



Intertek Fisheries Certification (IFC)

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Third Annual Surveillance Report
***Pandalus borealis* SFA 5 & 6 Fishery**

Certificate No.: MML-F-126

Intertek Fisheries Certification Ltd
December 2014

Authors:
Don Aldous, Howard Powles

1.0 GENERAL INFORMATION

Scope against which the surveillance is undertaken: MSC Principles and Criteria for Sustainable Fishing as applied to the *Pandalus borealis* SFA 5 & 6 Fishery

Species: Northern Shrimp (*Pandalus borealis*)

Area: Shrimp Fishing Area (SFA) 5 & 6

Method of capture: Trawl

Date of Surveillance Visit:	November 27, 2014			
Initial Certification	Date: 20 March 2012		Certificate Ref: MML-F-126	
Surveillance stage	1 st	2 nd	3 rd	4 th
Surveillance team:	Lead Assessor: Don Aldous Assessor: Howard Powles			
Company Name: Address:	Northern Coalition, Fogo Island Coop, Association of Seafood Producers and the Canadian Association of Prawn Producers as the lead organization. c/o 1362 Revell Drive Manotick, Ontario K4M 1K8 Canada			
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2.0 RESULTS, CONCLUSIONS AND RECOMMENDATIONS

This report contains the findings of the **third** surveillance cycle in relation to this fishery.

The client's response to the Conditions of Certification was set out in a Client Action Plan (CAP), which was appended to the Public Certification Report. Progress associated with the actions set forth in the CAP was examined as a part of this surveillance audit. For each Condition, the report sets out progress to date. This progress has been evaluated by the Intertek Fisheries Certification (IFC) Audit Team (set out below as 'Observations' and 'Conclusion') against the commitments made in the CAP. This assessment includes a re-evaluation of the scoring allocated to the relevant Performance Indicators (PIs) in the original MSC assessment. Where the requirements of a Condition are met, the PI is re-scored at 80 or more and the Condition is "closed out".

The surveillance audit process and methodology as defined in the current version of the MSC Certification Requirements is followed in this audit and so the MSC criteria for determining the level of surveillance audit that the fishery requires is followed (see Annex 3).

Information Sources:

Meetings

All stakeholders from the full assessment were contacted by email prior to the surveillance audit and a notice of the pending audit was placed on msc.org on November 6, 2014. There were no requests from stakeholders for meetings during the site visit.

During the site visit, meetings were held as follows:

- November 27, 2014 with the client;
- November 27, 2014 with the client and DFO

Reports etc

ASMFC 2014. Northern shrimp. <http://www.asmfc.org/species/northern-shrimp>. Consulted November 30, 2014

DFO 2010. Integrated Fishery Management Plan – Northern Shrimp – Shrimp Fishing Areas (SFAs) 0-7 and Flemish Cap. Resource Management Operations, Fisheries and Oceans Canada. Available at <http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/ifmp-gmp/shrimp-crevette/shrimp-crevette-2007-eng.htm>. Consulted November 17, 2014.

DFO 2013. Ecological risk assessment framework (ERAF) for coldwater corals and sponge dominated communities. Available at <http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/risk-ecolo-risque-eng.htm>, consulted November 30, 2014.

DFO 2013b. Oceanographic conditions in the Atlantic zone in 2012. Can. Sci. Adv. Sec. Sci. Adv. Rep. 2013/057 : 18 pp.

DFO 2014a. Update of stock status indicators for northern shrimp, *Pandalus borealis*, in Shrimp Fishing Areas 4, 5 and 6. CSAS Science Response 2014/021: 16 pp.

DFO 2014b. Short-term stock prospects for cod, crab and shrimp in the Newfoundland and Labrador Region (Divisions 2J3KL). CSAS Sci. Resp. 2014/049: 18 pp.

Jorde, P. E., G. Søvik, J.-I. Westgaard, D. Orr, G. Han, D. Stansbury, and K. E. Jørstad. 2014. Genetic population structure of northern shrimp, *Pandalus borealis*, in the Northwest Atlantic. Can. Tech. Rep. Fish. Aquat. Sci. 3046: iv + 27 p.

Kenchington, E., C. Lirette, A. Cogswell, D. Archambault, P. Archambault, H. Benoit, D. Bernier,

B. Brodie, S. Fuller, K. Gilkinson, M. Lévesque, D. Power, T. Siferd, M. Treble, and V. Wareham. 2010. Delineating Coral and Sponge Concentrations in the Biogeographic Regions of the East Coast of Canada Using Spatial Analyses. CSAS Res. Doc. 2010/041: 208 pp.

Knudby, A., E. Kenchington and F. J. Murillo. 2013. Modeling the distribution of *Geodia* sponges and sponge grounds in the Northwest Atlantic. PLOS One 8(12) e82306, 20 pp.
doi:10.1371/journal.pone.0082306.

Standards and Guidelines used:

1. MSC Principles and Criteria
2. MSC Certification Requirements v1.3
3. Guidance to the MSC Certification Requirements, v 1.3

Update on Stock Status

Assessments are carried out biennially, with a status update in intervening years, under the DFO Regional Advisory Process (RAP). The most recent full assessment was conducted in February 2013, while a status update was conducted in February 2014 (DFO 2014a). TACs are set by DFO early in the calendar year, with input from stakeholders via the NSAC, and guided by the reference levels established using the DFO precautionary approach.

Resource status is assessed based on a DFO fall multi-species research vessel (RV) bottom trawl survey series (1996-2013), which provides information on shrimp distribution, abundance, biomass, recruitment, and size. Trends in fishery performance were also inferred from fishery catch per unit effort (CPUE) and fishing patterns. Spawning stock biomass and exploitation rate index are compared with reference levels in a precautionary approach framework.

SFA 5

TACs and catches have increased stepwise since the fishery began in the 1970s, with TACS stable at 23,300t since 2003/4 (DFO 2014a; Fig. 1). For 2013/4 the catch to the assessment date was 20,953t or 90% of the TAC, and it was expected that the TAC would be taken (DFO 2014a). The spawning stock biomass index for 2013 (44,000t) was 30% below the previous value and has declined to levels last seen prior to the year 2000 (Fig. 2). Exploitation rate index has varied without trend around 15% from 1997 to 2013/4; based on catch taken in 2013/4 the ER index was 14%, while the potential ER based on the TAC being taken was 16% (DFO 2014a).

The SSB index was in the healthy zone based on the 2013 survey results although there was a 33% probability of being in the cautious zone (DFO 2014a; Fig. 2). If the TAC were maintained and taken in 2014/5, based on the 2013 survey biomass indices, exploitation rate would increase to 31%, well above values seen in the past (Fig. 2).

The TAC for the 2014/5 season was reduced 10% from the previous season, to 20,970t. With a fishable biomass estimate for 2013 of 76,000t (DFO 2014a), this would generate an exploitation rate index of 28%, well above the “base exploitation rate” of 15% identified in the IFMP Annex I (DFO 2010). A two-year average exploitation rate (based on catch in 2013/4 and TAC for 2014/5) would be 20.8% with this level of TAC.

