

Surveillance Report

CANADIAN NORTHERN PRAWN TRAWL FISHERY Shrimp Fishing Areas 5, 6, & 7

Certificate No.: MML 029

Moody Marine Ltd.

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1.0 GENERAL INFORMATION

Scope against which the surveillance is undertaken: MSC Principles and Criteria for Sustainable Fishing as applied to the CANADIAN NORTHERN PRAWN TRAWL FISHERY Shrimp Fishing Areas 5, 6 and 7.

Species: Pandalus borealis

Area: Shrimp Fishing Area 5, 6, 7 (Newfoundland and Labrador Atlantic coast of Canada)

Method of capture: Trawl

Date of Surveillance Visit:	31 st August 2010				
Initial Certification	Date: 4 th Augus	st 2009	Certificate Ref: MML 029		
Surveillance stage	1st	2 nd		3rd	4th
Surveillance team:	Lead Assessor: Paul Knapman Assessors: Howard Powles, Colin Bannister				
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2.0 RESULTS, CONCLUSIONS AND RECOMMENDATIONS

This report contains the findings of the second surveillance audit in relation to the Association of Seafood Producers (ASP) Canadian Northern Prawn Trawl Fishery in Shrimp Fishing Areas 5, 6, 7. The surveillance audit was carried out in accordance with the Marine Stewardship Council (MSC) Fisheries Certification Methodology (FCM) Version 6.

An announcement of the surveillance site visit was sent to recognised stakeholders on 12 July 2010 and published on the MSC website advising stakeholders that the audit site visit would take place the week of 30^{st} August. (See appendix A).

The surveillance team – Howard Powles, Colin Bannister and Paul Knapman - met with members of the client group – Derek Butler and Greg Viscount - and with staff from the Department of Fisheries and Oceans, Canada (DFO) Newfoundland and Labrador Region and Head office – Heather Bishop, Jennifer Buie (by phone), Corina Busby (by phone), Annette Rumboldt, Bob Lambert, Jason Cooper, and Dave Orr on Tuesday 31st August 2010. Information and evidence was gathered on the status of the stock, the performance of the fishery throughout the year, measures to meet the Conditions of Certification and changes in management.

The following section is set out as a table within which general information about the status of the stock and the fishery for this reporting period is provided along with the surveillance team's observations, conclusions and recommendations on the current status of the fishery and the client's progress toward meeting the Conditions of Certification.

The table includes the original assessment scoring guideposts and scoring commentary and the requirements of the original Condition alongside the heading 'Activity assessed'. This identifies the areas in which the fishery was determined to perform below the level required by the MSC standard during the initial assessment, and the required actions to address these issues.

As required by the MSC assessment methodology, ASP produced an Action Plan setting out the stages involved in addressing the Conditions raised. This is set out in the table alongside the heading 'ASP Action Plan'.

According to the terms of the Action Plan, the client has provided information on the work undertaken to date.

This progress has been evaluated by the Moody Marine surveillance team ('Observations' and 'Conclusion') against:

- 1. the commitments made in the Action Plan;
- 2. the intent of the original Condition; and,
- 3. the original scoring indicator, guideposts and commentary.

The influence of any overall legislative and management changes in the fishery are also taken into consideration.

When the Condition has been judged to have been met, a re-evaluation of the scoring allocated to the relevant Performance Indicator(s) in the original MSC assessment will be included within the evaluation.

Item	Comments regarding <i>P. borealis</i> in SFA 5, 6, and 7		
1	Stock status		
Observations	<u>The Fishery</u> The number of active harvesters is unchanged at approximately 250 vessels, but there is one less inshore plant (n=12). The fishery opened later than usual in May after a price dispute. Up to August 25^{th} the fishery had landed just under 90 million lbs or 60% of the quota of 144.3 million pounds. The Association of Shrimp Producers (ASP) suggests that the fleet may not take the reduced quota because of the late start.		
	<u>Stock Overview</u> A new assessment of shrimp in SFA 4, 5 and 6 was reported by DFO in March 2010 (SAR 2010/018). This uses fishery data (observer and log book datasets) to estimate indices of catch rate and fishery aggregation, and survey data (fall multi-species RV bottom trawl surveys, 1996-2009) to estimate recruitment, fishable biomass, spawning stock biomass (SSB) and exploitation rate (E, % of fishable biomass). After several years at high level in most SFAs, stock trends are now diverging geographically, decreasing in SFA6, increasing further north in SFA4, but being uncertain in SFIA 5. In 3LNO (SFA 7, assessed by NAFO) some aspects of the distribution of shrimp appear to be changing.		
	Stock Status in SFA 4 Stock status is positive. Fishable biomass, SSB, and recruitment have increased since 2005, and E has decreased from 15% to below 10% of fishable biomass. Large vessel CPUE mainly fluctuates above the 1989-2009 mean and has increased since 2005. SBB is well above the provisional Upper Stock Reference Point (USR). The TAC, which was close to 10,300 t from 2004-2006 and close to 11,320 t from 2007-2009, was retained at 11,320 for 2010.		
	Stock Status in SFA5 (Hopedale and Cartwright Channels) The area of the fishery has contracted, but there is no concern about stock status. In the <u>south</u> (Cartwright Channel) fishable biomass (surveyed annually) rose through 1996 to 2005, then fell by 40% in 2009 (but the estimate has a wide confidence interval).		
	In the <u>north</u> (Hopedale) intermittent surveys from 2001 to 2008 show that fishable and spawning biomass were high but decreasing slightly to 2008 (there was no 2009 survey), and that recruitment has been average. Large vessel CPUE increased from 1992 to 2001, before declining gradually to 2009, but is still above the 1980-2009 mean. E was 15% in 5 out of 9 years but was 20% in 1998 and again in 2008.		
	Because of survey issues stock status is somewhat uncertain, but E has generally been low, and SSB has been well above the USR. The TAC has been around 23,300 t since 2004, and was retained at 23,300t in 2010.		
	Stock Status in SFA 6 (Hawk Channel + Division 3K), A change in stock status is causing concern.		
	The distribution of shrimp and the large vessel fishery has not changed, but total, fishable and spawning biomass that rose from 1996 to 2006 have since fallen by 50% to below the 1996-2009 mean. <i>Female spawning biomass has fallen into the cautious zone at 97% of the provisional Upper Stock Reference Point (USR)</i> . Large vessel CPUE (kg/hr) that was high from 1997 to 2006 fell below the 1980-2009 mean by 2009 Small vessel CPUE, previously increasing to 2007 decreased in 2009		

