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## Intertek Fisheries Certification (IFC)

### **4<sup>th</sup> Annual Surveillance Report**

*Pandalus borealis* SFA 1 Fishery Certificate No.: MML-F-107

*Pandalus borealis* SFA 2, 3 & 4 Fishery Certificate No.: MML-F-104

*Pandalus borealis* SFA 5 & 6 Fishery Certificate No.: MML-F-126

*Pandalus borealis* SFA 7 Fishery Certificate No.: MML-F-105

*Pandalus montagui* SFA 2, 3 & 4 Fishery Certificate No.: MML-F-106

### **Client**

Bruce Chapman  
1362 Revell Drive, Manotick, Ontario, K4M 1K8

### **Representing**

Northern Coalition, Baffin Fisheries Coalition &  
the Canadian Association of Prawn Producers as the lead organization.  
(*Pandalus borealis* SFA 1, *SFA 2, 3 & 4* & *Pandalus montagui* SFA 2, 3 & 4)

Northern Coalition, Fogo Island Coop, Association of Seafood Producers  
& the Canadian Association of Prawn Producers as the lead organization.  
(*Pandalus borealis* *SFA 5 & 6*, *SFA 7*)

### **Authors**

Howard Powles & Ian Scott

August 2015

**Please Note:** In no way should any notification from any IFC representative be regarded as advice or consultancy. If you feel that advice or consultancy has been provided, please bring this to IFC's attention directly.



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\*Dear stakeholder. This fishery commenced full assessment with Intertek Fisheries Certification (IFC). During the assessment the client transferred to Acoura Marine Ltd. This report, and subsequent certification product, is from Acoura Marine. Any reference in this report to Intertek or IFC should be read as Acoura Marine Ltd.

Any communication related to this fishery assessment should be directed to Acoura Marine as per the contact details below.

1. GENERAL INFORMATION

Name of Fishery	<i>Pandalus borealis</i> SFA 1 Fishery		
Certificate #	MML-F-107	Date of expiry	19 <sup>th</sup> March 2017
Date of surveillance audit	23 – 25 June 2015		
Species	Northern Shrimp ( <i>Pandalus borealis</i> )		
Stock Name	Shrimp Fishing Area 1		
Geographical Area	North west Atlantic		
Fishing Method/s	Trawl		
Client Group	Northern Coalition, Baffin Fisheries Coalition and the Canadian Association of Prawn Producers		
Other Eligible Fishers	None		

Name of Fishery	<i>Pandalus borealis</i> SFA 2, 3 & 4 Fishery		
Certificate #	MML-F-104	Date of expiry	23 <sup>rd</sup> June 2016
Date of surveillance audit	23 – 25 June 2015		
Species	Northern Shrimp ( <i>Pandalus borealis</i> )		
Stock Name	Shrimp Fishing Area 2, 3 & 4		
Geographical Area	North west Atlantic		
Fishing Method/s	Trawl		
Client Group	Northern Coalition, Baffin Fisheries Coalition (SFA 2 & 3 only) & the Canadian Association of Prawn Producers		
Other Eligible Fishers	None		

Name of Fishery	<i>Pandalus borealis</i> SFA 5 & 6 Fishery		
Certificate #	MML-F-126	Date of expiry	23 <sup>rd</sup> June 2016
Date of surveillance audit	23 – 25 June 2015		
Species	Northern Shrimp ( <i>Pandalus borealis</i> )		
Stock Name	Shrimp Fishing Area 5 & 6		
Geographical Area	North west Atlantic		
Fishing Method/s	Trawl		
Client Group	Northern Coalition, Fogo Island Coop, Association of Seafood Producers & the Canadian Association of Prawn Producers		
Other Eligible Fishers	None		

Name of Fishery	<i>Pandalus borealis</i> SFA 7 Fishery		
Certificate #	MML-F-105	Date of expiry	23 <sup>rd</sup> June 2016
Date of surveillance audit	23 – 25 June 2015		
Species	Northern Shrimp ( <i>Pandalus borealis</i> )		
Stock Name	Shrimp Fishing Area 7		
Geographical Area	North west Atlantic		
Fishing Method/s	Trawl		
Client Group	Northern Coalition, Fogo Island Coop, Association of Seafood Producers & the Canadian Association of Prawn Producers		
Other Eligible Fishers	None		

Name of Fishery	<i>Pandalus montagui</i> SFA 2, 3 & 4 Fishery		
Certificate #	MML-F-106	Date of expiry	23 <sup>rd</sup> June 2016
Date of surveillance audit	23 – 25 June 2015		
Species	Striped Shrimp ( <i>Pandalus montagui</i> )		
Stock Name	Shrimp Fishing Area 2, 3 & 4		
Geographical Area	North west Atlantic		
Fishing Method/s	Trawl		
Client Group	Northern Coalition & the Canadian Association of Prawn Producers		
Other Eligible Fishers	None		

All Units Of Certification

Surveillance level and type	Level	6	Type	On-site
	Any changes in surveillance activity since PCDR / previous surveillance report		None	
	1st Surveillance			<input type="checkbox"/>
	2nd Surveillance			<input type="checkbox"/>
	3rd Surveillance			<input type="checkbox"/>
	4th Surveillance			<input checked="" type="checkbox"/>
	Other			<input type="checkbox"/>
Surveillance program changed?				<input type="checkbox"/>
Surveillance team	Lead assessor:	Ian Scott		
	Assessor:	Howard Powles		
CAB name	Acoura Marine Ltd			
CAB contact details	Address	Fisheries Department 6 Redheughs Rigg South Gyle Edinburgh EH12 9DQ		
	Phone/Fax	0131 335 6662		
	Email	<a href="mailto:fisheries@acoura.com">fisheries@acoura.com</a>		
	Contact name	Ian Scott		
Client contact details	Address	1362 Revell Drive, Manotick, Ontario, K4M 1K8		
	Phone/Fax	613 692 8249		
	Email	<a href="mailto:bchapman@sympatico.ca">bchapman@sympatico.ca</a>		
	Contact name(s)	Bruce Chapman		

## 2. BACKGROUND

### 2.1 Borealis SFA 1

#### 2.1.1 Changes since last published report

##### Management systems & Relevant Regulations

See Appendix 5.

##### Personnel involved in science, management or industry

There have been no changes in DFO personnel.

##### Scientific base of information - including stock assessments

###### ***Changes to scientific base of information***

Stock status is reviewed annually by the NAFO-ICES *Pandalus* Assessment Group (NIPAG) (NAFO 2014a), with advice provided by the NAFO Scientific Council (NAFO 2014b). Information and a provisional assessment are provided by scientists based at the Greenland Institute of Natural Resources. The most recent assessment was in September 2014.

All data series were updated by one year and the Schaefer production model was run as in previous years to provide information and advice on stock status. While there were not any material changes to the stock assessment methodology or data sources, there was a minor change related to the way cod predation was incorporated into the population model (Kingsley 2014a). Although this change did not appreciably affect the assessment results relative to the previous years it did increase uncertainty around the shrimp biomass results.

A study will soon be published on population structure of *P. borealis* in the northwest Atlantic based on genetic studies. This should help to define the relationships between shrimp in different areas. The study was conducted by scientists based in Norway, with samples from much of the species' range in the northwest Atlantic.

###### ***Stock status update***

Stock biomass has been declining from its maximum reached in 2004. Survey and fishery CPUE show different decline patterns but both are decreasing. The modelled biomass in 2014 was at the same level as in the early 1990s, near  $B_{msy}$  (Fig. 1).

Total mortality has been increasing over the period covered by the population model, and since 2006 has been close to  $Z_{msy}$  (Fig. 2).

NAFO (2014a) summarized the assessment results as follows:

- ***Recruitment.*** Pre-recruits at CL 14–16.5 mm are few and, in absolute terms, have been so since 2008. As a consequence, short-term recruitment is expected to be low. The number at age 2 in 2014 is near its 20-year median.
- ***Biomass.*** A stock-dynamic model gave a maximum biomass in 2004 with a subsequent continuing decline. At the end of 2014, the stock will be at  $B_{msy}$ , with a risk of being below  $B_{lim}$  (30% of  $B_{msy}$ ) of 2%.
- ***Mortality.*** With 2014 catches projected at 90,000 mt the risk that total mortality will exceed  $Z_{msy}$  is estimated at about 53%. In 2014, Atlantic cod remained concentrated in southerly areas where shrimp is now scarce, but cod biomass is high and predation pressure is expected to be similar to the previous 3 years.

Based on the NAFO Scientific Council objective of maintaining the risk that total mortality would exceed the MSY level at less than 35%, NAFO (2014a) advised a TAC for 2015 of 60,000 mt. As in previous years, NAFO (2014b) provided a table showing risk levels associated with different assumptions for future catches and future cod predation that  $B_{msy}$ ,  $B_{lim}$  and  $Z_{msy}$  reference levels would be exceeded.

The distribution of the shrimp stock has shifted over recent years. Following an increase in catches in southerly regions (south of 66°N) and a general expansion in the number of statistical areas fished in the late 1990s, from the early 2000s the distribution of the shrimp fishery has moved northwards with a decrease in the number of statistical areas fished (NAFO 2014a). One consequence of this shift has been a decreased overlap with cod distribution. However,

with the increase in cod biomass, in the population model the shrimp mortality due to cod predation has remained more or less constant.

In addition, in recent years the biomass trajectories in inshore (Greenland) and offshore fishing areas have been different, with the latter continuing to decline while the former has remained more or less stable (Fig. 4). In 2014, inshore biomass was higher than offshore for the first time.

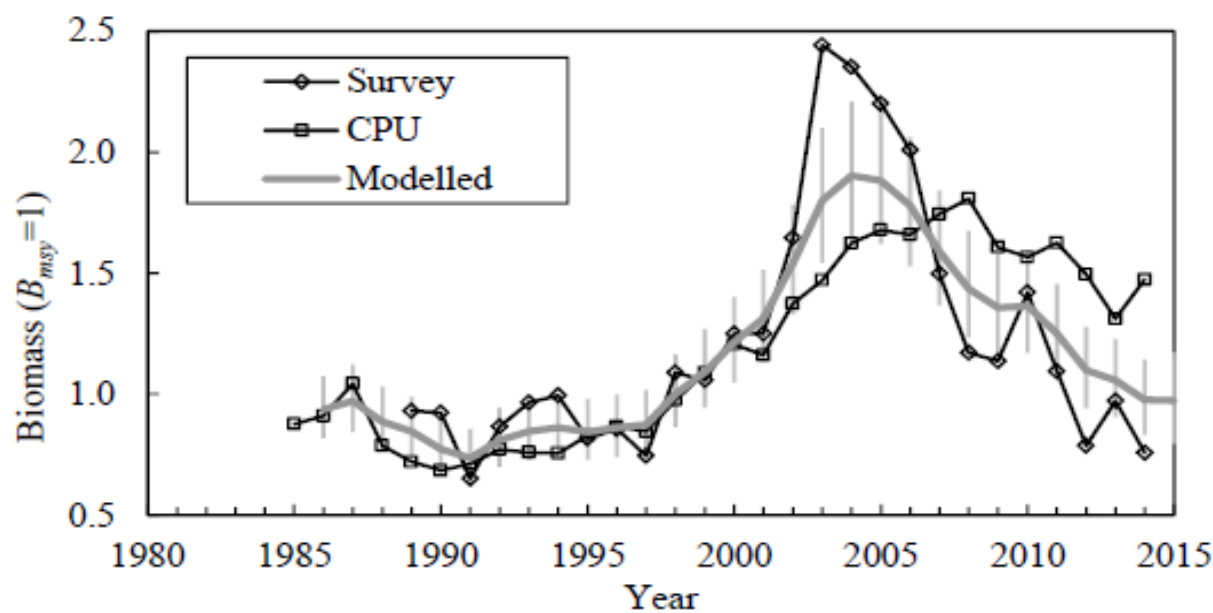
**2.1.2 Updates on enhanced fishery's position in relation to scope criteria**

Not applicable.

**2.1.3 Any developments or changes within the fishery which impact traceability or the ability to segregate between fish from the Unit of Certification (UoC) and fish from outside the UoC (non-certified fish)**

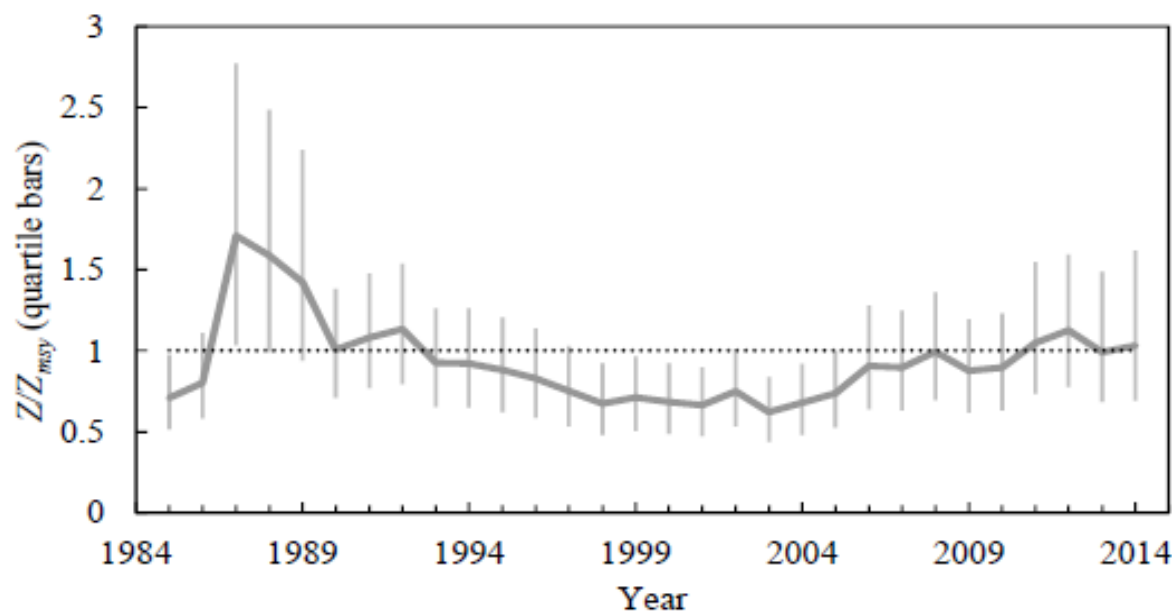
None.

**Figure 1: Northern Shrimp in SA 1 and Canadian SFA1: trajectory of the median estimate of stock biomass relative to  $B_{msy}$  at start of year 1986–2015, with median CPUE and survey indices.**



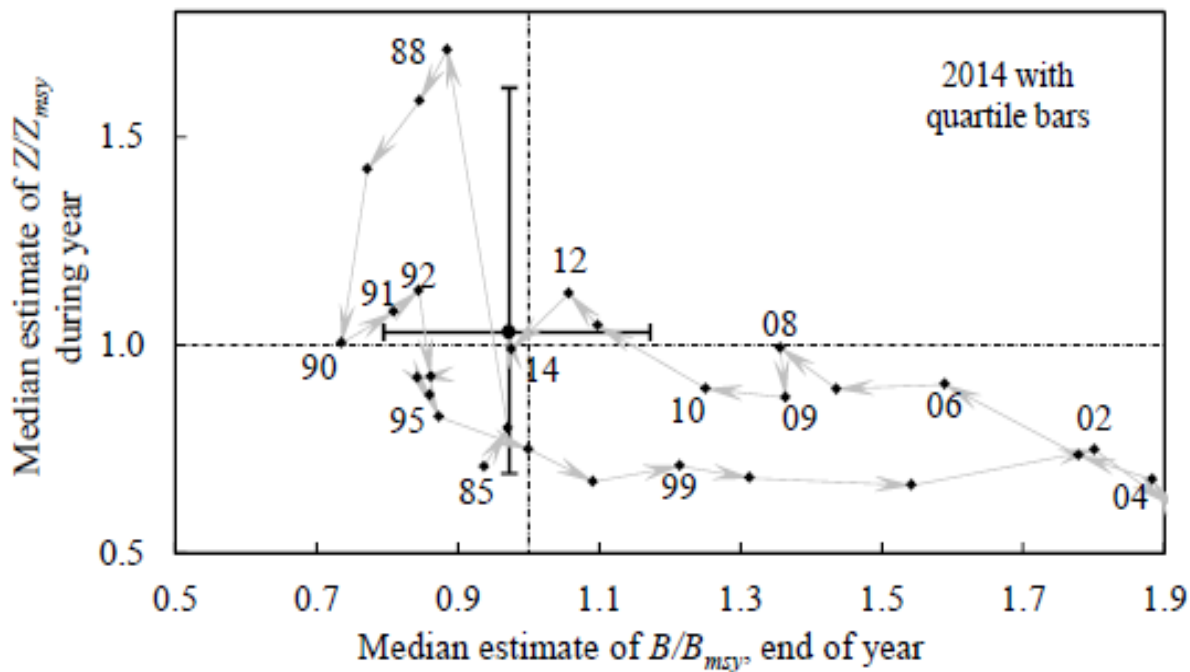
Source: NAFO (2014a)

**Figure 2. Northern Shrimp in SA 1 and Canadian SFA1: trajectory of the median modelled estimate of mortality relative to  $Z_{msy}$ .**



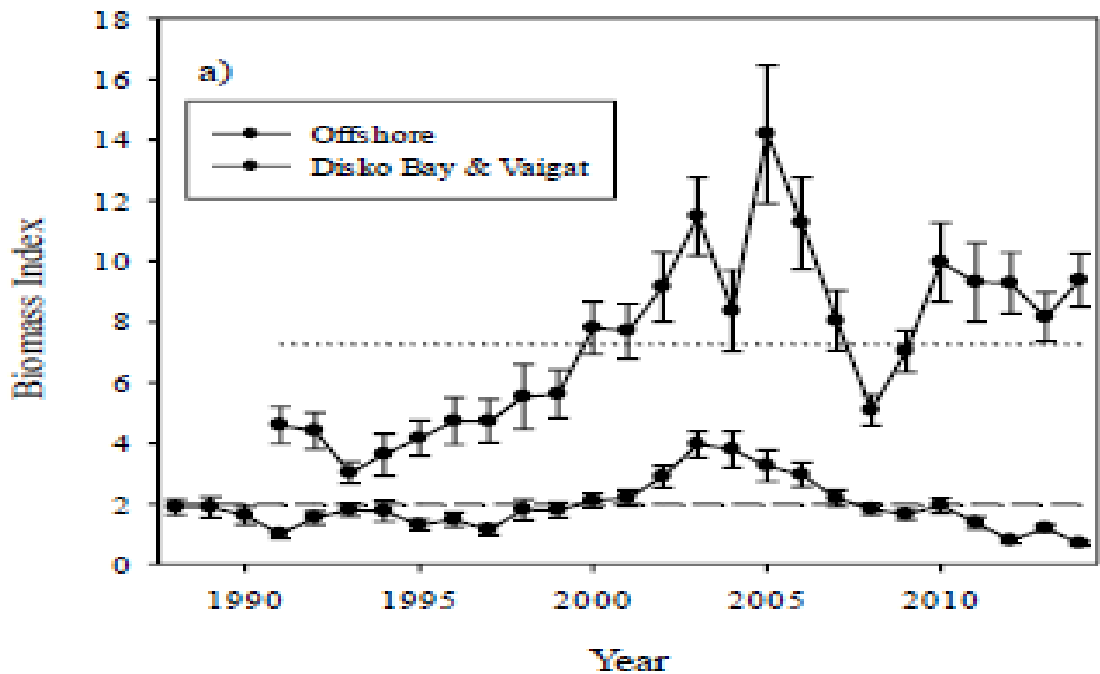
Source: NAFO (2014a)

**Figure 3: Northern shrimp in Subarea 1 and Canadian SFA1: trajectory of relative biomass and relative mortality, 1985–2014.**



Source: NAFO (2014a)

**Figure 4. Northern Shrimp in Subarea 1 and Canadian SFA 1: survey mean catch rates inshore (upper line) and offshore (lower line).**



Source: NAFO (2014a)



## **2.2      Borealis SFA 2, 3 & 4**

### **2.2.1    Changes since last published report**

#### **Management systems & Relevant Regulations**

See Appendix 5.

#### **Personnel involved in science, management or industry**

There have been some changes in DFO personnel due to retirements. This may impact the ability to complete the work programme.

#### **Scientific base of information - including stock assessments**

Changes to management areas in 2013/14, led to SFA 2 and SFA 3 being replaced by the Eastern Assessment Zone (EAZ) and Western Assessment Zone (WAZ). SFA 4 remains the same.

Biennial assessments for northern and striped shrimp (supplemented with a status update in intervening years) are done under the DFO Regional Advisory Process (RAP). The most recent full assessment was conducted in February 2015. TACs are set by DFO early in the calendar year, with input from stakeholders via the NSAC, and consistent with the reference levels established using the DFO Precautionary Approach framework.

Stocks are assessed on the basis of a comparison of trawl survey results to identified reference levels of biomass and exploitation rate.

##### *Eastern Assessment Zone (EAZ) (DFO 2015EW)*

The stock remained in the healthy zone, well above the Upper Stock Reference level (Fig. 5). In 2014/15, the Exploitation rate index was just below 10%, with 60% of the TAC taken (due to ice conditions late in the season this is expected to be most of the year's catch). Female spawning stock biomass is just below the long-term mean (Fig. 6). Recruitment prospects are uncertain, as few pre-recruits are taken in the survey trawl.

Annual landings have fluctuated around 6,000 mt since 1997 (Fig. 7).

##### *Western Assessment Zone (WAZ) (DFO 2015 EW)*

With the change in management areas in 2013, TACs were established for *P. borealis* in the WAZ for the first time. In 2014, a new survey was initiated using the same vessel and gear as for the EAZ. This should bring consistency to assessments in these areas. As a result of these changes, a DFO Precautionary Approach framework is not in place as this will require the establishment of a survey time series of at least 5 years. In the interim the assessment is based on maintaining relatively low exploitation rate indices.

Potential exploitation rate indices for 2013/4 and 2014/5 (based on TACs) were around 6%, while the realised indices (based on catch) were around 4%. These are considered precautionary harvest levels.

Catches increased in 2013/4 with the new management areas, but have been well below TACs in 2013/4 and 2014/5 (Figure 8).

##### *SFA 4 (DFO 2015all)*

The stock is in the healthy zone of the PA framework based on female spawning stock biomass (Figure 9). The Exploitation Rate Index in 2014/15 was 11.2%, compared to around 6% in 2009/10.

Female SSB and fishable biomass have been more or less constant since 2007 (available time series since 2005), while commercial CPUE has been above the long-term mean since 2009 (available time series since 1988).

TACs and catches have increased from 11,000 mt in 2010/11 to 14,971 mt in 2014/5 (Fig. 10).

### **2.2.2    Updates on enhanced fishery's position in relation to scope criteria**

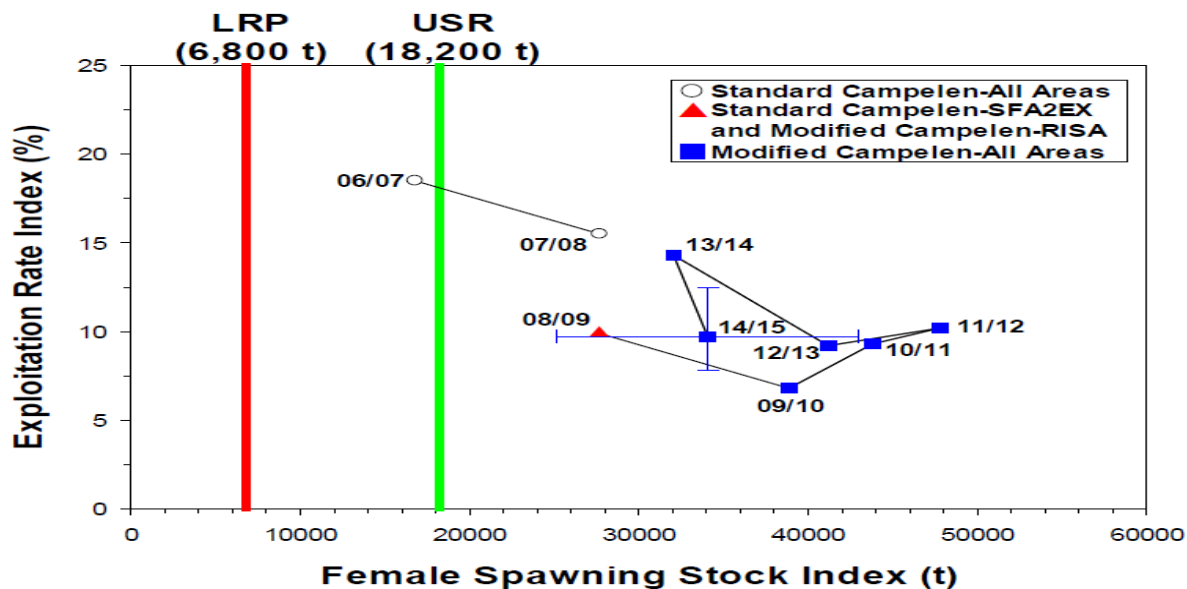
Not applicable

Not applicable.

**2.2.3    Any developments or changes within the fishery which impact traceability or the ability to segregate between fish from the Unit of Certification (UoC) and fish from outside the UoC (non-certified fish)**

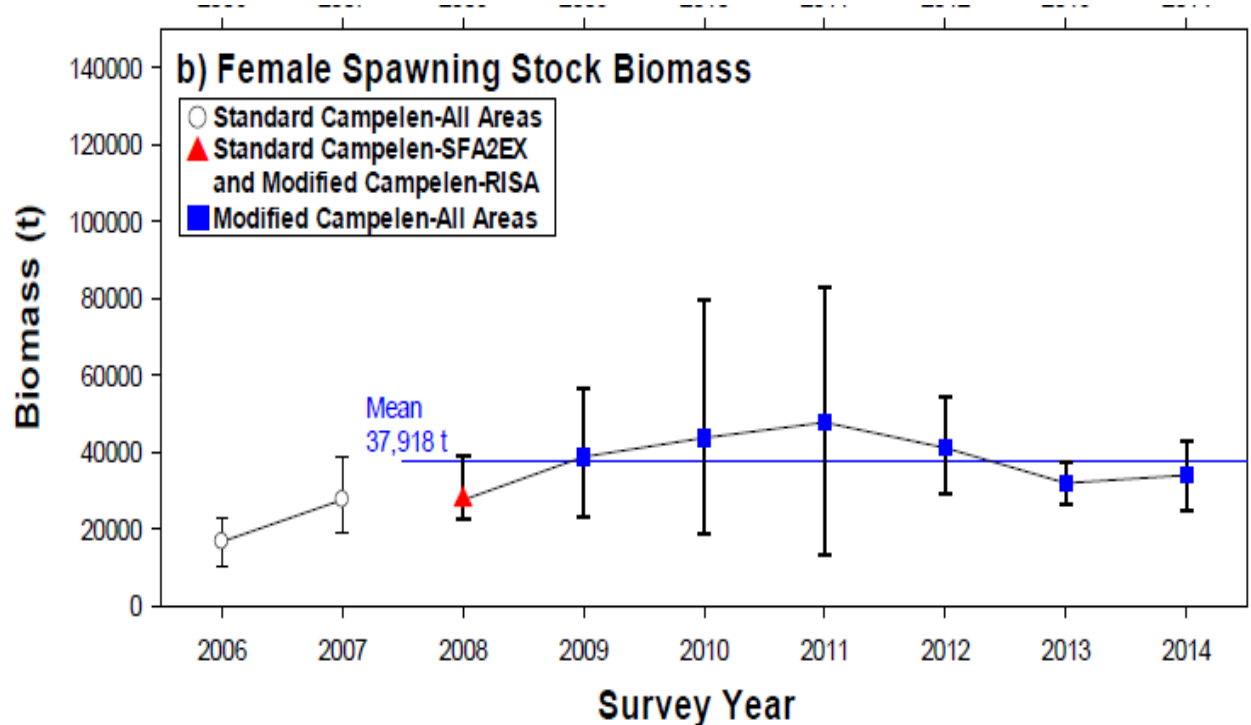
None

**Figure 5: Eastern Assessment Zone - *Pandalus borealis* female spawning stock biomass and exploitation rate indices.**



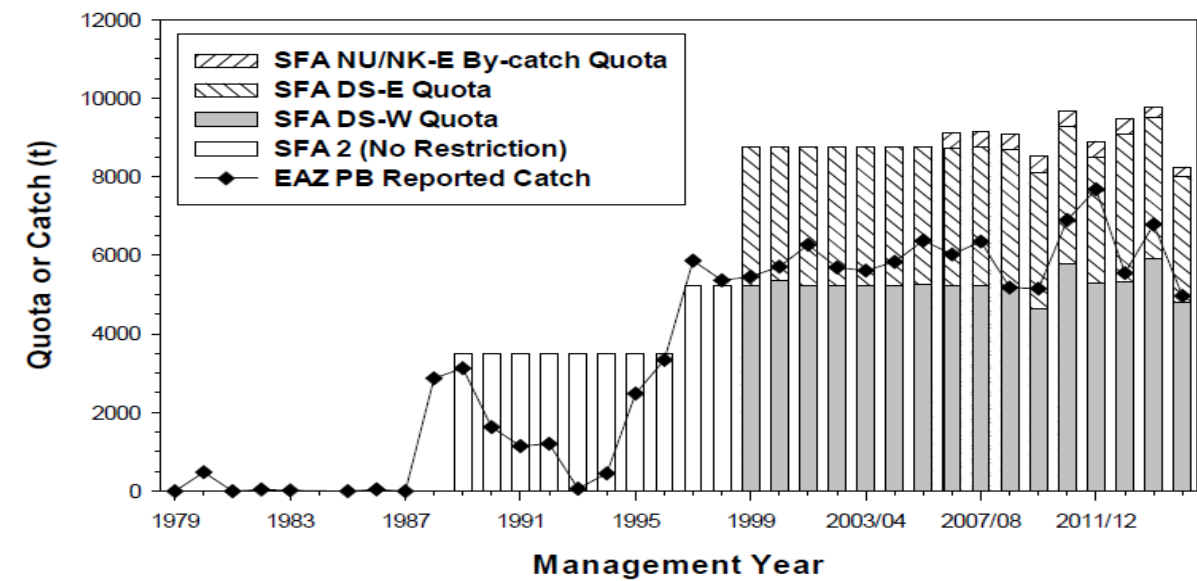
Note: USR=Upper stock reference and LRP=limit reference point. Error bars are 95% confidence ranges.

