impacts of Fishing on Sensitive Benthic Areas (SeBA</p>

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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.
	<p>Policy), i.e. further work on identifying potential VMEs, their overlap with fishing activities and, where/if necessary, management measures for Significant Benthic Areas (SBAs).</p> <p>ESSSAC recommended that the Habitat Management Strategy be appended to the IFMP, however, DFO indicated that this was not currently possible as the format of the Strategy was not consistent with the IFMP format. DFO did confirm at an annual MSC audit that the Strategy could be incorporated at a later date when the IFMP is fully rewritten. The strategy can be found in the 2nd annual surveillance report (2016) at: https://fisheries.msc.org/en/fisheries/canada-scotian-shelf-northern-prawn-trawl/@assessments</p> <p>At a regional level, in 2015 the Coral and Sponge Conservation Strategy for Eastern Canada (DFO, 2015) was implemented, with the intent of supporting coordination and collaboration of management and research efforts on coral and sponge conservation throughout the five eastern Canada regions of DFO.</p> <p>At a national level, Canada has taken a number of steps to protect benthic habitats and ecosystems. This includes MPAs and marine refugia for VME habitat on the Scotian Shelf, (e.g. The Gully MPA, Western/Emerald Banks Conservation Area, St. Anns Bank MPA) and the SeBA Policy (DFO, 2009b) with its development of tools and information to support its application (see section 3.5.3.1). While broad implementation of the policy is still an on-going process (Koen-Alonso <i>et al.</i>, 2018), SBAs have been identified within the Scotian Shelf bioregion, i.e. areas that contain sponges (Porifera), large and small gorgonian corals (Alcyonacea) and/or sea pens (Pennatulacea) as dominant and defining features (Kenchington <i>et al.</i>, 2016) These are the equivalent of VMEs (DFO, 2017g).</p> <p>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 section 4.1.7.4 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).</p> <p>The "Scotian Shelf Shrimp Trawl Fishery Move-on Protocols" became effective as of February 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.</p> <p>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.</p> <p>As a result, of the above, it is concluded that the SG 80 is met as there is a partial strategy in place that is expected to achieve the Habitat Outcome 80 level of performance.</p> <p>It is noted that, in accordance with the MSC's derogation on scoring this SI, if SG 80 is met then SG 60 is not scored.</p> <p>The SG 100 is not met as there is not a strategy in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats.</p> <p>A recommendation is made that within the remaining certification period (i.e., the existing certificate is valid until 3rd March 2025) the client provide a geo-spatial analysis of the fishery footprint using more recent data than the 2005–2014 period used by Koen-Alonso <i>et al.</i> (2018) and provide an updated estimate of the overlap with SBA/VME.</p>

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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.		
		<p>Trap</p> <p>The use of traps, the limited number of licences (14 in total), the trap limit (maximum of 100 per licence) and the seasonal nature of the fishery result in an estimated annual footprint of approximately 0.014 km². There is no known overlap of the trap fishery with VMEs. Given the evidence of limited impact caused to habitats and habitat-forming species by this gear type (e.g., Eno <i>et al.</i>, 2001, DFO, 2010, Shester & Micheli 2011, NEFMC 2011, Grieve <i>et al.</i>, 2014) it is concluded that the operation of the fishery meets the MSC definition of a partial strategy and it is expected to achieve the Habitat Outcome 80 level of performance or above. thereby meeting the SG 60 and 80. It is noted that, in accordance with the MSC's derogation on scoring this SI, if SG 80 is met then SG 60 is not scored.</p> <p>At a national level, Canada has taken a number of steps to protect benthic habitats and ecosystems. This includes the Policy on Managing the Impacts of Fishing on Sensitive Benthic Areas (DFO, 2009b) and the development of tools and information to support its application (see section 4.1.7.4). At a regional level, in 2015 the Coral and Sponge Conservation Strategy for Eastern Canada (DFO, 2015) was implemented, with the intent of supporting coordination and collaboration of management and research efforts on coral and sponge conservation throughout the five eastern Canada regions of DFO.</p> <p>Full implementation of the Policy on Managing the Impacts of Fishing on Sensitive Benthic Areas would likely result in the SG 100 being met. However, in the absence of this, the SG 100 is not met.</p>		
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?	Trawl – Y Trap – Y	Trawl – N Y Trap – Y	Trawl – N Trap – N
	Justification	<p>Trawl</p> <p>The following lists the habitat information that is known or being gathered about the UoA and the actions that are being taken:</p> <ul style="list-style-type: none">• Surficial sediments have been identified and mapped;• Geospatial mapping of habitats and fishing effort (Pisces, 2018, Koen-Alonso, 2018) (on-going);• Implementation of protected areas network on the Scotian Shelf (Table 15 and Figure 31 (on-going);• The identification and delineation of SBAs (which are considered to be the equivalent of VMEs) (DFO, 2017e) (on-going);• Work on the development of guidance on the protection of SBAs (e.g. DFO, 2017g) (on-going); and,• The client fishery has adopted “move-on protocols” similar to those developed and implemented by NAFO. These became effective as of February 2019. <p>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</p>		

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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.	
		<p>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.</p> <p>The assessment team recognises that the implementation of the SeBA Policy (DFO, 2009b) is an on-going process and measures to avoid encounters with identified SBAs/VMEs are likely to be developed on a scientific basis 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.</p> <p>DFO have confirmed that the shrimp fleet are adhering to not fishing within the protected area network, therefore there is some objective basis for confidence that the partial strategy will work and so the SG 80 is met.</p> <p>The SG 100 is not met as there was no evidence of direct testing within the UoA to support high confidence that the partial strategy will work.</p> <p>Trap</p> <p>The limited number of licences, the limited number of traps, information on the habitat types targeted by the shrimp trap fishery (soft muddy substrate, high in organic material), and, the limited impact of trap gears on habitats and habitat-forming species, (e.g., Eno <i>et al.</i>, 2001; DFO, 2010; Shester & Micheli, 2011; NEFMC, 2011; Grieve <i>et al.</i>, 2014), provides some objective basis for confidence that the partial strategy will work based on information directly about the UoA and/or habitats involved, thereby meeting the SG 60 and 80. The SG 100 is not met as the partial strategy has not been tested.</p>	
c	Management strategy implementation		
	Guide post		There is some quantitative evidence that the measures/partial strategy is being implemented successfully.
	Met?		Trawl – N Y Trap – Y
	Justification	Trawl	
		<p>The gathering and presentation of information to support the ESSSAC Habitat Management Strategy, i.e. geospatial mapping of habitats and fishing intensity; the designation of MPAs and Conservation Areas on the Scotian Shelf (see Table 15); and, the on-going work on informing and developing the application of the SeBA Policy (DFO, 2009b), e.g. the review and publication on the delineation of SBAs and overlap of fishing with SBAs (Kenchington <i>et al.</i>, 2016; Koen Alonso <i>et al.</i>, 2018), provides excellent quantitative evidence. However, owing to the fact the recently adopted “move-on protocols” have not been tested in the fishery or developed on a scientific basis, the SG 80 is not met.</p> <p>Monitoring to ensure that no shrimp vessels encroach and fish within the MPAs and Conservation Areas is facilitated through the requirement to have operating VMS and carry observers when required (a target of 5% of all trips).</p> <p>There has been no indication of any non-compliance with the spatial boundaries established to protect habitats by the shrimp fleet (Jeff Graves, C&P Maritime Region, pers. comm.). Therefore, it is considered that there is some quantitative evidence that the UoA complies with its management requirements and that the same requirements are applied to all MSC UoAs and non-MSC fisheries.</p>	