Recruitment, variable but at a peak in 2006, has since fallen to the 1996-2009 mean.
If the 2008/2009 TAC of 85,275 t continued into 2010, E would likely become 28% of fishable biomass (20-37% at the upper and lower CI of the biomass estimate), much higher than any previous value (previously always <20%). Out of concern for stock status it was agreed to reduce the 2010 TAC substantially to 61,632 t, equivalent to an E of approximately 20%, leading to the elimination of two licences on the LIFO (last in, first out) principle (ASP, pers comm.).
Stock Status in SFA 7 (NAFO 3LNO) In the NAFO/ICES assessment for 2009 (NAFO SCR Doc.09/59) fall survey biomass has varied at high level since 2001 and large vessel CPUE has fluctuated around the 2000-2009 mean since 2004. Spring survey biomass has fallen 61% since 2007, however, and although less precise, this correlates with small vessel CPUE. Spawning and fishable biomass increased from 1996 to 2007, then declined substantially. Recruitment has fluctuated around an upward trend, but has fallen since 2004/5. Exploitation rate is low (never above 14%), and fell to 10% in 2009. Spawning biomass is well above Blim, (set as 15% of the maximum 2007 value). The declines in recruitment and the spring and small vessel biomass indices caution that shrimp distribution may be changing, but it is not clear why. The TAC (3L only) was 30,000 t in 2009. If this is retained in 2010, E will likely rise to 17.25%.
<u>Predation</u> The biological and fishery significance of recent shrimp stock changes is still unclear. Predation on shrimp may be increasing owing to an increase of shrimp in the diet of cod and other predators, but the increase in cod abundance is only modest, and the largest decrease in shrimp biomass is in the south (SFA 6), whereas the role of shrimp in the diet decreases from north to south (Orr, pers com., based on Koen-Alonso et al, 2010).
The IFMP The Northern Shrimp Integrated Fisheries Management Plan (NSIFMP, or IFMP) has been updated considerably (IFMP, 2007 as amended), with the most recent version posted on the DFO web site in May 2010. Work is in progress to develop the application of a Bayesian production model (Hvingel & Orr, 2010, draft) to estimate MSY, and to model the risk associated with different TAC strategies taking into account predation on shrimp, but this work is not complete.
The team noted that although the IFMP is occasionally revised and reposted on the DFO web site, the title page does not indicate the date of publication, and there is no indication of changes made between versions. This makes tracking improvements to fishery management very difficult and is not consistent with transparency in the management process. The team recommends that the client work with DFO to ensure that the publication date of the IFMP be included on the title page, and that a table of changes be included in the IFMP.
References DFO, 2010a. Assessment of Divisions 2G-3K Northern Shrimp. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2010/018
Hvingel, C. and D. C. Orr DFO, 2010. An assessment of the shrimp (<i>Pandalus borealis</i>) stock in SFA6 using a Bayesian production model by. DFO Can. Sci. Advis. Sec. Sci. Res.Doc. 2010/nnn. Draft.

IFMP, 2007	as amended. NC	ORTHERN SHRIM	P INTEGRATED FISHE	ERIES
MANAGEM	ENT PLAN. SHRIM	P FISHING AREAS	S (SFAs) 0-7 and the FLE	MISH
CAP. Resou	ce Management Op	erations. Fisheries	and Oceans Canada. Eff	ective
January 2007				
Koen-Alonso	, M., F. Mowbray	, P.Pepin, J. Morg	gan, W.Brodie, B. Vater	rs, D.
Holloway, A	Buren, K. Dwyer, C	B. Stenson, and K. C	Gilkinson, 2010. Key aspe	ects of
the Newfoun	dland-Labrador Shelf	f Ecosystem (NAFC	Divs. 2J3KLNO). Power	Point
presentation	o the DFO Science 7	Zonal Advisory Proc	ess (ZAP), Northern and S	triped
Shrimp in Ar	eas 0, 2, 3, 4, 5, 6. M	arch 24-31 2010, St.	John's, NL	
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NAFO, 2009	. NAFO/ICES WG	PANDALUS ASSE	SSMENT GROUP-OCT	OBER
2009. The 2	009 assessment of	the Northern Shrim	p (Pandalus borealis, K	royer)
resource in N	AFO Divisions 3LN	O, by D.C.Orr, P.J.	Veitch and D.J.Sullivan. N	NĂFÓ
SCR Doc. 09	/059. Serial No. N57	20.		

Item	P. borealis in SFA 5,6,7
2	Condition 1: Reference Points and Decision Rules
Activity assessed	 This Condition relates to the development and incorporation of precautionary reference points and decision rules in the management advice for the fishery. Five related Performance Indicators (PIs) under MSC Principle 1 and 3 were considered to be deficient in the initial assessment of the fishery. The following bullet points reflect the narrative used for the 80 Scoring Guidepost (SG) for each of these PIs: Appropriate limit and precautionary reference points should be determined and implemented taking into account stock biology and the limitations of the available fishery and assessment data (PI 1.1.3.2). Major uncertainties and assumptions should be reflected in the management advice and limitations addressed through the appropriate decision rules (PI 1.1.3.5). Clear decision making rules should exist, be fully documented and reconciled with appropriate reference points and with data and assessment limitations (PI 1.1.3.7). Results from monitoring the stock are regularly interpreted in relation to reference points (3A.6.2). Practical procedures exist to reduce harvest in the light of monitoring results and provide for stock recovery to specified levels. Measures can be implemented speedily (3A.6.3). To ensure that, as a minimum, each of the PIs achieves the 80 SG the assessment team recommended that within the second year of the fisheries MSC certification the client should address the following points: a) The informal precautionary reference points and decision rules currently guiding fishery management should be undertaken to develop and implement reference points based on stock biology, fishery characteristics and the limitations of the available data. C) Management advice and decision rules should take explicit account of the implications of the major uncertainties and assumptions in the assessment especially in the context of future declines in biomass.
Association of Seafood Producers (ASP) Action Plan	 Action Plan Condition 1 DFO has agreed to work on developing proxies and reference points, for presentation to relevant RAP meeting, and eventual discussion at NSAC. Consideration will be given to levels of abundance that are deemed acceptable or unacceptable based upon trends over time in consultation with NSAC. Key ongoing uncertainties and assumptions currently documented in the scientific advice, and reflected in the low exploitation rates in management decision will be formalized in the IFMP within 2 years.
Conclusion from first annual audit	The client has significant support from the DFO to ensure that progress is made toward achieving this Condition. Progress is on target and it is anticipated that this Condition will be met within the second year of certification.
Observations	The 2009 surveillance report (Moody, 2009) noted that work was on track to develop