**Figure 6: Eastern Assessment Zone - female spawning stock biomass indices of *Pandalus borealis* for the survey years 2006–2014.**



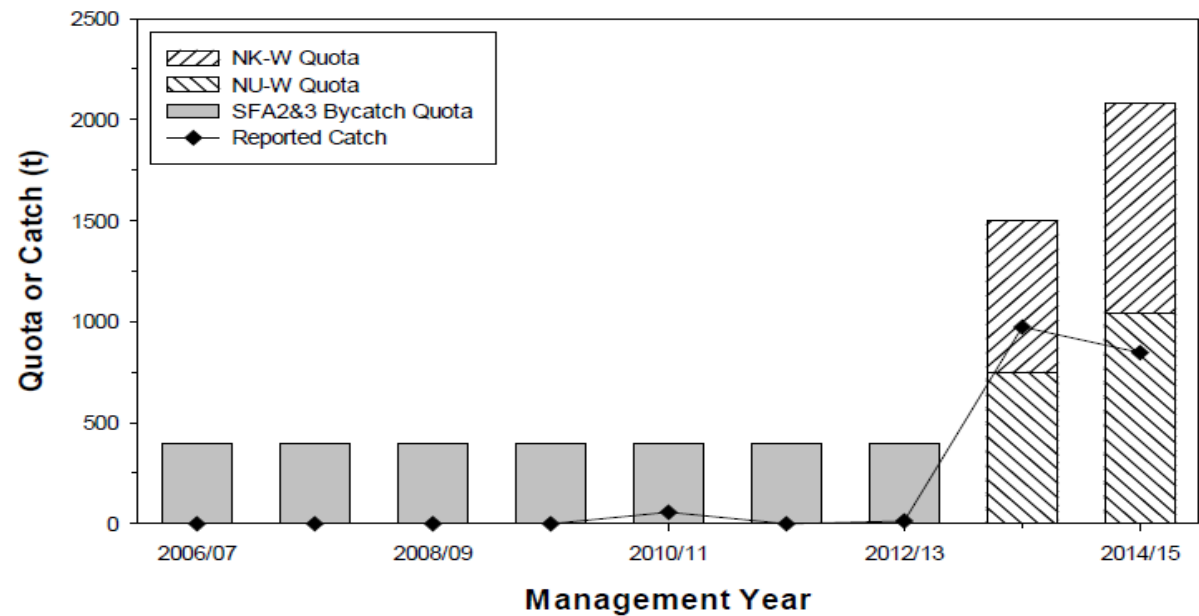
Note: The first two years of survey data (2006–2007) are not considered to be comparable with the rest of the series because of poor trawl performance around Resolution Island. Error bars are 95% confidence ranges.

Figure 7. Eastern Assessment Zone - *Pandalus borealis* TAC and catch.



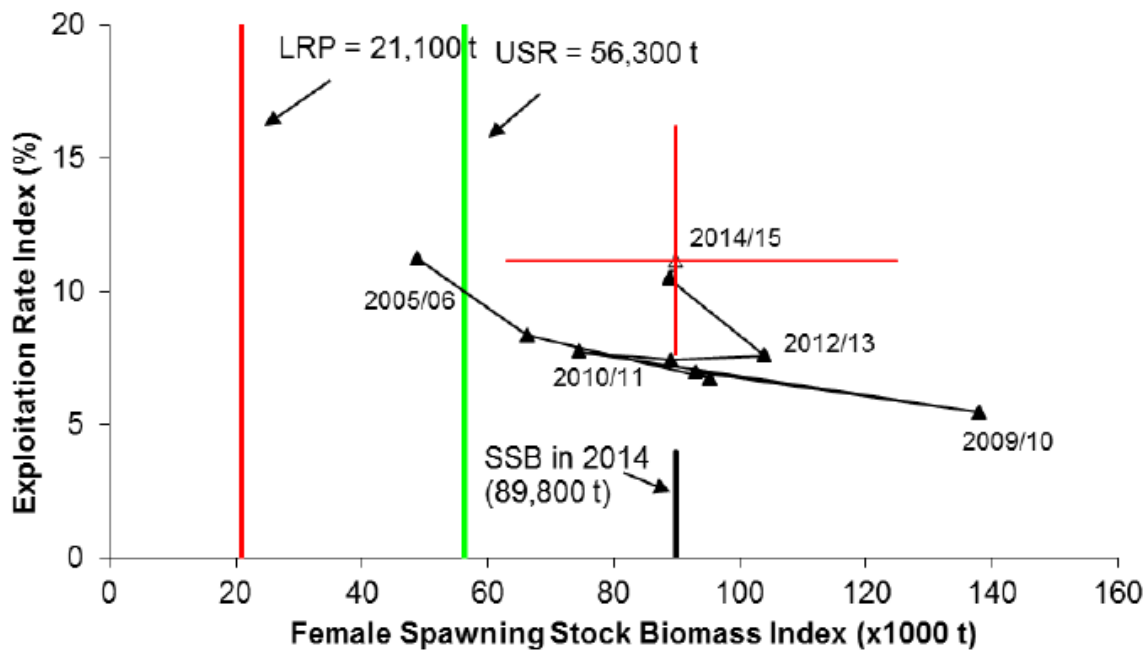
Note: The 2014/15 data are as of 22 January 2015.

Figure 8: Western Assessment Zone - *Pandalus borealis* TAC and catch



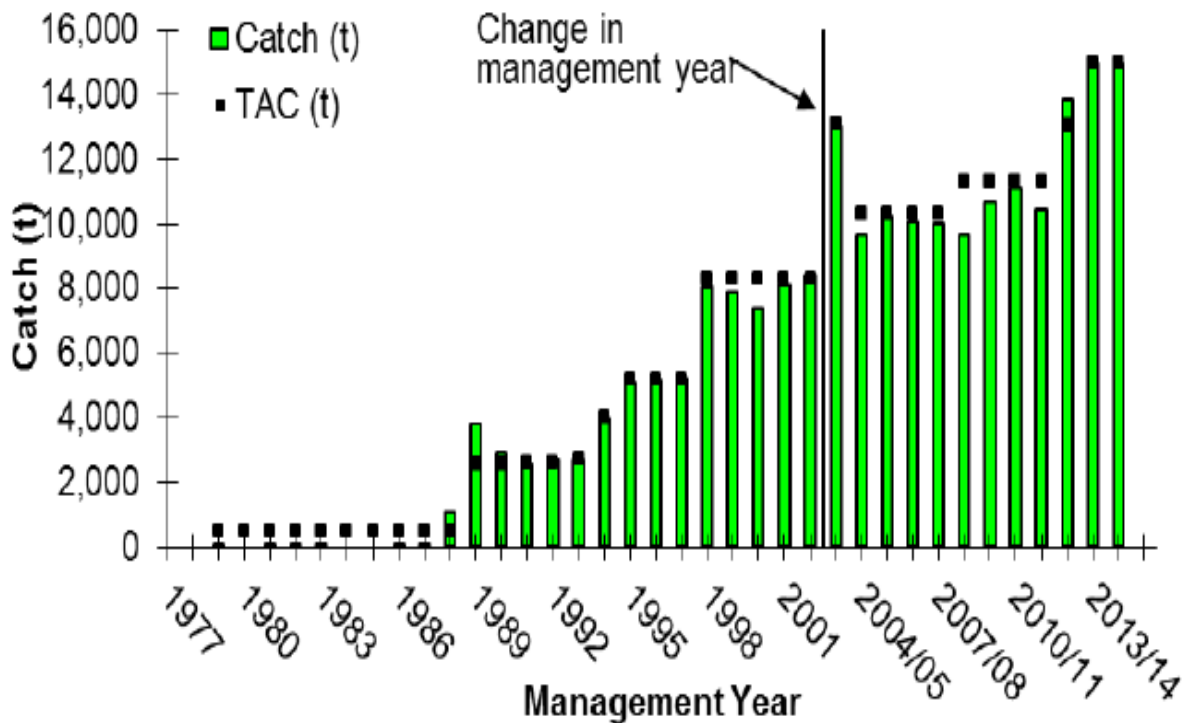
Note: Catch for 2014/5 is as of 22 January 2015 (season runs to March 31) but is expected to represent most of the season's catch.

**Figure 9: *P. borealis*, SFA 4 - trajectory of exploitation rate index versus female spawning stock biomass index**



Note: The red cross on the 2014/15 point indicates 95% confidence intervals for the 2014 female SSB index (horizontal) and the 2014/15 exploitation rate index (vertical)

**Figure 10: *P. borealis*, SFA 4 - catch and TAC history**



## **2.3      Borealis SFA 5 & 6**

### **2.3.1      Changes since last published report**

#### **Management systems & Relevant Regulations**

See Appendix 5.

#### **Personnel involved in science, management or industry**

Changes in DFO personnel have been made or pending. SFAs 2-4 (borealis and montagu) TIm Siferd (stock biologist) will be retiring in 2016 and Tyler Jirvan has replaced Beth Hiltz in Fisheries Management. For all SFAs (borealis) Don Stansbury, DFO Science, will retire in 2016

#### **Scientific base of information - including stock assessments**

Stock assessments are conducted every two years, with a review of indices in intervening years. The most recent full assessment was in February 2015 (DFO 2015all). The assessment, based on trawl survey and fishery information, compares index values with reference levels in a DFO Precautionary Approach framework.

With warming environmental conditions since the mid-1990s, thermal habitat for the shrimp resource has been reduced and spring plankton blooms have been occurring earlier in the year. Both factors would be expected to negatively affect shrimp recruitment, and accordingly fishable biomass may continue declining in the short term (DFO 2014pr). Predation on shrimp may also affect recruitment prospects. Estimates of shrimp predation by groundfish peaked in 2011 and have since declined to around twice the level of the mid-2000s, due to an increase in alternate preferred prey (principally capelin). Future trends in predation will depend on trajectory of predator biomass and of biomass of alternate prey (DFO 2015all).

#### ***SFA 5***

For 2015/16 the stock is in the healthy zone, with a SSB of 60,600 mt and a potential exploitation rate index (based on the TAC) of 18.1% (Figure 11). The Exploitation Rate Index has varied around 18% over the available time series (1996 - present), except for 2014/15 where the value of 25% is based on what appears to be an anomalously low SSB estimate (Figure 12).

After a long period when they increased, annual TACs were maintained at 23,300 mt from 2003/4 to 2013/14. They were reduced to 20,970t in 2014/15 (Fig. 19) because of a decline in estimated survey biomass for 2013 (Fig. 13). The low biomass estimate appears to have been anomalous as the 2014 value was close to that of previous years (Fig. 13).

#### ***SFA 6***

Currently, the stock is at the mid-point of the cautious zone in the precautionary approach framework, with a 2014 SSB of 136,000 mt (Fig. 14). In 2014/15, the Exploitation Rate Index based on the TAC, which has shown an upward trend since the mid-2000s (Fig. 14), was 22.3%.

Both fishable stock biomass and SSB have declined from their maximum in 2006, and in 2013 and 2014 were at or near their lowest levels in the time series (Fig. 15).

From the late 1970s, the annual TAC was increased to peak at 85,725 mt in 2008/9 and 2009/10 (Fig. 16). Subsequently, the annual TAC reduced; ranging from 52,000 mt to 62,000 mt until 2014/5 when it was further reduced to 48,196 mt. Catches have generally followed TACs and it was expected that the 2014/15 TAC would be harvested in full.

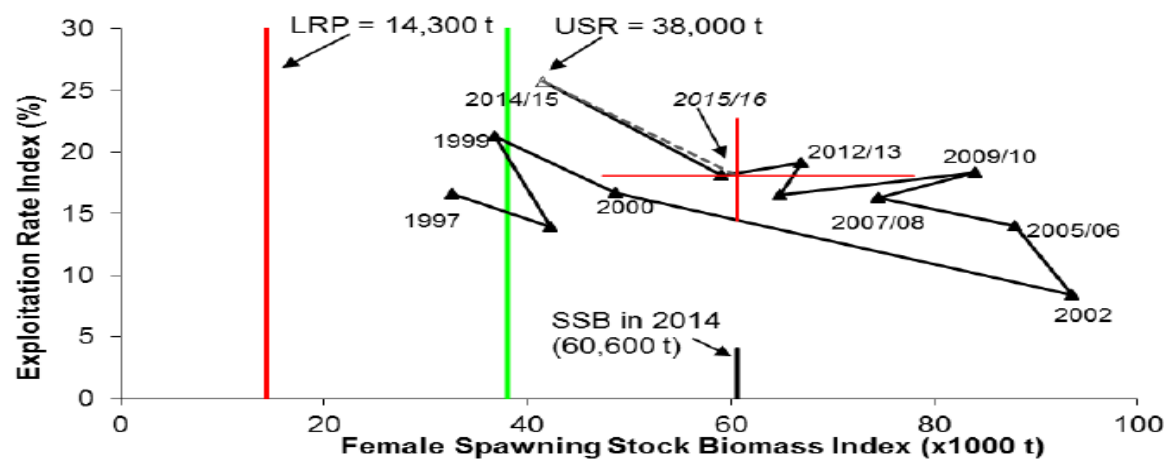
### **2.3.2      Updates on enhanced fishery's position in relation to scope criteria**

Not applicable.

### **2.3.3      Any developments or changes within the fishery which impact traceability or the ability to segregate between fish from the Unit of Certification (UoC) and fish from outside the UoC (non-certified fish)**

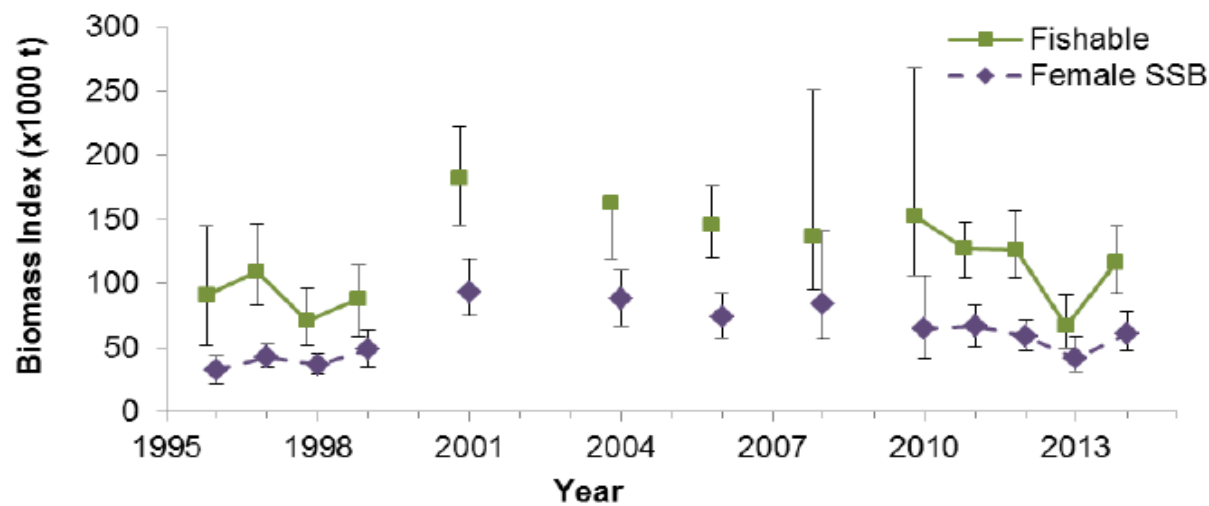
None

**Figure 11: *P. borealis*, SFA 5 - trajectory of exploitation rate index versus female spawning stock biomass index**



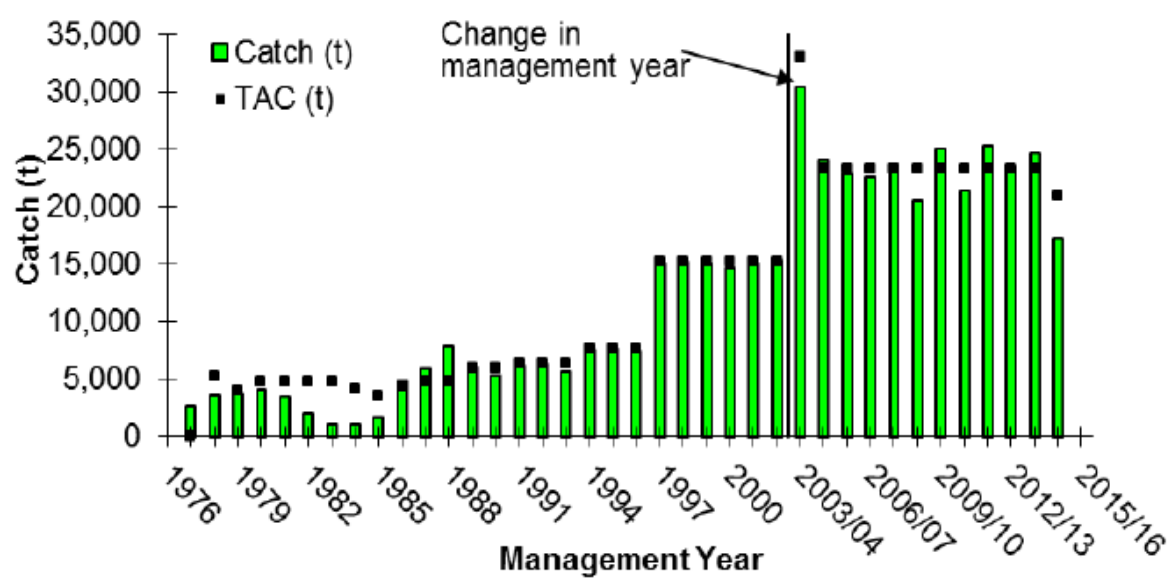
Note: The 2014/15 point is based on reported catch as of January 30, 2015. The red cross on the 2015/16 point indicates 95% confidence intervals for the 2014 female SSB index (horizontal) and the 2014/15 exploitation rate index (vertical), assuming that the 20,970 mt TAC is maintained and taken in the 2015/16 fishery.

**Figure 12: *P. borealis*, SFA 5 - fishable (green solid line) and female spawning stock (purple dashed line) biomass indices**



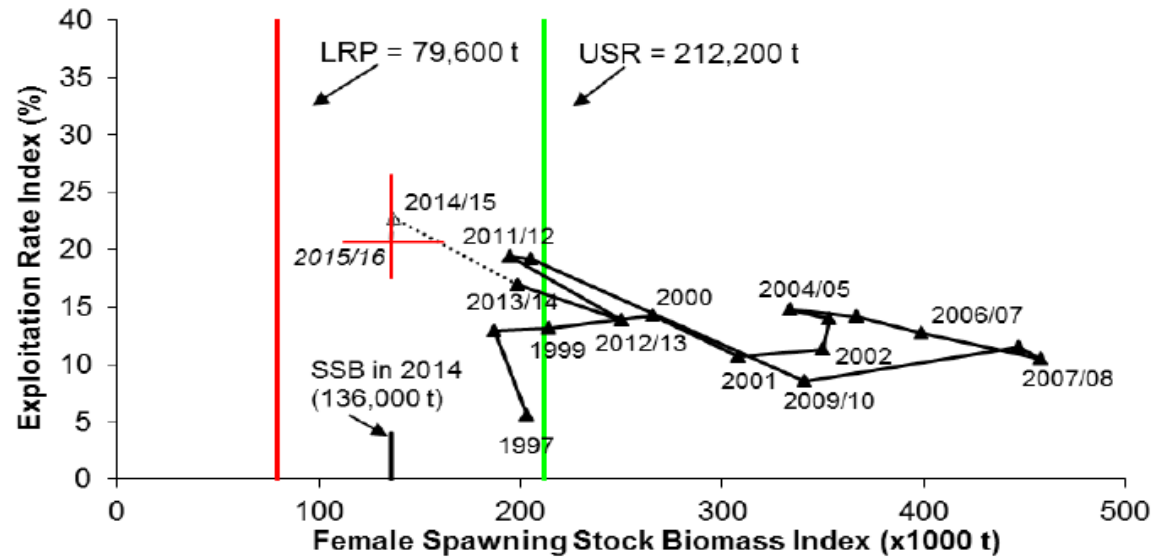
Note: Error bars indicate 95% confidence intervals.

Figure 13: *P. borealis*,SFA 5 - catch and TAC history



Note: 2014/15 values are preliminary and based upon catches to January 30, 2015.

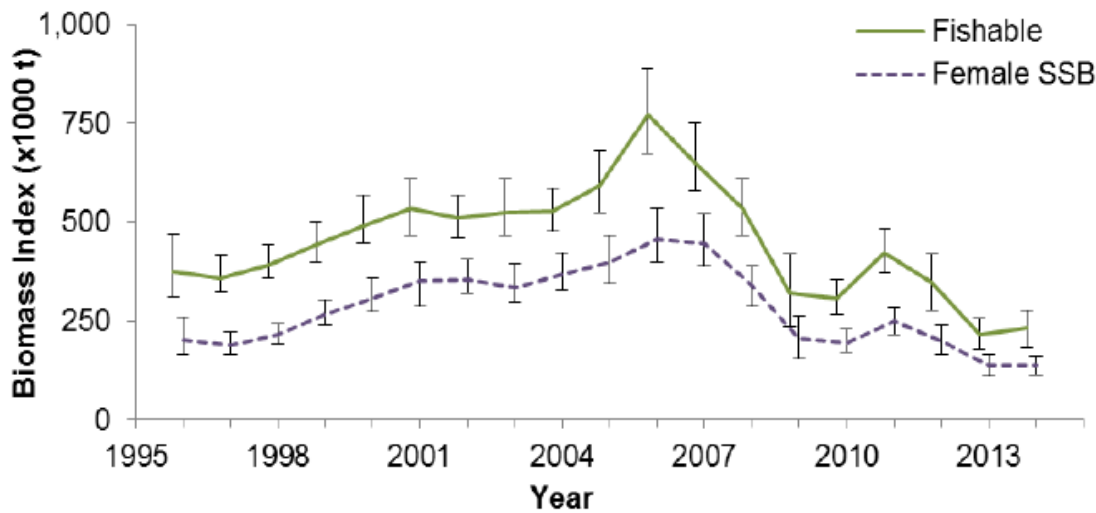
Figure 14. *P. borealis*, SFA 6 - trajectory of exploitation rate index versus female spawning stock biomass index



Note: The 2014/15 point is based on the TAC since catches for the year were not complete. The red cross on the 2015/16 point indicates 95% confidence intervals for the 2014 female SSB index (horizontal) and the 2015/16 exploitation rate index (vertical), assuming that the 48,196 t TAC is maintained and taken in the 2015/16 fishery.

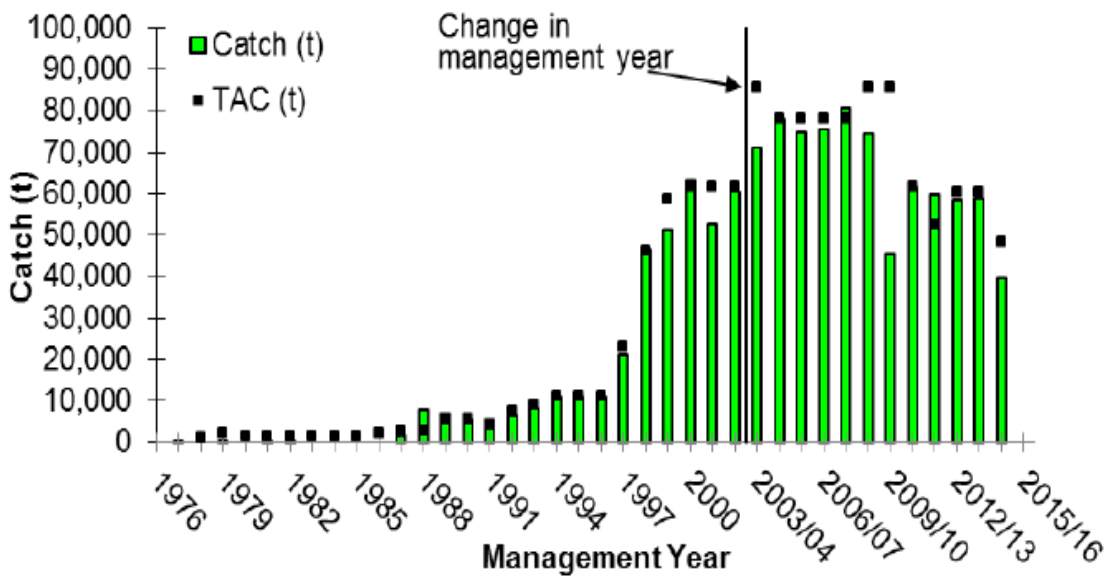


**Figure 15. *P. borealis*, SFA 6 - fishable (green solid line) and female spawning stock (purple dashed line) biomass indices**



Note: Error bars indicate 95% confidence intervals.

**Figure 16: *P. borealis*, SFA 6 - catch and TAC history**



Note: 2014/15 values are preliminary and based on catches to January 30, 2015.

## 2.4 Borealis SFA 7

### 2.4.1 Changes since last published report

#### Management systems & Relevant Regulations

See Appendix 5.

#### Personnel involved in science, management or industry

Changes in DFO personnel have been made or pending. SFAs 2-4 (borealis and montagu) TIm Siferd (stock biologist) will be retiring in 2016 and Tyler Jirvan has replaced Beth Hiltz in Fisheries Management. For all SFAs (borealis) Don Stansbury, DFO Science, will retire in 2016.

#### Scientific base of information - including stock assessments

Stock status is reviewed annually by the NAFO - ICES *Pandalus* Assessment Group (NIPAG) (NAFO 2014a), and advice is provided by the NAFO Scientific Council (NAFO 2014b). Input information and the provisional assessment are provided by scientists based in DFO's Newfoundland and Labrador Region. The most recent assessment was in September 2014.

There has been no change to assessment methods that continue to be based on the comparison of survey biomass indices with an identified Limit Reference level with consideration of biological information from surveys and the fishery.

SSB as measured by the fall DFO survey has declined from its peak in 2007, and in 2013 (the most recent value) was near the lowest level in the time series (Figure 17) at 11,780 mt. There was a 95% probability that female SSB was below the NAFO precautionary Limit Reference Point of 19,300 mt. Recruitment prospects are unfavourable as recruitment indices have been declining since 2008 and are now among the lowest observed (NAFO 2014a).

The Exploitation Rate Index based on catch and fishable biomass estimates from surveys has increased since the mid-2000s, with levels above 20% in the most recent years (Fig. 18). Catches and TACs have declined rapidly since the mid-2000s (Fig. 19).

Given the high probability that biomass was below the LRP (NAFO 2014b), the NAFO Scientific Council recommended no directed fishery on this stock. At its fall 2014 meeting, the NAFO Fisheries Council decided against a directed fishery in 2015.