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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.		
		<p>Trap</p> <p>The partial strategy relies on a limited number of licences, being able to fish a limited number of traps, in a defined and relatively small area, combined with evidence from trap impact research that the gear has limited impact on habitats (e.g., Eno <i>et al.</i>, 2001; DFO, 2010; Shester & Micheli, 2011; NEFMC, 2011; Grieve <i>et al.</i>, 2014). Monitoring of the fishery, e.g. licence checks, trap tags, fishery provides quantitative evidence that that the measures/partial strategy is being implemented successfully, thereby meeting the SG 80. The SG 100 is not met owing to a lack of clear quantitative evidence.</p>		
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?		<p>Trawl – Y</p> <p>Trap – Not relevant</p>	<p>Trawl – N Y</p> <p>Trap – Not relevant</p>	<p>Trawl – N</p> <p>Trap – Not relevant</p>
Justification		<p>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 v2.0 SA3.14.3 requires that the cumulative impact of MSC certified fisheries on VMEs is taken into account at the SG 80 and 100.</p> <p>Trawl</p> <p>There are a number of other fisheries operating on the Scotian Shelf that have been MSC certified – see Table 17 Canada Atlantic Halibut – Gillnet, Handline, Trawl, Scotian Shelf Snow Crab Trap, Eastern Canada Offshore Scallop, Clearwater Seafoods Arctic Surf Clam, Canada Scotia Fundy Haddock, Maritime Canada inshore Lobster, North West Atlantic Harpoon Swordfish, North West Atlantic Longline Swordfish. Using fishing effort information provided by the client and information presented in Koen-Alonso <i>et al</i> (2018), it can be deduced that the MSC certified Scotian Shelf Snow Crab Trap Fishery fishes on the same or similar habitats to the shrimp trawl fishery, (see Figure 26 and Figure 27) and likely overlaps with the shrimp trawl fishery on a sponge SBA/VME (identified as SS2a in Figure 26).</p> <p>The overlap of the fisheries is confirmed in the IFMP (DFO, 2016a), where it describes that gear conflicts were an issue in the past prior to negotiated seasonal and temporary closed areas between the snow crab trap and shrimp trawl fleets.</p> <p>Analysis by Koen-Alonso <i>et al</i> (2018) estimates that up to 11.1% and 5.1% of the identified sponge SBA/VME within the Scotian Shelf bioregion overlaps with the snow crab trap and shrimp trawl fisheries, respectively, and, 1.25% and 0.7% of the identified sea pen SBA/VME, respectively. These percentages are not additive as there will likely be instances where the fishing directly overlaps the same seabed habitat.</p> <p>According to the Public Certification Report (PCR) for the Scotian Shelf Snow Crab Trap Fishery (SAI Global, 2017) no management measures are in place for the snow crab fishery with respect to the interaction/encounter with the SBA/VME. While the PCR confirms the overlap of snow crab fishery footprint with SBAs it does not acknowledge the overlap with the shrimp trawl fishery and therefore the potential cumulative impact. This may be due to information not being available to the SAI Global assessment team at the time.</p>		

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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.
	<p>The Scotian Shelf shrimp trawl UoAs approach to managing the protection of VMEs has been to identify and establish a number of protected areas (See Table 11) 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 60 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. Butler pers. comm.). Because the protected areas do not overlap with where the shrimp fishery operates, the risk to the protected areas is negligible.</p> <p>For the In 2019 season, the Scotian Shelf Shrimp Trawl Fishery will adopted new “move-on protocols” (see section 4.1.7.4 and Appendix 2). No reports of VME species have been reported either by fishers or observers. While the new “move-on protocols” have not yet been tested owing to the 2019 season starting in the spring. 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.</p> <p>The Scotian Shelf Shrimp Trawl Fishery overlaps with the MSC certified Scotian Shelf Snow Crab Fishery. The Scotian Shelf Snow Crab assessment considers that the 5 coral and sponge conservation areas established on the Scotian Shelf, the management measures in place for the fishery (e.g., gear size and number restrictions) and a comprehensive monitoring, control and surveillance system provide quantitative evidence that the snow crab fishery complies with management requirements. yet, there are no VME protection measures in place for the snow crab fishery, other than the potentially low impacting nature of traps on sea bed habitats. Quantitative evidence that the UoA complies with the new move on protocols is not yet available, and so the SG 80 is not met. Therefore, the cumulative effect of these MSC certified fisheries are considered highly unlikely to have a serious or irreversible effect on the VME habitats. Therefore, the SG 60 and 80 are met.</p> <p>The SG 100 is not met as there is limited independent verification of the application of the move on protocol.</p> <p>Trap The shrimp trap fishery does not overlap with a VME nor does another MSC or non-MSC fishery overlap with a VME in the managed area. As a result, this SI is not relevant to the shrimp trap fishery.</p>
References	<p>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</p> <p>DFO 2010. Potential impacts of fishing gears (excluding mobile bottom-contacting gears) on marine habitats and communities. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2010/003. http://waves-vagues.dfo-mpo.gc.ca/Library/340622.pdf</p> <p>DFO 2015. Coral and Sponge Conservation Strategy for Eastern Canada 2015. http://www.dfo-mpo.gc.ca/oceans/publications/cs-ce/page13-eng.html</p> <p>DFO 2017e. 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</p> <p>DFO 2017g, 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</p>

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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.
	<p>Eno, N.C., MacDonald, D.S., Kinnear, J.A.M., Amos, C.S., Chapman, C.J., Clark, R.A., Bunker, F. St P.D. & C. Munro. 2001. Effects of crustacean traps on benthic fauna. ICES Journal of Marine Science, V. 58, pp. 11–20.</p> <p>Grieve, C., Brady, D.C. & H. Polet. 2014. Best practices for managing, measuring and mitigating the benthic impacts of fishing – Part 1. Marine Stewardship Council Science Series, V. 2, pp. 18 – 88.</p> <p>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</p> <p>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</p> <p>NAFO, 2019. Article 22, of the NAFO Conservation and Enforcement Measures (2019), "Provisions in case of an encounter with VME indicator species". https://www.nafo.int/Portals/0/PDFs/COM/2019/comdoc19-01.pdf</p> <p>NEFMC 2011. Essential fish habitat (EFH) omnibus amendment – The swept area seabed impact (SASI) model: a tool for analysing the effects of fishing on essential fish habitat. New England Fishery Management Council, Newburyport, Massachusetts., 1 February 2011. 304 pp http://archive.nefmc.org/habitat/sasi_info/110121_SASI_Document.pdf</p> <p>SAI Global, 2017. MSC Public Certification Report for the Scotian Shelf Snow Crab Trap Fishery https://fisheries.msc.org/en/fisheries/scotian-shelf-snow-crab-trap/@assessments</p> <p>SAI Global, 2022. MSC Announcement Comment Draft Report for the Scotian Shelf Snow Crab Trap Fishery https://fisheries.msc.org/en/fisheries/scotian-shelf-snow-crab-trap/@assessments</p>
OVERALL PERFORMANCE INDICATOR SCORE: Trawl	
6 80	
OVERALL PERFORMANCE INDICATOR SCORE: Trap	
80	
CONDITION NUMBER (if relevant):	
2	

Table 11. Condition 2 Trawl Fishery (UoC 1) – Closed (To note, the justification is taken directly from the PCR (Knapman and Addison, 2020) and so references and figures are applicable in the PCR and not this audit report. The PCR can be accessed at <https://fisheries.msc.org/en/fisheries/canada-scotian-shelf-northern-prawn-trawl-and-trap/@assessments>)

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
Justification	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.