reference points and harvest rules based on scientific discussions on the precautionary approach (PA) at a National Working Group and a National Workshop held in 2008. Reference points and harvest rules have now been formulated for SFAs 4, 5 and 6, and as planning guidance for SFA 7 (NAFO 3L). They are described in Annex I of the Northern Shrimp Integrated Fisheries Management Plan (DFO, 2007, as amended), on which the following overview is based. These are termed "Provisional" in Annex I, but will be used in management; "Provisional" refers to the current non-feasibility of calculating Fmsy on which decision rules would ultimately be based. The IFMP states that this framework will be fully evaluated no later than the end of 2014.

Provisional Biomass Reference Points

Following DFO (2006) a limit reference point (LRP) defines the boundary between a lower critical zone and an intermediate cautious zone, and an upper reference point (URP) defines the boundary between the cautious zone and an upper healthy zone.

For Northern Shrimp, the *Provisional* LRP is 30% of the mean SSB for the moderately productive period 1996-2003 (analogous to the NAFO rule of 15% of maximum observed SSB), and the *Provisional* URP is 80% of the 1996-2003 mean SSB (the default option in the DFO draft PA framework).

Provisional Exploitation Rate and Harvest Control Rules for setting TACs In the healthy zone (i.e. SSB is above URP)

- Measures should aim to keep SSB above URP, and there should be no increase in capacity or infrastructure during any period of stability or stock decline.
- Base exploitation rate should be 15% of exploitable biomass, but while in this zone, a stable TAC strategy and a decline in SSB may cause exploitation rate to exceed this base rate, subject to effective monitoring.
- E should not exceed Fmsy (not yet calculated, but is thought to be well above the base rate).
- Changes in TAC should not exceed +/- 15%, unless stock is falling precipitously.

In the <u>cautious</u> zone (i.e. SSB is between the URP and the LRP)

- Measures should aim to rebuild SSB towards URP, subject to natural fluctuations
- If stock is projected to decline, the TAC should not be increased.
- Changes in TAC should not exceed +/- 15%, unless stock is falling precipitously
- Within the cautious zone, the maximum exploitation rate should not exceed 2/3Fmsy in the upper two quartiles of the SSB range, 1/3Fmsy in the second SSB quartile, and 15% (Note 1) in the first (lower) SSB quartile.

In the <u>critical</u> zone (i.e. SSB is below the LRP)

- Measures must explicitly promote an increase in SSB above LRP within 6 years.
- Harvesting is only permitted as part of a rebuilding plan, and the exploitation rate shall not exceed 10% (Note 2).

Note 1: The IFMP text simply states '15%,' but the illustration of the harvest profile in the IFMP labels the ordinate 'Exploitation Rate (Percentage of MSY)' so this must be 15% of Fmsy, and should NOT be confused with 15% of exploitable biomass. **This requires clarification in the IFMP**.

Note 2: Similarly, the IFMP text states '10%', but this should presumably be '10% of Fmsy'. **This requires clarification in the IFMP.**



dynamic range of the impact of fishing on a stock driven largely by the environment. This has prevented the estimation of Bmsy and Fmsy, whether from a conventional stock-recruitment relationship, or from the application of the Greenland shrimp Bayesian production model (used to estimate Bmsy and the risk associated with different TAC options (Hvingel, 2006, Hvingel & Kingsley, 2006.))

Nonetheless, the 2010 Northern Shrimp Advisory Committee (NSAC) responded to the finding of the recent SFA 6 stock assessment, showing that SSB has fallen into the cautious zone at 97% of the provisional URP, and that if the 2008/2009 TAC of 85,275 t continued in 2010, E would likely become 28% of fishable biomass (20-37% at the upper and lower CI of the biomass estimate), much higher than any previous value, and well above the 15% maximum exploitation base rate. The assessment team learned that out of concern for the stock and the MSC certification, NSAC responded by negotiating the 2010 SFA6 TAC down to 61,632 t, requiring the elimination of some licences on the last-in first-out (LIFO) principle. We believe that the new TAC is equivalent to an E of 20% of the fishable biomass. This illustrates the implementation of the upper biomass reference point to identify a stock problem, followed by amendment of the harvest and access rules, under the provisional PA framework for Northern Shrimp. The outcome represents a significant reduction in the take for 2010, although the agreed TAC does not appear to reduce the prospective exploitation rate down to the 15% maximum base rate.

In SFA 4, 5 and 7, SSB remains in the healthy zone above the provisional URP. Therefore no change in TAC is required, and the previous TACs were retained for 2010.

Uncertainty.

The trends in survey biomass and in vessel CPUE are provided with confidence intervals. Some survey series (e.g. SFA 5 south) are intermittent, which may affect biomass estimation. It is unknown how survey biomass is affected by changes in the timing of surveys. The relationship between recruitment and spawning biomass, and the calculation of female mortality (there are no estimates for males) are uncertain.