As in the third-year audit report (IFC 2014), the Team considered whether PI 1.1.1 should be rescored based on the observed decline in biomass. Based on the same rationale as in the third year report, we determined not to rescore PI 1.1.1 at this time as:

1. Although the stock has been declining since 2007, the estimated SSB (11,780 mt) is above the LRP in the DFO IFMP which has been accepted as the standard for judging performance of this fishery against the MSC standard. In addition, the stock has shown the capacity to build to a very high abundance level from the current level (as was observed in the 1990s).
2. Accordingly, we conclude that there is a high degree of certainty that the stock is above the point where recruitment would be impaired, thus meeting the SIa at SG100 for PI 1.1.1.
3. The female SSB has been below the DFO Upper Stock Reference for 3 years, but prior to that had been consistently above the DFO USR in the 12 years from 2001. Given this pattern, we consider that the stock continues to fluctuate around the DFO USR; it has recently dropped below this level and may increase in coming years. However NAFO has not yet established a TRP for this fishery. For the latter reason, the fishery was scored at 80 on this SG in the Certification Report. Accordingly, the scoring rationale described in the Certification Report is still valid and the fishery meets SIb at SG 80.
4. Overall, the fishery continues to score 90 for this PI.

The decision not to rescore PI 1.1.1 does not compromise the MSC CR requirements for stock status. This is because under the more conservative *Blim* used in management by NAFO there is no directed fishing in the 2015 season and this meets the objectives of the MSC standard. The stock will be reassessed in September 2015.

During the recertification of the fishery (to be completed by spring 2016) there will be opportunity to further consider the score of this PI based on the September 2015 NAFO stock assessment.

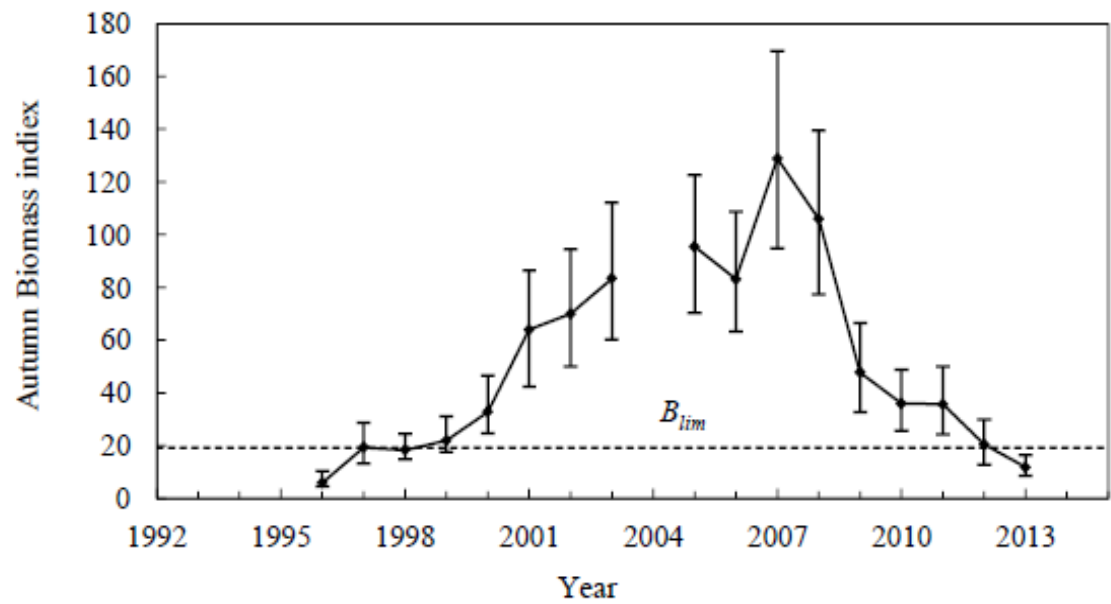
**2.4.2    Updates on enhanced fishery’s position in relation to scope criteria**

Not applicable.

**2.4.3    Any developments or changes within the fishery which impact traceability or the ability to segregate between fish from the Unit of Certification (UoC) and fish from outside the UoC (non-certified fish)**

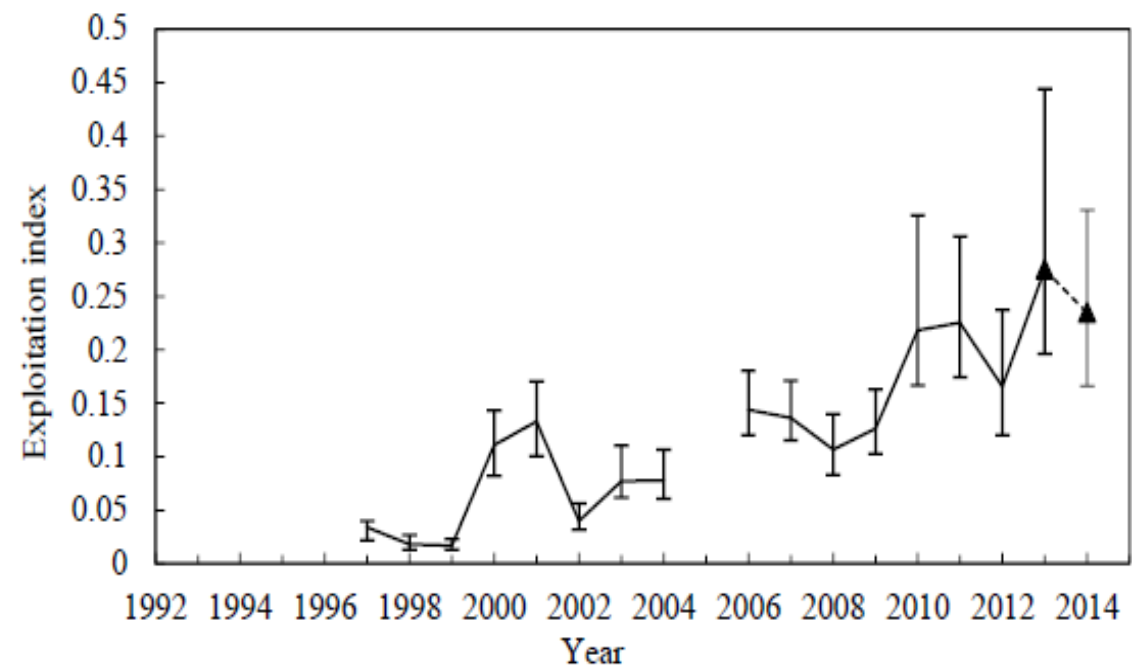
None.

**Figure 17: *P. borealis*, SFA 7 - autumn survey female spawning stock biomass (SSB) and Blim**



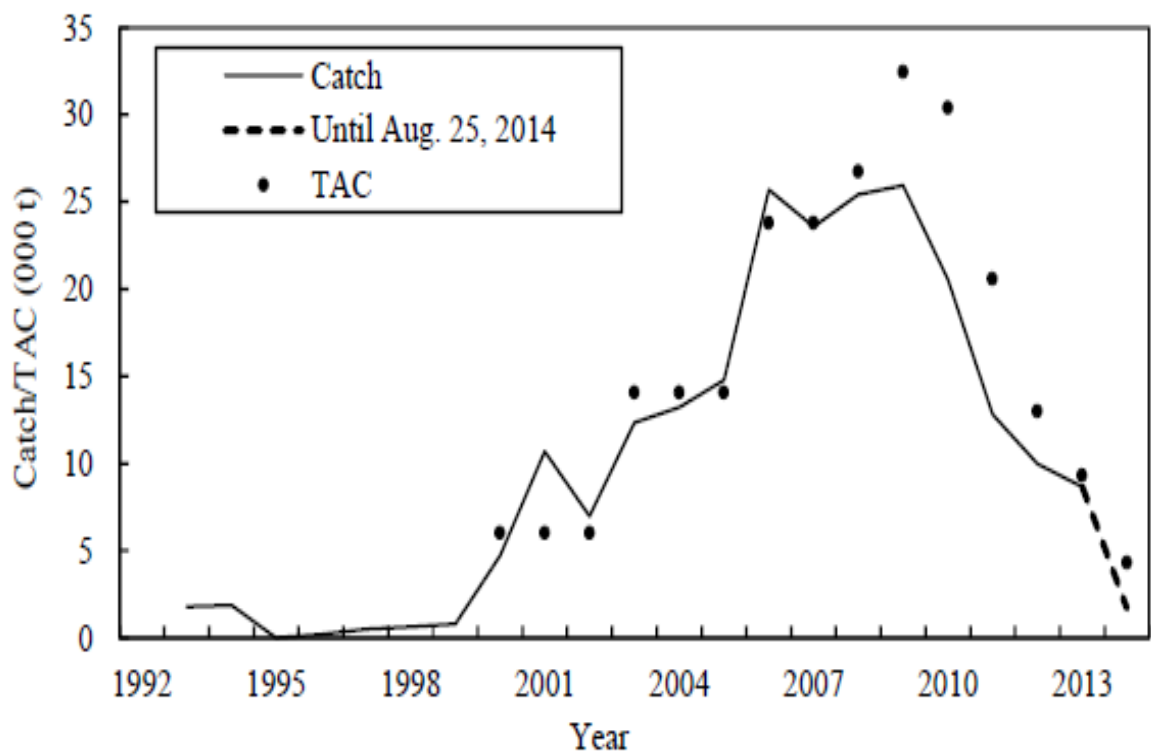
Note: Bars indicate 95% confidence limits.

**Figure 18: *P. borealis*, SFA 7 - exploitation rate index (year's catch divided by previous year's autumn fishable biomass index). Bars are 95% confidence limits.**



Note: Bars indicate 95% confidence limits.

Figure 19: *P. borealis*, SFA 7 - catch and TAC history



## **2.5 Montagui SFA 2, 3 & 4**

### **2.5.1 Changes since last published report**

#### **Management systems & Relevant Regulations**

See Appendix 5.

#### **Personnel involved in science, management or industry**

Changes in DFO personnel have been made or pending. SFAs 2-4 (borealis and montagui) TIm Siferd (stock biologist) will be retiring in 2016 and Tyler Jirvan has replaced Beth Hiltz in Fisheries Management. For all SFAs (borealis) Don Stansbury, DFO Science, will retire in 2016.

#### **Scientific base of information - including stock assessments**

Following the 2013/4 changes to management areas, SFAs 2 and 3 have been replaced by the Eastern Assessment Zone (EAZ) and Western Assessment Zone (WAZ). The SFA 4 management area is unchanged.

Assessments for northern and striped shrimp are carried out biennially, with a status update in intervening years. Assessments are done under the DFO RAP. The most recent full assessment was conducted in February 2015. TACs are set by DFO early in the calendar year, with input from stakeholders via the NSAC, and consistent with the reference levels established using the DFO Precautionary Approach framework.

Stocks are assessed based on comparison of trawl survey results to identified reference levels of biomass and exploitation rate.

##### *Eastern Assessment Zone (EAZ) (DFO 2015EW)*

Although the most recent assessment indicates that the stock is in the healthy zone there is uncertainty about the annual biomass estimates with wide fluctuations in recent SSB estimates (Figs. 20, 21). The Exploitation Rate based on catches has varied without trend from 2008/09 to 2014/5, with an annual average of 8.3%. The potential Exploitation Rate Index for 2014/5 based on TAC would be 5.1%.

Annual catches have declined from a maximum of around 4,000 mt in 1999-2001 (Fig. 22) to 401 mt in 2014/5 which was 48% of the TAC of 840 mt. TACs were substantially reduced for 2013/4 and 2014/5.

##### *Western Assessment Zone (WAZ) (DFO 2015EW)*

The new survey initiated in 2014 using the same vessel and gear as for the EAZ should bring consistency to assessments in the two areas. However, due to the changes a DFO Precautionary Approach framework is not in place as in other areas; this requires a survey time series of at least 5 years. In the interim, the assessment is based on maintaining relatively low exploitation rate indices.

The Exploitation Rate Index for 2014/5 based on catch (and TAC, since this was taken) was 8%. Catches have increased substantially with the implementation of the TACs for the new management areas (Figure 23).

##### *SFA 4 (DFO 2015all)*

Catches (Fig. 24) and biomass estimates (Fig. 25) have been highly variable from year to year, mainly because the fishery operates in a boundary zone between areas, where distribution of shrimp concentrations can change quickly. *P. montagui* is primarily taken as bycatch in the *P. borealis* fishery. The assessment is mainly based on inspection of exploitation rate Indices and maintaining these at less than 20%. The Exploitation Rate Index based on the catch (to January 2015) was 3.5%, and would have been 11.8% had the TAC been taken.

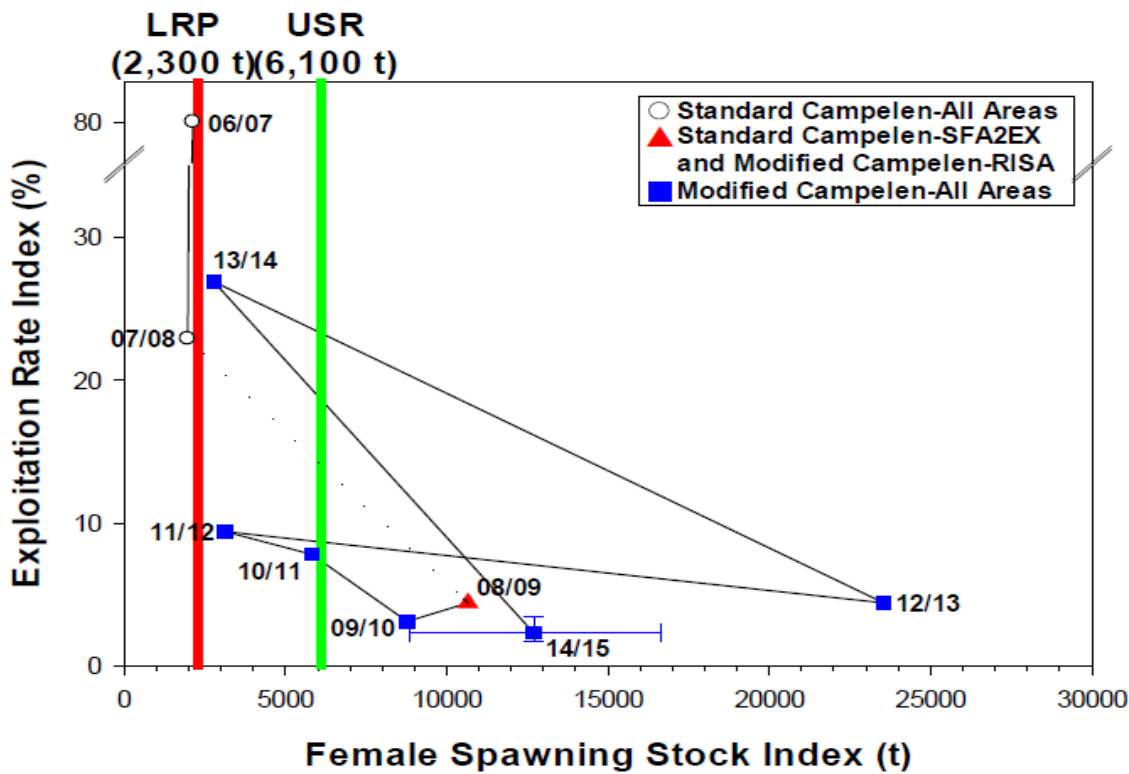
### **2.5.2 Updates on enhanced fishery's position in relation to scope criteria**

Not applicable.

### **2.5.3 Any developments or changes within the fishery which impact traceability or the ability to segregate between fish from the Unit of Certification (UoC) and fish from outside the UoC (non-certified fish)**

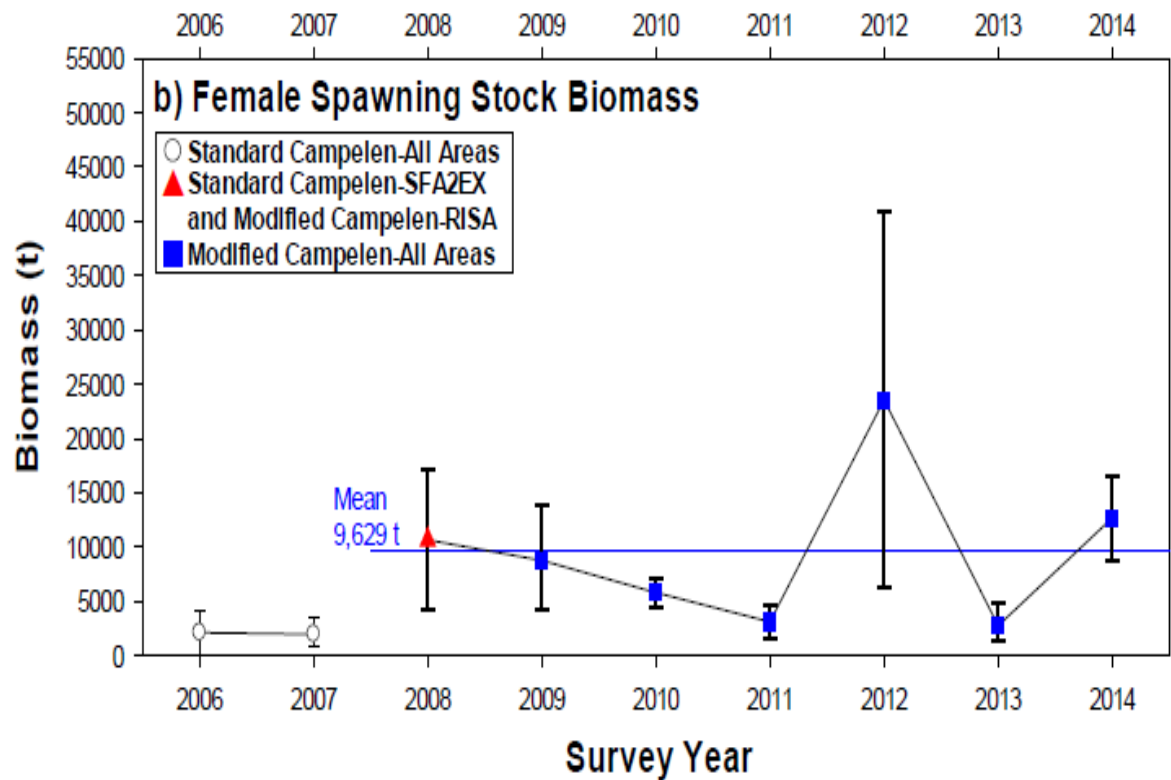
None

Figure 20: Eastern Assessment Zone - *Pandalus montagui* female SSB and exploitation rate indices in relation to reference points



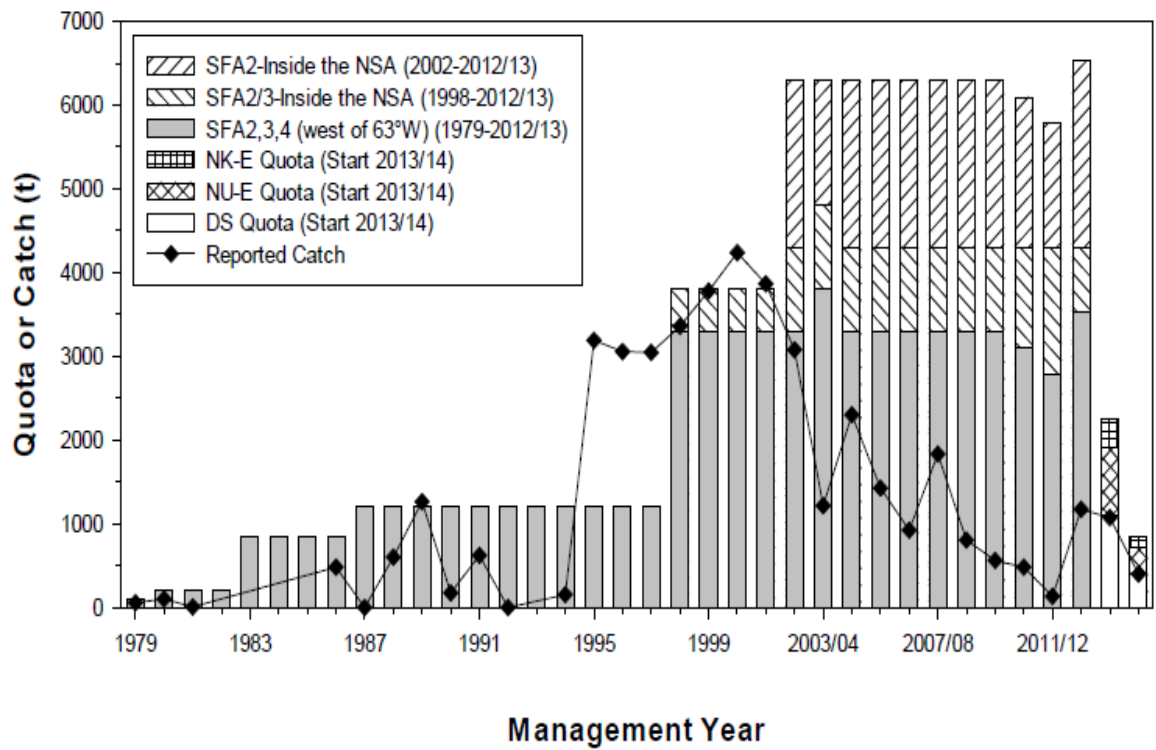
Note: USR=Upper stock reference and LRP=limit reference point. Error bars are 95% confidence ranges.

Figure 21: EAZ - *Pandalus montagui* female SSB indices 2006–14



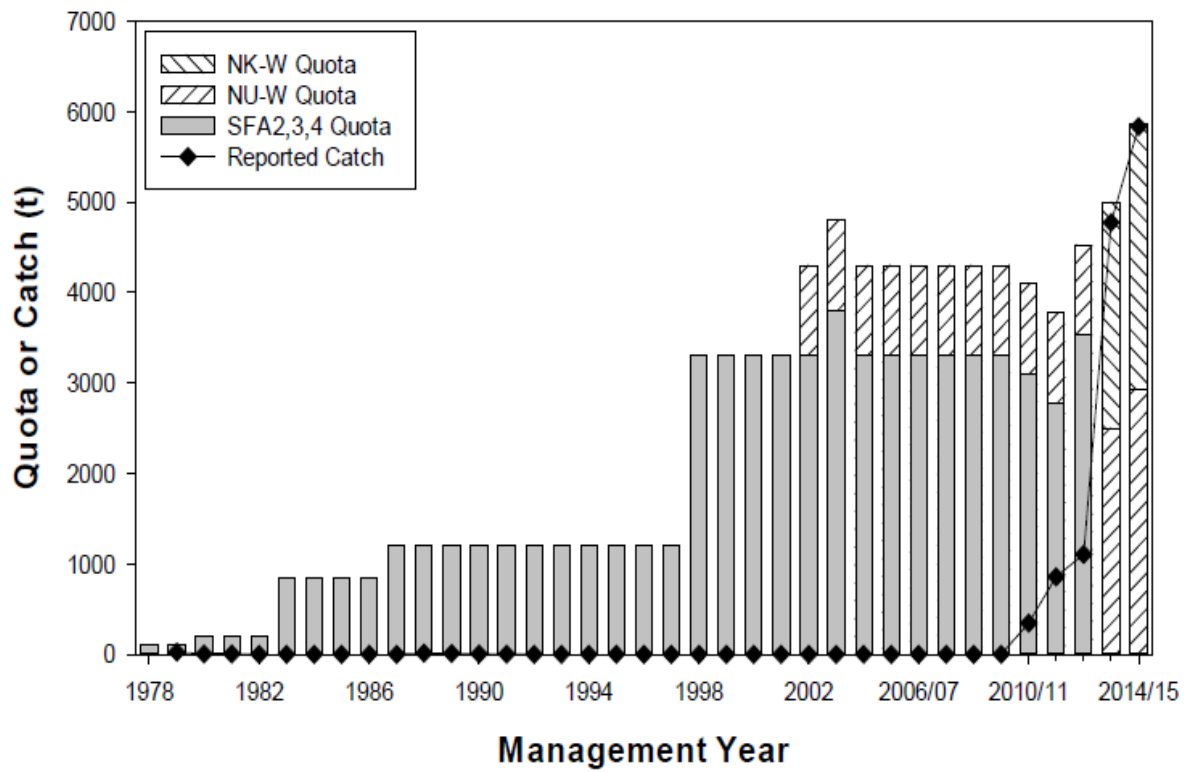
Note: Error bars are 95% confidence ranges.

Figure 22: EAZ - *Pandalus montagui* TAC & catch



Note: The 2014/15 data are as of 22 January 2015

Figure 23: WAZ - *Pandalus montagui* TAC and catch



Note: Catch for 2014/5 is as of 22 January 2015.



Figure 24: *P. montagui*, SFA 4 catches and bycatch limit established for 2013/14 - 2014/15

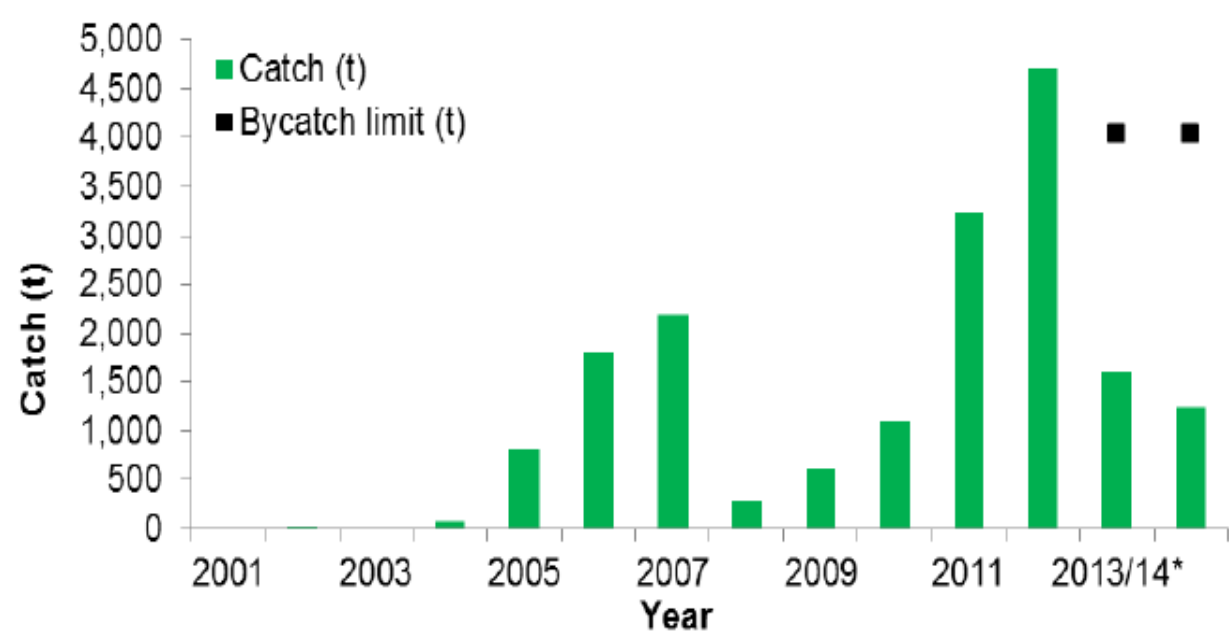
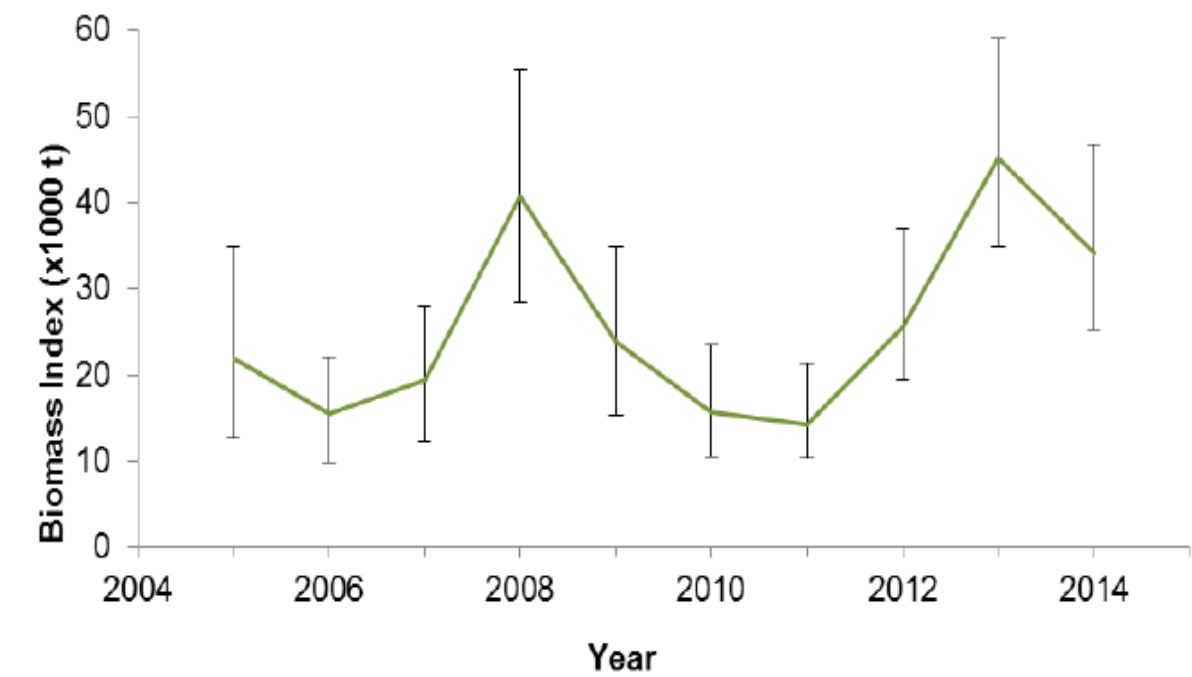


Figure 25: *P. montagui*, SFA 4 - fishable biomass



Note: index with error bars providing 95 % confidence intervals.