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Trawl

As part of meeting a previous condition of certification related to this PI and SI, in 2016, the Eastern Scotian Shelf Shrimp Advisory Committee (ESSSAC) developed and adopted a “Habitat Management Strategy” specifically for the shrimp trawl fishery.

The Strategy outlines measures in place to ensure that habitat impacts are acceptable (notably TAC and seasonal limitation on fishing intensity), and methods for monitoring impacts (geospatial mapping of habitats and fishing intensity, the latter to be updated every two years), and confirmed that ESSSAC would review habitat impacts at its annual meetings and make decisions on additional measures if required. The Strategy also outlines the broader context for protection of benthic habitats on the Eastern Scotian Shelf including implementation of marine protected areas (MPAs) (these have been implemented specifically to protect VMEs), identification of Environmentally and Biologically Significant Areas, and ongoing research on habitat characterisation. Furthermore, the strategy recognised that DFO has put in place the Policy for Managing the Impacts of Fishing on Sensitive Benthic Areas (SeBA Policy), i.e., further work on identifying potential VMEs, their overlap with fishing activities and, where/if necessary, management measures for Significant Benthic Areas (SBAs).

ESSSAC recommended that the Habitat Management Strategy be appended to the IFMP, however, DFO indicated that this was not currently possible as the format of the Strategy was not consistent with the IFMP format. DFO did confirm at an annual MSC audit that the Strategy could be incorporated at a later date when the IFMP is fully rewritten. The strategy can be found in the 2nd annual surveillance report (2016) at: <https://fisheries.msc.org/en/fisheries/canada-scotian-shelf-northern-prawn-trawl/@assessments>

At a regional level, in 2015 the Coral and Sponge Conservation Strategy for Eastern Canada (DFO, 2015) was implemented, with the intent of supporting coordination and collaboration of management and research efforts on coral and sponge conservation throughout the five eastern Canada regions of DFO.

At a national level, Canada has taken a number of steps to protect benthic habitats and ecosystems. This includes MPAs and marine refugia for VME habitat on the Scotian Shelf (e.g. [The Gully MPA](#), [Western/Emerald Banks Conservation Area](#), [St. Anns Bank MPA](#)) and the SeBA policy (DFO, 2009b) with its development of tools and information to support its application (see section 3.5.3.1). While broad implementation of the policy is still an on-going process (Koen-Alonso *et al.*, 2018), SBAs have been identified within the Scotian Shelf bioregion, i.e. areas that contain sponges (Porifera), large and small gorgonian corals (Alcyonacea) and/or sea pens (Pennatulacea) as dominant and defining features (Kenchington *et al.*, 2016) These are the equivalent of VMEs (DFO, 2017g).

Recent published research (DFO, 2017e; Koen-Alonso, 2018) shows that the shrimp trawl fishery overlaps with sponge SBAs/VMEs and, to a lesser extent sea pen SBAs/VME impacting approximately 5.1% and 0.7% of the estimated sponge and sea pen SBA/VME, respectively, within the Scotian Shelf bioregion. Some closed areas have been designated to protect sponge and sea pen SBAs. However, the management response to the interaction of the fishery to all SBAs is in the process of development (L. Hussey-Bondt pers. comm.) and presently, there are no management measures in place to mitigate potential or actual interactions between the fishery and all the identified 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”. These have been based on the NAFO developed and implemented “move-on” rule as set out in Article 22, of the NAFO Conservation and

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Enforcement Measures “Provisions in case of an encounter with VME indicator species” (NAFO, 2019).

The "Scotian Shelf Shrimp Trawl Fishery Move-on Protocols" became effective as of February 2019. In summary, it requires 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

Trawl

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 (Pisces, 2018, Koen-Alonso, 2018) (on-going);
- Implementation of protected areas network on the Scotian shelf (on-going);
- The identification and delineation of SBAs (which are considered to be the equivalent of VMEs) (DFO, 2017e) (on-going);
- Work on the development of guidance on the protection of SBAs (e.g. DFO, 2017g) (on-going); and,
- The client fishery has adopted “move-on protocols” similar to those developed and implemented by NAFO. These became effective as of February 2019.

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 SeBA Policy (DFO, 2009b) is an on-going process and measures to avoid encounters with identified SBAs/VMEs are likely to be developed on a scientific basis 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.

Trawl

The gathering and presentation of information to support the ESSSAC Habitat Management Strategy, i.e. geospatial mapping of habitats and fishing intensity; the designation of MPAs and Conservation Areas on the Scotian Shelf; and, the on-going work on informing and developing the application of the SeBA Policy (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

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	<p>evidence. However, owing to the fact the recently adopted “move-on protocols” have not yet been tested in the fishery or developed on a scientific basis, the SG 80 is not met.</p> <p>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.</p> <p>Trawl</p> <p>There are a number of other fisheries operating on the Scotian Shelf that have been MSC certified – see Table 17. Using fishing effort information provided by the client and information presented in Koen-Alonso <i>et al</i> (2018), it can be deduced that the MSC certified Scotian Shelf Snow Crab Trap Fishery fishes on the same or similar habitats to the shrimp trawl fishery, (see Figure 26 and Figure 27) and likely overlaps with the shrimp trawl fishery on a sponge SBA/VME (identified as SS2a in Figure 26).</p> <p>The overlap of the fisheries is confirmed in the IFMP (DFO, 2016a), where it describes that gear conflicts were an issue in the past prior to negotiated seasonal and temporary closed areas between the snow crab trap and shrimp trawl fleets.</p> <p>Analysis by Koen-Alonso <i>et al</i> (2018) estimates that up to 11.1% and 5.1% of the identified sponge SBA/VME within the Scotian Shelf bioregion overlaps with the snow crab trap and shrimp trawl fisheries, respectively, and, 1.25% and 0.7% of the identified sea pen SBA/VME, respectively. These percentages are not additive as there will likely be instances where the fishing directly overlaps the same seabed habitat.</p> <p>According to the Public Certification Report (PCR) for the Scotian Shelf Snow Crab Trap Fishery (SAI Global, 2017) no management measures are in place for the snow crab fishery with respect to the interaction/encounter with the SBA/VME. While the PCR confirms the overlap of snow crab fishery footprint with SBAs it does not acknowledge the overlap with the shrimp trawl fishery and therefore the potential cumulative impact. This may be due to information not being available to the SAI Global assessment team at the time.</p> <p>The Scotian Shelf shrimp trawl UoAs approach to managing the protection of VMEs has been to identify and establish a number of protected areas (See Table 11) 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 60 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. Butler pers. comm.). Because the protected areas do not overlap with where the shrimp fishery operates, the risk to the protected areas is negligible.</p> <p>For the 2019 season, the Scotian Shelf Shrimp Trawl Fishery will adopt new “move-on protocols” (see section 4.1.7.4 and Appendix 2). While the new “move-on protocols” have not yet been tested owing to the season starting in the spring, 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.</p> <p>The Scotian Shelf Shrimp Trawl Fishery overlaps with the MSC certified Scotian Shelf Snow Crab Fishery. As yet, there are no VME protection measures in place for the snow crab fishery, other than the potentially low impacting nature of traps on sea-bed habitats. Quantitative evidence that the UoA complies with the new move-on protocols is not yet available, and so the SG 80 is not met.</p>
Condition	<p>By the fifth year of certification* the client shall provide evidence that there is:</p> <ul style="list-style-type: none"> A partial strategy in place that is expected to achieve the Habitat Outcome 80 level of performance or above.