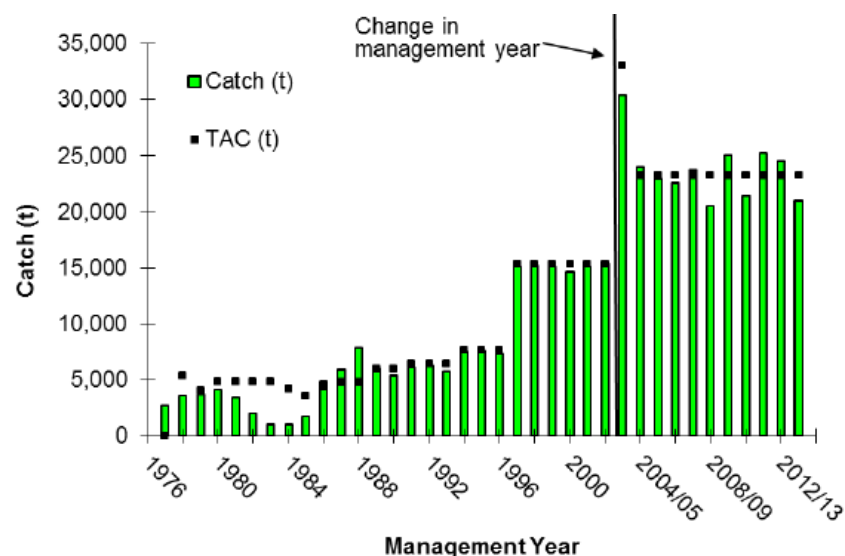


Figure 1. SFA 5 historical Northern Shrimp catches and TACs for the period 1976 – 2013/14 (2013/14 catches are preliminary as of February 14). In 2003 the management year changed from a calendar year to a fiscal year. Source: DFO (2014a).

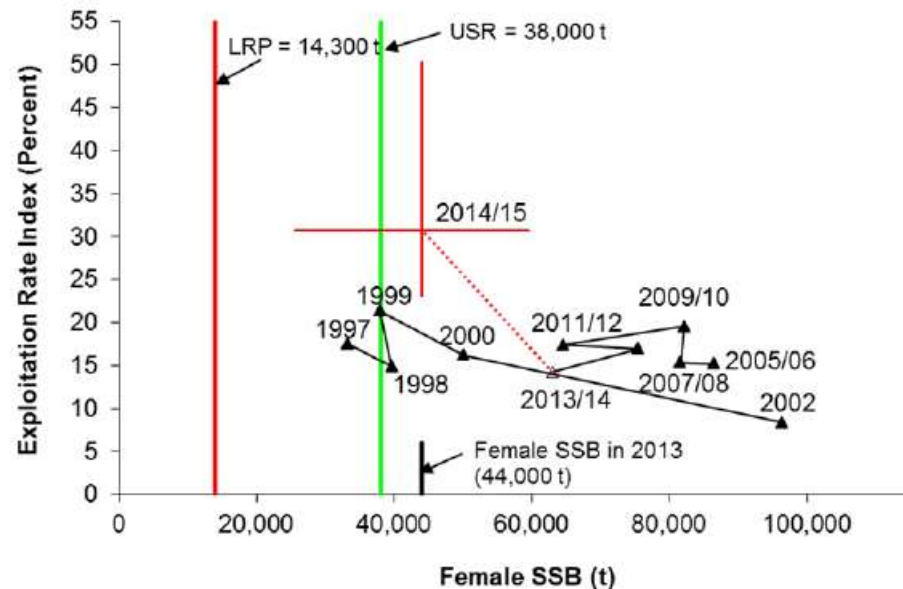


Figure 2. SFA 5 Precautionary Approach framework with trajectory of exploitation rate index versus female SSB index. Data point labels denote management year. The 2013/14 fishery was ongoing; therefore the 2013/14 point is preliminary. The red cross indicates 95% confidence intervals for the fall 2013 female SSB index (horizontal line) and projected exploitation rate (vertical line), assuming that the 23,300 t TAC is maintained and taken in the 2014/15 fishery. Source: DFO (2014a).

SFA 6

TACs and catches increased from the late 1980s, with TACs reaching a maximum 85,725t in 2008/9-2009/10 (Fig. 3). TACs were subsequently reduced to 60,245 for the 2012/3 and 2013/4 seasons. Catch to the assessment date for the 2013/4 season was 51,885t, 86% of the TAC, and it was expected the TAC would be taken (DFO 2014a).

Fishable biomass index was 212,000t in 2013, the lowest level in the time series and 26% below the 2012 level (DFO 2014a; Fig 4). Exploitation rate index has varied around 15% from 1997 to 2013/4, with a value of 16% in 2013/4 based on catch taken and a potential value of 19% based on the TAC being taken (based on a 2 year average) (DFO 2014).

Female SSB was slightly below the midpoint of the cautious zone in 2013 (Fig. 4). If the TAC of 60,245t was maintained and taken in 2014/5 the ER index would increase to 28%.

The TAC for the 2014/5 season was set 20% lower than in the previous season, at 48,196t, in response to the decline in biomass. The intent of the reduction was to maintain exploitation rate below 20% in the Cautious Zone, averaging 2 years' values. The IFMP Annex I on the precautionary framework for this stock identifies a "base target exploitation rate" of 15% in the Healthy Zone, but does not specifically identify an exploitation rate reference for the Cautious Zone.

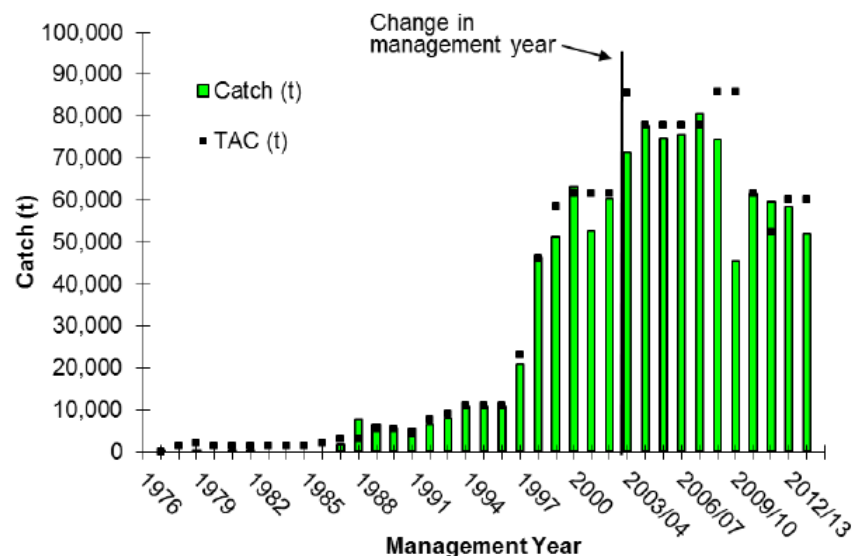


Figure 3. SFA 6 historical Northern Shrimp catches and TACs for the period 1976 – 2013/14 (2013/14 catches are preliminary as of February 14). In 2003 the management year changed from a calendar year to a fiscal year. Source: DFO (2014a)