2.6 TAC & Catch Data

Table 1: Borealis SFA 1: TAC / Catch

TAC	Year	2015/16	Amount	8,500 mt
UoA share of TAC	Year		Amount	
UoC share of TAC	Year		Amount	
Total green weight catch by UoC	Year	2014/15	Amount	0 mt
	Year 2013		Amount	

Table 2: Borealis SFA 2, 3 & 4: TAC / Catch

TAC	Year	2015/16	Amount	EAZ: 8,250 WAZ: 2,080 4: 14,971
UoA share of TAC	Year		Amount	
UoC share of TAC	Year		Amount	
Total green weight catch by UoC	Year	2014/15	Amount	EAZ: 5,013 WAZ: 706 4: 14,958
	Year		Amount	

Table 3: Borealis SFA 5 & 6: TAC / Catch

TAC	Year	2015/16	Amount	5: 23,300 6: 48,196
UoA share of TAC	Year		Amount	
UoC share of TAC	Year		Amount	
Total green weight catch by UoC	Year	2014/15	Amount	5: 21,747 6: 46,309
	Year		Amount	

Table 4: Borealis SFA 7: TAC / Catch

TAC	Year	2015/16	Amount	0
UoA share of TAC	Year		Amount	
UoC share of TAC	Year		Amount	
Total green weight catch by UoC	Year	2014/15	Amount	1,768
	Year		Amount	

Table 5: Montagui SFA 2,3 & 4: TAC / Catch

TAC	Year	2015/16	Amount	EAZ: 840 WAZ: 6,138 4: 4,033
UoA share of TAC	Year		Amount	NK
UoC share of TAC	Year		Amount	NK
Total green weight catch by UoC	Year	2014/15	Amount	EAZ: 439 WAZ: 5,826 4: 1,235
	Year		Amount	

2.7      Conditions

Table 6: Borealis SFA 1: Conditions

#	PI	Status	Original score	Revised score
1	1.2.1	Open	70	Not revised
2	1.2.2	Open	70	Not revised
3	2.4.1	Closed	60	100
4	2.4.2	Closed	60	80
5	2.4.3	Closed	70	80
6	2.5.1	Closed	70	90
7	2.5.2	Closed	70	85
8	2.5.3	Closed	70	80
9	3.2.1	Closed	70	80
10	3.2.4	Closed	75	80

Table 7: Borealis SFA 2, 3 & 4: Conditions

#	PI	Status	Original score	Revised score
1	2.4.1	Closed	60	100
2	2.4.2	Closed	60	80
3	2.4.3	Closed	70	80
4	2.5.1	Closed	70	90
5	2.5.2	Closed	70	85
6	2.5.3	Closed	70	80
7	3.2.1	Closed	70	80
8	3.2.4	Closed	75	80

Table 8: Borealis SFA 5 & 6: Conditions

#	PI	Status	Original score	Revised score
1	2.4.1	Closed	60	100
2	2.4.2	Closed	60	80
3	2.4.3	Closed	60	80
4	2.5.1	Closed	70	90
5	2.5.2	Closed	70	85
6	2.5.3	Closed	70	80
7	3.2.1	Closed	70	80
8	3.2.4	Closed	75	80

Table 9: Borealis SFA 7: Conditions

#	PI	Status	Original score	Revised score
1	1.2.2	Closed	70	100
2	2.4.1	Closed	60	80
3	2.4.2	Closed	60	80
4	2.4.3	Closed	70	90
5	2.5.1	Closed	70	85
6	2.5.2	Closed	70	80
7	2.5.3	Closed	70	80
8	3.2.1	Closed	60	80
9	3.2.4	Closed	75	80

Table 10: Montagui SFA 2,3 & 4: Conditions

#	PI	Status	Original score	Revised score
1	2.4.1	Closed	60	100
2	2.4.2	Closed	60	80
3	2.4.3	Closed	60	80
4	2.5.1	Closed	70	90
5	2.5.2	Closed	70	85
6	2.5.3	Closed	70	80
7	3.2.1	Closed	70	80
8	3.2.4	Closed	75	80

3. **AUDIT PROCESS**

3.1 **Scope and history of the assessment**

The five certified fisheries cover five groups of fishing areas (SFA 1, SFAs 2, 3 & 4, SFA 5 & 6 and SFA 7) for two shrimp species (Northern shrimp (*Pandalus borealis*) in all the SFAs and Striped shrimp (*Pandalus montagui*) that is a certified by-catch in SFA 2, 3 & 4). The fishery uses otter trawl.

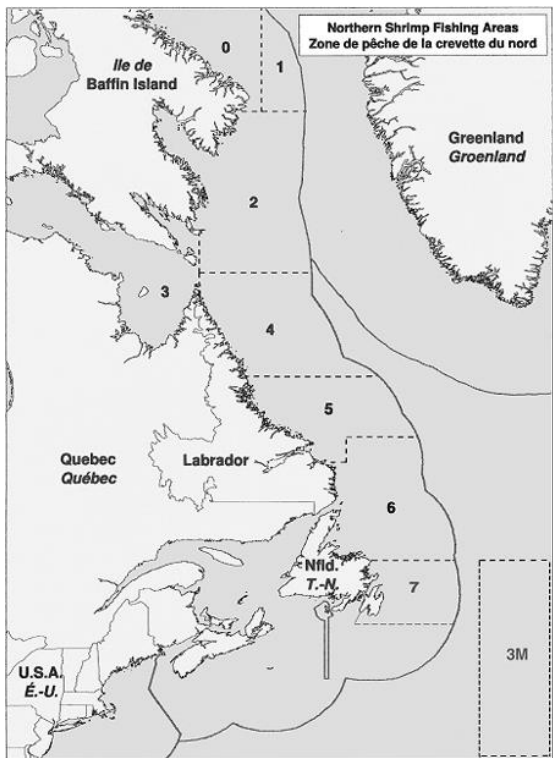
There are a number of clients:

- Northern Coalition & the Canadian Association of Prawn Producers (*Pandalus borealis* SFA 1, SFA 2,3 & 4 & *Pandalus montagui* SFA 2, 3 & 4);
- Northern Coalition, Fogo Island Coop, Association of Seafood Producers & the Canadian Association of Prawn Producers (*Pandalus borealis* SFA 5 & 6, SFA 7)

IFC confirm that the fishery is in scope.

As announced on the MSC web site with a posting dated 12<sup>th</sup> June 2012, a certificate sharing arrangement harmonised a number of certifications covering *Pandalus borealis* in the various SFAs (Fig 26).

**Figure 26: Shrimp Management Areas**



The situation for each SFA in June 2012 was as shown in Table 11. The position after the confirmation of the certificate sharing arrangement was as Table 12.

The SFA 1 fishery was certified according to the MSC standard on 20<sup>th</sup> March 2012 and the remainder certified on the 25<sup>th</sup> July 2011.

The scores at certification and after this surveillance audit are shown in Tables 13 & 14.

Table 11: Clients

ASP		
UOC	Species:	Northern Prawn/Shrimp ( <i>Pandalus borealis</i> )
	Geographical Area:	SFA 5, 6, 7
	Method of Capture:	Otter Trawl only
Date of certification	5 <sup>th</sup> August 2008	
CAB	Intertek Moody Marine (IMM).	
Assessment tree	Pre FAM	
Conditions	A single Condition on “ecological impacts” remains and is expected to be closed out by 4 <sup>th</sup> surveillance audit.	
CAPP/NC		
UOC	Species:	Northern Prawn/Shrimp ( <i>Pandalus borealis</i> )
	Geographical Area:	SFA 2, 3, 4, 5, 6 and SFA 7
	Method of Capture:	Otter Trawl only
	NB. The client requested that SFA 7 was separated out as it is managed by a different organisation	
Date of certification	24 <sup>th</sup> June 2011	
CAB	IMM	
Assessment tree	FAM v1	
Conditions	Harmonised with ASP certification. Eight Conditions were set for SFA 2-6 – of these 6 relate to habitat and ecosystem; 1 relates to management objectives; 1 to a research plan. The same conditions were set for SFA 7 but with an additional Condition related to the harvest control rule.	
FICS		
Unit of Certification	Species:	Northern Prawn/Shrimp ( <i>Pandalus borealis</i> )
	Geographical Area:	SFA 5, 6, 7
	Method of Capture:	Otter Trawl only
Date of certification	20 <sup>th</sup> October 2011	
CAB	Global Trust Certification (GT). FICS will inform GT of the certificate sharing.	
Assessment tree	FAM v2.1	
Conditions	Harmonised with ASP certification. Three Conditions were set and relate to habitat.	

Table 12: Post Variation

SFA	Clients	Status
1	CAPP/NC	Existing certificate – no change
2, 3, 4	CAPP/NC	New certificate – adapted from existing CAPP/NC certificate for SFA 2, 3, 4, 5, 6
5, 6	CAPP/NC, ASP, FICS	New certificate – adapted from existing CAPP/NC certificate for SFA 2, 3, 4, 5, 6
7	CAPP/NC, ASP, FICS	New certificate - adapted from existing CAPP/NC certificate for SFA 7

Table 13: PRINCIPLE SCORES AT CERTIFICATION

Component	Performance Indicator (PI)		Score	Wt Score	Score	Wt Score	Score	Wt Score	Score	Wt Score	Score	Wt Score
			SFA1		SFA2/3/4PB		SFA2/3/4PM		SFA5/6		SFA7	
Outcome	1.1.1	Stock status	100	25.00	100	25.00	80	20.00	100	25.00	90	22.50
	1.1.2	Reference points	80	20.00	80	20.00	80	20.00	80	20.00	80	20.00
	1.1.3	Stock rebuilding	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Management	1.2.1	Harvest strategy	70	8.75	90	11.25	80	10.00	90	11.25	80	10.00
	1.2.2	Harvest control rules & tools	70	8.75	80	10.00	80	10.00	80	10.00	70	8.75
	1.2.3	Information & monitoring	90	11.25	80	10.00	80	10.00	80	10.00	95	11.88
	1.2.4	Assessment of stock status	90	11.25	80	10.00	80	10.00	80	10.00	90	11.25
Retained species	2.1.1	Outcome	100	6.67	80	5.33	80	5.33	80	5.33	100	6.67
	2.1.2	Management	100	6.67	95	6.33	95	6.33	95	6.33	100	6.67
	2.1.3	Information	90	6.00	90	6.00	90	6.00	90	6.00	100	6.67
Bycatch	2.2.1	Outcome	80	5.33	80	5.33	80	5.33	80	5.33	80	5.33
	2.2.2	Management	90	6.00	85	5.67	85	5.67	85	5.67	90	6.00
	2.2.3	Information	90	6.00	100	6.67	100	6.67	100	6.67	100	6.67
ETP species	2.3.1	Outcome	100	6.67	100	6.67	100	6.67	100	6.67	100	6.67
	2.3.2	Management	90	6.00	90	6.00	90	6.00	90	6.00	90	6.00
	2.3.3	Information	90	6.00	100	6.67	100	6.67	100	6.67	100	6.67
Habitats	2.4.1	Outcome	60	4.00	60	4.00	60	4.00	60	4.00	60	4.00
	2.4.2	Management	60	4.00	70	4.67	70	4.67	70	4.67	70	4.67
	2.4.3	Information	70	4.67	70	4.67	70	4.67	70	4.67	70	4.67
Trophic function	2.5.1	Outcome	70	4.67	70	4.67	70	4.67	70	4.67	70	4.67
	2.5.2	Management	70	4.67	70	4.67	70	4.67	70	4.67	70	4.67
	2.5.3	Information	70	4.67	70	4.67	60	4.00	70	4.67	60	4.00
Governance and policy	3.1.1	Legal & customary framework	90	11.25	100	12.50	100	12.50	100	12.50	80	10.00
	3.1.2	Consultation, roles &	95	11.88	95	11.88	95	11.88	95	11.88	95	11.88
	3.1.3	Long term objectives	100	12.50	100	12.50	100	12.50	100	12.50	85	10.63
	3.1.4	Incentives for sustainable fishing	85	10.63	85	10.63	85	10.63	85	10.63	85	10.63
Fishery specific management system	3.2.1	Fishery specific objectives	70	7.00	70	7.00	70	7.00	70	7.00	60	6.00
	3.2.2	Decision making processes	80	8.00	80	8.00	80	8.00	80	8.00	80	8.00
	3.2.3	Compliance & enforcement	95	9.50	95	9.50	95	9.50	95	9.50	90	9.00
	3.2.4	Research plan	75	7.50	75	7.50	70	7.00	75	7.50	75	7.50
	3.2.5	Management performance	80	8.00	80	8.00	80	8.00	80	8.00	80	8.00
Overall weighted Principle-level scores												
Principle 1 - Target species				85.0		86.3		80.0		86.3		84.4
Principle 2 - Ecosystem				82.0		82.0		81.3		82.0		84.0
Principle 3 - Management				86.3		87.5		87.0		87.5		81.6

Table 14: PRINCIPLE SCORES AFTER SURVEILLANCE 4

P	Component	Performance Indicator (PI)		Score	Wt Score	Score	Wt Score	Score	Wt Score	Score	Wt Score	Score	Wt Score
				SFA1		SFA2/3/4PB		SFA2/3/4PM		SFA5/6		SFA7	
1	Outcome	1.1.1	Stock status	100	25.00	100	25.00	80	20.00	100	25.00	90	22.50
		1.1.2	Reference points	80	20.00	80	20.00	80	20.00	80	20.00	80	20.00
		1.1.3	Stock rebuilding	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
	Management	1.2.1	Harvest strategy	70	8.75	90	11.25	80	10.00	90	11.25	80	10.00
		1.2.2	Harvest control rules & tools	70	8.75	80	10.00	80	10.00	80	10.00	80	10.00
		1.2.3	Information & monitoring	90	11.25	80	10.00	80	10.00	80	10.00	95	11.88
		1.2.4	Assessment of stock status	90	11.25	80	10.00	80	10.00	80	10.00	90	11.25
2	Retained species	2.1.1	Outcome	100	6.67	80	5.33	80	5.33	80	5.33	100	6.67
		2.1.2	Management	100	6.67	95	6.33	95	6.33	95	6.33	100	6.67
		2.1.3	Information	90	6.00	90	6.00	90	6.00	90	6.00	100	6.67
	Bycatch	2.2.1	Outcome	80	5.33	80	5.33	80	5.33	80	5.33	80	5.33
		2.2.2	Management	90	6.00	85	5.67	85	5.67	85	5.67	90	6.00
		2.2.3	Information	90	6.00	100	6.67	100	6.67	100	6.67	100	6.67
	ETP species	2.3.1	Outcome	100	6.67	100	6.67	100	6.67	100	6.67	100	6.67
		2.3.2	Management	90	6.00	90	6.00	90	6.00	90	6.00	90	6.00
		2.3.3	Information	90	6.00	100	6.67	100	6.67	100	6.67	100	6.67
	Habitats	2.4.1	Outcome	100	6.67	100	6.67	100	6.67	100	6.67	100	6.67
		2.4.2	Management	80	5.33	80	5.33	80	5.33	80	5.33	80	5.33
		2.4.3	Information	80	5.33	80	5.33	80	5.33	80	5.33	80	5.33
	Trophic function	2.5.1	Outcome	90	6.00	90	6.00	90	6.00	90	6.00	90	6.00
		2.5.2	Management	85	5.67	85	5.67	85	5.67	85	5.67	85	5.67
		2.5.3	Information	80	5.33	80	5.33	80	5.33	80	5.33	80	5.33
3	Governance and policy	3.1.1	Legal & customary framework	90	11.25	100	12.50	100	12.50	100	12.50	80	10.00
		3.1.2	Consultation, roles & responsibilities	95	11.88	95	11.88	95	11.88	95	11.88	95	11.88
		3.1.3	Long term objectives	100	12.50	100	12.50	100	12.50	100	12.50	85	10.63
3.1.4		Incentives for sustainable fishing	85	10.63	85	10.63	85	10.63	85	10.63	85	10.63	
	Fishery specific management system	3.2.1	Fishery specific objectives	80	8.00	80	8.00	80	8.00	80	8.00	80	8.00
		3.2.2	Decision making processes	80	8.00	80	8.00	80	8.00	80	8.00	80	8.00
		3.2.3	Compliance & enforcement	95	9.50	95	9.50	95	9.50	95	9.50	90	9.00
		3.2.4	Research plan	80	8.00	80	8.00	80	8.00	80	8.00	80	8.00
		3.2.5	Management performance evaluation	80	8.00	80	8.00	80	8.00	80	8.00	80	8.00
		Overall weighted Principle-level scores											
		Principle 1 - Target species			85.0		86.3		80.0		86.3		85.6
		Principle 2 - Ecosystem			89.7		89.0		89.0		89.0		91.7
		Principle 3 - Management			87.8		89.0		89.0		89.0		84.1



3.2 Surveillance activities

The audit was announced on the MSC web site on 21<sup>st</sup> May, 2015. Identified stakeholders were informed of the up-coming surveillance audit by email dated 28<sup>th</sup> April, 2015. The auditors received expressions of interest from the David Suzuki Foundation and the Ecology Action Centre. No written or oral submissions were received on the annual surveillance audit.

The client provided information to the auditors to inform them of the situation in the fishery prior to the site visit.

The site visit took place on June 22<sup>th</sup> – 29<sup>th</sup>. Meetings were held with the client and the client /DFO.

**Table 15: MEETINGS: JUNE 22<sup>nd</sup> - 25<sup>th</sup> 2015 NEWFOUNDLAND**

June 24 Client	Organisation
Ian Scott	Lead Auditor / P3
Howard Powles	P1/P2
Bruce Chapman	CAPP
Derek Butler	ASP
Phil Barnes	Fogo Island Coop
Ken Butler	Fogo Island Coop
June 24 Client / DFO	Organisation
Ian Scott	Lead Auditor / P3
Howard Powles	P1/P2
Bruce Chapman	CAPP
Derek Butler	ASP
Phil Barnes	Fogo Island Coop
Ken Butler	Fogo Island Coop
Don Stansbury	DFO Science
Chad Ward	DFO C&P
Annette Rumbolt	DFO RM
Brooks Pilgrim	DFO Policy
Katherine Skanes	DFO Science
Mariano Cohen-Alfonso	DFO Science
Leigh Edgar (telephone)	DFO RM NHQ
Tim Siferd	DFO

Due to poor health of the lead auditor the completion of the report was delayed until the beginning of September, 2015. There then followed a further delay in being able to publish the report as IFC announced their exit from their MSC fisheries certification business and so IFC contracts had to be transferred to Acoura Marine. This administrative process took some time.

3.2.1 Versions used

**Table 16: All Fisheries: MSC Versions Used**

MSC Sustainable Fishery Standard	V1.3
MSC Certification Requirements	V2.0
MSC Guidance to the Certification Requirements	V2.0

3.3 Results



3.4 **Borealis SFA 1: Conditions**

3.4.1 **Condition Borealis SFA 1: 1**

Performance Indicator & Score	PI	Scoring issue/ scoring guidepost	Score
	1.2.1	Sla. The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving management objectives reflected in the target and limit reference points.	70
Condition	The client is required to present evidence by the fourth annual audit that the elements of the harvest strategy work together towards achieving management objectives reflected in the target and limit reference points.		
Milestones	Not defined		
Client action plan	<p>CAPP and NC will collaborate with other stakeholders and the DFO to draft a harvest strategy relative to reference points established for the stock, and collaborate with Greenland as appropriate to avoid the stock declining below the limit reference point.</p> <ul style="list-style-type: none"><li>• By the first annual audit, evidence will be provided that a draft strategy has been prepared and circulated to stakeholders for consideration.</li><li>• By the second annual audit, evidence will be provided that feedback from stakeholders has been considered, and that an amended draft strategy has been tabled for consideration if required.</li><li>• By the third annual audit, evidence will be provided on the status of formal discussions between DFO and Greenland.</li><li>• By the fourth annual audit a strategy will be adopted in the IFMP</li></ul>		
Progress on Condition [2012]	<p>The Audit Team concludes that the client Discussion Paper describes in DRAFT form all the principal elements that are required to meet the definition of a harvest strategy for SFA1, including new prospective control rules that are analogous to those used in other shrimp fishing areas under the Northern Shrimp IFMP. The Paper acknowledges the problem posed by the independent setting of TACs in the two fishery zones should there be a precipitous decline in biomass, and it contains a commitment to seek a cooperative solution should that become necessary. The Paper is being circulated to stakeholders for comment. The assessment team therefore concludes that the content of the Paper is largely in line with what is required to meet MSC standard for Principle 1, and that the requirements of Milestone 1 have been achieved successfully. Progress on the action plan is therefore on track to meet the terms of this condition. Regarding the potential cooperation over joint management of the whole stock in the event of a future crisis, the Audit Team welcomes the commitment to seek cooperation, but it does have concerns about the wait that is implied by the phrase ‘should that become necessary’. The inherent risk in waiting for the crisis is that it is not a foregone conclusion that appropriate joint action would necessarily be agreed in time to secure the required timely action. The Team suggests that to be properly precautionary, it is more appropriate to develop and define a joint strategy in advance of a crisis. This would conform more closely to the requirement that a harvest strategy and control rule should embody a pre-agreed response for all critical eventualities under the two management systems responsible for a joint stock. The client is asked to consider this point in time for the second annual audit</p>		
Progress on Condition [2013]	<p>The team concluded that the year 2 milestone had been met for this PI and that progress was on track to meet the condition by year 4.</p>		

<b>Progress on Condition [2014]</b>	The team concluded that the year three milestone - “evidence will be provided on the status of formal discussions between DFO and Greenland” - had been met and the fishery was on target to meet this condition.
<b>Client Progress Report 2015</b>	Canada and Greenland entered into bilateral discussions in the summer of 2014, with the objective of negotiating a comprehensive agreement on management of the trans-boundary shrimp resource. Among other elements, it is intended that such an agreement would include a quota sharing component and a common approach (including Harvest Control Rules) to the setting of Total Allowable Catches (TACs). Formal negotiations commenced in 2015, but agreement has not yet been reached. Originally planning to await the outcome of the negotiations with Greenland, DFO has agreed to work with the Client in the development of a Harvest Strategy (HS) and related Harvest Control Rules (HCRs) to be utilized by Canada pending an agreement being reached with Greenland. It is anticipated that the HS and HCRs will be adopted by DFO by the first quarter of 2016.
<b>Auditor Observations 2015</b>	<p>This UoC was certified 9 months after the other UoCs. While this is the fourth audit it has come in year 3 of its certification. The current certificate expires in the Spring of 2017.</p> <p>The CAB did not define milestones to meet the condition, however the condition requires that by the fourth annual audit well defined HCRs are in place that are consistent with the HS and that incorporates the requirement to reduce the exploitation rate as the limit reference point is approached.</p> <p>The client action plan stated that a suite of harvest control rules will be adopted by DFO by the time of the Year 4 audit.</p> <p>The audit cycle for this and other UoCs was varied in 2012 to allow audits to be synchronised. As a result, this year’s audit of SFA1 has taken place in year 3 of the certification and the audit outcome has been assessed 9 months ahead of its 4th anniversary. It is therefore difficult to conclude whether the UoC is on target or behind target, although we note the Client’s submission that DFO has agreed to proceed with the development of harvest control rules pending an agreement being reached with Greenland, with the Client’s expectation that the HS and HCRs will be adopted by DFO by the first quarter of 2016.</p>
<b>Status of condition 2015</b>	With the above in mind and the fishery now in re-assessment and not subject to another surveillance audit, the audit team requires the client to continue to work toward meeting their commitment for a suite of harvest control rules being adopted by DFO. Evidence of progress should be provided to the reassessment team prior to the publication of the reassessment Final Draft Client Report.

3.4.2 Condition Borealis SFA 1: 2

<b>Performance Indicator &amp; Score</b>	<b>PI</b>	<b>Scoring issue/ scoring guidepost</b>	<b>Score</b>
	1.2.2	SlA Well defined HCRs are in place that are consistent with the HS and ensure that the exploitation rate is reduced as limit reference points are approached.	70
<b>Condition</b>	The client is required to provide evidence by the fourth annual audit that well defined HCRs are in place that are consistent with the HS and that incorporates the requirement to reduce the exploitation rate as the limit reference point is approached.		
<b>Milestones</b>	Not defined		

<b>Client action plan</b>	<p>CAPP and NC will collaborate with other stakeholders and the DFO to include explicit HCRs for the Canadian fishery in the IFMP.</p> <ul style="list-style-type: none"><li>• By the first annual audit, evidence will be provided that draft HCRs have been prepared and circulated to stakeholders for consideration</li><li>• By the second annual audit, evidence will be provided that feedback from stakeholders has been considered, and that amended HCRs have been tabled for consideration if required.</li><li>• By the third annual audit, evidence will be provided on the status of formal discussions between DFO and Nunavut.</li><li>• By the fourth annual audit, a suite of HCRs will be adopted in the IFMP.</li></ul>
<b>Progress on Condition [2012]</b>	<p>The Audit Team reviewed the draft rules, which include both obligatory and discretionary components that are in principle consistent with achieving precautionary management of the shrimp stock in SFA1. The rules contain probability criteria, and therefore take into account uncertainty in the stock assessment, although the rationale for the particular values chosen is not described. The draft rules were circulated to stakeholders for comment. The Team is therefore satisfied that the requirements of Milestone 1 have been achieved successfully and that progress on the action plan is on track to meet the terms of this condition. The Audit Team suggests that it would be helpful if the rationale for the chosen values of the probability criteria could be included in any future draft of the HCR, say by the second annual audit. In anticipation of the problems that might be encountered when trying to develop a cooperative approach to the joint management of this stock with Greenland, should that become necessary, it would also be helpful to consider how the likely effectiveness of these rules could be modeled using, say, trial stock projections made by the Bayesian stock production model that is used to assess the joint stock.</p>
<b>Progress on Condition [2013]</b>	<p>The team concluded that the year 2 milestone had been met for this PI and that progress was on track to meet the condition by year 4.</p>
<b>Progress on Condition [2014]</b>	<p>Since we consider that the year three milestone should refer to Greenland rather than Nunavut, we conclude that the year three milestone (“evidence will be provided on the status of formal discussions between DFO and Nunavut) has been met. Although not strictly relevant (given our interpretation of the wording of the year three milestone) for the record, we also note that formal discussions between DFO and Nunavut have been held and resulted in a consensus-based set of changes to the management system in Hudson Strait. Progress toward meeting the condition is on target.</p>
<b>Client Progress Report 2015</b>	<p>Canada and Greenland entered into bilateral discussions in the summer of 2014, with the objective of negotiating a comprehensive agreement on management of the trans-boundary shrimp resource. Among other elements, it is intended that such an agreement would include a quota sharing component and a common approach (including Harvest Control Rules) to the setting of Total Allowable Catches (TACs). Formal negotiations commenced in 2015, but agreement has not yet been reached. Originally planning to await the outcome of the negotiations with Greenland, DFO has agreed to work with the Client in the development of a Harvest Strategy (HS) and related Harvest Control Rules (HCRs) to be utilized by Canada pending an agreement being reached with Greenland. It is anticipated that the HS and HCRs will be adopted by DFO by the first quarter of 2016.</p>
<b>Auditor Observations 2015</b>	<p>This UoC was certified 9 months after the other UoCs. While this is the fourth audit it has come in year 3 of its certification. The current certificate expires in the Spring of 2017.</p> <p>The CAB did not define milestones to meet the condition, however the condition requires that by the fourth annual audit well defined HCRs are in place that are consistent with the HS and that incorporates the requirement to reduce the exploitation rate as the limit reference point is approached.</p> <p>The client action plan stated that a suite of harvest control rules will be adopted by DFO by the time of the Year 4 audit.</p>

	The audit cycle for this and other UoCs was varied in 2012 to allow audits to be synchronised. As a result, this year’s audit of SFA1 has taken place in year 3 of the certification and the audit outcome has been assessed 9 months ahead of its 4th anniversary. It is therefore difficult to conclude whether the UoC is on target or behind target, although we note the Client’s submission that DFO has agreed to proceed with the development of harvest control rules pending an agreement being reached with Greenland, with the Client’s expectation that the HS and HCRs will be adopted by DFO by the first quarter of 2016.
<b>Status of condition 2015</b>	With the above in mind and the fishery now in re-assessment and not subject to another surveillance audit, the audit team requires the client to continue to work toward meeting their commitment for a suite of harvest control rules being adopted by DFO. Evidence of progress should be provided to the reassessment team prior to the publication of the reassessment Final Draft Client Report.