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	<ul style="list-style-type: none"> 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. <p>*In February 2021 the MSC issued “Derogation 6” extending eligible condition deadlines and associated milestones by 12 months.</p>
Condition start	25 th November 2020
Condition deadline	The condition deadline has been extended as a result of MSC Derogation 6 . This condition is required to be met in the fifth year (2025) of the certification with evidence being provided in time for an Assessment Team to evaluate and include in the Client and Peer Review Draft Report (CPDR).
Milestones	<p>The timeline for achieving the milestones has been amended to take account of Derogation 6.</p> <p>At the first audit (2021) 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.</p> <p>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.</p> <p>At the second audit (2022) 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.</p> <p>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.</p> <p>At the third audit (2023) the client shall:</p> <ol style="list-style-type: none"> 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; Provide some objective basis for confidence that the measures being developed will work, based on information directly about the UoA and/or habitats involved. <p>This milestone is an incremental step toward fulfilling the condition. Successful completion of point 2 will result in a revised score of 65.</p> <p>At the fourth audit (2024) the client shall:</p> <ol style="list-style-type: none"> Provide evidence on the implementation of the scientifically based precautionary measures and to avoid encounters and potential serious or irreversible harm on VMEs. <p>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.</p> <p>In year 5 (2025) At the fourth audit the client shall:</p>

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	<ol style="list-style-type: none"> 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. <p>This will result in the rescoring of this PI to at least 80.</p>
<p>Progress on Condition (Year 2)</p>	<p>On 5th November 2020, the MSC issued a derogation for scoring PI 2.4.2a:</p> <p>The derogation applies to any assessment (initial assessment, surveillance audit, scope extension, expedited audit, or reassessment) against v2.0 or v2.01 of the Fisheries Standard that is announced on or after 5th November 2020. The derogation also applies to fisheries certified against v2.0 or v2.01 of the Fisheries Standard and any assessment that was announced before the publication date of the derogation.</p> <p>The derogation applies until fisheries are assessed against the next version of the MSC Fisheries Standard.</p> <p>The stated objective of the derogation is: If a fishery has a partial management strategy in place that protects and avoids vulnerable marine ecosystems (VMEs) and potential VMEs, then commonly accepted move-on rules are not required (at the SG 60 level).</p> <p>The derogation requirements are as follows:</p> <p>Eligibility – The CAB shall only apply the derogation when assessing and scoring PI 2.4.2 scoring issue ‘a’ for UoAs that encounter VMEs or potential VMEs.</p> <p>Derogation – When scoring PI 2.4.2 the CAB shall assess the UoA at the SG80 level for scoring issue ‘a’ first.</p> <p>If SG80 for scoring issue ‘a’ is met, including complying with requirements under SA3.14.2.2 and associated guidance GSA3.14.2.2, the CAB shall not assess the UoA at the SG60 level for scoring issue ‘a’.</p> <p>The CAB shall follow FCP 7.17.4, 7.17.7.2, 7.17.7.3, 7.17.9 and 7.17.10 the CAB shall consider SG60 for PI 2.4.2 scoring issue ‘a’ as met.</p> <p>The CAB shall report the application of this derogation in the scoring rationale for PI 2.4.2 scoring issue ‘a’.</p> <p>If SG80 is not met the CAB shall assess the UoA at the SG60 level as per FCP 7.17, SA3.14.2.3, GSA3.14.2.3 and the accompanying interpretation.</p> <p>Given the above, this PI has been re-evaluated in accordance with the derogation - see section 4.2 below. The outcome of the revised evaluation approach has not resulted in a change in the score and the condition remains.</p> <p>With respect to progress made by the client on meeting the condition, the client's submission, provides a review of steps that were taken by the fishery up to the last re-certification of the fishery and highlights that at the January 2020 and 2021 Annual General Meeting of the Atlantic Canadian Mobile Shrimp Association (ACMSA), there was discussion on the geographical location of the</p>

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	<p>VMEs within the shrimp fishing areas and encouragement not to fish within them. There were no reports of move-on protocol thresholds being exceeded.</p> <p>The audit team note that without some evaluation of the selectivity of the gear for VME species, i.e. in this instance sponge and sea pen, it is unclear if the move-on rules are effective, hence the need for some scientifically based precautionary measures.</p> <p>The 1st year milestone for the client is to 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.</p> <p>No evidence of such discussions was provided. In normal circumstances, the lack of evidence and hence progress against the year 1 milestone would be considered to be behind target, however, given the implementation of "Derogation 6", the deadline for meeting this condition has been extended and the year 1 milestone has been carried over to year 2.</p>
	<p>Year 2 As detailed in section 5.3.1 above PI 2.4.2 has been re-evaluated (Table 10), the score revised, and the condition closed.</p>
	<p>Year 3 Summary of progress</p>
	<p>Year 4 Summary of progress</p>
Progress status	<p>As detailed in section 5.3.1 above PI 2.4.2 has been re-evaluated (Table 10), the score revised, and the condition closed.</p>

4.3.2 Progress against conditions

Table 12. Condition 1 Trap Fishery (UoC 2)

Performance Indicator	2.3.1 - The UoA meets national and international requirements for the protection of ETP species
Score	75
Justification	<p>SG 80, SI(b): 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.</p> <p>There is a national limit for the protection and rebuilding of the NARW but there is no international limit set through an international agreement. The Canadian national limit for the rebuilding of the NARW population is a zero-take.</p> <p>There have been no recorded interactions/entanglements of NARW with the shrimp trap fishery and, therefore, the assessment team conclude that the effects of the UoA on the NARW population are likely to be within the national limit. As a result the SG 60 is met.</p> <p>With respect to SG 80, according to MSC FCR v2.0, GSA3.10, the assessment team should consider the combined effects of MSC UoAs subject to national or international limits. Furthermore, according to the MSC Interpretations website, fisheries assessed against v2.0 shall only be required to consider cumulative impacts with other fisheries assessed under v2.0. Therefore, the impact of the following MSC assessed/certified fisheries needs to be considered: the Southern Gulf of St. Lawrence Snow Crab Trap Fishery; the Newfoundland and Labrador Snow Crab Trap Fishery; the Îles-de-la-Madeleine Lobster Trap Fishery; and the Scotian Shelf Snow Crab Trap Fishery.</p>