Previous trials using the Bayesian model to make an analytical assessment of the risk associated with various TAC options under uncertainty failed, but the assessment team learned that a recent trial using the latest assessment data for SFA6 has been more successful (Hvingel and Orr, 2010, in draft). It will be presented for scrutiny by the Northern Shrimp RAP early in 2011, and could be an important step towards full implementation of the PA framework for Northern Shrimp.

The IFMP also states an intention that the provisional precautionary reference framework will be tested in the future by some form of Management Strategy Evaluation (MSE), which will presumably require the application of some form of scenario modelling to analyse the effects of observational and process error.

References:

DFO, 2006. A Harvest Strategy Compliant with the Precautionary Approach. DFO Can. Sci. Advis. Sec. Advis. Rep. 2006/023

Hvingel, C. 2006. A framework to model shrimp (Pandalus borealis) stock dynamics and quantify risk associated with alternative management options, using Bayesian methods. ICES J.Mar.Sci.63:68-82.

Hvingel, C. and M.C.S. Kingsley, 2002. A framework for the development of

	 management advice on a shrimp stock using a Bayesian approach. NAFO SCR Doc. 02/158 Serial No. N478.7 Hvingel,C. and D. C. Orr DFO, 2010. An assessment of the shrimp (<i>Pandalus borealis</i>) stock in SFA6 using a Bayesian production model by. DFO Can. Sci. Advis. Sec. Sci. Res.Doc. 2010/nnn. Draft. IFMP, 2007, as amended. NORTHERN SHRIMP INTEGRATED FISHERIES MANAGEMENT PLAN. SHRIMP FISHING AREAS (SFAs) 0-7 and the FLEMISH CAP. Resource Management Operations. Fisheries and Oceans Canada. Effective January 2007.
	Fishery. Shrimp Fishing Areas 5,6,&7. Certificate No: MML029.
Conclusion	The surveillance team conclude that Parts a) and b) of this condition have been met by including in the IFMP a precautionary management framework based on the provisional reference points and decision rules described in Annex 1 of the IFMP.
	The team concludes that Part c) of this condition is being met at a minimum level by identifying sources of uncertainty in the assessment; by quantifying confidence intervals; and by adopting a cautious 15% base exploitation rate for the healthy zone.
	This Condition relates to multiple PIs: 1.1.3.2; 1.1.3.5; 1.1.3.7; 3A.6.2; 3A.6.3. A score of \geq 80 is required for all the PIs in order for the Condition to be closed out. On the basis of the above commentary:
	PI 1.1.3.2 SG80 Appropriate limit and precautionary reference points are determined and implemented taking into account stock biology and the limitations of the available fishery and assessment data.
	SG 100 Appropriate limit and precautionary reference points are determined and implemented taking into account stock biology and statistical simulations of the variability and uncertainty of fishery and assessment data.
	The performance of the fishery meets the requirements of the 80 Scoring Guidepost: a precautionary management framework based on the provisional reference points are now being used within the fishery. PI 1.1.3.2 is rescored at 80.
	PI 1.1.3.5 SG80 Major uncertainties and assumptions are reflected in the management advice and limitations addressed through the appropriate decision rules.
	SG 100 All significant uncertainties and assumptions are addressed and reflected in the management advice, including appropriate decision rules.
	The performance of the fishery meets the requirements of the 80 Scoring Guidepost: sources of uncertainty are taken account of within the assessment by quantifying

confidence intervals and by adopting a cautious 15% base exploitation rate when the fishery is within the "healthy zone". PI 1.1.3.5 is rescored at 80.
PI 1.1.3.7
SG80 Clear decision making rules exist, are fully documented, but may not have been fully
evaluated. Decision rules are reconciled with appropriate reference points and with data and assessment limitations.
SG 100
Clear, documented and tested decision rules are fully implemented and have been fully reconciled with reference points, and the data and assessment limitations, and have been periodically evaluated.
The performance of the fishery meets the requirements of the 80 Scoring Guidepost
The, "last in first out" principle has been adhered to, as witnessed within SFA 6 in the 2010 season, and a 15% exploitation rate has been set. Although, as indicated above.
this does not appear to have been fully implemented in setting the 2010 TAC in SFA 6. However, it is noted that full implementation of decision rules is a requirement of
the SG100. PI 1.1.3.7 is rescored at 80.
PI 3A.6.2 SG 80
Results of monitoring are regularly interpreted in relation to reference points.
SG 100
Results of monitoring are quantitatively evaluated against precautionary reference points on a regular and timely basis.
The performance of the fishery meets the requirements of the 80 Scoring Guidepost: Stock status is now regularly interpreted in relation to reference points. PI 3A.6.2 is rescored at 80.
PI 3A.6.3
SG80 Practical procedures exist to reduce harvest in the light of monitoring results and
provide for stock recovery to specified levels. Measures can be implemented speedily
SG100 Practical procedures exist to reduce harvest in light of monitoring results and provide
for stock recovery to specified levels within specified time frames. There are well documented procedures to implement changes and these can be introduced with immediate effect
The <i>provisional</i> exploitation rate and harvest control rules for setting TACs provide
for the rebuilding of SSB to predefined reference points within specified timelines. PI 3A.6.3 is rescored at 80.
The Condition is closed out and the issues associated with the PIs will be part of the overall review of the on-going operation of the fishery at future annual audits.
Additional Comments
The assessment team recognises that problems in applying the Bayesian surplus production model due to the limited dynamic range of the stock under exploitation

have prevented the model from investigating uncertainty analytically, and have also impeded the calculation of Fmsy, thus preventing a rigorous implementation of the provisional harvest rules prescribed for the cautious zone. It is therefore recommended that future surveillance audits should monitor developments in these areas as work on the application of models and the framework progresses. The assessment team was somewhat concerned to find that although the harvest rules specify a cautious 15% base exploitation rate, the TAC adopted for SFA6 in 2010 is expected to generate an exploitation rate of 20%. Whilst this is probably not excessive for a northern shrimp stock, and is clearly substantially less than the rate that could have resulted had the TAC not been reduced, it nevertheless appears that the new rules-based framework was not fully implemented and it is recommended that this is monitored in future surveillance audits. The surveillance team recognises that the implementation of a new precautionary framework will necessarily proceed iteratively as capability allows. It is therefore recommended that future surveillance audits should continue to monitor the efficacy of the new framework, including the results of the management strategy evaluation prescribed in the IFMP, when these become available.