3.4.3 Condition Borealis SFA 1: 3

Performance Indicator & Score	PI	Scoring issue/ scoring guidepost	Score
	2.4.1	Sl.a. The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	60
Condition	The client is required to provide evidence by the fourth annual audit that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be a serious or irreversible harm.		
Milestones	Not defined		
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 4 and 5, both of which relate to performance habitat PIs:</p> <ul style="list-style-type: none"><li>• CAPP and NC will collaborate with other stakeholders and 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 the conduct of shrimp fishing in this area.</li><li>• 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.</li><li>• By the second annual audit there will documented evidence showing the information that has been assembled and the results of analysis to date.</li><li>• By the third annual audit there will be documented evidence showing that at least a provisional evaluation has been completed.</li><li>• 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.</li></ul>		
Progress on Condition [2012]	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. 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). 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.
<b>Progress on Condition [2013]</b>	The team concluded that the year 2 milestone had been met for this PI and that progress was on track to meet the condition by year 4.
<b>Progress on Condition [2014]</b>	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.
<b>Client Progress Report 2015</b>	<ul style="list-style-type: none"><li>• In the course of implementing the Client Action Plan, we have demonstrated it is highly unlikely that the shrimp fishery is disrupting the structure and function of benthic communities or their habitat to a point where there would be serious or irreversible harm. Highlights of this evaluation include:<ul style="list-style-type: none"><li>○ In less-sensitive areas, the fishery footprint within main habitat types 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.</li><li>○ In designated areas of high coral concentrations, shrimp fishing interacts with only 3.299% of the total area, well below the threshold of 10% of the sensitive areas. Within these areas, the fishery occurs in the proximity of only 3 RV survey set locations containing defined threshold levels of coral.</li><li>○ In designated areas of high sponge concentrations, shrimp fishing interacts with only 0.008% of the total designated areas. Within these areas, there is virtually no interaction with research survey set locations containing defined threshold levels of sponge.</li></ul></li><li>• Notwithstanding this conclusion, NSAC did adopt a Partial Strategy at its March 2015 meeting, as confirmed in the draft meeting Minutes. Pursuant to this adopted Strategy, the &gt;100’ shrimp sector is in the process of implementing voluntary area closures in area C84.</li></ul>
<b>Auditor Observations 2015</b>	<p>We reviewed the most recent draft of “Northern Shrimp Advisory Committee (NSAC) - A (Partial) Habitat and Ecosystem Strategy for the Northern Shrimp Fishery” (CAPP 2015), along with the underlying analyses of the fishery footprint (Spatial analysis 2013). The Partial Strategy was adopted by the NSAC on March 4, 2015 and will be made public as part of the minutes of the meeting. Earlier versions of the document incorporating footprint analyses were considered in previous audit visits and Team comments were summarized in related Annual Surveillance Reports.</p> <p>Following the process outlined in DFO’s Ecological Risk Assessment Framework (ERAF) for Coldwater Corals and Sponge Dominated Communities (DFO 2013), CAPP (2015) summarizes the proportion of sensitive and total habitats impacted by trawls in a three-year period (2009-2011). If more than 10% of sensitive habitats is impacted, a further risk analysis is conducted. Although not part of the DFO ERAF, the document summarizes footprint on non-sensitive habitats (i.e. those not characterized as sensitive) as well as on sensitive habitats. If more than 30% of non-sensitive habitats is impacted a further risk analysis is to be conducted.</p> <p>CAPP (2015) concludes that under the current fishing strategy, areas impacted by trawls in the various SFAs are below the threshold values. In SFAs 2-4 and in SFA 7 initial analysis shows that more than 10% of sensitive habitat is impacted, but a more detailed analysis concludes that there is in fact very little overlap between the fishery footprint and identified sensitive areas. In SFA 2-4, industry has undertaken to implement a voluntary fishery closure in an area where the footprint overlaps an identified sensitive area.</p> <p>The Client (CAPP 2015, part H, p. 46) commits to reanalyse the fishery footprint every 5-years to monitor any change in risk level.</p>

<b>Status of condition 2015</b>	We find that there is evidence that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm. We conclude that Condition Borealis SFA 1: 3 has been met. Accordingly, PI 2.4.1 has been rescored to 100 (Appendix 1) and the Condition is closed.
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3.4.4 Condition Borealis SFA 1: 4

	PI	Scoring issue/ scoring guidepost	Score
<b>Performance Indicator &amp; Score</b>	2.4.2	<p>Sl.a. 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>Sl.b. 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>Sl.c. There is some evidence that the partial strategy is being implemented successfully</p>	60
<b>Condition</b>	<p>The client is required to provide evidence by the fourth annual audit that:</p> <ul style="list-style-type: none"><li>• 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.</li><li>• 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.</li><li>• There is some evidence that the partial strategy is being implemented successfully.</li></ul>		
<b>Milestones</b>	Not defined		
<b>Client action plan</b>	<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 3 and 5, both of which relate to performance indicators for habitat:</p> <ul style="list-style-type: none"><li>• CAPP and NC will collaborate with other stakeholders and the 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 the conduct of shrimp fishing in this area.</li></ul>		



	<ul style="list-style-type: none"><li>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.</li><li>By the second annual audit there will documented evidence showing the information that has been assembled and the results of analysis to date.</li><li>By the third annual audit there will be documented evidence showing that at least a provisional evaluation has been completed.</li><li>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.</li></ul>
Progress on Condition [2012]	See Condition Borealis SFA 1: 3
Progress on Condition [2013]	See Condition Borealis SFA 1: 3
Progress on Condition [2014]	See Condition Borealis SFA 1: 3
Client Progress Report 2015	See Condition Borealis SFA 1: 3
Auditor Observations 2015	See Condition Borealis SFA 1: 3
Status of condition 2015	<p>Evidence has been provided that shows: 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; 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; and the partial strategy is being implemented successfully.</p> <p>We conclude that Condition Borealis SFA 1: 4 has been met. Accordingly, PI 2.4.2 has been rescored to 80 (Appendix 1) and the Condition is closed.</p>

3.4.5 Condition Borealis SFA 1: 5

Performance Indicator & Score	PI	Scoring issue/ scoring guidepost	Score
	2.4.3	Slc. 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).	70

Condition	The client is required to provide evidence by the fourth annual audit that: 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).
Milestones	Not defined
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 3 and 4, both of which relate to performance indicators for habitat:</p> <ul style="list-style-type: none"><li>• CAPP and NC will collaborate with other stakeholders and 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 the conduct of shrimp fishing in this area.</li><li>• 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.</li><li>• By the second annual audit there will documented evidence showing the information that has been assembled and the results of analysis to date.</li><li>• By the third annual audit there will be documented evidence showing that at least a provisional evaluation has been completed.</li><li>• 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.</li></ul>
Progress on Condition [2012]	See Condition Borealis SFA 1: 3
Progress on Condition [2013]	See Condition Borealis SFA 1: 3
Progress on Condition [2014]	See Condition Borealis SFA 1: 3
Client Progress Report 2015	See Condition Borealis SFA 1: 3
Auditor Observations 2015	See Condition Borealis SFA 1: 3
Status of condition 2015	<p>Evidence has been provided that shows: Sufficient data continue to be collected to detect any increase in risk to habitat (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).</p> <p>We conclude that Condition Borealis SFA 1: 5 has been met, Accordingly, PI 2.4.3 has been rescored to 80 (Appendix 1) and the Condition is closed.</p>



3.4.6    Condition Borealis SFA 1: 6

Performance Indicator & Score	PI	Scoring issue/ scoring guidepost	Score
	2.5.1	SlA The fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	70
Condition	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.		
Milestones	Not defined		
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 7 and 8, both of which relate to performance indicators for the ecosystem:</p> <ul style="list-style-type: none"><li>• CAPP and NC will collaborate with other stakeholders and the DFO towards development of a program (a) to enhance the collection of information, and (b) to conduct an evaluation of the vulnerability of ecosystem components and the inferred 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 as they applies to the conduct of shrimp fishing in this area.</li><li>• 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.</li><li>• By the second annual audit there will documented evidence showing the information that has been assembled and the results of analysis to date.</li><li>• By the third annual audit there will documented evidence showing that at least a provisional evaluation has been completed.</li></ul>		

	<ul style="list-style-type: none"><li>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.</li></ul>
Progress on Condition [2012]	See Condition Borealis SFA 1: 3
Progress on Condition [2013]	See Condition Borealis SFA 1: 3
Progress on Condition [2014]	See Condition Borealis SFA 1: 3
Client Progress Report 2015	See Condition Borealis SFA 1: 3
Auditor Observations 2015	See Condition Borealis SFA 1: 3
Status of condition 2015	Evidence has been provided that shows that the fishery is highly unlikely to disrupt benthic community structure and function to a point where there would be serious or irreversible harm. We conclude that Condition Borealis SFA 1: 6 has been met, Accordingly, PI 2.5.1 has been rescored to 90 (Appendix 1) and the Condition is closed.

3.4.7 Condition Borealis SFA 1: 7

	PI	Scoring issue/ scoring guidepost	Score
Performance Indicator & Score	2.5.2	Sl.a 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 so as to achieve the Ecosystem Outcome 80 level of performance.  Sl.b. The partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries / ecosystems).  Sl.c. There is some evidence that the measures comprising the partial strategy are being implemented successfully.	70

<b>Condition</b>	<p>The client is required to provide evidence by the fourth annual audit that:</p> <ul style="list-style-type: none"><li>• 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.</li><li>• The partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ ecosystems).</li><li>• There is some evidence that the measures comprising the partial strategy are being implemented successfully.</li></ul>
<b>Milestones</b>	Not defined
<b>Client action plan</b>	<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 6 and 8, both of which relate to performance indicators for the ecosystem:</p> <ul style="list-style-type: none"><li>• CAPP and NC will collaborate with other stakeholders and the DFO towards development of a program (a) to enhance the collection of information, and (b) to conduct an evaluation of the vulnerability of ecosystem components and the inferred 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 as they applies to the conduct of shrimp fishing in this area.</li><li>• 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.</li><li>• By the second annual audit there will documented evidence showing the information that has been assembled and the results of analysis to date.</li><li>• By the third annual audit there will documented evidence showing that at least a provisional evaluation has been completed.</li><li>• 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.</li></ul>
<b>Progress on Condition [2012]</b>	See Condition Borealis SFA 1: 3
<b>Progress on Condition [2013]</b>	See Condition Borealis SFA 1: 3
<b>Progress on Condition [2014]</b>	See Condition Borealis SFA 1: 3
<b>Client Progress Report 2015</b>	See Condition Borealis SFA 1: 3
<b>Auditor Observations</b>	See Condition Borealis SFA 1: 3

2015	
Status of condition 2015	<p>Evidence has been provided that shows that: there is a partial strategy in place 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; the partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ ecosystems); and the measures comprising the partial strategy are being implemented successfully.</p> <p>We conclude that Condition Borealis SFA 1: 7 has been met, Accordingly, PI 2.5.2 has been rescored to 85 (Appendix 1) and the Condition is closed.</p>

3.4.8 Condition Borealis SFA 1: 8

Performance Indicator & Score	PI	Scoring issue/ scoring guidepost	Score
	2.5.3	<p>Sld. Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred.</p> <p>Sle. 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>	70
Condition	<p>The client is required to provide evidence by the fourth annual audit that:</p> <ul style="list-style-type: none"><li>• 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.</li><li>• 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).</li></ul>		
Milestones	Not defined.		
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 6 and 7, both of which relate to performance indicators for the ecosystem:</p> <ul style="list-style-type: none"><li>• CAPP and NC will collaborate with other stakeholders and the DFO towards development of a program (a) to enhance the collection of information, and (b) to conduct an evaluation of the vulnerability of ecosystem components and the inferred impact of otter trawl fishing for shrimp in this area. A “project</li></ul>		

	<p>team” will be assembled for this purpose, which more generally will also ensure implementation of DFO’s Sustainable Fisheries Framework Policies as they applies to the conduct of shrimp fishing in this area.</p> <ul style="list-style-type: none"><li>• 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.</li><li>• By the second annual audit there will documented evidence showing the information that has been assembled and the results of analysis to date.</li><li>• By the third annual audit there will documented evidence showing that at least a provisional evaluation has been completed.</li><li>• 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.</li></ul>
Progress on Condition [2012]	See Condition Borealis SFA 1: 3
Progress on Condition [2013]	See Condition Borealis SFA 1: 3
Progress on Condition [2014]	See Condition Borealis SFA 1: 3
Client Progress Report 2015	See Condition Borealis SFA 1: 3
Auditor Observations 2015	See Condition Borealis SFA 1: 3
Status of condition 2015	<p>Evidence has been provided that shows that: 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; and Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).</p> <p>We conclude that Condition Borealis SFA 1: 8 has been met, Accordingly, PI 2.5.3 has been rescored to 80 (Appendix 1) and the Condition is closed.</p>

3.4.9 Condition Borealis SFA 1: 9

Performance Indicator &	PI	Scoring issue/ scoring guidepost	Score
	3.2.1	Sla. 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.	70

Score			
Condition	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.		
Milestones	Not defined.		
Client action plan	CAPP and NC will collaborate with other stakeholders and the 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.		
Progress on Condition [2012]	The Audit Team concludes that this condition has been met. This PI has been rescored to 80 and the condition has been closed out.		

3.4.10 Condition Borealis SFA 1: 10

Performance Indicator & Score	PI	Scoring issue/ scoring guidepost	Score
	3.2.4	SI a. A research plan provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC’s Principles 1 and 2.	75
Condition	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.		
Milestones	Not defined		
Client action plan	CAPP and NC will collaborate with other stakeholders and the 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. <ul style="list-style-type: none"><li>• By the first annual audit there will be documented evidence that a plan to conduct gap analysis has been developed by the working group.</li><li>• By the second annual audit there will be documented evidence that a gap analysis has been completed.</li><li>• By the fourth annual audit there will be documented evidence that a research plan is in place.</li></ul>		
Progress on Condition 2012	The Audit team concludes that progress on the action plan is on track to meet the Condition by Year 4 of the certification period.		

<b>Progress on Condition 2013</b>	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.
<b>Progress on Condition 2014</b>	No specific milestone was identified for Year 3 in the Client Action Plan. However, the Team concludes that progress is on target to meeting this condition in Year 4 as required.
<b>Client Progress Report 2015</b>	<p>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. The following elements were reviewed at the October meeting of the MSC Working Group, and recommended for adoption at the 2015 meeting of NSAC.</p> <ul style="list-style-type: none"><li>• Continue to conduct research surveys of the shrimp resources to enable updating of shrimp based indices (i.e., fishable biomass, SSB, recruitment indices, ageing etc.) that are used to determine relative exploitation rates, and in setting TACs: In SFAs 5,6,7 (autumn DFO survey in 2HJ3KLNO; spring DFO survey in 3LNOPsn);. in SFA4 and the Eastern Assessment Zone (EAZ) (annual summer NSRF-DFO survey); and in the Western Assessment Zone (WAZ) (annual summer NSRF-DFO survey)</li><li>• Continue to analyze recruitment indices and various environmental covariates with the intent of developing models that will predict fishable biomass.</li><li>• Continue to conduct genetic analysis to delineate stock assessment area(s), especially for use in modeling.</li><li>• Continue the shrimp ageing project for <i>borealis</i> and <i>montagui</i>.</li><li>• Continue efforts to develop an assessment model, eventually to cover all SFAs.</li><li>• Conditional on the development of an accepted assessment model, to begin a Management Strategy Evaluation to develop modeled harvest control rules. Continue collaborative efforts with Dr. Patrick Ouellet (IML) on an International Governance Strategy project to determine the impacts of climate change upon shrimp population dynamics.</li><li>• Continue to gather and analyze information related to corals, sponges and other vulnerable marine ecosystems.</li><li>• Continue to analyze trends in the fish community (including shrimp).</li><li>• Continue diet studies of major groundfish species (predators of shrimp), and to estimate food consumption by main predator and prey groups.</li><li>• Continue to estimate overall food consumption by the fish community.</li><li>• Continue to investigate trophic level for key species (including shrimp) using diet composition and stable isotopes.</li><li>• Continue to investigate the development of fisheries production potential models.</li></ul> <p>The Research Plan was adopted at the March 2015 meeting of NSAC.</p>
<b>Auditor Observations 2015</b>	The requirement was for evidence that a research plan was in place. This was provided by the client.
<b>Status of condition 2015</b>	There is a research plan and the condition is closed. PI 3.2.4 has been rescored to 80. (see Appendix1).

3.5 Borealis SFA 2, 3 & 4: Conditions

3.5.1 Condition Borealis SFA 2, 3 & 4: 1

Performance Indicator & Score	PI	Scoring issue/ scoring guidepost	Score
	2.4.1	Sla. The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	60
Condition	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.		
Milestones	Not defined		
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 4 and 5, both of which relate to performance habitat PIs:</p> <ul style="list-style-type: none"><li>• CAPP and NC will collaborate with other stakeholders and 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 the conduct of shrimp fishing in this area.</li><li>• 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.</li><li>• By the second annual audit there will documented evidence showing the information that has been assembled and the results of analysis to date.</li><li>• By the third annual audit there will be documented evidence showing that at least a provisional evaluation has been completed.</li><li>• 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.</li></ul>		
Progress on Condition [2012]	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. 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). 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.		
Progress on Condition [2013]	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.		



<b>Progress on Condition [2014]</b>	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.
<b>Client Progress Report 2015</b>	<p>In the course of implementing the Client Action Plan, we have demonstrated it is highly unlikely that the shrimp fishery is disrupting the structure and function of benthic communities or their habitat to a point where there would be serious or irreversible harm. Highlights of this evaluation include:</p> <ul style="list-style-type: none"><li>○ In less-sensitive areas, the fishery footprint within main habitat types 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.</li><li>○ In designated areas of high coral concentrations, shrimp fishing interacts with only 3.299% of the total area, well below the threshold of 10% of the sensitive areas. Within these areas, the fishery occurs in the proximity of only 3 RV survey set locations containing defined threshold levels of coral.</li><li>○ In designated areas of high sponge concentrations, shrimp fishing interacts with only 0.008% of the total designated areas. Within these areas, there is virtually no interaction with research survey set locations containing defined threshold levels of sponge.</li></ul> <ul style="list-style-type: none"><li>● Notwithstanding this conclusion, NSAC did adopt a Partial Strategy at its March 2015 meeting, as confirmed in the draft meeting Minutes. Pursuant to this adopted Strategy, the &gt;100’ shrimp sector is in the process of implementing voluntary area closures in area C84.</li></ul>
<b>Auditor Observations 2015</b>	<p>We reviewed the latest iteration of the document “Northern Shrimp Advisory Committee (NSAC) - A (Partial) Habitat and Ecosystem Strategy for the Northern Shrimp Fishery” (CAPP 2015), along with the underlying analyses of the fishery footprint (Spatialanalysis 2013). The Partial Strategy document was adopted by the NSAC on March 4, 2015 and will be made public as part of the minutes of the meeting. Earlier versions of the document incorporating footprint analyses have been tabled on earlier audit visits, and Team comments were summarized in related Audit Reports.</p> <p>Following the process outlined in DFO’s Ecological Risk Assessment Framework (ERAF) for Coldwater Corals and Sponge Dominated Communities (DFO 2013), CAPP (2015) summarizes the proportion of sensitive and total habitats impacted by trawls in a three-year period (2009-2011). If more than 10% of sensitive habitats is impacted, a further risk analysis is conducted. Although not part of the DFO ERAF, the document summarizes footprint on non-sensitive habitats (ie those not characterized as sensitive) as well as on sensitive habitats. If more than 30% of non-sensitive habitats is impacted a further risk analysis is to be conducted.</p> <p>CAPP (2015) concludes that under the current fishing strategy areas impacted by trawls in the various SFAs are below the threshold values. In SFAs 2-4 and in SFA 7 initial analysis shows that more than 10% of sensitive habitat is impacted, but a more detailed analysis concludes that there is in fact very little overlap between the fishery footprint and identified sensitive areas. In SFA 2-4, industry has undertaken to implement a voluntary fishery closure in an area where the footprint overlaps an identified sensitive area.</p> <p>Details of the assessment are provided in Appendix 1.</p> <p>The Client (CAPP 2015, part H, p. 46) commits to reanalysing the fishery footprint on a 5-year cycle, in order to monitor risk level.</p>
<b>Status of</b>	We find that there is evidence that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm. We conclude that Condition Borealis SFA 2, 3 & 4: 1 has been met. Accordingly, PI 2.4.1 has been rescored to 100 (Appendix 1) and

condition 2015	the Condition is closed.
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3.5.2    Condition Borealis SFA 2, 3 & 4: 2

	PI	Scoring issue/ scoring guidepost	Score
Performance Indicator & Score	2.4.2	Sl.a. 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  Sl.b. 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.  Sl.c. There is some evidence that the partial strategy is being implemented successfully	60
Condition	The client is required to provide evidence by the fourth annual audit that: <ul style="list-style-type: none"><li>• 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.</li><li>• 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.</li><li>• There is some evidence that the partial strategy is being implemented successfully.</li></ul>		

<b>Milestones</b>	Not defined.
<b>Client action plan</b>	<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 1 and 3, both of which relate to performance indicators for habitat:</p> <ul style="list-style-type: none"><li>• CAPP and NC will collaborate with other stakeholders and the 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 the conduct of shrimp fishing in this area.</li><li>• 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.</li><li>• By the second annual audit there will documented evidence showing the information that has been assembled and the results of analysis to date.</li><li>• By the third annual audit there will be documented evidence showing that at least a provisional evaluation has been completed.</li><li>• 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.</li></ul>
<b>Progress on Condition [2012]</b>	See Condition Borealis SFA 2, 3 & 4: 1
<b>Progress on Condition [2013]</b>	See Condition Borealis SFA 2, 3 & 4: 1
<b>Progress on Condition [2014]</b>	See Condition Borealis SFA 2, 3 & 4: 1
<b>Client Progress Report 2015</b>	See Condition Borealis SFA 2, 3 & 4: 1
<b>Auditor Observations 2015</b>	See Condition Borealis SFA 2, 3 & 4: 1
<b>Status of condition 2015</b>	<p>Evidence has been provided that shows: 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; 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; and the partial strategy is being implemented successfully.</p> <p>We conclude that Condition Borealis SFA 2, 3 &amp; 4: 2 has been met. Accordingly, PI 2.4.2 has been rescored to 80 (Appendix 1) and the Condition is closed.</p>

3.5.3    Condition Borealis SFA 2, 3 & 4: 3

Performance Indicator & Score	PI	Scoring issue/ scoring guidepost	Score
	2.4.3	Slc. 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).	70
Condition	The client is required to provide evidence by the fourth annual audit that: 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).		
Milestones	Not defined.		
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 1 and 2, both of which relate to performance indicators for habitat:</p> <ul style="list-style-type: none"><li>• CAPP and NC will collaborate with other stakeholders and the 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 the conduct of shrimp fishing in this area.</li><li>• 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.</li><li>• By the second annual audit there will documented evidence showing the information that has been assembled and the results of analysis to date.</li><li>• By the third annual audit there will be documented evidence showing that at least a provisional evaluation has been completed.</li><li>• 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.</li></ul>		
Progress on Condition [2012]	See Condition Borealis SFA 2, 3 & 4: 1		
Progress on Condition [2013]	See Condition Borealis SFA 2, 3 & 4: 1		
Progress on Condition [2014]	See Condition Borealis SFA 2, 3 & 4: 1		
Client Progress	See Condition Borealis SFA 2, 3 & 4: 1		

Report 2015	
Auditor Observations 2015	See Condition Borealis SFA 2, 3 & 4: 1
Status of condition 2015	<p>Evidence has been provided that shows: Sufficient data continue to be collected to detect any increase in risk to habitat (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).</p> <p>We conclude that Condition Borealis SFA 2, 3 &amp; 4: 3 has been met, Accordingly, PI 2.4.3 has been rescored to 80 (Appendix 1) and the Condition is closed.</p>

3.5.4 Condition Borealis SFA 2, 3 & 4: 4

Performance Indicator & Score	PI	Scoring issue/ scoring guidepost	Score
	2.5.1	SlA The fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	70
Condition	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.		
Milestones	Not defined.		
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 5 and 6, both of which relate to performance indicators for the ecosystem:</p> <ul style="list-style-type: none"><li>• CAPP and NC will collaborate with other stakeholders and the DFO, towards development of a program (a) to enhance the collection of information, and (b) to conduct an evaluation of the vulnerability of ecosystem components and the inferred 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 as they applies to the conduct of shrimp fishing in this area.</li><li>• 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.</li><li>• By the second annual audit there will documented evidence showing the information that has been assembled and the results of analysis to date.</li><li>• By the third annual audit there will documented evidence showing that at least a provisional evaluation has been completed.</li><li>• 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.</li></ul>		

Progress on Condition [2012]	See Condition Borealis SFA 2, 3 & 4: 1
Progress on Condition [2013]	See Condition Borealis SFA 2, 3 & 4: 1
Progress on Condition [2014]	See Condition Borealis SFA 2, 3 & 4: 1
Client Progress Report 2015	See Condition Borealis SFA 2, 3 & 4: 1
Auditor Observations 2015	See Condition Borealis SFA 2, 3 & 4: 1
Status of condition 2015	Evidence has been provided that shows that the fishery is highly unlikely to disrupt benthic community structure and function to a point where there would be serious or irreversible harm.  We conclude that Condition Borealis SFA 2, 3 & 4: 4 has been met, Accordingly, PI 2.5.1 has been rescored to 90 (Appendix 1) and the Condition is closed.

3.5.5    Condition Borealis SFA 2, 3 & 4: 5

	PI	Scoring issue/ scoring guidepost	Score
Performance Indicator & Score	2.5.2	Sl.a 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 so as to achieve the Ecosystem Outcome 80 level of performance.  Sl.b. The partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries / ecosystems).  Sl.c. There is some evidence that the measures comprising the partial strategy are being implemented successfully.	70

<b>Condition</b>	<p>The client is required to provide evidence by the fourth annual audit that:</p> <ul style="list-style-type: none"><li>• 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.</li><li>• The partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ ecosystems).</li><li>• There is some evidence that the measures comprising the partial strategy are being implemented successfully.</li></ul>
<b>Milestones</b>	Not defined.
<b>Client action plan</b>	<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 4 and 6, both of which relate to performance indicators for the ecosystem:</p> <ul style="list-style-type: none"><li>• CAPP and NC will collaborate with other stakeholders and the DFO towards development of a program (a) to enhance the collection of information, and (b) to conduct an evaluation of the vulnerability of ecosystem components and the inferred 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 as they applies to the conduct of shrimp fishing in this area.</li><li>• 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.</li><li>• By the second annual audit there will documented evidence showing the information that has been assembled and the results of analysis to date.</li><li>• By the third annual audit there will documented evidence showing that at least a provisional evaluation has been completed.</li><li>• 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.</li></ul>
<b>Progress on Condition [2012]</b>	See Condition Borealis SFA 2, 3 & 4: 1
<b>Progress on Condition [2013]</b>	See Condition Borealis SFA 2, 3 & 4: 1
<b>Progress on Condition [2014]</b>	See Condition Borealis SFA 2, 3 & 4: 1
<b>Client Progress Report 2015</b>	See Condition Borealis SFA 2, 3 & 4: 1
<b>Auditor Observations</b>	See Condition Borealis SFA 2, 3 & 4: 1



2015	
Status of condition 2015	<p>Evidence has been provided that shows that: there is a partial strategy in place 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; the partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ ecosystems); and the measures comprising the partial strategy are being implemented successfully.</p> <p>We conclude that Condition Borealis SFA 2, 3 &amp; 4: 5 has been met, Accordingly, PI 2.5.2 has been rescored to 85 (Appendix 1) and the Condition is closed.</p>

3.5.6 Condition Borealis SFA 2, 3 & 4: 6

Performance Indicator & Score	PI	Scoring issue/ scoring guidepost	Score
	2.5.3	<p>SId. Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred.</p> <p>Sle. 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>	70
Condition	<p>The client is required to provide evidence by the fourth annual audit that:</p> <ul style="list-style-type: none"><li>• 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.</li><li>• 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).</li></ul>		
Milestones	Not defined.		
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 4 and 5, both of which relate to performance indicators for the ecosystem:</p> <ul style="list-style-type: none"><li>• CAPP and NC will collaborate with other stakeholders and the DFO towards development of a program (a) to enhance the collection of information, and (b) to conduct an evaluation of the vulnerability of ecosystem components and the inferred 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 as they applies to the conduct of shrimp fishing in this area.</li><li>• 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.</li><li>• By the second annual audit there will documented evidence showing the information that has been assembled and the results of analysis to date.</li><li>• By the third annual audit there will documented evidence showing that at least a provisional evaluation has been completed.</li></ul>		



	<ul style="list-style-type: none"><li>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.</li></ul>
Progress on Condition [2012]	See Condition Borealis SFA 2, 3 & 4: 1
Progress on Condition [2013]	See Condition Borealis SFA 2, 3 & 4: 1
Progress on Condition [2014]	See Condition Borealis SFA 2, 3 & 4: 1
Client Progress Report 2015	See Condition Borealis SFA 2, 3 & 4: 1
Auditor Observations 2015	See Condition Borealis SFA 2, 3 & 4: 1
Status of condition 2015	<p>Evidence has been provided that shows that: 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; and Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).</p> <p>We conclude that Condition Borealis SFA 2, 3 &amp; 4: 6 has been met, Accordingly, PI 2.5.3 has been rescored to 80 (Appendix 1) and the Condition is closed.</p>

3.5.7    Condition Borealis SFA 2, 3 & 4: 7

Performance Indicator & Score	PI	Scoring issue/ scoring guidepost	Score
	3.2.1	Sla. 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.	70
Condition	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.		