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	<p>In 2017, an unprecedented NARW mortality event occurred in the Gulf of St. Lawrence and at least 2 mortalities were confirmed as being caused by entanglement in fishing gear from the MSC certified Gulf of St. Lawrence Snow Crab Trap fishery. This exceeds the zero-take applied by Canada and so, by association, all of the fisheries assessed or being assessed against the MSC standard, have a combined effect of exceeding the national limit.</p> <p>While the assessment team are of the view that the likelihood of the trap fishery causing unacceptable impacts to NARW is negligible owing to the operational aspects of the fishery, i.e. the fishery takes place in a confined area close inshore, where NARW are not known to transit or feed; at a time of year (fall and winter) when NARW are likely to have migrated further south; and the fishing gear configuration helps to mitigate the risk of entanglement, e.g. traps are fished in fleets so reducing the number of vertical lines, and sinking lead ropes are used between the traps (reducing floating line in the water which is known to increase the risk of whale entanglement), the combined effects of the Canadian UoAs certified or assessed using MSC FCR v2.0 are not highly likely to be within the national limit for the protection and the rebuilding of the NARW, and so it has to be concluded that the SG80 is not met.</p>	
Condition	By the second annual audit the client shall provide evidence that the combined effects of the MSC UoAs on the NARW population are known and highly likely to be within national limits.	
Condition start	25 th November 2020	
Condition deadline	25 th November 2022.	
Milestones	<p>At the first audit the client will provide evidence that a strategy has been implemented successfully for the conservation of the NARW and that this strategy is mandatory for both the Eastern Scotian Shelf shrimp trap fishery and other Canadian MSC certified or in assessment fisheries that could potentially interact with the NARW population.</p> <p>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.</p> <p>At the second audit the client shall provide evidence that the combined effect of the MSC UoAs on the NARW population are known and highly likely to be within national limits.</p> <p>This will result in the rescoring of this PI to at least 80.</p>	
Progress on Condition (Year 2)	Year 1	<p>Since the recertification of the fishery, the client group representative (Pisces Consulting Limited) has been active in engaging regulators, harvesting associations and NGOs regarding information disclosure, management measures, research activities, and continues to work collaboratively with other MSC-certified fixed gear fisheries in Atlantic Canada to ensure consistent and regular monitoring and reporting of mitigation strategies to keep all stakeholders, regulators and buyers better informed regarding the suite of initiatives being undertaken in Canada.</p> <p>In relation to the Eastern Scotian Shelf shrimp fishery, gear marking is now mandatory and included in the license for 2021, and the Guysborough County Inshore Fishermen's Association (GCIFA) in conjunction with DFO have installed passive acoustic monitoring devices in Chedabucto Bay. To date, only a small portion of these data have been fully analysed for whale vocalizations, though this analysis indicates no NARW have been identified (Client, pers. comm.). There is now a mandatory independent observer scheme in place for the trap</p>

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fishery, and GCIFA have also employed a technician to undertake additional observer trips. No right whales have been sighted on these trips.

At the surveillance audit, the Client provided maps of NARW sightings on the Scotian Shelf for 2018 to 2020 extracted from WHALEMAP (<https://whalemap.ocean.dal.ca/>). Although there was little directed overflight activity over the location of the shrimp trap fishery, there were no sightings recorded near the fishing area in the past three years (Figure 13). In addition, the NARW Annual Report Card for 2020 stated that there were no NARW entanglements reported on the Scotian shelf (Pettis *et al.*, 2020). In conclusion the risk of encounters between the shrimp trap fishery and NARW continues to be extremely low given the localised nature of the fishery, and the seasonality of the fishery in relation to the movements and distribution of NARW.

More widely across trap fisheries in Atlantic Canada and Quebec, DFO has introduced revised licence conditions including seasonal closures, static and dynamic area closures, floating line length limitations, line weighting to eliminate vertical lines floating in the water, all of which should identify the gear in the event of an entanglement and minimise the risk of entanglement. The suite of fisheries measures and initiatives in place in Atlantic Canada and Quebec to prevent entanglements in fishing gear are set out in the 2021 fishery management measures for NARW (DFO, 2021c). DFO has published updated distributions of NARW in Canadian waters based on systematic aerial surveys and passive acoustic monitoring (DFO, 2020b) and on the risk of entanglements in fishing gear and vessel strikes in Canadian waters (DFO, 2019). There is a wealth of research activities and initiatives being conducted under the umbrella of DFO, including a report of progress under the Species at Risk Act (SARA) of the NARW recovery strategy implementation (2015-2020) and the proposal of an Action Plan for NARW, implementation of the potential gear modifications announced by the Minister in February 2020, research on noise impacts on NARW, testing technologies for near real-time detections of NARW, funding to support the development of standard methods for evaluating ropeless fishing gear and testing ropeless technologies in partnership with fishers and participation by DFO in annual Canada/US NARW meetings to share information and best practices. An updated stock assessment for NARW has also been published by the US NOAA (NOAA, 2020).

In summary there is evidence that a strategy has been implemented successfully for the conservation of the NARW and that this strategy is mandatory for both the Eastern Scotian Shelf shrimp trap fishery and other Canadian MSC certified or in assessment fisheries that could potentially interact with the NARW population. Further research is underway currently which will provide information on how the management strategy might be improved further. The condition has therefore met the Year 1 milestone.

As noted above, there are no reports of NARW sightings in the area of the shrimp trap fishery and no reports of entanglements with static gear in Scotian Shelf waters in recent years. However, with evidence that NARW mortalities were previously attributed to entanglements with static gear in the (now suspended) Gulf of St. Lawrence Snow Crab Trap fishery, there is still a possibility that static gear fisheries could be implicated with NARW entanglements and mortalities. There is a detailed and robust management strategy in place now to ensure that NARW entanglements and mortalities are minimised, but in line with other MSC-certified static gear fisheries in the region, the audit team considered that additional years when no interactions with NARW were recorded would be required before sufficient evidence is available to conclude that the combined effects of the MSC UoAs on the NARW population