Item	P. borealis in SFA 5,6,7
3	Condition 2: Ecological Impacts of the Fishery
Activity assessed	This Condition relates to better understanding and informing management of the effects of the fishery on seabed habitats and communities in order that, where appropriate and necessary, management measures can be adopted. Eight PIs that were considered deficient in the initial assessment of the fishery were combined to create this Condition. The following bullet points reflect the narrative used for the 80 SG for each of these PIs:
	 The nature and distribution of all main habitat types are known in adequate detail. Information is recent. The distribution of fishing operations is monitored and the sensitivity of key habitats is understood (PI 2.1.1.1). Impacts of gear use on the habitat are identified or can be reliably estimated including reliable information on the extent, timing and location of use (PI 2.1.3.1). It can be demonstrated that the fishery does not have unacceptable impacts upon habitats within major fishing areas or on sensitive habitats elsewhere (PI 2.1.4.3). Appropriate information is available on the effects of the fishery on biological diversity, community structure and productivity. This does not indicate any unacceptable impacts (PI 2.1.4.4). Management strategies are in place to detect and reduce ecosystem impacts, although these may not have been fully tested, they are considered appropriate to adequately protect key elements of the ecosystem within main fishing areas (PI2.1.4.5). There are appropriate evaluated procedures used for measuring performance relative to the objectives (3A.3.4). Measures are being applied to minimise any environmental impacts and there is evidence that the measures are working (3A.7.1). Suitability of no-take zones and closed areas / seasons has been reviewed and these have been or are currently being implemented and enforced if and where currently being implemented and enforced if and where
	To ensure that, as a minimum, each of the PIs achieve the 80 scoring guidepost the assessment team recommended that the client should address the following:
	Within the second year of certification:a) Based on existing information, the spatial distribution of fishing effort should be documented.b) Existing data should be compiled and used to map seabed habitats and, where possible, associated species.
	 Within the third year of certification: c) Based on the initial assessments above, develop a program to fill key knowledge gaps. d) Review information on the sensitivity of the identified seabed habitats and associated species. e) Compile information from existing studies of gear impacts on the identified seabed habitats. f) Using information from a, b, c, d, e above, assess the likely impacts of the fishery - taking into account extent, timing and location. g) Assess the acceptability of the current impacts of the fishery on habitat structure. h) Assess the acceptability of current impacts on biological diversity, community

	 structure, and productivity. i) Review the effectiveness of existing policies, operating procedures and codes of conduct for coral conservation. Within the fourth year of certification: j) If appropriate, using the information and outcomes from the above, new management strategies should be outlined and measures implemented to detect and minimise ecosystem impacts of the fishery and to ensure that key elements of the ecosystem are protected. In particular, the suitability of no-take zones and closed areas / seasons should be reviewed, and implemented and enforced if and where appropriate
ASP Action Plan	Action Plan Condition 2 Existing information on the spatial distribution on fishing effort/catch, as well as existing data on seabed habitats and associated species will be compiled. This existing work will form the basis of a qualitative analysis on sensitivity of key habitats and gear impacts.
	The RAP will apply existing information to evaluate the risk of unacceptable impacts on ecosystem function as a result of the shrimp fishery and identify options for mitigation in areas where high risk of impairing ecosystem function may be identified. The RAP will also identify any important knowledge gaps.
	In consultation with NSAC, the client will work to develop a monitoring program and propose strategies to address areas where there is a high risk of impairing ecosystem function.
Conclusion from first annual audit	Progress appears to be on target for meeting the first milestone of this Condition, i.e. documenting the spatial distribution of fishing effort and compilation and mapping of seabed habitats and species.
	While noting that the client has identified and "ring fenced" resources the audit team recommend that the client move quickly on their appointment of staff to undertake this work.
Observations	The client has provided funding to the Marine Institute of Memorial University to compile the information required to satisfy the Year 2 milestone toward meeting the condition, and a progress report on the compilation was presented to the Audit Team. Randy Gillespie of the School of Ocean Technology (SOT), a specialist in Geographical Information Systems (GIS), presented maps of fishing effort data from observer records compiled in a format which would be easily overlaid with spatial habitat and ecological data.
	Additional kinds of data to be entered into the GIS in order to meet the Year 2 requirements, and sources for the information, were identified during a meeting with the client, DFO and Mr Gillespie. The GIS is designed in such a way that it should be possible to incorporate new data rapidly. Types of data to be added include distribution of fishing effort from logbooks, data on distribution of sensitive benthic species (sponges and corals) from research vessels and fishery observers, and data on shrimp habitat parameters (depth, bottom temperature, sediment type). As noted in the certification report and the Year 1 audit report, substantial data is available on these parameters.

This mapping project is closely related to ongoing work on a Newfoundland and Labrador seabed atlas undertaken by the SOT. In addition to funding provided by the client, other sources of funding (government) are supporting the shrimp fishery and habitat mapping initiative.
While it appears that meeting the Year 2 milestone toward the overall condition should be possible in a relatively short time, it will be important for the client to consider in the near future, in consultation with management authorities and others, how the spatial information will be used to meet the Year 3 and Year 4 milestones and ultimately satisfy the condition. It may be useful to consider recruiting expertise from DFO, academia, NGOs or other agencies to the task of examining the information on distribution of fishing effort in relation to sensitive habitats or species, determining whether the impacts are potentially important, and considering what additional mitigation measures are necessary if impacts are considered unacceptable. DFO's developing Centre of Excellence on cold-water corals and sponges, based in DFO's Newfoundland and Labrador Region, might be a good source of such expertise. This project might fit well with the sponge/coral conservation strategy to be developed for Newfoundland and Labrador Region for 2012, or with other mapping and fishery impacts studies in the region. Establishment of a working group on trawl fishery impacts might be a way to carry this forward and to ensure that meeting the MSC condition for this shrimp fishery both contributes to and benefits from other related initiatives.
Seabed Atlas of Newfoundland and Labrador. www.seabed-atlas-nl.ca
While good progress has been made on setting up a GIS and entering data, the Year 2 milestone as outlined above has not been attained and so progress is behind target. In accordance with the MSC Fisheries Certification Methodology v6 if progress is judged to be behind target the certification body shall specify remedial action and time frame within which it shall be achieved.
The surveillance team therefore stipulates that the work as outlined in the Year 2 milestone, i.e. Based on existing information, the spatial distribution of fishing effort should be documented; Existing data should be compiled and used to map seabed habitats and, where possible, associated species, should be completed by December 31^{st} 2010 and evidence of this should be provided to the assessment team by this date.