Milestones	Not defined.
Client action plan	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.
Progress on Condition- 2012	The Audit Team concludes that this condition has been met. This PI has been rescored to 80 and the condition has been closed out.

3.5.8 Condition Borealis SFA 2, 3 & 4: 8

Performance Indicator & Score	PI	Scoring issue/ scoring guidepost	Score
	3.2.4	SI a. A research plan provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC’s Principles 1 and 2.	75
Condition	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.		
Milestones	Not defined.		
Client action plan	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. <ul style="list-style-type: none"><li>• By the first annual audit there will be documented evidence that a plan to conduct gap analysis has been developed by the working group.</li><li>• By the second annual audit there will be documented evidence that a gap analysis has been completed.</li></ul> By the fourth annual audit there will be documented evidence that a research plan is in place.		
Progress on Condition [2012]	The Audit team concludes that progress on the action plan is on track to meet the Condition by Year 4 of the certification period.		
Progress on Condition [2013]	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.		
Progress on Condition	No specific milestone was identified for Year 3 in the Client Action Plan. However, the Team concludes that progress is on target to meeting this condition in Year 4 as required.		

[2014]	
Client Progress Report 2015	<p>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. The following elements were reviewed at the October meeting of the MSC Working Group, and recommended for adoption at the 2015 meeting of NSAC.</p> <ul style="list-style-type: none"><li>• Continue to conduct research surveys of the shrimp resources to enable updating of shrimp based indices (i.e., fishable biomass, SSB, recruitment indices, ageing etc.) that are used to determine relative exploitation rates, and in setting TACs: In SFAs 5,6,7 (autumn DFO survey in 2HJ3KLNO; spring DFO survey in 3LNOPsn);. in SFA4 and the Eastern Assessment Zone (EAZ) (annual summer NSRF-DFO survey); and in the Western Assessment Zone (WAZ) (annual summer NSRF-DFO survey)</li><li>• Continue to analyze recruitment indices and various environmental covariates with the intent of developing models that will predict fishable biomass.</li><li>• Continue to conduct genetic analysis to delineate stock assessment area(s), especially for use in modeling.</li><li>• Continue the shrimp ageing project for <i>borealis</i> and <i>montagui</i>.</li><li>• Continue efforts to develop an assessment model, eventually to cover all SFAs.</li><li>• Conditional on the development of an accepted assessment model, to begin a Management Strategy Evaluation to develop modeled harvest control rules.Continue collaborative efforts with Dr. Patrick Ouellet (IML) on an International Governance Strategy project to determine the impacts of climate change upon shrimp population dynamics.</li><li>• Continue to gather and analyze information related to corals, sponges and other vulnerable marine ecosystems.</li><li>• Continue to analyze trends in the fish community (including shrimp).</li><li>• Continue diet studies of major groundfish species (predators of shrimp), and to estimate food consumption by main predator and prey groups.</li><li>• Continue to estimate overall food consumption by the fish community.</li><li>• Continue to investigate trophic level for key species (including shrimp) using diet composition and stable isotopes.</li><li>• Continue to investigate the development of fisheries production potential models.</li></ul> <p>The Research Plan was adopted at the March 2015 meeting of NSAC.</p>
Auditor Observations 2015	<p>The requirement was for evidence that a research plan was in place. This was provided by the client.</p>
Status of condition 2015	<p>There is a research plan and the condition is closed. PI 3.2.4 has been rescored to 80 (Appendix 1).</p>

3.6.1 Condition Borealis SFA 5 & 6: 1

Performance Indicator & Score	PI	Scoring issue/ scoring guidepost	Score
	2.4.1	Sl.a. The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	60
Condition	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.		
Milestones	Not defined		
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 4 and 5, both of which relate to performance habitat PIs:</p> <ul style="list-style-type: none"><li>• CAPP and NC will collaborate with other stakeholders and 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 the conduct of shrimp fishing in this area.</li><li>• 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.</li><li>• By the second annual audit there will documented evidence showing the information that has been assembled and the results of analysis to date.</li><li>• By the third annual audit there will be documented evidence showing that at least a provisional evaluation has been completed.</li><li>• 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.</li></ul>		
Progress on Condition [2012]	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. 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). 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.		
Progress on Condition [2013]	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.		
Progress on Condition	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.		

[2014]	
Client Progress Report 2015	<p>In the course of implementing the Client Action Plan, we have demonstrated it is highly unlikely that the shrimp fishery is disrupting the structure and function of benthic communities or their habitat to a point where there would be serious or irreversible harm. Highlights of this evaluation include:</p> <ul style="list-style-type: none"><li>○ In less-sensitive areas, the fishery footprint within main habitat types 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.</li><li>○ In designated areas of high coral concentrations, shrimp fishing interacts with only 3.299% of the total area, well below the threshold of 10% of the sensitive areas. Within these areas, the fishery occurs in the proximity of only 3 RV survey set locations containing defined threshold levels of coral.</li><li>○ In designated areas of high sponge concentrations, shrimp fishing interacts with only 0.008% of the total designated areas. Within these areas, there is virtually no interaction with research survey set locations containing defined threshold levels of sponge.</li></ul> <p>Notwithstanding this conclusion, NSAC did adopt a Partial Strategy at its March 2015 meeting, as confirmed in the draft meeting Minutes. Pursuant to this adopted Strategy, the &gt;100' shrimp sector is in the process of implementing voluntary area closures in area C84.</p>
Auditor Observations 2015	<p>We reviewed the most recent draft of “Northern Shrimp Advisory Committee (NSAC) - A (Partial) Habitat and Ecosystem Strategy for the Northern Shrimp Fishery” (CAPP 2015), along with the underlying analyses of the fishery footprint (Spatial analysis 2013). The Partial Strategy was adopted by the NSAC on March 4, 2015 and will be made public as part of the minutes of the meeting. Earlier versions of the document incorporating footprint analyses were considered in previous audit visits and Team comments were summarized in related Annual Surveillance Reports.</p> <p>Following the process outlined in DFO’s Ecological Risk Assessment Framework (ERAF) for Coldwater Corals and Sponge Dominated Communities (DFO 2013), CAPP (2015) summarizes the proportion of sensitive and total habitats impacted by trawls in a three-year period (2009-2011). If more than 10% of sensitive habitats is impacted, a further risk analysis is conducted. Although not part of the DFO ERAF, the document summarizes footprint on non-sensitive habitats (i.e. those not characterized as sensitive) as well as on sensitive habitats. If more than 30% of non-sensitive habitats is impacted a further risk analysis is to be conducted.</p> <p>CAPP (2015) concludes that under the current fishing strategy, areas impacted by trawls in the various SFAs are below the threshold values. In SFAs 2-4 and in SFA 7 initial analysis shows that more than 10% of sensitive habitat is impacted, but a more detailed analysis concludes that there is in fact very little overlap between the fishery footprint and identified sensitive areas. In SFA 2-4, industry has undertaken to implement a voluntary fishery closure in an area where the footprint overlaps an identified sensitive area.</p> <p>The Client (CAPP 2015, part H, p. 46) commits to reanalyse the fishery footprint every 5-years to monitor any change in risk level.</p>
Status of condition 2015	<p>We find that there is evidence that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm. We conclude that Condition Borealis SFA 5 &amp; 6: 1 has been met.</p> <p>Accordingly, PI 2.4.1 has been rescored to 100 (Appendix 1) and the Condition is closed.</p>

3.6.2 Condition Borealis SFA 5 & 6: 2

	PI	Scoring issue/ scoring guidepost	Score
Performance Indicator & Score	2.4.2	<p>Sl.a. 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>Sl.b. 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>Sl.c. There is some evidence that the partial strategy is being implemented successfully</p>	60
Condition	<p>The client is required to provide evidence by the fourth annual audit that:</p> <ul style="list-style-type: none"><li>• 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.</li><li>• 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.</li><li>• There is some evidence that the partial strategy is being implemented successfully.</li></ul>		
Milestones	Not defined		
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 1 and 3, both of which relate to performance indicators for habitat:</p> <ul style="list-style-type: none"><li>• CAPP and NC will collaborate with other stakeholders and the 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 the conduct of shrimp fishing in this area.</li><li>• 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.</li><li>• By the second annual audit there will documented evidence showing the information that has been assembled and the results of analysis to date.</li><li>• By the third annual audit there will be documented evidence showing that at least a provisional evaluation has been completed. 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.</li></ul>		
Progress on Condition [2012]	See Condition Borealis SFA 5 & 6: 1		

Progress on Condition [2013]	See Condition Borealis SFA 5 & 6: 1
Progress on Condition [2014]	See Condition Borealis SFA 5 & 6: 1
Client Progress Report 2015	See Condition Borealis SFA 5 & 6: 1
Auditor Observations 2015	See Condition Borealis SFA 5 & 6: 1
Status of condition 2015	Evidence has been provided that shows: 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; 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; and the partial strategy is being implemented successfully.  We conclude that Condition Borealis SFA 5 & 6: 2 has been met. Accordingly, PI 2.4.2 has been rescored to 80 (Appendix 1) and the Condition is closed.

3.6.3 Condition Borealis SFA 5 & 6: 3

Performance Indicator & Score	PI	Scoring issue/ scoring guidepost	Score
	2.4.3	Slc. 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).	70
Condition	The client is required to provide evidence by the fourth annual audit that: 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).		
Milestones	Not defined		
Client action plan	The client has set out their actions and expected outcomes for this performance indicator in a logical step wise approach in association with Conditions 1 and 2, both of which relate to performance indicators for habitat: <ul style="list-style-type: none"><li>CAPP and NC will collaborate with other stakeholders and the DFO towards development of a program (a) to enhance the collection of information,</li></ul>		



	<p>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 the conduct of shrimp fishing in this area.</p> <ul style="list-style-type: none"><li>• 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.</li><li>• By the second annual audit there will documented evidence showing the information that has been assembled and the results of analysis to date.</li><li>• By the third annual audit there will be documented evidence showing that at least a provisional evaluation has been completed.</li><li>• 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.</li></ul>
<b>Progress on Condition [2012]</b>	See Condition Borealis SFA 5 & 6: 1
<b>Progress on Condition [2013]</b>	See Condition Borealis SFA 5 & 6: 1
<b>Progress on Condition [2014]</b>	See Condition Borealis SFA 5 & 6: 1
<b>Client Progress Report 2015</b>	See Condition Borealis SFA 5 & 6: 1
<b>Auditor Observations 2015</b>	See Condition Borealis SFA 5 & 6: 1
<b>Status of condition 2015</b>	<p>Evidence has been provided that shows: Sufficient data continue to be collected to detect any increase in risk to habitat (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).</p> <p>We conclude that Condition Borealis SFA 5 &amp; 6: 3 has been met, Accordingly, PI 2.4.3 has been rescored to 80 (Appendix 1) and the Condition is closed.</p>



3.6.4    Condition Borealis SFA 5 & 6: 4

Performance Indicator & Score	PI	Scoring issue/ scoring guidepost	Score
	2.5.1	SlA The fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	70
Condition	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.		
Milestones	Not defined.		
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 5 and 6, both of which relate to performance indicators for the ecosystem:</p> <ul style="list-style-type: none"><li>• CAPP and NC will collaborate with other stakeholders and the DFO towards development of a program (a) to enhance the collection of information, and (b) to conduct an evaluation of the vulnerability of ecosystem components and the inferred 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 as they applies to the conduct of shrimp fishing in this area.</li><li>• 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.</li><li>• By the second annual audit there will documented evidence showing the information that has been assembled and the results of analysis to date.</li><li>• By the third annual audit there will documented evidence showing that at least a provisional evaluation has been completed.</li><li>• 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.</li></ul>		
Progress on Condition [2012]	See Condition Borealis SFA 5 & 6: 1		
Progress on Condition [2013]	See Condition Borealis SFA 5 & 6: 1		
Progress on Condition [2014]	See Condition Borealis SFA 5 & 6: 1		
Client Progress	See Condition Borealis SFA 5 & 6: 1		

Report 2015	
Auditor Observations 2015	See Condition Borealis SFA 5 & 6: 1
Status of condition 2015	Evidence has been provided that shows that the fishery is highly unlikely to disrupt benthic community structure and function to a point where there would be serious or irreversible harm. We conclude that Condition Borealis SFA 5 & 6: 4 has been met, Accordingly, PI 2.5.1 has been rescored to 90 (Appendix 1) and the Condition is closed.

3.6.5 Condition Borealis SFA 5 & 6: 5

	PI	Scoring issue/ scoring guidepost	Score
Performance Indicator & Score	2.5.2	Sl.a 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 so as to achieve the Ecosystem Outcome 80 level of performance. Sl.b. The partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries / ecosystems). Sl.c. There is some evidence that the measures comprising the partial strategy are being implemented successfully.	70
Condition	The client is required to provide evidence by the fourth annual audit that: <ul style="list-style-type: none"><li>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.</li><li>The partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ ecosystems).</li><li>There is some evidence that the measures comprising the partial strategy are being implemented successfully.</li></ul>		
Milestones	Not defined.		
Client action plan	The client has set out their actions and expected outcomes for this performance indicator in a logical step wise approach in association with Conditions 4 and 6, both of which relate to performance indicators for the ecosystem: <ul style="list-style-type: none"><li>CAPP and NC will collaborate with other stakeholders and the DFO towards development of a program (a) to enhance the collection of information, and (b) to conduct an evaluation of the vulnerability of ecosystem components and the inferred 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 as they applies to the conduct of shrimp fishing in this area.</li></ul>		

	<ul style="list-style-type: none"><li>• 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.</li><li>• By the second annual audit there will documented evidence showing the information that has been assembled and the results of analysis to date.</li><li>• By the third annual audit there will documented evidence showing that at least a provisional evaluation has been completed.</li><li>• 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.</li></ul>
<b>Progress on Condition [2012]</b>	See Condition Borealis SFA 5 & 6: 1
<b>Progress on Condition [2013]</b>	See Condition Borealis SFA 5 & 6: 1
<b>Progress on Condition [2014]</b>	See Condition Borealis SFA 5 & 6: 1
<b>Client Progress Report 2015</b>	See Condition Borealis SFA 5 & 6: 1
<b>Auditor Observations 2015</b>	See Condition Borealis SFA 5 & 6: 1
<b>Status of condition 2015</b>	<p>Evidence has been provided that shows that: there is a partial strategy in place 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; the partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ ecosystems); and the measures comprising the partial strategy are being implemented successfully.</p> <p>We conclude that Condition Borealis SFA 5 &amp; 6: 5 has been met, Accordingly, PI 2.5.2 has been rescored to 85 (Appendix 1) and the Condition is closed.</p>

3.6.6 Condition Borealis SFA 5 & 6: 6

	PI	Scoring issue/ scoring guidepost	Score
Performance Indicator & Score	2.5.3	Sld. Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred.  Sle. 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).	70
Condition	The client is required to provide evidence by the fourth annual audit that: <ul style="list-style-type: none"><li>• 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.</li><li>• 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).</li></ul>		
Milestones	Not defined		
Client action plan	The client has set out their actions and expected outcomes for this performance indicator in a logical step wise approach in association with Conditions 4 and 5, both of which relate to performance indicators for the ecosystem: <ul style="list-style-type: none"><li>• CAPP and NC will collaborate with other stakeholders and the DFO towards development of a program (a) to enhance the collection of information, and (b) to conduct an evaluation of the vulnerability of ecosystem components and the inferred 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 as they applies to the conduct of shrimp fishing in this area.</li><li>• 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.</li><li>• By the second annual audit there will documented evidence showing the information that has been assembled and the results of analysis to date.</li><li>• By the third annual audit there will documented evidence showing that at least a provisional evaluation has been completed.</li><li>• 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.</li></ul>		
Progress on Condition [2012]	See Condition Borealis SFA 5 & 6: 1		
Progress on Condition [2013]	See Condition Borealis SFA 5 & 6: 1		

Progress on Condition [2014]	See Condition Borealis SFA 5 & 6: 1
Client Progress Report 2015	See Condition Borealis SFA 5 & 6: 1
Auditor Observations 2015	See Condition Borealis SFA 5 & 6: 1
Status of condition 2015	Evidence has been provided that shows that: 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; and 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).  We conclude that Condition Borealis SFA 5 & 6: 6 has been met, Accordingly, PI 2.5.3 has been rescored to 80 (Appendix 1) and the Condition is closed.

3.6.7    Condition Borealis SFA 5 & 6: 7

Performance Indicator & Score	PI	Scoring issue/ scoring guidepost	Score
	3.2.1	Sla. 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.	70
Condition	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.		
Milestones	Not defined.		
Client action plan	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.		
Progress on Condition [2012]	The Audit Team concludes that this condition has been met. This PI has been rescored to 80 and the condition has been closed out.		

3.6.8    Condition Borealis SFA 5 & 6: 8

Performance Indicator & Score	PI	Scoring issue/ scoring guidepost	Score
	3.2.4	SI a. A research plan provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC’s Principles 1 and 2.	75
Condition	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.		
Milestones	Not defined.		
Client action plan	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. <ul style="list-style-type: none"><li>• By the first annual audit there will be documented evidence that a plan to conduct gap analysis has been developed by the working group.</li><li>• By the second annual audit there will be documented evidence that a gap analysis has been completed.</li><li>• By the fourth annual audit there will be documented evidence that a research plan is in place.</li></ul>		
Progress on Condition 2012	The Audit team concludes that progress on the action plan is on track to meet the Condition by Year 4 of the certification period.		
Progress on Condition 2013	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.		
Progress on Condition 2014	No specific milestone was identified for Year 3 in the Client Action Plan. However, the Team concludes that progress is on target to meeting this condition in Year 4 as required.		
Client Progress Report 2015	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. The following elements were reviewed at the October meeting of the MSC Working Group, and recommended for adoption at the 2015 meeting of NSAC. <ul style="list-style-type: none"><li>• Continue to conduct research surveys of the shrimp resources to enable updating of shrimp based indices (i.e., fishable biomass, SSB, recruitment indices, ageing etc.) that are used to determine relative exploitation rates, and in setting TACs: In SFAs 5,6,7 (autumn DFO survey in 2HJ3KLNO; spring DFO survey in 3LNOPsn);. in SFA4 and the Eastern Assessment Zone (EAZ) (annual summer NSRF-DFO survey); and in the Western Assessment Zone (WAZ) (annual summer NSRF-DFO survey)</li><li>• Continue to analyze recruitment indices and various environmental covariates with the intent of developing models that will predict fishable biomass.</li><li>• Continue to conduct genetic analysis to delineate stock assessment area(s), especially for use in modeling.</li><li>• Continue the shrimp ageing project for <i>borealis</i> and <i>montagui</i>.</li><li>• Continue efforts to develop an assessment model, eventually to cover all SFAs.</li><li>• Conditional on the development of an accepted assessment model, to begin a Management</li><li>• Strategy Evaluation to develop modeled harvest control rules. Continue collaborative efforts with Dr. Patrick Ouellet (IML) on an International</li></ul>		

	<p>Governance Strategy project to determine the impacts of climate change upon shrimp population dynamics.</p> <ul style="list-style-type: none"><li>• Continue to gather and analyze information related to corals, sponges and other vulnerable marine ecosystems.</li><li>• Continue to analyze trends in the fish community (including shrimp).</li><li>• Continue diet studies of major groundfish species (predators of shrimp), and to estimate food consumption by main predator and prey groups.</li><li>• Continue to estimate overall food consumption by the fish community.</li><li>• Continue to investigate trophic level for key species (including shrimp) using diet composition and stable isotopes.</li><li>• Continue to investigate the development of fisheries production potential models.</li></ul> <p>The Research Plan was adopted at the March 2015 meeting of NSAC.</p>
<b>Auditor Observations 2015</b>	The requirement was for evidence that a research plan was in place. This was provided by the client.
<b>Status of condition 2015</b>	There is a research plan and the condition is closed. PI 3.2.4 has been rescored to 80 (Appendix 1).

3.7 Borealis SFA 7: Conditions

3.7.1 Condition Borealis SFA 7: 1

Performance Indicator & Score	PI	Scoring issue/ scoring guidepost	Score
	1.2.2	Sl a Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.	70
<b>Condition</b>	The client is required to demonstrate by the fourth annual audit that well-defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.		
<b>Milestones</b>	Not defined		
<b>Client action plan</b>	CAPP and NC will collaborate with other stakeholders and the DFO to refine domestic decision rules as appropriate and to promote NAFO's formal adoption of compatible reference points and harvest control rules, and to provide evidence of such.		
<b>Progress on Condition 2012</b>	The Audit Team concludes that whilst it is difficult to foresee the precise outcome of the above processes and steps, they nevertheless provide evidence that there is a potentially effective plan in place to achieve the required outcome of this Condition by the fourth annual audit. The words 'potentially		



	<p>effective’ are used because it is uncertain whether appropriate integration, or resolution of the differences, between the existing NAFO and the provisional DFO frameworks and rules will necessarily emerge within the required timescale. The time-scales involved in both the negotiations with NAFO, and the development of the assessment model, could quite conceivably be optimistic. This perception may reflect the fact that the Action Plan is devoid of the step-wise annual milestones that would make it easier for an assessment team to judge the likelihood and effectiveness of progress in the future.</p> <p>The team is prepared to accept that there is a plan, and that some actions have begun, sufficient to say that the client is on track, but it is strongly recommended that the steps listed in the Client Progress Report be broken down into appropriate milestones for the second, third and fourth annual audits, and that they provide sufficient internal detail to enable future audits to make a more realistic evaluation of progress against these milestones. One additional step that might be helpful is to see if the assessment model could be developed to make stock projections capable of exploring the relative performance of the two precautionary frameworks. That might show how similar or far apart they actually are. Despite this concern, the Team is satisfied that progress on the action plan is on track to meet the terms of this condition.</p>
<b>Progress on Condition 2013</b>	<p>The team concludes that progress is on track to meet this condition in year 4 as required.</p>
<b>Progress on Condition 2014</b>	<p>Although no Year Three milestone was identified for this PI, we conclude that the Client and DFO continue to work to harmonise Canadian and NAFO harvest control rules for this stock, and as such progress is on target for meeting this condition by Year Four as required. The timeline for harmonising HCRs is uncertain. For the present, we note that the NAFO limit reference point/harvest control rule is more conservative than those in the Canadian IFMP and has resulted in a decision of no directed fishing for the coming season, such that the disconnect between the two sets of HCRs has not been prejudicial to stock status nor to respecting the MSC standard.</p>
<b>Client Progress Report 2015</b>	<p>The Client referred to a letter from Sylvie Lapointe, Acting Director General, Fisheries Resource Management in DFO (June 9, 2015), indicating that “due to the closure to commercial fishing for 2015, NAFO has suspended the development of HCRs for 3LNO (SFA7)”.</p>
<b>Auditor Observations 2015</b>	<p>We note that HCRs equivalent to those for SFAs 2-6 are included in the IFMP.</p> <p>NAFO, that holds management responsibility for this stock, has suspended development of HCRs for it as the fishery has been closed in 2015. Although this decision was not the result of formal HCRs, it is the result of a <i>de facto</i> harvest control strategy of closing the fishery when the stock is below the NAFO-defined LRP.</p> <p>The <i>de facto</i> NAFO harvest control strategy is more conservative than the strategy outlined by the HCRs for this stock in the IFMP, that is, the NAFO-defined LRP below which fishing has been closed is set at a higher level than the LRP in the IFMP.</p> <p>Pending information on future stock trends and NAFO management measures, it may be concluded that the client has met the requirement to have clear HCRs in the IFMP, and that the stock is being managed by NAFO in a precautionary manner using a <i>de facto</i> harvest control strategy, consistent with the Canadian HCRs.</p>
<b>Status of condition 2015</b>	<p>We conclude that the Condition (the client is required to demonstrate by the fourth annual audit that well-defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached) has been met. Accordingly, PI 1.2.2 has been rescored to 80 (Appendix 1) and the Condition SFA 7: 1 is closed.</p>

3.7.2 Condition Borealis SFA 7: 2

Performance Indicator & Score	PI	Scoring issue/ scoring guidepost	Score
	2.4.1	Sl.a. The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	60
Condition	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.		
Milestones	Not defined		
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 4 and 5, both of which relate to performance habitat PIs:</p> <ul style="list-style-type: none"><li>• CAPP and NC will collaborate with other stakeholders and 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 the conduct of shrimp fishing in this area.</li><li>• 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.</li><li>• By the second annual audit there will documented evidence showing the information that has been assembled and the results of analysis to date.</li><li>• By the third annual audit there will be documented evidence showing that at least a provisional evaluation has been completed.</li><li>• 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.</li></ul>		
Progress on Condition 2012	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. 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). 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.		
Progress on Condition 2013	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.		
Progress on Condition 2014	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.		

Client Progress Report 2015	<ul style="list-style-type: none"><li>In the course of implementing the Client Action Plan, we have demonstrated it is highly unlikely that the shrimp fishery is disrupting the structure and function of benthic communities or their habitat to a point where there would be serious or irreversible harm. Highlights of this evaluation include:<ul style="list-style-type: none"><li>In less-sensitive areas, the fishery footprint within main habitat types 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.</li><li>In designated areas of high coral concentrations, shrimp fishing interacts with only 3.299% of the total area, well below the threshold of 10% of the sensitive areas. Within these areas, the fishery occurs in the proximity of only 3 RV survey set locations containing defined threshold levels of coral.</li><li>In designated areas of high sponge concentrations, shrimp fishing interacts with only 0.008% of the total designated areas. Within these areas, there is virtually no interaction with research survey set locations containing defined threshold levels of sponge.</li></ul></li></ul> <p>Notwithstanding this conclusion, NSAC did adopt a Partial Strategy at its March 2015 meeting, as confirmed in the draft meeting Minutes. Pursuant to this adopted Strategy, the &gt;100' shrimp sector is in the process of implementing voluntary area closures in area C84.</p>
Auditor Observations 2015	<p>We reviewed the most recent draft of “Northern Shrimp Advisory Committee (NSAC) - A (Partial) Habitat and Ecosystem Strategy for the Northern Shrimp Fishery” (CAPP 2015), along with the underlying analyses of the fishery footprint (Spatial analysis 2013). The Partial Strategy was adopted by the NSAC on March 4, 2015 and will be made public as part of the minutes of the meeting. Earlier versions of the document incorporating footprint analyses were considered in previous audit visits and Team comments were summarized in related Annual Surveillance Reports.</p> <p>Following the process outlined in DFO’s Ecological Risk Assessment Framework (ERAF) for Coldwater Corals and Sponge Dominated Communities (DFO 2013), CAPP (2015) summarizes the proportion of sensitive and total habitats impacted by trawls in a three-year period (2009-2011). If more than 10% of sensitive habitats is impacted, a further risk analysis is conducted. Although not part of the DFO ERAF, the document summarizes footprint on non-sensitive habitats (i.e. those not characterized as sensitive) as well as on sensitive habitats. If more than 30% of non-sensitive habitats is impacted a further risk analysis is to be conducted.</p> <p>CAPP (2015) concludes that under the current fishing strategy, areas impacted by trawls in the various SFAs are below the threshold values. In SFAs 2-4 and in SFA 7 initial analysis shows that more than 10% of sensitive habitat is impacted, but a more detailed analysis concludes that there is in fact very little overlap between the fishery footprint and identified sensitive areas. In SFA 2-4, industry has undertaken to implement a voluntary fishery closure in an area where the footprint overlaps an identified sensitive area.</p> <p>The Client (CAPP 2015, part H, p. 46) commits to reanalyse the fishery footprint every 5-years to monitor any change in risk level.</p>
Status of condition 2015	<p>We find that there is evidence that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm. We conclude that Condition Borealis SFA 7: 2 has been met. Accordingly, PI 2.4.1 has been rescored to 100 (Appendix 1) and the Condition is closed.</p>

3.7.3 Condition Borealis SFA 7: 3

	PI	Scoring issue/ scoring guidepost	Score
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<b>Performance Indicator &amp; Score</b>	2.4.2	<p>Sl.a. 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>Sl.b. 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>Sl.c. There is some evidence that the partial strategy is being implemented successfully</p>	60
<b>Condition</b>	<p>The client is required to provide evidence by the fourth annual audit that:</p> <ul style="list-style-type: none"><li>• 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.</li><li>• 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.</li><li>• There is some evidence that the partial strategy is being implemented successfully.</li></ul>		
<b>Milestones</b>	Not defined.		
<b>Client action plan</b>	<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 4, both of which relate to performance indicators for habitat:</p> <ul style="list-style-type: none"><li>• CAPP and NC will collaborate with other stakeholders and the 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 the conduct of shrimp fishing in this area.</li><li>• 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.</li><li>• By the second annual audit there will documented evidence showing the information that has been assembled and the results of analysis to date.</li><li>• By the third annual audit there will be documented evidence showing that at least a provisional evaluation has been completed.</li><li>• 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.</li></ul>		
<b>Progress on Condition 2012</b>	See Condition Borealis SFA 7: 2		
<b>Progress on Condition 2013</b>	See Condition Borealis SFA 7: 2		
<b>Progress on Condition 2014</b>	See Condition Borealis SFA 7: 2		

Client Progress Report 2015	See Condition Borealis SFA 7: 2
Auditor Observations 2015	See Condition Borealis SFA 7: 2
Status of condition 2015	<p>Evidence has been provided that shows: 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; 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; and the partial strategy is being implemented successfully.</p> <p>We conclude that Condition Borealis SFA 7: 3 has been met. Accordingly, PI 2.4.2 has been rescored to 80 (Appendix 1) and the Condition is closed.</p>

3.7.4 Condition Borealis SFA 7: 4

Performance Indicator & Score	PI	Scoring issue/ scoring guidepost	Score
	2.4.3	Slc. 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).	70
Condition	The client is required to provide evidence by the fourth annual audit that: 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).		
Milestones	Not defined.		
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> <ul style="list-style-type: none"><li>CAPP and NC will collaborate with other stakeholders and the 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 the conduct of shrimp fishing in this area.</li><li>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.</li><li>By the second annual audit there will documented evidence showing the information that has been assembled and the results of analysis to date.</li><li>By the third annual audit there will be documented evidence showing that at least a provisional evaluation has been completed.</li><li>By the fourth annual audit there will be documented evidence that at least a partial strategy is in place, and incremental mitigation measures have</li></ul>		

	been identified and are being implemented as appropriate for this fishing activity.
Progress on Condition 2012	See Condition Borealis SFA 7: 2
Progress on Condition 2013	See Condition Borealis SFA 7: 2
Progress on Condition 2014	See Condition Borealis SFA 7: 2
Client Progress Report 2015	See Condition Borealis SFA 7: 2
Auditor Observations 2015	See Condition Borealis SFA 7: 2
Status of condition 2015	Evidence has been provided that shows: 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). We conclude that Condition Borealis SFA 7: 4 has been met, Accordingly, PI 2.4.3 has been rescored to 80 (Appendix 1) and the Condition is closed.