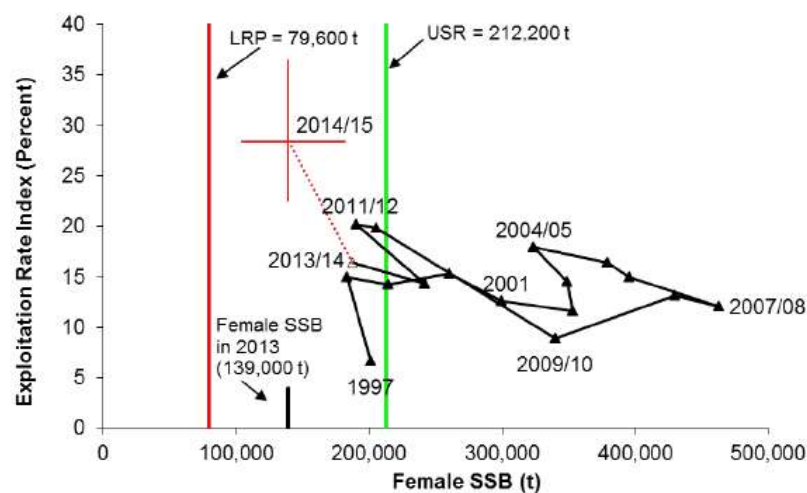


Figure 4. SFA 6 Precautionary Approach framework with trajectory of exploitation rate index versus female SSB index. Data point labels denote management year. The 2013/14 fishery was ongoing; therefore the 2013/14 point is preliminary. The red cross indicates 95% confidence intervals for the fall 2013 female SSB index (horizontal line) and projected exploitation rate (vertical line), assuming that the 60,245 t TAC is maintained and taken in the 2014/15 fishery. Source: DFO (2014a).

Total Allowable Catch (TAC) in most recent fishing year	<p>The Canadian TAC for 2013-2014 fishing year for SFA 6 is 60,245, and for 2014/5 is 48,196t.</p> <p>For SFA 5 the TAC was 23,300t for 2013/4 and 20,970t for 2014/5.</p>																																				
Unit of Certification share of TAC	100%																																				
Client share of TAC	The client share (including Fogo Island and the members of the Association of Seafood Producers of Newfoundland & Labrador) of the TAC is 100%.																																				
Green Weight¹ of catch taken by client group	<p>The total green weight taken by the client group during the 2013-14 fishing year was 37,260. See Table 2.</p> <p>Table 2: Catch of Northern Shrimp by area and species 2013-14</p> <table><tr><th>Species</th><th>SFA 2,3,4</th><th>SFA1</th><th>SFA 5,6</th><th>SFA 7</th><th>All areas</th></tr><tr><td><i>P. montagui</i></td><td>875</td><td></td><td>3</td><td></td><td>878</td></tr><tr><td><i>P. Borealis</i></td><td>5,530</td><td>0</td><td>37,260</td><td>1,742</td><td>44,532</td></tr></table> <p>Table 4: Catch of Northern Shrimp by area and species 2012-13</p> <table><tr><th>Species</th><th>SFA 2,3,4</th><th>SFA1</th><th>SFA 5,6</th><th>SFA 7</th><th>All areas</th></tr><tr><td><i>P. montagui</i></td><td>4,909</td><td></td><td>312</td><td></td><td>5,221</td></tr><tr><td><i>P. Borealis</i></td><td>20,447</td><td>5</td><td>82,864</td><td>8,019</td><td>111,335</td></tr></table>	Species	SFA 2,3,4	SFA1	SFA 5,6	SFA 7	All areas	<i>P. montagui</i>	875		3		878	<i>P. Borealis</i>	5,530	0	37,260	1,742	44,532	Species	SFA 2,3,4	SFA1	SFA 5,6	SFA 7	All areas	<i>P. montagui</i>	4,909		312		5,221	<i>P. Borealis</i>	20,447	5	82,864	8,019	111,335
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¹ The weight of a catch prior to processing

Condition 1 PI 2.4.1 (Score 60)	<p>The client is required to provide evidence by the fourth annual audit that the fishery is highly unlikely to disrupt benthic communities structure and function to a point where there would be a serious or irreversible harm.</p>
Condition 2 PI 2.4.2 (Score 70)	<p>The client is required to provide evidence by the fourth annual audit that:</p> <p>A partial strategy is in place such that the fishery is expected to be highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.</p> <p>There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or habitats involved.</p> <p>There is some evidence that the partial strategy is being implemented successfully.</p>
Condition 3 PI 2.4.3 (Score 70)	<p>The client is required to provide evidence by the fourth annual audit that:</p> <p>Sufficient data continue to be collected to detect any increase in risk to habitat (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).</p>
Condition 4 PI 2.5.1 (Score 70)	<p>The client is required to provide evidence by the fourth annual audit that the fishery is highly unlikely to disrupt benthic communities structure and function to a point where there would be a serious or irreversible harm.</p>
Condition 5 PI 2.5.2 (Score 70)	<p>The client is required to provide evidence by the fourth annual audit that:</p> <p>There is a partial strategy in place, if necessary, that takes into account available information and is expected to restrain impacts of the fishery on the ecosystem – in particular the non-catch impacts on benthic communities - to achieve the Ecosystem Outcome 80 level of performance.</p> <p>The partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ ecosystems).</p> <p>There is some evidence that the measures comprising the partial strategy are being implemented successfully.</p>
Condition 6 PI 2.5.3 (Score 70)	<p>The client is required to provide evidence by the fourth annual audit that:</p> <p>Sufficient information is available on the impacts of the fishery on benthic communities to allow some of the main consequences for the ecosystem to be inferred.</p> <p>Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).</p>
Client Action Plan	<p>The client has set out their actions and expected outcomes for this performance indicator in a logical step wise approach in association with Conditions 2 and 3, both of which relate to performance indicators for habitat:</p> <p>CAPP and NC will collaborate with other stakeholders and the Department of Fisheries & Oceans Canada (DFO), towards development of a program (a) to enhance the collection of information, and (b) to conduct an evaluation of the nature and distribution of habitat types, their vulnerability, and the related impact of otter trawl fishing for shrimp in this area. A “project team” will be assembled for this purpose, which more generally will also ensure implementation of DFO’s Sustainable Fisheries Framework Policies, including with respect to Sensitive Benthic Areas as it applies to</p>