Item	P. borealis in SFA 5,6,7
4	Condition 3: Potential Impacts on Protected, Endangered and Threatened Species
Activity assessed	 This Condition relates to ensuring that management takes into account any significant the effect caused by the fishery on Protected, Endangered or Threatened (PET) species. The following bullet point reflects the narrative used for the 80 SG for the single PI that was considered to be deficient in this area of the assessment: Management objectives are set to detect and reduce impacts on protected, endangered and threatened (PET) species. Accompanying strategies are designed to adequately protect endangered and threatened species within main fishing areas (PI 2.2.2.1).
	To ensure that, as a minimum, this PI achieves the 80 SG the assessment team recommended that the client address the following points:
	 Within the second year of the certification: a) Explicit recognition should be given in the fishery management plan to the potential impacts of the fishery on protected, endangered and threatened species. b) The adequacy of the existing management measures in protecting such species should be assessed in relation to identified objectives. c) Additional management measures to detect and reduce impacts on protected, endangered and threatened species should be put in place if necessary.
ASP Action Plan	Action Plan Condition 3 It is agreed the IFMP for shrimp will be updated to reference the Recovery Plans and mitigation measures implemented in the Northern Shrimp fishery for these species.
	The Client will undertake to communicate appropriate information to all vessels in the shrimp fishery regarding species on the COSEWIC list not already covered as "protected, endangered or threatened species" under SARA.
Conclusion from first annual audit	The assessment team consider that the new wording in the draft IFMP to be adequate to meet part (a) of the Condition. Once the IFMP, including this wording, is published the assessment team will able to confirm that this part has been met.
	If the client were to obtain a written opinion from the wolffish recovery team (or others responsible for leading on wolffish recovery) confirming that the impact of the shrimp fishery on spotted and northern wolffish is minimal, and that no further measures were required, parts (b) and (c) of the Condition would be met and the Condition could be closed out at the next annual audit.
Observations	No new species which might be impacted by this fishery have been added to Schedule 1 of the <i>Species at Risk Act</i> (SARA) since the Year 1 audit. Accordingly, the two wolffish species listed under SARA at the time of the certification report, northern wolffish and spotted wolffish, remain the only protected, endangered and threatened species of relevance to the fishery.
	The Integrated Fisheries Management Plan (IFMP), whose most recent version was posted on the DFO web site in May 2010, makes explicit reference to the need to

	protect species listed under SARA to and contribute to their recovery. As noted in the Year 1 audit report, based on a draft of the IFMP seen at that time, the Plan notes the potential impact of the fishery on the two wolffish species listed under SARA, notes the existence of a recovery strategy for these species, and indicates that shrimp fishing licence conditions prohibit retention of any individuals of these species and require return in good condition if alive. Accordingly, part (a) of the condition is met. Based on information contained in a review of bycatch in the shrimp fishery in 2007- 2009 (large and small vessels, SFAs 4, 5, 6, 7) to be submitted to an upcoming NAFO assessment (Orr et al MS), the audit team was advised in writing by the Section Head, Marine Species at Risk, in DFO's Science Branch in St. John's, that the impact of the shrimp fishery on these species was minimal and unlikely to have a significant impact on recovery of these populations. This letter means that parts (b) and (c) of the condition above have been met.
	A full review of the status of the listed wolffish species is planned by DFO during September 2010, in part in preparation for a mandatory COSEWIC (Committee on Status of Endangered Wildlife in Canada) status review in 2011. This review should provide further detail on current status of wolffishes and the potential impact of the shrimp fishery (which based on the referenced letter is minimal) and other fisheries on their populations.
	Reference
	Mark Simpson, Section Head, Marine Fish Species at Risk, DFO Science Branch, St. John's, letter to Paul Knapman, September 2, 2010.
	Orr, D., P. Veitch, D. Sullivan, J. Firth, C. Peters and T. Inkpen MS. Groundfish by- catch within the northern shrimp fishery off the eastern coasts of Newfoundland and Labrador over the years 2007-2009. MS for presentation to NAFO, fall 2010.
Conclusion	There have been textual changes to the IFMP and written confirmation, based on a thorough bycatch analysis, that the impact of this fishery on the two protected, endangered and threatened species potentially affected by the fishery is minimal and unlikely to have a significant impact on their recovery.
	This Condition of Certification is related to PI 2.2.2.1. On the basis of the above commentary the score associated with this PI is adjusted as follows:
	80 SG: Management objectives are set to detect and reduce impacts. Accompanying strategies are designed to adequately protect endangered and threatened species within main fishing areas.
	100 SG: Tested management objectives are set to detect and reduce impacts Accompanying strategies are designed to adequately protect endangered and threatened species.
	The performance of the fishery meets the requirements of the 80 Scoring Guidepost: management recognises the need to meet SARA objectives; an analysis of the bycatch of species in the fishery confirms there is only minimal impact on protected, endangered and threatened species; and, in the absence of significant risk to these species there is presently no need for strategies for protection.

The PI is re-scored at 80. The Condition is closed out and the issues associated with this PI will be part of the overall review of the on-going operation of the fishery at future annual audits.
<u>Additional Comments</u> The surveillance team note that further information on wolffishes will be forthcoming from DFO's September 2010 review and COSEWIC's 2011 assessment. Future audits should monitor whether additional protected, endangered or threatened species are added to SARA Schedule 1, which might be affected by the fishery.