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		are known and highly likely to be within national limits. The audit team noted that there has been some uncertainty amongst MSC assessment teams as to whether there is a formal national limit of mortalities for NARW in Canadian waters, and therefore whether the MSC UoAs should be considered under PI 2.3.1a. Clarification from DFO on whether national limits exist for NARW has been sought, but responses to date have not provided sufficient clarification.
	Year 2	<p>The client submission provided an extensive review of the actions undertaken by DFO and Transport Canada in relation to management measures and initiatives to mitigate the risk to NARW.</p> <p>The client highlighted that the trap fishery had declined significantly during 2020 and fishers had stopped fishing due to poor market conditions.</p> <p>When the initial assessment and certification of the Canada Scotian Shelf Northern Prawn Trap took place between March 2018 and November 2019, the Southern Gulf of St. Lawrence Snow Crab Fishery was in the MSC program. The snow crab fishery was suspended at that time, owing to recent entanglement interactions and subsequent mortality of NARW. As a result of these interactions and the potential risk posed by other fixed gear fisheries within the seasonal migration route of NARW, the cumulative impacts of all Canadian MSC certified fisheries were taken into account. As a result, and despite no record of interaction/mortality caused by them, the following Canadian MSC certified fixed gear fisheries were all harmonised, scored at SG 60 and the same condition set: the Gaspésie Lobster Trap Fishery, Iles-de-la-Madeleine Lobster Trap Fishery, AQIP Snow Crab Trap Fishery and Maritime Canada Inshore Lobster Trap Fishery.</p> <p>In June 2021, the Southern Gulf of St. Lawrence Snow Crab Trap Fishery withdrew from the MSC program and entered into a Fisheries Improvement Plan (FIP) with an emphasis on resolving the entanglement issues that had beset the fishery. In so doing, the combined impacts of the remaining MSC certified fisheries (i.e., mortality of NARW) returned to zero. It had therefore been the expectation of the relevant CABs involved in the assessment/auditing of these MSC fisheries that this PI would be rescored at 80. However, in light of the research presented by the NEA on entanglements, the unpredictable and apparent expansion of the NARW range and the continued decline in the NARW population (see section 3.4.2) the CABs have concluded that it cannot be stated that the combined effects of the Canadian MSC certified fisheries are highly likely (80% likelihood) to be within the national limit of zero mortality. While the Audit Team recognise the significantly reduced fishing activity in the Scotian Shelf Northern prawn Trap Fishery and the very low risk this fishery appears to present to NARW entanglements, this PI relates to the combined effects of MSC certified fisheries and so this condition remains open.</p>
	Year 3	Summary of progress
	Year 4	Summary of progress
Progress status	<p>This PI was scheduled to be met at this audit. For the reasons described above, the milestone has not been and therefore progress toward meeting the condition is 'behind target'.</p> <p>In accordance with MSC FCR v2.2, section 7.28.16.1 b,i, the client has 12 months within which to achieve the original condition.</p> <p>If the condition is not closed within 12 months then the CAB will follow MSC FCR v2.2, section 7.28.16.4 which will result in the suspension or withdrawal of the fishery.</p>	

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Remedial action	Given this PI is about the cumulative effects of MSC certified fisheries, there is limited remedial action the client can undertake other than continuing to advocate, where appropriate, that management measures to mitigate the entanglement of NARW are applied and adhered to by MSC certified fisheries.
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Table 13. Condition 3 Trawl Fishery (UoC 1)

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.
Score	75
Justification	<p>SG 80, SI(b):</p> <p>The fishery-specific management system is subject to regular internal and occasional external review.</p> <p>Annual meetings of ESSSAC provides an opportunity to internally review and evaluate key parts of the management system. The Committee can also establish ad-hoc working groups to review and assess specific policy and management measures (DFO, 2016a). DFO also reviews and evaluates compliance and monitoring on a regular basis (DFO, 2017e).</p> <p>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 Scotian Shelf Shrimp Trawl and Trap Fishery has never been subject to an external review by either these Committees or the OAGC.</p> <p>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 Scotian Shelf Shrimp Trawl and Trap 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.</p>
Condition	<p>By the fourth* annual audit the client shall provide evidence that the Scotian Shelf Shrimp Trawl Fishery management system is subject to regular internal and occasional external review.</p> <p>*In February 2021 the MSC issued "Derogation 6" extending eligible condition deadlines and associated milestones by 12 months.</p>
Condition start	25 th November 2020
Condition deadline	The condition deadline has been extended as a result of MSC Derogation 6 . This condition is required to be met at the fourth audit (2024).
Milestones	<p>The timeline for achieving the milestones has been amended to take account of Derogation 6.</p> <p>At the first audit (2021) the client will provide evidence in the form of minutes and/or meeting reports showing discussion on how it will to initiate and adopt an occasional external review of the shrimp trawl fishery management system.</p>

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Progress on Condition (Year 2)		<p>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.</p> <p>At the second audit (2022) 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.</p> <p>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.</p> <p>At the third audit (2023) 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.</p> <p>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.</p> <p>At the fourth 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.</p> <p>Successful completion of this and the previous milestones will demonstrate that the Canada Scotian Shelf Shrimp Trawl Fishery management system is subject to occasional external review. This will result in the rescoring of this PI to at least 80.</p>
	Year 1	<p>In the client's submission and, at the site visit, the client confirmed that representatives for the client group have conducted research into determining the protocols and procedures for conducting an external review. The MSC website was reviewed to find other fisheries that had a similar condition and how they undertook to meet it. Other MSC certified fisheries within the Maritimes region have a similar condition and so representatives from MSC certificate holders have agreed that actions should be consistent across similarly affected MSC fisheries.</p> <p>The client submission confirms that Jean Jacques Maguire has agreed to perform the management review and templates being considered for the review include that cited in the reports of the Commissioner of Environment and Sustainable Development. Jean Jacques ("JJ") Maguire is an independent consultant with considerable fisheries science and management experience, (including MSC assessments). JJ also has experience of reviewing aspects of management systems having been one of the independent reviewers appointed by the International Commission for the Conservation of Atlantic Tunas (ICCAT) to review their management system.</p>
	Year 2	The client confirmed that Jean Jacques ("JJ") Maguire and Dr. Cate O'Keefe have been contracted to undertake the review and provided contractual documentation.
	Year 3	Summary of progress
	Year 4	Summary of progress
Progress status	The year 2 milestone has been met. The fishery is "on target" to meet the condition.	
Remedial action	N/A	

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Table 14. Condition 4 Trap Fishery (UoC 2)

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.
Score	75
Justification	<p>SG 80, SI(b):</p> <p>The fishery-specific management system is subject to regular internal and occasional external review.</p> <p>Annual meetings of ESSSAC provides an opportunity to internally review and evaluate key parts of the management system. The Committee can also establish ad-hoc working groups to review and assess specific policy and management measures (DFO, 2016a). DFO also reviews and evaluates compliance and monitoring on a regular basis (DFO, 2017e).</p> <p>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 Scotian Shelf Shrimp Trawl and Trap Fishery has never been subject to an external review by either these Committees or the OAGC.</p> <p>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 Scotian Shelf Shrimp Trawl and Trap 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.</p>
Condition	<p>By the fourth* annual audit the client shall provide evidence that the Scotian Shelf Shrimp Trap Fishery management system is subject to regular internal and occasional external review.</p> <p>*In February 2021 the MSC issued "Derogation 6" extending eligible condition deadlines and associated milestones by 12 months.</p>
Condition start	25 th November 2020
Condition deadline	The condition deadline has been extended as a result of MSC Derogation 6 . This condition is required to be met at the fourth audit (2024)
Milestones	<p>The timeline for achieving the milestones has been amended to take account of Derogation 6.</p> <p>At the first audit (2021) the client will provide evidence in the form of minutes and/or meeting reports showing discussion on how it will to initiate and adopt an occasional external review of the shrimp trawl fishery management system.</p> <p>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.</p> <p>At the second audit (2022) 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.</p>