	<p>the conduct of shrimp fishing in this area.</p> <p>By the first annual audit there will documented evidence that a plan for the assembly of available information and a program for evaluation has been developed by the “project team”, and data collection and assembly for this purpose has commenced.</p> <p>By the second annual audit there will documented evidence showing the information that has been assembled and the results of analysis to date.</p> <p>By the third annual audit there will be documented evidence showing that at least a provisional evaluation has been completed.</p> <p>By the fourth annual audit there will be documented evidence that at least a partial strategy is in place, and incremental mitigation measures have been identified and are being implemented as appropriate for this fishing activity.</p>
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2012 Client Progress Report	<p>The Northern Shrimp Advisory Committee (NSAC) has formed an MSC Working Group, which functions as the “project team”. The Project Team reviewed and generally endorsed a draft plan at its meeting held May 15/12 (draft minutes are attached) and subsequently reviewed/accepted minor adjustments that are reflected in the attached plan. Data collection has commenced.</p>
2012 Observations	<p>The Audit Team reviewed the “Elements of a Strategy to evaluate, manage & monitor the impact of the Northern Shrimp Fishery on Habitats and Ecosystems within the respective certification units” discussed by the NSAC MSC Working Group on November 1, 2012. This outlines a stepwise approach to assembling information, assessing impacts, and putting in place additional measures to manage impact of the fishery on habitats and ecosystems, if necessary.</p> <p>The team sought clarification on several elements of the strategy.</p> <p>With respect to the Ecological Risk Assessment Framework (ERAF) to be used in assessing risk of serious or irreversible harm to coral and sponge areas, the team reviewed a draft of this Framework that is being developed by DFO (DFO 2012c. The approach is consistent with other ecological risk approaches including the SICO approach used by MSC and as such appears to be appropriate for use in this fishery. The team noted that the Framework applies to “significant benthic areas”, and that limited guidance is provided on identifying these.</p> <p>The team noted that assessment and management actions for benthic habitats and ecosystems would be triggered if analyses of the fisheries footprint indicated that 10% of sensitive habitats or 30% of less sensitive habitats were affected by the fishery, and questioned the source of the 10%/30% thresholds. The client advised that the 30% threshold (assessment and management action would be triggered if analyses determined that the fishery impacts more than 30% of less sensitive habitats for more than 100 days) was based on the MSC guideline for determining whether it was “highly likely” that the fishery was not causing serious or irreversible to habitats and ecosystems (MSC Certification Requirements Table CB18 p. C88) – there should be no more than a 30% probability that the true status of the component is within the range where there is risk of serious or irreversible harm. While noting that the two contexts were different (probability of harm vs proportion of habitat impacted by the fishery) the team agreed that this was a reasonable threshold for the client strategy. The client advised that the 10% threshold for assessment and management action on sensitive habitats was a judgment based on the fact that a higher level of caution should be applied to sensitive than to non-sensitive habitats. The team agreed that this was reasonable; although not based on modeling or analysis, this threshold seems a reasonable judgment-based level to guide action.</p> <p>While concurring that the 10%/30% guidelines were appropriate thresholds for action, the team noted that it would be critical to clearly define “of what” 10% and 30% were being taken – these percentages should be applied to habitats within the depth range or general area of operation of the fishery, not, for example, to all continental shelf areas.</p> <p>The team was advised that data assembly had begun as indicated in the client action plan and in the “Elements of a Strategy”. With respect to the footprint of the fishery, information on distribution of offshore fishing effort has been compiled, and information on distribution of effort by the inshore fleet will be compiled in the near future. Information on distribution of bottom habitats will be available from DFO and other sources. A consultant with prior experience on mapping fishery footprints has been engaged to do the data mapping. A template and analytical approach which have been used by the client to assess habitat and ecosystem impacts in other fisheries will be used in this analysis. The client has compiled a bibliography of studies on impacts</p>

	<p>of shrimp fisheries on habitats and ecosystems.</p> <p>DFO is not directly involved in implementing the Strategy but will be providing information (fishery distribution, habitat distribution) and will be contributing to oversight of the work through their participation on the NSAC.</p> <p>In addition to the Strategy to be implemented by the client, the team was advised of the continuing development of a strategy for protection of sponge-coral areas in Newfoundland-Labrador Region of DFO. This will be part of DFO's Coral and Sponge Conservation Strategy for Eastern Canadian Waters. In 2010/11 DFO's Newfoundland and Labrador and Central and Arctic Regions consulted with stakeholders (governments, Aboriginal, fishing industry, oil and gas, ENGOs) on elements to be included in the strategy. One outcome of these consultations was specific targets and actions to achieve conservation, management and research objectives. Subsequently development of the strategy was expanded to cover all Atlantic and eastern Arctic areas. Once consultations and definition of targets and actions in the remaining areas (Maritimes, Gulf, Québec Regions) have been completed, further consultations on a draft strategy will be undertaken. Consultations on the draft strategy are expected to be complete by March 31, 2013. The strategy will be finalised and implemented following this date.</p> <p>Development of this strategy follows from a series of policy and science initiatives related to impacts of fishing in benthic environments in recent years, including, for example:</p> <ul style="list-style-type: none"> • Development of a Policy on Managing the Impacts of Fishing on Sensitive Benthic Areas (DFO 2009) • Mapping of coral and sponge areas, based on available information, in all Atlantic Canadian ocean areas, and establishing thresholds for protecting these areas (Kenchington et al 2010; DFO 2010a) • Development of science advice on encounter protocols for fishing gear which may impact corals and sponges (DFO 2011b) <p>References</p> <p>DFO 2009</p> <p>DFO 2010a</p> <p>DFO 2011b</p> <p>DFO 2012c</p> <p>Kenchington, et al 2010</p>
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2012 Conclusion	<p>The Audit Team concludes that progress is on track toward meeting the condition in Year 4 of the certification, and that milestones set for the first annual audit in the Client Action Plan have been met. In particular, a project team has been established to carry through work required, a draft strategy has been prepared to address the conditions, and data assembly has begun.</p> <p>The Team considers that the “Elements of a Strategy” outlined by the project provide an appropriate framework for meeting the Condition by Year 4 of the certification. We note that with respect to the 10% and 30% thresholds for action on sensitive and non-sensitive habitats, it would be important to clarify that these percentages apply to habitats within the general area where the fishery operates (for example within the depth range in which the fishery operates).</p> <p>The Team notes that the strategy will address both sensitive and less sensitive habitats and ecosystems, a broader scope than the recent DFO initiatives, which focus on protecting coral-sponge areas.</p>
2013 Client Progress Report	<p>With the help of contracted experts we have assembled information in relation to the elements and function of the habitat and ecosystems (Section A), and the fishery footprints of the inshore and offshore fleets in total and separately for both sensitive and less sensitive habitat/ecosystems (Sections B, C and F).</p> <p>Analyses have been provided in relation to the spatial and temporal profile of catch/effort as the case may be. Results of analysis indicates:</p> <p>The maximum theoretical footprint ranges from a low of 0.14% to 6.82 in the respective units of certification, with the actual footprint (due to overlapping tow tracked) likely to be about 2/3 of these values on average.</p> <p>The most intensive 1/3 of catch/effort occurs in about 4-6% of the cells that are actually fished, and 2/3 of the catch/effort occurs in <19% of the cells that are actually fished.</p> <p>84-100% of the respective units of certification are fished for <10 days annually; only 2 units of certification have cells with fishing >50 days per year - 6 cells (0.1% of total cells) in SFAs 5-6 and 1 cell (0.06% of total cells) in SFA7; no cell in any SFA is fished >100 days.</p> <p>With respect to sensitive areas (high concentrations of corals and sponge), while the two data sets portray a similar profile, observer data has not yet been fully reconciled with logbook data. Based on observer data:</p> <p>Only 35 sets of 56,300 (0.06%) occurred within the designated sponge areas and no sponge bycatch was taken.</p> <p>There are two designated coral areas where significant fishing occurs. Over the period 2008-2012 there were 3247 sets in area C84 with only 2 (0.06%) of these sets containing coral bycatch; there were 1607 sets in area C70 of which 16 sets (1%) contained coral bycatch. Virtually all coral bycatch consisted of soft coral species (<i>Gersemia</i> spp., <i>Duva florida</i>, <i>Nephtheid</i>).</p> <p>This data has not yet been evaluated in relation to the risk of serious or irreversible harm (Sections D and G)</p> <p>The approach to fishing mortality and the question of mitigation measures (Section E) requires the yet-to-be completed evaluation referenced above.</p> <p>Changes to the fishery footprints (Section H) and to the main predator/prey species of shrimp (Section I) are not applicable at this time.</p>