Item	P. borealis in SFA 5,6,7
5	Condition 4: Unobserved Fishing Mortality
Activity assessed	 This Condition relates to understanding the unobserved fishing mortality on the target species. In this instance, because illegal, unreported and unregulated (IUU) fishing and unobserved fishing is not considered to be an issue in the fishery this Condition relates to the mortality of the gear during the fishing operation. The following bullet point reflects the narrative used for the 80 SG for the PI that was considered to be deficient in this area of the assessment: Information from existing work has allowed qualitative estimates of unobserved fishing mortality to be made (PI 2.1.2.3).
	To ensure that, as a minimum, that this PI achieves the 80 SG the assessment team recommend that within the second year of the certification:a) Information from existing studies should be compiled to produce a qualitative assessment of probable unobserved fishing mortality on target and non target species in this fishery.
ASP Action Plan	Action Plan Condition 4 It is agreed that the relevant RAP assessment of northern shrimp will consider available studies on unobserved mortality and make a qualitative determination of the level of unobserved fishing mortality.
Conclusion from first annual audit	Progress on meeting this Condition appears to be on target as funds have been set aside and the client is actively seeking to appoint someone to undertake this work. The audit team recommend that this work commence as soon as possible to ensure that this Condition can be met, rescored and closed out at the next annual audit as agreed in the Action Plan.
Observations	The client has provided funding to the Marine Institute of Memorial University to prepare a review of information on unobserved fishing mortality from shrimp trawling, and assess the potential impact. The audit team met with Scott Grant of the School of Sustainable Aquatic Resources of the Marine Institute, who presented a draft review of this topic (Grant and Hiscock MS).
	The review is a very thorough and comprehensive summary of available information on potential unobserved fishing mortality from the Newfoundland shrimp fishery. This is a difficult topic for study, given the problems with making observations around trawls at depth, but the review summarises relevant available information from a very wide range of sources. The review examines potential unobserved mortality from different parts of the trawl (ground gear, contact with the Nordmore grate, passage through codend mesh) and provides a qualitative assessment of potential mortality on different species found in the bycatch. The overall conclusion is that unobserved mortality is likely to be low, and thus that bycatch information would assess impact of the gear on non-target species relatively well.
	From what the team could determine, the information in the review is comprehensive and the conclusions sound. Dr Grant sought feedback on the report (subsequently provided by the team) and intends to produce a final version within a few weeks.
	The report notes that harvesters continue to seek ways of minimising bycatch, since sorting catches on board is a significant cost to their operations. Some vessels have

	begun using square mesh in the codends, although prevalence of this practice is unknown.
	The team encourages the client and Dr. Grant to ensure that this review gets wide circulation, as it is a valuable contribution to the literature on ecosystem impacts of trawl fisheries in Canada (and probably internationally). The Client Action Plan indicates that a review of unobserved fishing mortality would be taken through a DFO RAP (Regional Advisory Process) on northern shrimp, and this would indeed help to ensure that the information is reviewed in a meeting format and could be published in DFO's CSAS Research Document series. The team encourages Dr. Grant to publish this review in a Marine Institute report series, if the CSAS Research Document option is not possible, and to submit it for publication in the primary literature.
	References
	Grant, S. M. and W. Hiscock MS. Unobserved fishing mortality in the Canadian northern shrimp fishery: Shrimp Fishing Areas 5, 6 and 7 (Newfoundland-Labrador Shelf) and Shrimp Fishing Areas 13, 14, and 15 (Scotian Shelf). Submitted to Association of Seafood Producers, St. John's, August 2010. 29 pp.
Conclusion	The team concludes that this condition has been met. The review by Grant and Hiscock thoroughly summarises available information and the conclusions appear sound. Overall it appears that unobserved fishing mortality would is relatively low in this fishery. Review through the DFO RAP process or by submission to a journal would help to ensure that the information and conclusions were peer reviewed.
	The team recommends that the client and the authors of the review make every effort to ensure that this review is widely disseminated, as it represents a good contribution to knowledge of ecosystem impacts of trawl gear. The DFO RAP process, publication in a report series (e.g. CSAS Research Documents, Marine Institute) and/or publication in primary literature would be possible mechanisms for ensuring wide distribution.
	This Condition of Certification is related to PI 2.1.2.3 On the basis of the above commentary the score associated with this PI is adjusted as follows:
	80 Scoring Guidepost: Information from existing work has allowed qualitative estimates of unobserved fishing mortality to be made.
	100 Scoring Guidepost: Research has been carried out on unobserved fishing mortality allowing quantitative estimates to be made (or it is known that significant unobserved mortality does not occur).
	The performance of the fishery meets the requirements of the 80 Scoring Guidepost: The review by Grant and Hiscock has provided a summary of available information and a qualitative estimate of unobserved fishing mortality. The PI is re-scored at 80. The Condition is closed out and the issues associated with this PI will be part of the overall review of the on-going operation of the fishery at future annual audits.