3.7.5 Condition Borealis SFA 7: 5

Performance Indicator & Score	PI	Scoring issue/ scoring guidepost	Score
	2.5.1	SlA The fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	70
Condition	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.		
Milestones	Not defined.		



<b>Client action plan</b>	<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 5 and 6, both of which relate to performance indicators for the ecosystem:</p> <ul style="list-style-type: none"><li>• CAPP and NC will collaborate with other stakeholders and the DFO towards development of a program (a) to enhance the collection of information, and (b) to conduct an evaluation of the vulnerability of ecosystem components and the inferred 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 as they applies to the conduct of shrimp fishing in this area.</li><li>• 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.</li><li>• By the second annual audit there will documented evidence showing the information that has been assembled and the results of analysis to date.</li><li>• By the third annual audit there will documented evidence showing that at least a provisional evaluation has been completed.</li><li>• 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.</li></ul>
<b>Progress on Condition 2012</b>	See Condition Borealis SFA 7: 2
<b>Progress on Condition 2013</b>	See Condition Borealis SFA 7: 2
<b>Progress on Condition 2014</b>	See Condition Borealis SFA 7: 2
<b>Client Progress Report 2015</b>	See Condition Borealis SFA 7: 2
<b>Auditor Observations 2015</b>	See Condition Borealis SFA 7: 2
<b>Status of condition 2015</b>	<p>Evidence has been provided that shows that the fishery is highly unlikely to disrupt benthic community structure and function to a point where there would be serious or irreversible harm.</p> <p>We conclude that Condition Borealis SFA 7: 5 has been met, Accordingly, PI 2.5.1 has been rescored to 90 (Appendix 1) and the Condition is closed.</p>



3.7.6 Condition Borealis SFA 7: 6

	PI	Scoring issue/ scoring guidepost	Score
Performance Indicator & Score	2.5.2	<p>S1a 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 so as to achieve the Ecosystem Outcome 80 level of performance.</p> <p>S1b. 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>S1c. There is some evidence that the measures comprising the partial strategy are being implemented successfully.</p>	70
Condition	<p>The client is required to provide evidence by the fourth annual audit that:</p> <ul style="list-style-type: none"><li>• 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.</li><li>• The partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ ecosystems).</li><li>• There is some evidence that the measures comprising the partial strategy are being implemented successfully.</li></ul>		
Milestones	Not defined.		
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 4 and 6, both of which relate to performance indicators for the ecosystem:</p> <ul style="list-style-type: none"><li>• CAPP and NC will collaborate with other stakeholders and the DFO towards development of a program (a) to enhance the collection of information, and (b) to conduct an evaluation of the vulnerability of ecosystem components and the inferred 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 as they applies to the conduct of shrimp fishing in this area.</li><li>• 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.</li><li>• By the second annual audit there will documented evidence showing the information that has been assembled and the results of analysis to date.</li><li>• By the third annual audit there will documented evidence showing that at least a provisional evaluation has been completed.</li><li>• 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.</li></ul>		
Progress on Condition 2012	See Condition Borealis SFA 7: 2		

Progress on Condition 2013	See Condition Borealis SFA 7: 2
Progress on Condition 2014	See Condition Borealis SFA 7: 2
Client Progress Report 2015	See Condition Borealis SFA 7: 2
Auditor Observations 2015	See Condition Borealis SFA 7: 2
Status of condition 2015	Evidence has been provided that shows that: there is a partial strategy in place 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; the partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ ecosystems); and the measures comprising the partial strategy are being implemented successfully. We conclude that Condition Borealis SFA 7: 6 has been met, Accordingly, PI 2.5.2 has been rescored to 85 (Appendix 1) and the Condition is closed.

3.7.7 Condition Borealis SFA 7: 7

Performance Indicator & Score	PI	Scoring issue/ scoring guidepost text	Score
	2.5.3	Sld. Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred.  Sle. 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).	70
Condition	The client is required to provide evidence by the fourth annual audit that: <ul style="list-style-type: none"><li>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.</li><li>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).</li></ul>		
Milestones	Not defined		

<b>Client action plan</b>	<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 4 and 5, both of which relate to performance indicators for the ecosystem:</p> <ul style="list-style-type: none"><li>• CAPP and NC will collaborate with other stakeholders and the DFO towards development of a program (a) to enhance the collection of information, and (b) to conduct an evaluation of the vulnerability of ecosystem components and the inferred 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 as they applies to the conduct of shrimp fishing in this area.</li><li>• 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.</li><li>• By the second annual audit there will documented evidence showing the information that has been assembled and the results of analysis to date.</li><li>• By the third annual audit there will documented evidence showing that at least a provisional evaluation has been completed.</li><li>• 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.</li></ul>
<b>Progress on Condition 2012</b>	See Condition Borealis SFA 7: 2
<b>Progress on Condition 2013</b>	See Condition Borealis SFA 7: 2
<b>Progress on Condition 2014</b>	See Condition Borealis SFA 7: 2
<b>Client Progress Report 2015</b>	See Condition Borealis SFA 7: 2
<b>Auditor Observations 2015</b>	See Condition Borealis SFA 7: 2
<b>Status of condition 2015</b>	<p>Evidence has been provided that shows that: 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; and Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).</p> <p>We conclude that Condition Borealis SFA 7: 7 has been met, Accordingly, PI 2.5.3 has been rescored to 80 (Appendix 1) and the Condition is closed.</p>

3.7.8    Condition Borealis SFA 7: 8

Performance Indicator & Score	PI	Scoring issue/ scoring guidepost	Score
	3.2.1	Sla. 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.	70
Condition	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.		
Milestones	Not defined.		
Client action plan	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.		
Progress on Condition 2012	The Audit Team concludes that this condition has been met. This PI has been rescored to 80 and the condition has been closed out.		

3.7.9    Condition Borealis SFA 7: 9

Performance Indicator & Score	PI	Scoring issue/ scoring guidepost	Score
	3.2.4	SI a. A research plan provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.	75
Condition	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.		
Milestones	Not defined		
Client action plan	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. <ul style="list-style-type: none"><li>• By the first annual audit there will be documented evidence that a plan to conduct gap analysis has been developed by the working group.</li></ul>		

	<ul style="list-style-type: none"><li>• By the second annual audit there will be documented evidence that a gap analysis has been completed.</li></ul> By the fourth annual audit there will be documented evidence that a research plan is in place.
<b>Progress on Condition 2012</b>	The Audit team concludes that progress on the action plan is on track to meet the Condition by Year 4 of the certification period.
<b>Progress on Condition 2013</b>	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.
<b>Progress on Condition 2014</b>	No specific milestone was identified for Year 3 in the Client Action Plan. However, the Team concludes that progress is on target to meeting this condition in Year 4 as required.
<b>Client Progress Report 2015</b>	<p>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. The following elements were reviewed at the October meeting of the MSC Working Group, and recommended for adoption at the 2015 meeting of NSAC.</p> <ul style="list-style-type: none"><li>• Continue to conduct research surveys of the shrimp resources to enable updating of shrimp based indices (i.e., fishable biomass, SSB, recruitment indices, ageing etc.) that are used to determine relative exploitation rates, and in setting TACs: In SFAs 5,6,7 (autumn DFO survey in 2HJ3KLNO; spring DFO survey in 3LNOPsn);. in SFA4 and the Eastern Assessment Zone (EAZ) (annual summer NSRF-DFO survey); and in the Western Assessment Zone (WAZ) (annual summer NSRF-DFO survey)</li><li>• Continue to analyze recruitment indices and various environmental covariates with the intent of developing models that will predict fishable biomass.</li><li>• Continue to conduct genetic analysis to delineate stock assessment area(s), especially for use in modeling.</li><li>• Continue the shrimp ageing project for borealis and montagui.</li><li>• Continue efforts to develop an assessment model, eventually to cover all SFAs.</li><li>• Conditional on the development of an accepted assessment model, to begin a Management Strategy Evaluation to develop modeled harvest control rules.Continue collaborative efforts with Dr. Patrick Ouellet (IML) on an International Governance Strategy project to determine the impacts of climate change upon shrimp population dynamics.</li><li>• Continue to gather and analyze information related to corals, sponges and other vulnerable marine ecosystems.</li><li>• Continue to analyze trends in the fish community (including shrimp).</li><li>• Continue diet studies of major groundfish species (predators of shrimp), and to estimate food consumption by main predator and prey groups.</li><li>• Continue to estimate overall food consumption by the fish community.</li><li>• Continue to investigate trophic level for key species (including shrimp) using diet composition and stable isotopes.</li><li>• Continue to investigate the development of fisheries production potential models.</li></ul> <p>The Research Plan was adopted at the March 2015 meeting of NSAC.</p>
<b>Auditor Observations</b>	The requirement was for evidence that a research plan was in place. This was provided by the client.

2015	
Status of condition 2015	There is a research plan and the condition is closed. PI 3.2.4 has been rescored to 80. (see Appendix1).

3.8 Montagui SFA 2, 3 & 4: Conditions

3.8.1 Condition Montagui SFA 2, 3 & 4: 1

Performance Indicator & Score	PI	Scoring issue/ scoring guidepost	Score
	2.4.1	Sl.a. The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	60
Condition	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.		
Milestones	Not defined		
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 4 and 5, both of which relate to performance habitat PIs:</p> <ul style="list-style-type: none"><li>• CAPP and NC will collaborate with other stakeholders and 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 the conduct of shrimp fishing in this area.</li><li>• 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.</li><li>• By the second annual audit there will documented evidence showing the information that has been assembled and the results of analysis to date.</li><li>• By the third annual audit there will be documented evidence showing that at least a provisional evaluation has been completed.</li><li>• 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.</li></ul>		
Progress on Condition 2012	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. 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). 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.
<b>Progress on Condition 2013</b>	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.
<b>Progress on Condition 2014</b>	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.
<b>Client Progress Report 2015</b>	<p>In the course of implementing the Client Action Plan, we have demonstrated it is highly unlikely that the shrimp fishery is disrupting the structure and function of benthic communities or their habitat to a point where there would be serious or irreversible harm. Highlights of this evaluation include:</p> <ul style="list-style-type: none"><li>○ In less-sensitive areas, the fishery footprint within main habitat types 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.</li><li>○ In designated areas of high coral concentrations, shrimp fishing interacts with only 3.299% of the total area, well below the threshold of 10% of the sensitive areas. Within these areas, the fishery occurs in the proximity of only 3 RV survey set locations containing defined threshold levels of coral.</li><li>○ In designated areas of high sponge concentrations, shrimp fishing interacts with only 0.008% of the total designated areas. Within these areas, there is virtually no interaction with research survey set locations containing defined threshold levels of sponge.</li></ul> <p>Notwithstanding this conclusion, NSAC did adopt a Partial Strategy at its March 2015 meeting, as confirmed in the draft meeting Minutes. Pursuant to this adopted Strategy, the &gt;100’ shrimp sector is in the process of implementing voluntary area closures in area C84.</p>
<b>Auditor Observations 2015</b>	<p>We reviewed the latest iteration of the document “Northern Shrimp Advisory Committee (NSAC) - A (Partial) Habitat and Ecosystem Strategy for the Northern Shrimp Fishery” (CAPP 2015), along with the underlying analyses of the fishery footprint (Spatialanalysis 2013). The Partial Strategy document was adopted by the NSAC on March 4, 2015 and will be made public as part of the minutes of the meeting. Earlier versions of the document incorporating footprint analyses have been tabled on earlier audit visits, and Team comments were summarized in related Audit Reports.</p> <p>Following the process outlined in DFO’s Ecological Risk Assessment Framework (ERAF) for Coldwater Corals and Sponge Dominated Communities (DFO 2013), CAPP (2015) summarizes the proportion of sensitive and total habitats impacted by trawls in a three-year period (2009-2011). If more than 10% of sensitive habitats is impacted, a further risk analysis is conducted. Although not part of the DFO ERAF, the document summarizes footprint on non-sensitive habitats (ie those not characterized as sensitive) as well as on sensitive habitats. If more than 30% of non-sensitive habitats is impacted a further risk analysis is to be conducted.</p> <p>CAPP (2015) concludes that under the current fishing strategy areas impacted by trawls in the various SFAs are below the threshold values. In SFAs 2-4 and in SFA 7 initial analysis shows that more than 10% of sensitive habitat is impacted, but a more detailed analysis concludes that there is in fact very little overlap between the fishery footprint and identified sensitive areas. In SFA 2-4, industry has undertaken to implement a voluntary fishery closure in an area where the footprint overlaps an identified sensitive area.</p>



	Details of the assessment are provided in Appendix 1. The Client (CAPP 2015, part H, p. 46) commits to reanalysing the fishery footprint on a 5-year cycle, in order to monitor risk level.
<b>Status of condition 2015</b>	We find that there is evidence that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm. We conclude that Condition Montagui SFA 2, 3 & 4: 1 has been met. Accordingly, PI 2.4.1 has been rescored to 100 (Appendix 1) and the Condition is closed.

3.8.2 Condition Montagui SFA 2, 3 & 4: 2

	PI	Scoring issue/ scoring guidepost	Score
<b>Performance Indicator &amp; Score</b>	2.4.2	Sla. 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  Slb. 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.  Slc. There is some evidence that the partial strategy is being implemented successfully	60
<b>Condition</b>	The client is required to provide evidence by the fourth annual audit that: <ul style="list-style-type: none"><li>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.</li><li>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.</li><li>There is some evidence that the partial strategy is being implemented successfully.</li></ul>		
<b>Milestones</b>	Not defined		
<b>Client action plan</b>	The client has set out their actions and expected outcomes for this performance indicator in a logical step wise approach in association with Conditions 1 and 3, both of which relate to performance indicators for habitat: <ul style="list-style-type: none"><li>CAPP and NC will collaborate with other stakeholders and the 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 the conduct of shrimp fishing in this area.</li><li>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.</li></ul>		

	<ul style="list-style-type: none"><li>By the second annual audit there will documented evidence showing the information that has been assembled and the results of analysis to date.</li><li>By the third annual audit there will be documented evidence showing that at least a provisional evaluation has been completed.</li><li>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.</li></ul>
Progress on Condition 2012	See Condition Montagui SFA 2, 3 & 4: 1
Progress on Condition 2013	See Condition Montagui SFA 2, 3 & 4: 1
Progress on Condition 2014	See Condition Montagui SFA 2, 3 & 4: 1
Client Progress Report 2015	See Condition Montagui SFA 2, 3 & 4: 1
Auditor Observations 2015	See Condition Montagui SFA 2, 3 & 4: 1
Status of condition 2015	<p>Evidence has been provided that shows: 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; 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; and the partial strategy is being implemented successfully.</p> <p>We conclude that Condition Montagui SFA 2, 3 &amp; 4: 2 has been met. Accordingly, PI 2.4.2 has been rescored to 80 (Appendix 1) and the Condition is closed.</p>

3.8.3 Condition Montagui SFA 2, 3 & 4: 3

Performance Indicator & Score	PI	Scoring issue/ scoring guidepost text	Score
	2.4.3	Slc. 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).	60
Condition	The client is required to provide evidence by the fourth annual audit that: 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).		
Milestones	Not defined		
Client action plan	The client has set out their actions and expected outcomes for this performance indicator in a logical step wise approach in association with Conditions 1 and 2, both of which relate to performance indicators for habitat:		

	<ul style="list-style-type: none"><li>CAPP and NC will collaborate with other stakeholders and the 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 the conduct of shrimp fishing in this area.</li><li>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.</li><li>By the second annual audit there will documented evidence showing the information that has been assembled and the results of analysis to date.</li><li>By the third annual audit there will be documented evidence showing that at least a provisional evaluation has been completed.</li><li>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.</li></ul>
Progress on Condition 2012	See Condition Montagui SFA 2, 3 & 4: 1
Progress on Condition 2013	See Condition Montagui SFA 2, 3 & 4: 1
Progress on Condition 2014	See Condition Montagui SFA 2, 3 & 4: 1
Client Progress Report 2015	See Condition Montagui SFA 2, 3 & 4: 1
Auditor Observations 2015	See Condition Montagui SFA 2, 3 & 4: 1
Status of condition 2015	<p>Evidence has been provided that shows: Sufficient data continue to be collected to detect any increase in risk to habitat (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).</p> <p>We conclude that Condition Montagui SFA 2, 3 &amp; 4: 4 has been met, Accordingly, PI 2.4.3 has been rescored to 80 (Appendix 1) and the Condition is closed.</p>

3.8.4 Condition Montagui SFA 2, 3 & 4: 4

	PI	Scoring issue/ scoring guidepost	Score
Performance	2.5.1	Sla The fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a	70

Indicator & Score		point where there would be a serious or irreversible harm.	
Condition	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.		
Milestones	Not defined		
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 5 and 6, both of which relate to performance indicators for the ecosystem:</p> <ul style="list-style-type: none"><li>• CAPP and NC will collaborate with other stakeholders and the DFO towards development of a program (a) to enhance the collection of information, and (b) to conduct an evaluation of the vulnerability of ecosystem components and the inferred 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 as they applies to the conduct of shrimp fishing in this area.</li><li>• 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.</li><li>• By the second annual audit there will documented evidence showing the information that has been assembled and the results of analysis to date.</li><li>• By the third annual audit there will documented evidence showing that at least a provisional evaluation has been completed.</li><li>• 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.</li></ul>		
Progress on Condition 2012	See Condition Montagui SFA 2, 3 & 4: 1		
Progress on Condition 2013	See Condition Montagui SFA 2, 3 & 4: 1		
Progress on Condition 2014	See Condition Montagui SFA 2, 3 & 4: 1		
Client Progress Report 2015	See Condition Montagui SFA 2, 3 & 4: 1		
Auditor Observations 2015	See Condition Montagui SFA 2, 3 & 4: 1		
Status of condition 2015	<p>Evidence has been provided that shows that the fishery is highly unlikely to disrupt benthic community structure and function to a point where there would be serious or irreversible harm.</p> <p>We conclude that Condition Montagui SFA 2, 3 &amp; 4: 4 has been met, Accordingly, PI 2.5.1 has been rescored to 90 (Appendix 1) and the Condition is</p>		

	closed.
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3.8.5 Condition Montaguí SFA 2, 3 & 4: 5

	PI	Scoring issue/ scoring guidepost	Score
Performance Indicator & Score	2.5.2	SIa 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 so as to achieve the Ecosystem Outcome 80 level of performance.  SIb. The partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries / ecosystems).  SIc. There is some evidence that the measures comprising the partial strategy are being implemented successfully.	70
Condition	The client is required to provide evidence by the fourth annual audit that: <ul style="list-style-type: none"><li>• 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.</li><li>• The partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ ecosystems).</li><li>• There is some evidence that the measures comprising the partial strategy are being implemented successfully.</li></ul>		
Milestones	Not defined.		
Client action plan	The client has set out their actions and expected outcomes for this performance indicator in a logical step wise approach in association with Conditions 4 and 6, both of which relate to performance indicators for the ecosystem: <ul style="list-style-type: none"><li>• CAPP and NC will collaborate with other stakeholders and the DFO towards development of a program (a) to enhance the collection of information, and (b) to conduct an evaluation of the vulnerability of ecosystem components and the inferred 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 as they applies to the conduct of shrimp fishing in this area.</li><li>• 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.</li><li>• By the second annual audit there will documented evidence showing the information that has been assembled and the results of analysis to date.</li><li>• By the third annual audit there will documented evidence showing that at least a provisional evaluation has been completed.</li><li>• 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.</li></ul>		

Progress on Condition 2012	See Condition Montagui SFA 2, 3 & 4: 1
Progress on Condition 2013	See Condition Montagui SFA 2, 3 & 4: 1
Progress on Condition 2014	See Condition Montagui SFA 2, 3 & 4: 1
Client Progress Report 2015	See Condition Montagui SFA 2, 3 & 4: 1
Auditor Observations 2015	See Condition Montagui SFA 2, 3 & 4: 1
Status of condition 2015	<p>Evidence has been provided that shows that: there is a partial strategy in place 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; the partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ ecosystems); and the measures comprising the partial strategy are being implemented successfully.</p> <p>We conclude that Condition Montagui SFA 2, 3 &amp; 4: 5 has been met, Accordingly, PI 2.5.2 has been rescored to 85 (Appendix 1) and the Condition is closed.</p>

3.8.6 Condition Montagui SFA 2, 3 & 4: 6

Performance Indicator & Score	PI	Scoring issue/ scoring guidepost	Score
	2.5.3	<p>Sld. Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred.</p> <p>Sle. 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>	70
Condition	<p>The client is required to provide evidence by the fourth annual audit that:</p> <ul style="list-style-type: none"><li>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.</li><li>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).</li></ul>		

Milestone	Not defined.
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 4 and 5, both of which relate to performance indicators for the ecosystem:</p> <ul style="list-style-type: none"><li>• CAPP and NC will collaborate with other stakeholders and the DFO towards development of a program (a) to enhance the collection of information, and (b) to conduct an evaluation of the vulnerability of ecosystem components and the inferred 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 as they applies to the conduct of shrimp fishing in this area.</li><li>• 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.</li><li>• By the second annual audit there will documented evidence showing the information that has been assembled and the results of analysis to date.</li><li>• By the third annual audit there will documented evidence showing that at least a provisional evaluation has been completed.</li><li>• 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.</li></ul>
Progress on Condition 2012	See Condition Montagui SFA 2, 3 & 4: 1
Progress on Condition 2013	See Condition Montagui SFA 2, 3 & 4: 1
Progress on Condition 2014	See Condition Montagui SFA 2, 3 & 4: 1
Client Progress Report 2015	See Condition Montagui SFA 2, 3 & 4: 1
Auditor Observations 2015	See Condition Montagui SFA 2, 3 & 4: 1
Status of condition 2015	<p>Evidence has been provided that shows that: 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; and Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).</p> <p>We conclude that Condition Montagui SFA 2, 3 &amp; 4: 6 has been met, Accordingly, PI 2.5.3 has been rescored to 80 (Appendix 1) and the Condition is closed.</p>



3.8.7 Condition Montagu SFA 2, 3 & 4: 7

Performance Indicator & Score	PI	Scoring issue/ scoring guidepost	Score
	3.2.1	Sl.a. 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.	70
Condition	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.		
Milestones	Not defined.		
Client action plan	CAPP and NC will collaborate with other stakeholders and the 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.		
Progress on Condition 2012	The Audit Team concludes that this condition has been met. This PI has been rescored to 80 and the condition has been closed out.		

3.8.8 Condition Montagu SFA 2, 3 & 4: 8

Performance Indicator & Score	PI	Scoring issue/ scoring guidepost text	Score
	3.2.4	SI a. A research plan provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.	75
Condition	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.		
Milestones	Not defined		
Client action plan	CAPP and NC will collaborate with other stakeholders and the 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. <ul style="list-style-type: none"><li>• By the first annual audit there will be documented evidence that a plan to conduct gap analysis has been developed by the working group.</li><li>• By the second annual audit there will be documented evidence that a gap analysis has been completed.</li></ul>		

	<ul style="list-style-type: none"><li>• By the fourth annual audit there will be documented evidence that a research plan is in place.</li></ul>
Progress on Condition 2012	The Audit team concludes that progress on the action plan is on track to meet the Condition by Year 4 of the certification period.
Progress on Condition 2013	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.
Progress on Condition 2014	No specific milestone was identified for Year 3 in the Client Action Plan. However, the Team concludes that progress is on target to meeting this condition in Year 4 as required.
Client Progress Report 2015	<p>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. The following elements were reviewed at the October meeting of the MSC Working Group, and recommended for adoption at the 2015 meeting of NSAC.</p> <ul style="list-style-type: none"><li>• Continue to conduct research surveys of the shrimp resources to enable updating of shrimp based indices (i.e., fishable biomass, SSB, recruitment indices, ageing etc.) that are used to determine relative exploitation rates, and in setting TACs: In SFAs 5,6,7 (autumn DFO survey in 2HJ3KLNO; spring DFO survey in 3LNOPsn);. in SFA4 and the Eastern Assessment Zone (EAZ) (annual summer NSRF-DFO survey); and in the Western Assessment Zone (WAZ) (annual summer NSRF-DFO survey)</li><li>• Continue to analyze recruitment indices and various environmental covariates with the intent of developing models that will predict fishable biomass.</li><li>• Continue to conduct genetic analysis to delineate stock assessment area(s), especially for use in modeling.</li><li>• Continue the shrimp ageing project for <i>borealis</i> and <i>montagui</i>.</li><li>• Continue efforts to develop an assessment model, eventually to cover all SFAs.</li><li>• Conditional on the development of an accepted assessment model, to begin a Management Strategy Evaluation to develop modeled harvest control rules. Continue collaborative efforts with Dr. Patrick Ouellet (IML) on an International Governance Strategy project to determine the impacts of climate change upon shrimp population dynamics.</li><li>• Continue to gather and analyze information related to corals, sponges and other vulnerable marine ecosystems.</li><li>• Continue to analyze trends in the fish community (including shrimp).</li><li>• Continue diet studies of major groundfish species (predators of shrimp), and to estimate food consumption by main predator and prey groups.</li><li>• Continue to estimate overall food consumption by the fish community.</li><li>• Continue to investigate trophic level for key species (including shrimp) using diet composition and stable isotopes.</li><li>• Continue to investigate the development of fisheries production potential models.</li></ul> <p>The Research Plan was adopted at the March 2015 meeting of NSAC.</p>
Auditor Observations	The requirement was for evidence that a research plan was in place. This was provided by the client.

2015	
Status of condition 2015	There is a research plan and the condition is closed. PI 3.2.4 has been rescored at 80 (Appendix 1).

#### 4. SUMMARY & CONCLUSIONS

The assessment team conducting the 4<sup>th</sup> surveillance audit confirms that the client has met the requirements for continued certification to the MSC Principles and Criteria for Sustainable Fishing.

The assessment team concludes that the evidence and information provided by the client as verified by the auditors confirm the commitment to meeting the conditions of certification.

The assessment team recommends the continued certification of the Canada Northern & Striped Shrimp Fishery against the MSC standard covering:

- *Pandalus borealis* SFA 1
- *Pandalus borealis* SFA 2, 3 & 4
- *Pandalus borealis* SFA 5 & 6
- *Pandalus borealis* SFA 7
- *Pandalus montagui* SFA 2, 3 & 4

The recertification assessment will be complete by end-2015.