2013 Observations	<p>The audit team was impressed with the work carried out since the year 1 audit. Comprehensive data compilation and analysis has been carried out on :</p> <ul style="list-style-type: none"> • description of key ecosystem elements in the fishery area, focusing on benthic communities and trophic relationships, covering recent studies conducted since the certification report was finalised in 2011 • analysis of the fishery footprint in the various SFAs, and of the % of bottom habitat impacted by trawling • analysis of overlap of the fishery with sensitive habitats, as defined by presence of coral and sponge concentrations • analysis of overlap of the fishery with less sensitive habitats as determined by maps of bottom sediments <p>In light of the work done on compiling and analysing relevant information, progress is consistent with the year 2 milestone for the habitat and ecosystem conditions. The analyses conducted to date should provide a good basis for doing the risk analyses which are required to meet the year 3 milestones.</p> <p>With respect to the percentage of bottom habitat impacted by the shrimp fishery, the team again notes (as in the year 1 audit) that this depends on how the « total potential habitat » is determined – the larger the potential habitat, the smaller the percentage of this represented by the habitat impacted. This is critical since the strategy for assessing impacts depends on the percentage of habitat affected – for example if more than 10% of sensitive habitats are impacted, an analysis of whether there is significant harm would be required.</p> <p>The analyses presented used all continental shelf habitat at depths less than 600m as the potential habitat, which appears to the team overly expansive. The team suggested that restricting the “potential habitat” to depths at which shrimp might occur (eg 100-600m) might be more appropriate. In any case, since the methods for calculating percentages of habitat impacted are clearly described it is possible to explore alternative analyses. Even if values for potential habitat lower by 50% were used to determine the percentages affected by the fishery, these would be very low. Also, because overlaps in tows cannot be incorporated in the analysis, the percentages of habitat impacted in the reports provided are probably overestimated by a fairly significant proportion. The general conclusion, that a low proportion of potential habitat is impacted by shrimp trawling, appears to be justified.</p> <p>The analyses of overlap with sensitive and non-sensitive habitats appear to be sound and show quite low overlap in most areas. In a few areas there appear to be overlaps with coral concentrations although bycatches in these areas have been very low.</p> <p>The audit team was informed of progress on ongoing initiatives in DFO to address impacts of trawling on benthic habitats and communities (several such initiatives were also noted in the year 1 audit report).</p> <p>Newfoundland and Labrador Region of DFO has been developing a sponge-coral strategy which will be going out for consultation very soon; the goal is to complete consultations in January 2014 and to approve the strategy by March 2014.</p> <p>The ERAF has been finalized and is available on-line with corals and sponges being the first thing to which it will be applied. There was a national workshop in October 2013 (FAM, Oceans, P&E, Science) on implementing the ERAF.</p> <p>DFO has recently reported on a series of ecosystem studies done over the past 4-5 years, including a study of benthic species and communities of the Grand Banks based on grab sampling during spring multispecies survey cruises (DFO 2013d; Gilkinson</p>
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	<p>2012). Although the latter study was mainly outside of the shrimp fishery area in SFA 7, given the relatively limited information available on benthic communities on the Newfoundland-Labrador shelf, this is a significant contribution.</p> <p>DFO has also published a Science Advisory Report on Ecologically and Biologically Significant Areas (EBSAs) in the Newfoundland-Labrador shelf bioregion off Newfoundland and Labrador (DFO 2013e). While not directly relevant to assessing shrimp trawling impacts this is a contribution to assessing and managing ecosystem impacts of fishing and other marine activities generally.</p>
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2013 Conclusions	The team concludes that the year 2 milestone has been met for this PI and that progress is on track to meet the condition by year 4 as required.
2014 Client Progress Report	<p>The provisional evaluation has been completed for the period 2008-2011 and is shown in Section D of the draft (Partial) Habitat & Ecosystem Strategy for the Northern Shrimp Fishery.</p> <p>The fishery footprint within less sensitive main habitat types, as reported in section F above, ranged from a low of 0.01% to a high of 9.74%. Only 7 cells were fished for an average of more than 50 days per year, and none were fished for more than 100 days per year. This is well below the threshold of 30% being fished for greater than 100 days a year.</p> <p>The fishery footprint within designated areas of high sponge concentrations, range from 0.0% to 0.8% in the respective areas of certification, in no case above the threshold of 10% that would require a more comprehensive evaluation.</p> <p>The fishery footprint within designated areas of high coral concentrations ranged from 0.1% to 32.0% in the respective areas of certification. The fishery had significant overlap in two designated areas, i.e. 3 of 13 coral locations (23%) within C84 (SFA4), and 1 of 12 coral locations (8%) within C70 (SFA7). Our evaluation indicates that the coral locations within these designated areas are generally at greater depths than the shrimp fishery, with the overlap occurring only at points where the designated areas extend into more shallow depths. For C70, “the overlap between the shrimp fishery and coral locations is less than the 10% threshold stipulated in the Action Plan, and it may be reasonably concluded that the fishery is highly unlikely to disrupt the structure and function to the point where there would be serious or irreversible harm to the gorgonian locations within this sensitive area.” For C84, “further evaluation would be required to determine whether the fishery in the vicinity of these 3 gorgonian locations is highly unlikely to disrupt the structure and function to a point where there would be serious or irreversible harm to the overall coral community within C84; alternatively, small, targeted area closures might be considered to protect some or all of these 3 gorgonian locations”.</p>
2014 Observations	<p>Once again the Team was impressed with the work that had been done during the past year toward meeting this condition. We reviewed the updated version of the document “Draft Partial Habitat and Ecosystem Strategy” which has been updated in successive years to address milestones toward meeting the Conditions. In addition to the provisional evaluation described in the Client Progress Report (Section D of the draft Partial Habitat and Ecosystem Strategy), Section C (“mapping and quantifying the footprint of the fishery”) has been modified over the past year to take into account the Team’s suggestion at the last audit that the total potential shrimp habitat to be considered be 100-600 m depth rather than 0-600 m depth.</p> <p>The Team considers that the provisional evaluation (Section D) followed a reasonable approach and used the best information publicly available on distribution of sensitive (and other) habitats in the fishery area.</p> <p>The information on distribution of sensitive habitats (from Kenchington et al 2010) is recognised as being incomplete and imprecise (since it is primarily based on bycatch of corals and sponges on research trawl surveys and in bycatch from trawl fisheries), but provides the best picture available of distribution of sponges and corals which are indicators of sensitive habitats.</p> <p>The provisional risk assessment for vulnerable bottom habitats follows the approach outlined in DFO’s Ecological Risk Assessment Framework (ERAF) for coldwater corals and sponge dominated communities (DFO 2013). In addition, the approach outlined in the Client Action Plan uses a threshold of 10% of bottom habitat</p>