Item	P. borealis in SFA 5,6,7
6	Condition 5: Measurable and Explicit Long and Short Term Objectives
Activity assessed	 This Condition relates to the need for the management system to clearly identify short and long term objectives and implement precautionary measures where sufficient information is lacking. The following bullet points reflect the narrative used for the 80 SG for each PI that was considered to be deficient in this area of the assessment: The management system contains short and long-term resource and environment objectives (PI 3A.3.1). Appropriate, formalised measures exist to evaluate and implement a precautionary approach in the development and application of operational procedures in the absence of sufficient information (PI 3A.3.3). To ensure that, as a minimum, that these PIs achieve the 80 SG the assessment team recommended that within the third year of the certification the client should ensure that: a) Management plans should more explicitly specify measurable long and short term resource and environmental objectives, and appropriate formalised measures should be used to implement a precautionary approach in the absence of sufficient information approach in the absence of sufficient should ensure that:
ASP Action Plan	Action Plan Condition 5 The client will work with DFO in consultation with NSAC to discuss the development measurable and explicit long and short term objectives and include these in the IFMP.
Conclusion from first annual audit	Progress on meeting this Condition appears to be ahead of target, i.e. a revised IFMP is expected soon and will include short and long term objectives for the resource and the ecosystem; and, formalised measures for using a precautionary approach.
Observations	 The Northern Shrimp IFMP has been updated so that Section 1.1 provides a set of strategies and management measures to achieve objectives that are stated under three principles, Conservation and Sustainable Harvest, Benefits to Stakeholders, and Co-Management of the Resource. The section on <u>Conservation and Sustainable Harvest</u> cites objectives, strategies and measures that refer to, inter alia, application of the precautionary approach to harvesting; stock assessment and TAC setting; the utilisation of appropriate exploitation rates and reference points; the management of activity in ecologically sensitive areas; and promoting the development of sustainable fishing gear and practices. The section on <u>Benefits to Stakeholders</u> cites objectives, strategies and measures promoting commercially viable and sustainable fishing based on fair access and equitable sharing, with corresponding detailed rules on access (including agreements on aboriginal entitlement), licensing (including the principle of Last In First Out), and Enterprise Allocation. The section on <u>Co-management of the Resource</u> cites objectives, strategies and measures relating to the structure and processes for making TAC decisions for: the Flemish Cap fishery (SFA7, NAFO 3L) in NAFO; the joint fishery with Greenland in NAFO Division OA and Subarea 1 by bilateral agreement: the Canadian fishery in SEAs 2.4.5 and 6 based on

	 decisions at the Northern Shrimp Advisory Committee; and collaborations on scientific research.
Conclusion	With regard to objective, strategies, and measures, the IFMP now contains most of the requirements that led to the setting of this condition. It contains an explicit commitment to the implementation of the precautionary approach when setting exploitation rates for the directed fishery, and it contains a provisional framework of reference points and harvest rules for the directed fishery.
	Although the IFMP refers to individual strategies and management measures for ecologically sensitive areas, it does not contain a higher level commitment to applying a precautionary approach to management of the impact of fishing on sensitive habitat, species, and the ecosystem (i.e. a commitment to precautionary action in the absence of appropriate knowledge). The team considers that this is a significant omission that should be remedied.
	Also, for the existing text to be consistent with the MSC Principle 1 and 2 it is recommended to include modest additions along the lines illustrated by the following:
	Conservation and Sustainable Harvest 3 rd overarching objective: 'To mitigate the impacts on other species, <i>habitat</i> , and the ecosystem where shrimp fishing occurs'
	3 rd bullet of management measures: 'Control fishing mortality by setting an annual TAC, <i>taking into account the role of shrimp in the ecosystem</i> '
	After 6 th bullet of management measures, add extra bullet: ' <i>Promote the use of fishing gear and fishing practices that minimise impact on sensitive habitat</i> ' The key word here is habitat, as opposed to species.
	Co-management of the Resource 3^{rd} overarching objective: co-management should take into account the PA and harvest rules by adding text after Fisheries Act, for example, 'in line with the implementation of the precautionary approach and harvest rules'.
	Progress against this Condition is on target for delivery within the third year of the certification.

Item	Any complaints against the certified operation; recorded, reviewed and actioned
7	No complaints that would potentially compromise the certification were reported or brought to the attention of the audit team during the site visit.

Item	Any relevant changes to legislation or regulation.
8	There were no reported changes in legislation or regulation that affected the fishery during the audit period.

Item	Any relevant changes to management regime.
9	There were no other relevant reported changes to the management regime that affected the fishery during the audit period.

Item	Any other relevant changes.
10	Fogo Island Cooperative Society is no longer a member of ASP. As such the Cooperative can only gain access to MSC certified shrimp from the Canadian Northern Prawn Fishery via an ASP member.
	It has recently been announced that the Cooperative have entered into their own assessment of the fishery. This assessment will have to be undertaken using the MSC's Fisheries Assessment Methodology (FAM), i.e. a different assessment tree to that used in the original assessment of the fishery, and will have to be in accordance with MSC Technical Advisory Board (TAB) Directive 010 (v2) "certificate sharing" and TAB Directive 015 (v2) "harmonisation of certified and in assessment fisheries".

Item	Overall Conclusions regarding <i>P. borealis</i> in SFA 5, 6, 7
11 11	 Overall Conclusions regarding <i>P. borealts</i> in SFA 5, 6, 7 Conditions 1, 3 and 4 have been met, rescored and closed out and and the issues associated with their respective performance indicators will be part of the overall review of the on-going operation of the fishery at future annual audits. Progress on meeting milestones associated with Condition 2 are behind target. In accordance with the MSC Fisheries Certification Methodology v6 remedial actions and time frame for their achievement have been set by the surveillance team. These include: a. work as outlined in the Year 2 milestone, i.e. Based on existing information, the spatial distribution of fishing effort should be documented; Existing data should be compiled and used to map seabed habitats and, where possible, associated species, should be completed by December 31st 2010 and evidence of this should be provided to the assessment team by this date.

Condition 5 is due to be met within the third year of the certification and so remains
open. Progress is on target.
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.
MSC Certification should therefore continue subject to the delivery of the required outcomes identified for Condition 2 above within the specified timeline and to the satisfaction of the surveillance team.

Information Sources:

Meetings

August 31st, 2010: Meeting with members of the client group and DFO Atlantic Region, St John's.

Reports etc

Standards and Guidelines used:

- 1. MSC Principles and Criteria for Sustainable Fishing
- 2. MSC Fishery Certification Methodology Version 6. September 2006
- 3. TAB Directives all

Appendix A

Canadian Northern Prawn Trawl Fishery Shrimp Fishing Areas 5, 6, 7, 13, 14, 15

Marine Stewardship Council Certification – 2010 Surveillance Audit

Certification Body: Moody Marine Ltd Surveillance Audit

MSC certification requires annual surveillance audits of all certified fisheries. 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, we shall be speaking with representatives of the fishery, fishery management and any other stakeholder who would like to provide information that may help in our audit. We will be in Dartmouth on 30th August and St John's on 31st August.

Should you have any information on this fishery that you feel should be considered in the assessment, please advise us. 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

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9th August 2010