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		<p>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.</p> <p>At the third audit (2023) 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.</p> <p>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.</p> <p>At the fourth 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.</p> <p>Successful completion of this and the previous milestones will demonstrate that the Canada Scotian Shelf Shrimp Trap Fishery management system is subject to occasional external review. This will result in the rescoring of this PI to at least 80.</p>
Progress on Condition (Year 2)	Year 1	<p>In the client's submission and, at the site visit, the client confirmed that representatives for the client group have conducted research into determining the protocols and procedures for conducting an external review. The MSC website was reviewed to find other fisheries that had a similar condition and how they undertook to meet it. Other MSC certified fisheries within the Maritimes region have a similar condition and so representatives from MSC certificate holders have agreed that actions should be consistent across similarly affected MSC fisheries.</p> <p>The client submission confirms that Jean Jacques Maguire has agreed to perform the management review and templates being considered for the review include that cited in the reports of the Commissioner of Environment and Sustainable Development. Jean Jacques ("JJ") Maguire is an independent consultant with considerable fisheries science and management experience, (including MSC assessments). JJ also has experience of reviewing aspects of management systems having been one of the independent reviewers appointed by the International Commission for the Conservation of Atlantic Tunas (ICCAT) to review their management system.</p>
	Year 2	The client confirmed that Jean Jacques ("JJ") Maguire and Dr. Cate O'Keefe have been contracted to undertake the review and provided contractual documentation.
	Year 3	Summary of progress
	Year 4	Summary of progress
Progress status	The year 2 milestone has been met. The fishery is "on target" to meet the condition.	
Remedial action	NA	

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5 Appendices

5.1 References

Hyperlinks have been used in many instances in this report. They were all functioning as of 31st July 2022.

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5.2 Evaluation processes and techniques

5.2.1 Site visits

The audit was announced on the [MSC website on 13th May 2022](#) and a remote off-site audit took place on 17th June 2022.

The Audit Team spoke with the client representatives and Pisces Consulting by MS Teams on 17th June 2022:

Derek Butler	Executive Director, Association of Seafood Producers
Renae Butler	Programs and research Officer, Association of Seafood Producers
Rick Crouse	Pisces Consulting

Later the same day, the audit team spoke with DFO staff by MS Teams. With the agreement of DFO, the client representatives also participated in the call:

Laura Hussey-Bondt	Eco-certification co-ordinator
Jeff Graves	Conservation & Protection
Scott Coffen-Smout	Ecosystem Branch
Suzette Soomai	Resource Management
Manon Cassista-Da Ros	DFO Science
Paige Crowell	Species at Risk Branch
Katherine Hastings	Species at Risk Branch
Alan Reeves	Resource Management
Derek Butler	Executive Director, Association of Seafood Producers
Renae Butler	Programs and research Officer, Association of Seafood Producers
Rick Crouse	Pisces Consulting

Prior to the site visit the client provided a submission which included minutes and materials associated with the ESSAC; TAC and catch data; stock assessment reports; correspondence from DFO Maritimes related to the management of the fishery and a Conservation and Protection compliance report for the fishery.

This information was reviewed by the Audit Team prior to the above meetings and formed the basis of questions and clarifications at the meeting. The following key aspects were covered at the meetings:

- The scientific base of information and stock assessment;
- Changes to the fishery and its management, e.g., legislation and regulations;
- Changes and updates on ecosystem issues;
- Changes to personnel involved with the science, management and industry;
- Compliance;
- Harmonisation with other MSC certified fisheries;
- Any changes that might affect traceability within the fishery and conformity with regulations;
- Progress against the conditions of certification; and,
- Any action that has been taken in relation to the recommendations that were made when the fishery was certified.

5.2.2 Stakeholder participation

A total of 11 stakeholder organisations and individuals having relevant interest in the assessment were identified and consulted during this surveillance audit. The interest of other unidentified stakeholders was solicited through the posting on the MSC website.

No stakeholders responded or requested to meet/speak with the audit team.

DFO provided the client with a “material change” letter which is appended below.

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5.3 Stakeholder input



Fisheries and Oceans Canada
Pêches et Océans Canada

1 Challenger Drive
PO Box 1006
Dartmouth, NS
B2Y 4A2

MAR 28 2022

Mr. Derek Butler
Association of Seafood Producers
10 Fort William Place, Suite 103
Baine Johnson Centre
St. John's, NL A1C 1K4

Dear Mr. Butler:

Re: Canada Scotian Shelf northern prawn trawl and trap fishery Marine Stewardship Council certification – second annual surveillance audit

I am writing in response to your request for a material change letter, which is required for your upcoming second annual surveillance audit since recertification in September 2019, for Marine Stewardship Council (MSC) certification of the Canada Scotian Shelf northern prawn trawl and trap fishery. As the audit will examine if there have been any significant changes affecting the fishery (the stock, the ecosystem, or the management system) since it was last evaluated, an update on Fisheries and Oceans Canada (DFO) activities related to this fishery since the last audit in February 2021 is provided below.

With respect to the assessment of the resource, the process has not changed. A stock status update of Eastern Scotian Shelf Shrimp in Shrimp Fishing Areas 13-15 was carried out in December 2020. The resultant Science Response is available on the Canadian Science Advisory Secretariat website. A stock assessment took place in fall 2021, and the resultant document will be published online once finalized. Following the Department's Precautionary Approach, and in accordance with science advice, the Eastern Scotian Shelf Northern Shrimp stock status is in the Cautious Zone. The Total Allowable Catch (TAC) remained at 2,600t for the 2019, 2020, and 2021 fishing seasons. However, given the 2021 stock assessment results, the TAC has been reduced to 2,300t for 2022.

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Should you require anything further, please contact the Eco-certification Coordinator in the Maritimes Region, Laura Hussey-Bondt, either by phone: 902-403-3853 or by email: Laura.Hussey-Bondt@dfo-mpo.gc.ca. I wish you all the best with your upcoming surveillance audit.

Yours sincerely,



Doug Wentzell
Regional Director General
Maritimes Region

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5.4 Harmonised fishery assessments

The MSC Fisheries Certification Process v2.2 (FCP) sets out procedures for ensuring consistency of outcomes in overlapping fisheries (see Annex PB of the FCP). The intention of this process is to maintain the integrity of MSC fishery assessments.

The Audit Team have consulted the guidance issued on the MSC's interpretation log to identify the harmonisation requirements for this fishery (see <https://mscportal.force.com/interpret/s/article/What-are-the-MSC-requirements-on-harmonisation-multiple-questions-1527586957701>).

The MSC have provided the following table to guide harmonisation:

Table 15. MSC directions for harmonisation between overlapping MSC fisheries (MSC FCP v2.2.)

Performance Indicator / Scoring Issue	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 Point of Recruitment Impairment (PRI) (at SG 60, 80 and 100) and, if below, harmonise cumulative impacts at SG 80 (not at SG 60).
PI 2.2.1a	Partially	For stocks that are 'main' in both UoAs, harmonise status relative to Biologically Based Limits (BBL) (at SG 60, 80, 100), and if below the BBL, harmonise cumulative impacts at SG 80 (not at SG 60).
PI 2.3.1a	Partially	Harmonise recognition of any limits applicable to both UoAs (SG 60, 80, 100) and cumulative effects of the UoA at SG 60, 80, 100 (not at SG 60)
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 SG 100, since all fishery impacts are considered (not at SG 60 or 80)
All P2 PIs	Yes if...	Two UoAs are identical in scope, even if the UoCs are different (e.g. separate clients).
PI 3.1.1-3	Yes if...	Both UoAs are part of the same larger fishery or fleet or have stocks 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). The MSC accepts that it may be impractical to attempt full harmonisation, due to the large number of fisheries that may be managed under the relevant policy framework, and the differences in application between them.
PI 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, RFMs or others) or under the same agreements. Harmonisation is needed for those management arrangements that apply to both UoAs, e.g. at the RFMOs level but not the national level in the case of two separate national fleets both fishing the same regional stock.