	<p>potentially impacted - if less than this proportion of bottom habitat is impacted, it is considered that harm is not serious or irreversible. Where area potentially impacted is greater than 10% of total bottom habitat of the fishery, a more detailed risk assessment is done based on a likelihood/consequence matrix. The provisional assessment outlines options for voluntary management measures to reduce risk, should these be found to be necessary.</p> <p>The provisional assessment also examines potential impacts on less sensitive (essentially all) habitats impacted by the gear, based on % of habitat impacted and using a 30% threshold.</p> <p>The current version of the draft Partial Habitat and Ecosystem Strategy, with the provisional evaluation in Section D, was tabled for discussion at the NSAC MSC Working Group (with representatives from DFO Management and Science, the Provincial government, industry and the FFAW) on October 29, 2014. The WG acknowledged that the document was a reasonable provisional evaluation considering the narrow focus on coral and sponge concentrations.</p> <p>The Team enquired whether this draft Partial Strategy would eventually be made public, since MSC certification should be based on documents that are publicly available. We were advised that the intent was to table the document at the full NSAC meeting in March 2015 and that, if approved at that meeting, the Strategy could become available either as an addendum to the IFMP or as a document available on request or referenced in the IFMP or complementary records, such as NSAC minutes that are publicly available.</p> <p>On enquiring about the status of the coral/sponge strategy for Atlantic Canada on which Newfoundland/Labrador is leading development, we were advised that the document has been submitted to DFO authorities for formal approval. It is hoped that the document will receive this approval before the end of the year.</p> <p>The team was also provided with a recent publication on modeling distribution of large sponges using environmental information in combination with bycatch information (Knudby et al. 2013). This approach may help to fill in the necessarily partial distributions based on trawl bycatch information by predicting likely locations for sponges.</p>
2014 Conclusions	<p>Given that a provisional evaluation of potential risk to bottom habitats and ecosystems from the fishery has been completed, and that this has been discussed in the MSC WG of the NSAC, we conclude that the Year 3 milestone - “documented evidence showing that at least a provisional evaluation has been completed” - has been attained and these conditions are on target to be met by the 4th audit.</p>

Condition 7 PI 3.2.1 (Score 70)	<p>The client is required to present evidence by the first annual audit that short and long-term objectives, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery's management system.</p>
Client Action Plan	<p>CAPP and NC will collaborate with other stakeholders and the Department of Fisheries & Oceans Canada (DFO), to amend the IFMP with explicit references to the precautionary approach being applicable to managing the impact of fishing on sensitive habitat, species and the ecosystem.</p>
Client Progress 2013	<p>"Fishery Objectives" are contained in section 1.1 of the Integrated Fishery Management Plan (IFMP) for shrimp fishing areas (SFAs) 0-7 and the Flemish Cap. This section of the IFMP has been amended to include umbrella references to the Precautionary Approach for the Strategies and Management Measures, and special reference to the precautionary approach when setting exploitation rates for the directed fishery. The revised "Fishery Objectives" may be viewed at the following link: http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/ifmp-gmp/shrimp-crevette/shrimp-crevette-2007-eng.htm#n1.1</p>
Observations 2013	<p>The Audit Team confirmed that an expanded set of objectives, strategies and management measures has been added to section 1.1 of the IFMP at the request of the MSC Working Group of the Northern Shrimp Advisory Committee. Long-term objectives related to mitigating impacts on habitats, protecting biodiversity and ecosystem structure and function, and explicitly recognizing the role of shrimp as a forage species in setting TACs have been added, along with strategies and management measures related to these.</p> <p>As such, the suite of long-range objectives outlined in the IFMP now covers the range of P1 and P2 issues as required in the MSC assessment tree.</p> <p>Although the IFMP does not include a section entitled "short-term objectives", the Team considers that the strategies and management measures outlined in section 1.1 of the IFMP (along with the long-term objectives), constitute medium- and short-term objectives for management of the fishery consistent with the MSC requirements. The Team also noted that "Fisheries Management Decisions" are published annually at the start of the fishing year, outlining TACs for the year and any other management changes (DFO 2012d, DFO 2012e); these are considered to represent publication of short-term (annual) objectives for the fishery.</p> <p>The Team notes that although these new objectives were added to the IFMP during 2012, the date of the IFMP on the DFO internet site remains May 19, 2010. As such, the recommendation from the certification report that a version tracking system be added to the IFMP has not yet been addressed.</p> <p>References DFO 2012d. Fisheries Management Decisions. Northern shrimp in Shrimp Fishing Areas 0, 1 and 7 http://www.dfo-mpo.gc.ca/decisions/fm-2012-gp/at1-030-eng.htm</p> <p>DFO 2012e. Fisheries Management Decisions. Northern Shrimp in Shrimp Fishing Areas 2-6 http://www.dfo-mpo.gc.ca/decisions/fm-2012-gp/at1-031-eng.htm</p>
Conclusion 2013	<p>The Audit Team concludes that this condition has been met. This PI has been re-scored to 80 and the condition has been closed out.</p>

Condition 8 PI 3.2.4 (Score 75)	The client is required to present a research plan by the fourth annual audit that assembles current activity, identifies gaps, and provides the management system with a strategic approach to research including reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.
Client Action Plan	<p>CAPP and NC will collaborate with other stakeholders and the Department of Fisheries & Oceans Canada (DFO), in assembling a working group to codify existing activity and develop a Research Plan for the short-to-mid term, that are linked to the objectives established for the fishery and for MSC Principles 1 and 2.</p> <p>By the first annual audit there will be documented evidence that a plan to conduct gap analysis has been developed by the working group.</p> <p>By the second annual audit there will be documented evidence that a gap analysis has been completed.</p> <p>By the fourth annual audit there will be documented evidence that a research plan is in place.</p>
2012 Client Progress Report	The following "plan to conduct a gap analysis" has been developed for the working group. "DFO conducts an annual internal audit ("The Fishery Checklist") of various functions/activities within the Department, that also identifies gaps in research and stock assessment activities. The assembly of this checklist occurs annually during the October through March period, with a consolidated "checklist" being completed soon thereafter. In the late Spring of 2013, NSAC's MSC Working Group will review information from the updated checklist as it pertains to shrimp in SFAs 1-7, categorize research issues/activities into what may be "needed vs simply desirable", what may be cost-effective to achieve in the short-to-medium-to-long term, and prioritize these where possible. The result of this analysis will be vetted through the subsequent Regional Assessment Process (RAP), likely to occur in 2015. The final result of this process, i.e. the Research Plan, will be forwarded to NSAC and the Regional Director of Science."
2012 Observations	The Audit Team noted the Client Progress report and considers that the milestone outlined in the Action Plan has been met. The milestones in the Client Action Plan represent a rigorous approach to defining research priorities and should result in a sound research plan by Year 4 of the certification.
2012 Conclusions	The Audit team concludes that progress on the action plan is on track to meet the Condition by Year 4 of the certification period.
2013 Client Progress report	At the May 2013 meeting of NSAC's MSC Working Group, it was agreed that scientists would review their respective input to DFO's internal Checklist process, and would forward appropriate research issues to B. Chapman, who in turn would assemble a consolidated draft Northern Shrimp Research Plan. The attached August 9/13 draft was produced and will be considered at the next meeting of the MSC Working Group
2013 Observations	The client submitted a draft research plan being considered by the MSC working Group. The draft includes a gap analysis of ongoing research and potential future research to consider in development of the research plan

2013 Conclusions	The Audit team concludes that the milestone for the second annual surveillance audit has been met and progress on the action plan is on track to meet the Condition by Year 4 of the certification period.
2014 Client Progress Report	At the May 2013 meeting of the NSAC MSC Working Group, participants from DFO Science undertook to review respective checklist data (gap analysis) and develop a list of on-going research. This Working Group met by Conference Call on October 29/14, at which time it was agreed that the draft Research Plan would be recommended for adoption at the 2015 meeting of NSAC. Minutes of the October 29/14 meeting will be forwarded prior to the November 27 th site visit.
2014 Observations	<p>The Team noted the progress report above and was also provided with a copy of the minutes of the October 29, 2014 meeting of the NSAC MSC WG which considered the research plan among other issues. We also reviewed the latest draft of the research plan dated November 9, 2014. This provides a list of research activities identified as priorities, based on input from DFO science and the NSAC WG, based on an analysis of gaps in knowledge which need to be filled.</p> <p>The team was advised that the research plan will be revised in light of comments from the October 29, 2014 NSAC MSC WG meeting and will be tabled for consideration and adoption at the NSAC meeting planned for March 2015.</p>
2014 Conclusions	No specific milestone was identified for Year 3 in the Client Action Plan. However, the Team concludes that progress is on track to meeting this condition in Year 4 as required.

Any complaints against the certified operation; recorded, reviewed and actioned.

There were no complaints against the certified fishery since that last surveillance audit. Enforcement officials reported minor issues dealing with the implementation of a new reporting requirement but no charges were laid.

Any relevant changes to legislation or regulation.

There have been no changes to legislation or regulation since the last surveillance audit.

Any relevant changes to management regime.

The Department of Fisheries and Oceans indicated in a letter dated September 18, 2014 to Bruce Chapman, that there had been no changes to the fisheries management regime other than modifications to the northern boundaries of some SFAs to be consistent with land claim settlement areas and to better match coverage of the research vessel surveys. The management framework and harvest control rules remain unchanged.

The letter indicated that a process to update the Harvest Control Rules for SFAs 1-6 is ongoing through a committee of the Northern Shrimp Advisory Committee (NSAC). No timeline has been established for this process.

The letter also indicated that the Shrimp Fishery Integrated Fishery Management Plan (IFMP) is undergoing substantive revisions and that it is hoped that this would be complete by the time of the next NSAC meeting in March 2015. The team was advised that the intent of this revision is to bring the IFMP into compliance

with a new standard format for IFMPs within DFO.

Any other significant changes in scientific knowledge relating to the fishery (other than accounted for above).

Environmental conditions and shrimp abundance

It has been recognised for many years that abundance of pandalid shrimp is determined to a large extent by environmental conditions. Stock-recruitment relationships are not apparent for northern shrimp in some stocks including Newfoundland shrimp stocks (e.g. DFO 2013b). Environmental conditions affect recruitment to stocks of all exploited species, but because of the short life cycle the environmental influence seems particularly important for shrimp.

There has been increased interest in examining the relationships between physico-chemical conditions, predator-prey relationships, and spawning stock biomass in determining shrimp abundance. NAFO (2014a) provides environmental overviews for SFAs 1 and 7, and notes for SFA 7 that environmental conditions and predator abundance are probably influencing shrimp abundance, although the mechanisms are not clear at present. Oceanographic monitoring programs are providing long time series of a range of environmental factors which can be related to recruitment and abundance of shrimp and other species. Exploration of environmental factors affecting shrimp abundance is a priority topic in the draft research plan for this stock (see Condition on PI 3.2.4 below).

Following up on a request from fisheries managers, a science review of short-term prospects (5 yr) for Atlantic cod, snow crab and northern shrimp in relation to environmental conditions was recently conducted (DFO 2014b). For northern shrimp, the review noted that stocks on the Newfoundland-Labrador shelf had been declining and were collectively at the lowest level since 1995 (the beginning of the time series examined) (Fig. 2), and that surplus production had been declining. Reduced production rates were associated with a recent warming trend in ocean temperatures, early timing of the phytoplankton bloom (associated with early melting of sea ice), increasing biomass of predatory fishes, and fishing. Statistical relationships between shrimp production and these indices were best when the environmental indices were lagged 2-4 years; since environmental indices remain unfavorable, the current period of low or declining biomass may be extended.

Northern shrimp fisheries have recently been closed because of low stock abundance in areas peripheral to SFAs 1-7: the Flemish Cap (NAFO 3M) (NAFO 2014a) and the Gulf of Maine (ASMFC 2014). These stocks are apparently responding to unfavorable environmental conditions similar to those affecting Newfoundland-Labrador stocks.

The recent (since the late 1990s) period of high shrimp abundance followed a period of lower abundance and relatively limited distribution of fishable concentrations. Recruitment from these small populations was the basis for the subsequent increase to very large population sizes, due to apparently positive productivity conditions. The precautionary frameworks currently in use for managing these resources are based on the recent positive productivity conditions.