The Audit Team have taken the geographic scope of the harmonisation process to be the Eastern Scotian Shelf. The following MSC certified fisheries are found within this region:

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Table 16. Overlapping fisheries

Fishery name	Certification status and date	MSC Standard	Performance Indicators to harmonise
Canada Atlantic Halibut, handline, gillnet, trawl, longline	Re-certified – 3 rd January 2019 https://fisheries.msc.org/en/fisheries/canada-atlantic-halibut/@@assessments	V2.0	PI 3.1.1 – 3.1.3
Scotian Shelf Snow Crab	Re-certified – 13 March 2018 https://fisheries.msc.org/en/fisheries/scotian-shelf-snow-crab-trap/@@view	V2.0	PI 2.3.1a, PI 2.4.1b, PI 2.4.2 a, c PI 3.1.1 – 3.1.3
Eastern Canada Offshore Scallop	Re-certified – 27 th December 2020 https://fisheries.msc.org/en/fisheries/eastern-canada-offshore-scallop/@@assessments	V2.01	PI 2.4.1b, PI 2.4.2 a, c PI 3.1.1 – 3.1.3
North West Atlantic Longline Swordfish	Re-certified – 10 th June 2018 https://fisheries.msc.org/en/fisheries/north-west-atlantic-canada-longline-swordfish	V1.3	PI 3.1.1 – 3.1.3
North West Atlantic Harpoon Swordfish	Re-certified – 10 th June 2018 https://fisheries.msc.org/en/fisheries/north-west-atlantic-canada-harpoon-swordfish	V1.3	PI 3.1.1 – 3.1.3
Clearwater Seafoods Banquereau and Grand Banks Arctic surf clam	Re-certified – 25 th May 2018	V1.3	PI 3.1.1 – 3.1.3
Maritime Canada Inshore Lobster Trap Fishery	Certified- 25 th February 2021 https://fisheries.msc.org/en/fisheries/maritime-canada-inshore-lobster-trap-fishery/	V2.01	PI 2.3.1a, PI 2.4.1b, PI 2.4.2 a, c PI 3.1.1 – 3.1.3

Using Table 17 as a guide, the following PIs for all the overlapping fisheries have been identified as requiring harmonisation (blue/grey shaded rows):

Table 17. Performance Indicators / Scoring Issues that need to be harmonised

Performance Indicator / Scoring Issue	Comments	
All P1 PIs		None of the overlapping fisheries target Northern shrimp/prawn (<i>Pandalus borealis</i>). Therefore, no harmonisation required.
PI 2.1.1a	Trawl	There are no main primary species for the trawl fishery. Therefore, no harmonisation required.
	Trap	The only scoring element for the trap fishery which can be considered as a main primary species is the Gulf of St. Lawrence (GSL) herring Division 4T Fall Spawner Component which is used as bait in the trap fishery. None of the other MSC certified fisheries have 4T herring as a main primary species.
PI 2.2.1a	Trawl	There are no main secondary species for the trawl or trap fisheries. Therefore, no harmonisation required.
	Trap	
PI 2.3.1a	Trawl	Not applicable
	Trap	All the UoAs considered the North Atlantic Right Whale (NARW) as the only ETP species with national limits. Therefore, this PI needs to be considered for harmonisation.
PI 2.4.1b	Trawl	All the UoAs are considered to operate either fully or in part within the same managed area, i.e., the Eastern Scotian Shelf. Therefore, this PI needs to be considered for harmonisation.
	Trap	
PI 2.4.2a, c		The Scotian Shelf Northern Prawn Trawl and Tarp Fishery did not score 100 for PI 2.4.2a or c Therefore, PI 2.4.2a or c is not harmonised.

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Performance Indicator / Scoring Issue	Comments	
All P2 PIs		None of the UoAs are identical. Therefore, there is no need to consider harmonisation.
PI 3.1.1-3		All the UoAs are covered by the same management regime and so all of these PIs are required to be harmonised.
PI 3.2.1-4		All the UoAs have their own fishery specific management systems and so are not considered for harmonisation.

Table 18. Overlapping fisheries

Supporting information	
All the Public Certification Reports and audit reports, where relevant, for each of the overlapping fisheries, were reviewed and the scores and scoring rationales considered in relation to the PIs 2.3.1a, 2.4.1b, 2.4.2a, 3.1.1, 3.1.2, 3.1.3. The scores for each of these PIs/SIs are presented in Table 19 below.	
Was either FCP v2.2 Annex PB1.3.3.4 or PB1.3.4.5 applied when harmonising?	No
Date of harmonisation meeting	N/A

Table 19. Scoring differences

PIs	Scotia Fundy Haddock	Scotian Shelf Snow Crab	Eastern Canada Offshore Scallop	North West Atlantic Longline Swordfish	North West Atlantic Harpoon Swordfish	Clearwater Seafoods Banquereau and Grand Banks Arctic Surf Clam	Maritime Canada Inshore Lobster Trap	Scotian Shelf Northern Prawn	
								Trawl	Trap
PI 2.3.1a	75	75	75	80	100	80	75	80	75
PI 2.4.1b	80	100	80	100	100	80	100	80	80
PI 2.4.2a	80	100	100	100	100	80	100	80	80
PI 3.1.1	95	95	95	100	95	95	95	100	100
PI 3.1.2	85	85	85	85	85	85	85	90	90
PI 3.1.3	100	100	100	100	100	100	100	100	100

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Table 20. Rationale for scoring differences

If applicable, explain and justify any difference in scoring and rationale for the relevant Performance Indicators (FCP v2.2 Annex PB1.3.6)
<p>PI 2.3.1a is the only PI for which there is a material difference, i.e., where one or more fisheries have a condition and others do not. The reason for the differences in score are:</p> <ul style="list-style-type: none"> ○ North West Atlantic Longline Swordfish – The fishing gear is tended and is therefore considered not to pose a risk to NARW. ○ North West Atlantic Harpoon Swordfish – This is a highly selective form of fishing and the gear is not fixed and therefore unlikely to entangle NARW. ○ Clearwater Seafoods Banquereau and Grand Banks Arctic Surf Clam – owing to the mobile nature and seabed contacting operation of the fishery the risk of interaction with NARW is negligible. ○ Scotian Shelf Northern Prawn Trawl - owing to the mobile nature and seabed contacting operation of the fishery the risk of interaction with NARW is negligible.
If exceptional circumstances apply, outline the situation and whether there is agreement between or among teams on this determination
NA

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2.1	25 March 2020	Minor document change for usability

A controlled document list of MSC program documents is available on the MSC website (msc.org).

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