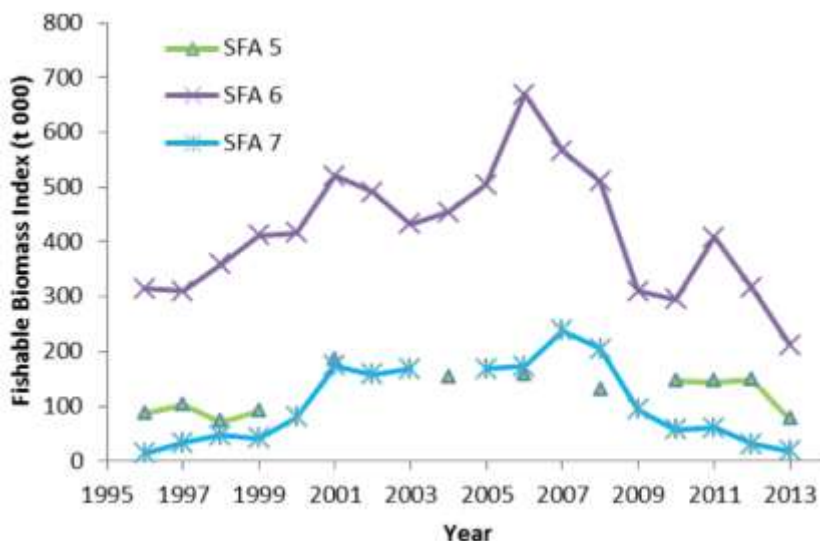


Figure 5. Northern Shrimp fishable biomass index within SFAs 5 – 7 from fall Canadian multi-species bottom trawl survey data, 1996-2013. Source: DFO (2014c).

Population structure study

A study of genetic variability patterns of northern shrimp (*P. borealis*) between Hudson Strait and the Gulf of Maine was published in 2014 (Jorde et al 2014). Shrimp in the Gulf of Maine and on the Flemish Cap were determined to be genetically distinct from those in other parts of the sampled range, so were considered to be separate populations. The Newfoundland/Labrador shelf areas were more homogeneous with respect to genetic characteristics of shrimp, consistent with population intermixing as a result of the Labrador Current.

Improvements to assessment models

The Northern Shrimp Research Foundation (NSRF), an industry-funded body, will be providing financial support for research on shrimp aging and population modelling over the next two years. Support will be provided to a post-doctoral fellow and to researchers at University of New Brunswick and Memorial University of Newfoundland, via a collaborative agreement in which DFO is also taking part.

Overall Conclusions.

No changes in management have taken place that would detrimentally affect the performance of this fishery against the MSC standard and the fishery continues to meet the requirements of the MSC Standard. It was verified during the site visit that no destructive fishing practices or controversial unilateral exemptions to an international agreement have been introduced.

MSC Certification should therefore continue with normal on-site annual audits as set out in Annex 3.

Annex 1**Written stakeholder submissions to the surveillance audit and IFC responses to points raised.**

There were no written submissions by stakeholders.

Annex 2**Notification of surveillance audit****Canadian Northern and Striped Shrimp Fishery****MSC Certification****Certification Body: Intertek Fisheries Certification****Surveillance Audit**

Following certification of this fishery, we are now continuing the process of annual surveillance audits of the fishery. These audits have two principal functions:

1. To review any changes in the management of the fishery, including regulations, key management or scientific staff, or stock evaluation
2. To evaluate the progress of the fishery against any Conditions of Certification raised during the Main Assessment

During the audit, or at separate meetings, we shall be speaking with representatives of the fishery and fishery management organisations. We expect to carry out meetings on **November 26-28, 2014**.

Meetings will be held at **St Johns, Newfoundland and Labrador** and attended by Audit Team members

Don Aldous	Lead Auditor	On site
Howard Powles	P2	On site

(see details of the team membership below).

Should you have any information on this fishery that you feel should be considered in the assessment, please advise the undersigned by November 10, 2014. We may be available to meet with stakeholders as appropriate. If you would like to arrange a meeting, please advise us of:

- a) your name and contact details
- b) your association with the fishery
- c) the issues you would like to discuss (in order for us to arrange appropriate representation)
- d) where and when you would like to meet

Don Aldous
Lead Assessor
Oct 26, 2014

E-mail: d.alldous@me.com

Audit Team Members:**Don Aldous**

Don is considered a P3 expert for Marine Stewardship Council (MSC) assessments and has been involved with Intertek Moody Marine as an Associate Auditor since 2009 as an editor, project coordinator, P3 expert and team leader. Don was the coordinator of the original assessment of this fishery and led the first and second surveillance audit in 2012.

Howard Powles

Howard Powles has worked in fishery science, stock assessment, and conservation and management of fishery resources since the mid-1960's, as a working scientist, science manager, program manager, and consultant, with a recurrent focus on crustacean resources. With respect to Canada's Atlantic shrimp resources, he was a member of the NAFO Working Group on the shrimp resource in NAFO Areas 0 and 1 in 1996-2000, participating in annual assessment meetings with scientists from Canada, Denmark, Greenland and the USA to develop and peer review scientific advice. He also participated in Canadian assessment meetings on the shrimp resource in shrimp fishing areas off Labrador and eastern Newfoundland in the same period. As Director of Fisheries Science and of Biodiversity Science (1998-2004) at Department of Fisheries and Oceans (DFO) Headquarters he was active in developing ecosystem-based approaches to ocean management, in particular approaches based on defining ecosystem objectives and indicators. Howard was involved as a P2 expert in the original assessment of this fishery and was an author for the first surveillance audit in 2012.

Full CVs of the team members are available on request from INTERTEK

Annex 3**Determination of surveillance level**

A surveillance audit may be conducted as either an “on-site” or “offsite audit”. This is determined by using criteria set out by the MSC:

Criteria	Surveillance Score	Insert name of fishery and complete scores
1. Default Assessment Tree		
Yes	0	0
No	2	0
2. Number of Conditions		
Zero Conditions	0	0
1-5 Conditions	1	1
>5 Conditions	2	0
3. Principle Level Scores		
≥ 85	0	0
<85	2	2
4. Conditions on outcome PIs?		
Yes	2	2
No	0	0
Total		5

The score for the fishery is used to determine the surveillance level appropriate to the fishery using the table below:

			Years after certification or re-certification			
Surveillance score	Surveillance level		Year 1	Year 2	Year 3	Year 4
2 or more	Normal surveillance		On-site surveillance audit	On-site surveillance audit	On-site surveillance audit	On-site surveillance audit & recertification visit
1	Remote surveillance	Option 1	Off-site surveillance audit	On-site surveillance audit	Off-site surveillance audit	On-site surveillance audit & recertification visit
		Option 2	On-site surveillance audit	Off-site surveillance audit	On-site surveillance audit	
0	Reduced surveillance		Review new information	On-site surveillance audit	Review new information	On-site surveillance audit & recertification visit

The *Pandalus borealis* SFA 5 & 6 Fishery scores 5 since 2 Conditions remain open and the Principle 2 score is <85, and so will require an on-site audit next year.