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6. Appendix 1: Re-scoring evaluation tables

6.1 Pandalus borealis SFA 1 Fishery

2.4	Strategies have been developed within the fisheries management system to address and restrain any significant negative impacts of the fishery on the ecosystem			
		SG60	SG80	SG100
2.4.1	<b>Status</b> The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function.	The fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	There is evidence that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.
<b>Scoring Comments</b>				
<b><u>CERTIFICATION REPORT</u></b>  The fishery concentrates on mud bottoms (or sand, or mixed mud-sand), and vessels avoid hard bottoms to minimise the risk of damage to trawls. Trawl gear is relatively light and efforts are underway to further reduce gear contact with the bottom in order to reduce fuel costs. Bottom rollers and trawl doors are the principal parts of the trawl contacting the bottom in most areas. A heavy “shoe” is used on some tows with twin trawls, which would have a greater impact on the bottom but over a narrow swathe (around 3 m).  Studies are unavailable on the impacts of shrimp gear on mud and mud-sand bottoms in this area, but some inferences can be made from studies on sand bottoms, recognising that impacts are to some extent site specific and that inference leaves some uncertainty about conclusions. In a 3-year study of impacts of trawl gear on the Grand Banks, there was no alteration to benthic communities and recovery of the sand habitat occurred within a year (results summarised in Gordon et al 2009). Soft bottoms are impacted relatively rapidly by trawling gear but recover relatively quickly (DFO 2006benthic).  The fishery probably produces occasional impacts on hard-bottom areas with erect sessile fauna which may be important as habitat. Coral bycatch is low, suggesting that contact with such areas is relatively rare, but bycatch information probably under represents interactions with such sensitive areas since impacts may occur when coral is not retained. Such habitats probably recover relatively slowly as growth rates of hard corals are low (Gilkinson and Edinger eds 2009).				
<b>Score = 60 (Original) 80 (Revised)</b>				
<b><u>CERTIFICATION REPORT</u></b>  Given its mode of operation, this fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm but				



analyses of fishery impacts would be required to increase certainty, particularly with respect to potential impacts on hard coral areas; accordingly it cannot be said that the fishery is “highly unlikely” to have unacceptable impacts.

**4<sup>TH</sup> ANNUAL AUDIT**

PI 2.4.1. The PI is rescored to 100, because there is evidence that the fishery is **highly unlikely** to reduce habitat structure and function to a point where there would be serious or irreversible harm.

- In the three years 2009-2011 the fishery impacted a maximum of 4.75% of bottom habitat in the fishery area (continental shelf between 100 and 600 m depth)(CAPP 2015 p. 19; Spatialanalysis 2013); thus the fishery leaves most of the habitat area undisturbed
- Actual area impacted was less than this because this figure does not account for overlapping tows
- A very small proportion of sensitive bottom habitat areas (significant coral and sponge concentrations as identified in Kenchington et al, 2010) was contacted: 0.1% for coral areas, 0% for sponge areas (CAPP 2015 p. 28)
- There is very little overlap between areas trawled and sensitive bottom habitat areas as defined, since the latter were almost entirely at greater depths than those exploited in the fishery (CAPP 2015 p. 28)
- Based on available information (see 2.4.3) trawl impacts on the main “non-sensitive” habitat types impacted by the fishery (soft substrates, mud, silt and sand or mixtures thereof) are not such as to cause serious or irreversible harm

**Audit Trace References**

**CERTIFICATION REPORT**

Gordon et al 2009; DFO 2006benthic; interviews (see 2.4.2); Gilkinson and Edinger eds 2009; Simpson and Watling 2006; Hinz et al 2009

**4<sup>TH</sup> ANNUAL AUDIT**

CAPP 2015 p. 19; Spatialanalysis 2013; Kenchington et al, 2010

		SG60	SG80	SG100
2.4.2	<b>Management strategy</b> There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types.	<p>There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.</p> <p>The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/habitats).</p>	<p>There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.</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>	<p>There is a strategy in place for managing the impact of the fishery on habitat types.</p> <p>The strategy is mainly based on information directly about the fishery and/or habitats involved, and testing supports high confidence that the strategy will work.</p> <p>There is clear evidence that the strategy is being implemented successfully, and intended changes are occurring. There is some evidence that the strategy is achieving its objective.</p>
<b>Scoring Comments</b>				
<b><u>CERTIFICATION REPORT</u></b>				
<p>Several measures are in place which would help to reduce impacts of the fishery on habitats. The fishery is concentrated on soft bottoms (mud and/or sand), preferred habitat for shrimp and with less risk of damage to trawls, and these types of habitats are generally considered relatively resilient to trawl impact (Rice 2006; Gordon et al 2006). Trawls and doors used are relatively low-impact, and work is under way to further lighten the gear in the interests of saving fuel (interviews at Newfound Pioneer , 2009; Marine Institute, 2007; Marine Institute n.d.).</p> <p>The relatively low proportion of trawl sets with corals as bycatch suggests that impacts on these habitats may be low, although presence in sets would underestimate impact since trawls may impact corals without retaining them.</p> <p>Steps are being taken toward developing a strategy for managing potential habitat impacts. A Closed Areas Working Group of the Northern Shrimp Advisory Committee has been established to consider closed areas and ecosystem impacts of the fishery. DFO Newfoundland/Labrador Region has committed to developing a coral/sponge conservation strategy for the Newfoundland / Labrador continental shelf, and this is expected to be complete by 2012; this may not include areas of the Davis Strait in the fishery area, however. DFO has developed a national policy for Managing the Impacts of Fishing on Sensitive Benthic Habitats (April 2009) (<a href="http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/benthi-eng.htm">http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/benthi-eng.htm</a> ), which is expected to provide an overall framework for actions to improve protection of sensitive habitats and species.</p>				
<b>Score = 60 (Original) 80 (Revised)</b>				

## **CERTIFICATION REPORT**

Measures are in place (e.g., the fishery is concentrated on soft bottoms, work is underway to reduce seabed contact of gear, a working group has been established to consider closed areas and ecosystem impacts of the fishery, there is a commitment to develop a sponge/coral conservation strategy and there is a national policy as described above that are likely to ensure that the fishery does not cause serious or irreversible harm to habitats, and there is a national policy for Managing the Impacts of Fishing on Sensitive Benthic Habitats which is expected to provide an overall framework for actions to improve protection of sensitive habitats and species) that are likely to ensure that the fishery does not cause serious or irreversible harm to habitats.

### **4<sup>TH</sup> ANNUAL AUDIT**

PI 2.4.2 The PI is rescored to 80, because

A. There is a **partial strategy** in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above;

- Elements of the fishing strategy are such as to minimize harm to habitats: gear is relatively light; the fishery concentrates on relatively resilient soft substrates where shrimp are concentrated and to minimise gear damage; the fishery concentrates at depths shallower than those at which identified sensitive coral and sponge habitats occur;
- The analysis of CAPP (2015) shows that the existing fishing strategy is such as to ensure that serious or irreversible harm to sensitive habitats does not occur, since a low proportion of habitats is impacted
- A partial strategy document, approved by NSAC on March 4, 2015, summarizes fishery footprint in relation to habitats
- The document includes a commitment to monitor fishery footprint at 5 year intervals and to modify fishing practices if analyses show that identified thresholds of proportion of habitat impacted are surpassed (CAPP 2015 p. 45)
- The fishery has shown the capacity to analyse and monitor habitat impacts and to put in place additional measures to protect habitat if necessary (voluntary closed areas in SFAs 2-4) (CAPP 2015)
- The partial strategy has been developed in the context of DFO national strategies on fishing in sensitive benthic habitats (DFO 2009) and on coral and sponge conservation (DFO 2015)
- As such, the fishery meets the MSC guidance on a partial strategy: a cohesive arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome and an awareness of the need to change the measures should they cease to be effective. It may not have been designed to manage the impact on that component specifically. (MSC 2013)

B. There is some **objective basis for confidence** that the partial strategy will work, based on **information directly about the fishery and/or habitats** involved.

- Analyses of the fishery, in particular its footprint in relation to sensitive and less-sensitive habitats, show that the fishery is highly likely to meet the SG 80 outcome indicator for PI 2.4.1 (see above)

C. There is **some evidence** that the partial strategy is being implemented successfully.

- Analyses of the fishery footprint in relation to sensitive and less-sensitive habitats show that the fishery is highly likely to meet the SG 80 outcome

indicator for PI 2.4.1 (see above)

The fishery does not meet the 100 SG because the partial strategy in place does not meet the MSC definition of a “strategy” (MSC Guidance, GCB 3.3) - “a cohesive and strategic arrangement...designed to manage impact on that component specifically”, there has been no testing of the strategy, and there is no evidence to show that intended changes are occurring or that the strategy is achieving its objective.

<b>Audit Trace References</b>
<b><u>CERTIFICATION REPORT</u></b>
Interviews at Newfound Pioneer, Marine Institute, DFO, CAPP; DFO web site; Integrated Fisheries Management Plan; GEAC et al 2007
<b><u>4<sup>TH</sup> ANNUAL AUDIT</u></b>
CAPP 2015; DFO 2015; MSC 2013

		SG60	SG80	SG100
2.4.3	<b>Information / monitoring</b> Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types.	<p>There is a basic understanding of the types and distribution of main habitats in the area of the fishery.</p> <p>Information is adequate to broadly understand the main impacts of gear use on the main habitats, including spatial extent of interaction.</p>	<p>The nature, distribution and vulnerability of all main habitat types in the fishery area are known at a level of detail relevant to the scale and intensity of the fishery.</p> <p>Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent, timing and location of use of the fishing gear.</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>	<p>The distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types.</p> <p>Changes in habitat distributions over time are measured.</p> <p>The physical impacts of the gear on the habitat types have been quantified fully.</p>

**Scoring Comments**

**CERTIFICATION REPORT**

No mapping of bottom sediments in the fishery area has been done, although some information is available and fishermen are aware of bottom type distribution and concentrate on preferred bottom types (mud and sand bottoms). Information on bottom types may be improved through a project to use acoustic equipment on commercial shrimp vessels to type bottoms in the fishery area (Marine Institute, School of Ocean Technology 2008).

Information on distribution of particularly sensitive habitat areas, coral concentration areas, is available and level of detail of this information continues to improve (Edinger et al 2007; Wareham and Edinger 2007; Wareham 2009). This information is mainly based on observations of corals in commercial trawl sets (observer program) and trawl survey programs.

Observations have been mapped separately for the various groups of corals, including hard and branching corals (mainly associated with hard-bottom areas) and soft corals (often found on soft bottoms). Distribution maps suggest that relatively few sets recorded corals in this fishery area (Edinger et al 2007), although formal analyses of bycatches by fishing area are not available. Preliminary investigation of areas of concentration of sponges, another type of sensitive habitat area, based on trawl survey and observer data from areas similar to this fishery area (Kenchington et al 2009) suggest that sponge

concentration areas are at depths greater than those at which the shrimp fishery operates.

Distribution of fishing operations is very well known from VMS and logbook information and is compiled (Spatialanalysis 2009; Orr et al MS 2008). Corals were recorded in 1.8% of shrimp trawl sets in shrimp fishery areas to the south of SFA 1, most of these being soft corals (Edinger et al. 2007).

Vulnerability of habitat types in the fishery area to bottom trawl gear is generally known (e.g. Rice 2006; Gordon et al 2006; Simpson and Watling 2006).

Available information has not been compiled into an overall summary that would provide adequate detail on the nature and distribution of habitat types relative to fishery operations, in relation to vulnerability of habitat types to impacts from trawl gear.

**Score = 70 (Original) 80 (Revised)**

**CERTIFICATION REPORT**

The fishery meets all elements of the 60 SG in that there is a basic understanding of types and distribution of habitats in the fishery, and of the impacts of the fishery on habitats. The fishery is assigned a score above 60 because there is detailed information on nature and distribution of sensitive habitats (coral and sponge areas) and reliable information on spatial extent, timing and location of the fishery.

**4<sup>TH</sup> ANNUAL AUDIT**

PI 2.4.3. The PI is rescored to 80, because:

A. The nature, distribution and **vulnerability** of all main habitat types in the fishery area are known at a level of detail relevant to the scale and intensity of the fishery.

- Maps of sediment types in the fishery area are available which show the nature and distribution of habitat types at a level of detail relevant to the scale and intensity of the fishery (CAPP 2015)
- Maps of sensitive habitats, as defined by the presence of significant concentrations of corals and sponges, are available (Kenchington et al 2010; DFO 2010).
- Vulnerability of the various habitat types to bottom trawl fishing are known (NEFMC 2011 and others, see below)

B. Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent of interaction, and the timing and location of use of the fishing gear.

- A review of the mode of operation of Newfoundland shrimp gear and potential impacts on bottom habitats is available (Grant MS 2012).
- Impacts of shrimp trawl gear on habitats in which they most commonly operate (soft substrates) have been described in publications from Oregon and Maine (Hixon and Tissot 2007; Simpson and Watling 2006)
- Research on impacts of mobile bottom gear on habitats in the Newfoundland-Labrador area has been summarised and reviewed (Gilkinson et al 2006), as has research on impacts in a nearby marine area (Gordon et al 2006)

- More general reviews of impacts of mobile bottom gear on habitats are available (Kaiser et al 2006; Rice 2006)
- A framework for assessing fishing gear impacts on bottom habitats has been developed in an attempt to guide risk assessment (NE FMC 2011)
- Timing and location of use of the fishing gear are monitored by VMS on all vessels, and can be used in analyses of the fishery footprint (eg CAPP 2015)

C. 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).

- VMS monitoring of fishing locations continues and the client has committed to 5-year reanalyses of fishery footprint in relation to habitat types

The fishery does not meet the 100 SG because the distribution of habitat types is not known over their range (there are gaps in knowledge of habitat distributions), changes in habitat distributions are not monitored, and the physical impacts of the gear on habitats has not been quantified fully.

**Audit Trace References**

**CERTIFICATION REPORT**

C-NPOPB 2008; Marine Institute, School of Ocean Technology 2008; Edinger et al 2007; Wareham and Edinger 2007; Wareham 2009; Kenchington et al 2009; Rice 2006; Gordon et al 2006; Spatialanalysis 2009; Orr et al MS 2008; Simpson and Watling 2006.

**4<sup>TH</sup> ANNUAL AUDIT**

CAPP 2015; Kenchington et al 2010; DFO 2010; NEFMC 2011; Grant MS 2012; Hixon and Tissot 2007; Simpson and Watling 2006; Gilkinson et al 2006; Gordon et al 2006



2.5	Ecosystem			
		SG60	SG80	SG100
2.5.1	<b>Status</b> The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function.	The fishery is <u>unlikely</u> to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The fishery is <u>highly unlikely</u> to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is <u>evidence</u> that the fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
<b>Scoring Comments</b>				
<b><u>CERTIFICATION REPORT</u></b>				
<p>The principal issues identified to be addressed here are (a) impact of removal of the target species, which are forage for a wide range of predator species, on trophic relationships (b) non-catch impacts on biological diversity and community structure, particularly for benthic species. In addition, overall impact on ecosystems is considered consistent with the MSC FAM.</p> <p>Impact of removal of target species on trophic relationships . Shrimp abundance is currently high relative to historical levels, although it is declining rapidly. Need to allocate shrimp as forage to predators is explicitly addressed in assessment and management, as cod predation is considered in the stock assessment and in determining sustainable TACs. Given that shrimp abundance is quantitatively monitored and that a quantitative assessment of predator requirements is considered, information on this component can be considered quantitative.</p> <p>Non-catch impact on benthic species and communities . This fishery is unlikely to be having serious or irreversible impacts on benthic species but no assessment has been done. An assessment of spatial distribution of the fishery has been done, suggesting that a low proportion of the continental shelf has been affected by shrimp trawling; this is a good initial step but additional analyses of communities and their sensitivity would be needed to assess impact. Information on this component can be considered qualitative.</p> <p>The fishery is unlikely to be affecting size spectra of caught species to an extent that there would be serious or irreversible harm. Shrimp size compositions are monitored regularly and indicate no truncation which would cause serious harm. Only small individuals of bycatch species are taken in the bycatch. Information is quantitative.</p> <p>There is no indication that serious or irreversible harm such as described in the MSC FAM (extinctions, trophic cascades, gross changes in species or community composition) is being caused. Information is qualitative.</p>				
<b>Score = 70 (Original) 80 (Revised)</b>				
<b><u>CERTIFICATION REPORT</u></b>				
<p>The fishery is highly unlikely to disrupt trophic relationships by reducing shrimp abundance to levels which would impact predators, as the need to maintain shrimp biomass as forage for predators is addressed in assessment and management.</p>				

There is no indication of serious or irreversible harm being caused at the levels described in the MSC FAM (Section 7.6.3).

The fishery is unlikely to be causing serious or irreversible harm through non-catch impacts on benthic communities but, because of limited analysis of benthic communities and their sensitivity to the impact of fishing, it is not possible to say that the fishery is highly unlikely to disrupt this key element structure and function to a point where there would be a serious or irreversible harm. Therefore a score of 70 is assigned to this PI.

**4<sup>TH</sup> ANNUAL AUDIT**

PI 2.5.1. The PI is rescored to 100 for the relevant ecosystem issue because there is evidence that the fishery is **highly unlikely** to disrupt the relevant key elements underlying ecosystem structure and function (that is, benthic biological diversity and community structure) to a point where there would be a serious or irreversible harm.

- The ecosystem issue for which this fishery scored less than 80 on ecosystem PIs is non-catch impacts on biological diversity and community structure, particularly for benthic species.
- In the three years 2009-2011 the fishery impacted a maximum of 4.75% of bottom habitats (and thus benthic communities) in the fishery area (continental shelf between 100 and 600 m depth)(CAPP 2015 p. 19; Spatialanalysis 2013), thus leaving most areas and communities undisturbed
- Actual area impacted was less than this because this figure does not account for overlapping tows
- Based on available information (see 2.5.3), trawl impacts on benthic species (and thus biodiversity and community structure) in the main habitat types impacted by the fishery (soft substrates, mud, silt and sand or mixtures thereof) are known and may cause measurable changes in benthic community structure; however because more than 90% of the distribution area of benthic communities of the fishery area is not impacted by the fishery, the overall impact is not such as to cause serious or irreversible harm
- Impacts on benthic biodiversity and community structure in sensitive habitats are addressed under the Habitats PIs (2.4)

Overall, the score for the PI is changed to 90, as the fishery scores 80 for one ecosystem issue (trophic relationships) and 100 for the other (benthic biodiversity)

**Audit Trace References**

**CERTIFICATION REPORT**

See 2.5.2, 2.5.3

**4<sup>TH</sup> ANNUAL AUDIT**

CAPP 2015 p. 19; Spatialanalysis 2013

		SG60	SG80	SG100
2.5.2	<b>Management strategy</b> There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function.	<p>There are measures in place, if necessary, that take into account potential impacts of the fishery on key elements of the ecosystem.</p> <p>The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ ecosystems).</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 so as 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>	<p>There is a strategy that consists of a plan, containing measures to address all main impacts of the fishery on the ecosystem, and at least some of these measures are in place. The plan and measures are based on well-understood functional relationships between the fishery and the Components and elements of the ecosystem.</p> <p>This plan provides for development of a full strategy that restrains impacts on the ecosystem to ensure the fishery does not cause serious or irreversible harm.</p> <p>The measures are considered likely to work based on prior experience, plausible argument or information directly from the fishery/ecosystems involved.</p> <p>There is evidence that the measures are being implemented successfully.</p>
<b>Scoring Comments</b>				
<b><u>CERTIFICATION REPORT</u></b>				
<p>Shrimp as a forage species. The need to ensure that predator needs for shrimp prey are met is explicitly addressed in the stock assessment; total mortality rates which are compared to target and limit rates include terms both for fishing mortality and for mortality due to cod predation (NAFO 2008/0-1). Scientific advice is considered in setting TACs and Canada has been harvesting at a low level in this area in recent years. This approach has ensured that an appropriate proportion of shrimp are reserved for predators.</p> <p>Non-catch impacts on biological diversity and benthic communities. The mode of operation of the fishery is for the most part consistent with reducing potential impacts on biological diversity and on benthic communities. Fishing operations are concentrated on soft bottom areas, which have shorter recovery times than</p>				

harder bottoms and whose mobile or infauna is generally less vulnerable to damage than the erect, sessile, long-lived fauna of hard bottoms. Trawls are relatively light and fitted with rollers which should roll over the bottom; however a heavy shoe which digs into bottom is used on some tows with twin trawls.

**Score = 70 (Original) 80 (Revised)**

**CERTIFICATION REPORT**

For non-catch and other ecosystem impacts, measures are in place to reduce ecosystem impacts and it can be inferred that these are working to ensure that serious or irreversible harm is not resulting, meeting the 60 SG.

Predator requirements are explicitly addressed in assessment and management, and there is evidence that shrimp abundance is being maintained at a level which will meet the needs of predators, meeting the 80 SG.

**4<sup>TH</sup> ANNUAL AUDIT**

A. There is a partial strategy in place (with respect to benthic biodiversity and community structure) (meets 80)

- Measures within the fishing strategy are such as to reduce harm to benthic biodiversity and community structure: gear is relatively light; the fishery operates on soft substrates whose benthic species are considered relatively resilient and of relatively short recovery time; the fishery does not impact over 90% of bottom areas in the fishery area
- A partial strategy document, approved by NSAC on March 4, 2015, summarizes fishery footprint in relation to habitats
- The document includes a commitment to monitor fishery footprint at 5 year intervals and to modify fishing practices if analyses show that identified critical thresholds are surpassed (CAPP 2015 p. 45)
- The fishery has shown the capacity to analyse and monitor ecosystem impacts and to put in place additional measures to protect the ecosystem if necessary
- As such, the fishery meets the MSC guidance on a partial strategy: a cohesive arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome and an awareness of the need to change the measures should they cease to be effective. It may not have been designed to manage the impact on that component specifically. (MSC 2013)

B. The partial strategy takes into account available information and is expected to restrain impacts of the fishery on the ecosystem (benthic biodiversity and community structure) so as to achieve the Ecosystem Outcome 80 level of performance (meets 80)

- The partial strategy is based on an analysis of the fishery footprint in the fishery area, available information on distribution of benthic species and communities in the fishery area, a review of non-catch impacts of this gear on benthic species and on inference from information in similar fisheries in other areas (see 2.5.3)
- Because the partial strategy ensures that less than 90% of the fishery area is impacted by the fishery and because of the inferred impact of the gear on those areas that are impacted, the partial strategy is expected to restrain impacts of the fishery such that there would not be serious or irreversible harm to benthic biodiversity and community structure.

C. The measures are considered likely to work based on prior experience, plausible argument or information directly from the fishery/ecosystems involved

<p>(meets 100)</p> <ul style="list-style-type: none"><li>• The partial strategy is considered likely to work based on analyses of the fishery footprint in relation to benthic communities (information directly from the fishery/ecosystems involved)</li></ul> <p>D. There is evidence that the measures comprising the partial strategy are being implemented successfully (meets 100).</p> <ul style="list-style-type: none"><li>• Distribution of fishing, monitored by VMS, shows that the footprint of the fishery on benthic communities is relatively small</li></ul> <p>The fishery does not meet the 100 SG for SIs A and B because the partial strategy in place does not meet the MSC definition of a “strategy” (MSC Guidance, GCB 3.3) - “a cohesive and strategic arrangement...designed to manage impact on that component specifically”,</p> <p>Overall, the score for this PI is changed to 85, as the fishery meets 80 for one ecosystem element (trophic relationships), 90 for the other (benthic biodiversity).</p>
<p><b>Audit Trace References</b></p>
<p><b><u>CERTIFICATION REPORT</u></b></p>
<p>FMP; interviews Newfound Pioneer , DFO, CAPP; NAFO 2008/0-1</p>
<p><b><u>4<sup>TH</sup> ANNUAL AUDIT</u></b></p>
<p>CAPP 2015; MSC 2013</p>

		SG60	SG80	SG100
2.5.3	<b>Information / monitoring</b> There is adequate knowledge of the impacts of the fishery on the ecosystem.	<p>Information is adequate to identify the key elements of the ecosystem (e.g. trophic structure and function, community composition, productivity pattern and biodiversity).</p> <p>Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, but have not been investigated in detail.</p>	<p>Information is adequate to broadly understand the functions of the key elements of the ecosystem.</p> <p>Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, but may not have been investigated in detail.</p> <p>The main functions of the Components (i.e. target, By-catch, Retained and ETP species and Habitats) in the ecosystem are known.</p> <p>Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred.</p> <p>Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).</p>	<p>Information is adequate to broadly understand the key elements of the ecosystem.</p> <p>Main interactions between the fishery and these ecosystem elements can be inferred from existing information, and have been investigated.</p> <p>The impacts of the fishery on target, By-catch, Retained and ETP species and Habitats are identified and the main functions of these Components in the ecosystem are understood.</p> <p>Sufficient information is available on the impacts of the fishery on the Components and elements to allow the main consequences for the ecosystem to be inferred.</p> <p>Information is sufficient to support the development of strategies to manage ecosystem impacts.</p>
<b>Scoring Comments</b>				
<b>CERTIFICATION REPORT</b>				
The ecological role of the target species is relatively well known. Pandalus shrimps prey on, and are prey for a variety of species (Parsons 2005a, 2005b, 2006;				

Savenkoff et al 2006), although other species (such as capelin for cod, fishes for seals) may be preferred prey. Trophic structures related to northern shrimp have not been studied in this area, but studies in continental shelf areas with generally similar conditions (e.g. Savenkoff et al 2004) probably provide a general picture of trophic relationships in the fishery area. Trophic relationships in demersal communities in this area have been outlined (Pedersen and Zeller 2001).

Information on benthic and demersal communities in which the fishery operates is relatively general, with the exception of exploited groundfishes for which detailed stock assessments are available. Basic life history information is available on non-commercial demersal fishes (eg Scott and Scott 1988; Fishbase). Species composition of benthos, major species, and relations of distributions to environmental conditions are known for stations in and near SFA 1 (Stewart et al 1985). Bycatch information from the shrimp trawls also provides a qualitative, and incomplete, picture of benthic species composition in the fishery area (T. Siferd, unpublished compilation).

Non-catch impacts on these species and others in the benthic community could result from gear passage, i.e. impact of rockhopper gear rollers or trawl doors; these impacts may be low, given that the gear is relatively light and large rollers are used, but have not been assessed. In this area, a heavy shoe is used on tows with twin trawls, and this is likely to damage sessile invertebrate species in the path of the gear over a swathe of some 3 m.

Ability of potentially impacted communities to recover from impacts is not known for the area, with the exception of commercial groundfish (although there is some uncertainty about ability to recover from current low abundance levels). Inferences on recovery ability of other groups can be made from work in other areas. Ability to recover generally varies with lifespan; slow-growing, long-lived species (such as some species of hard corals) will recover more slowly than short-lived species (eg tube-dwelling worms). A 3-year study of trawl impacts on sand bottoms on the Grand Banks suggested that benthic communities were little altered over this period (summarised by Gordon et al 2009). Simpson and Watling (2006) found little evidence of long-term impacts of shrimp trawling on benthos or habitat structure in the Gulf of Maine.

**Score = 70 (Original) 80 (Revised)**

**CERTIFICATION REPORT**

Information is adequate to broadly understand the key elements of the ecosystem, and the main functions of the components in the ecosystem is known. Main impacts of the fishery on some ecosystem elements are known such that ecosystem impacts can be inferred; the key unknown is non-catch impact of the fishery on benthic communities and species. Some relevant ongoing data collection is occurring (distribution of fishing) but risk level cannot be assessed for non-catch impacts on benthic communities and species.

The fishery clearly meets the 60 SG and meets at least the first three scoring issues of the 80 SG.

**4<sup>TH</sup> ANNUAL AUDIT**

A. Information is adequate to broadly understand the key elements of the ecosystem (meets 80)

- For this fishery, the elements for which a score of 80 was not achieved were benthic biodiversity and community structure
- Although studies of benthic species and communities have concentrated on sensitive areas (areas of sponge and coral concentration - see habitat 2.4), information is adequate to broadly understand the biodiversity and community structure of the soft-bottom habitats on which the fishery concentrates
- Maps of sediment types over the fishery area are available which show the nature and distribution of habitat types (CAPP 2015)



- Stewart et al (1985) sampled benthos in the Davis Strait near the fishery area and found that species present were similar to those in studies further south: ophiuroid echinoderms (brittle stars), polychaetes, bivalve molluscs and amphipod crustaceans were the major groups observed. The authors provided a species list by station and a summary of dominant species by station.
- Information on the benthic fauna of the Newfoundland-Labrador shelf, south of but ecologically similar to the fishery area, has been reviewed and summarised to support a mass balance model of this area (Bundy et al 2000); major benthos groups identified for this model are echinoderms (brittle stars, sea urchins), molluscs (bivalves, gastropods), polychaetes (tube-dwelling and mobile), and others including crustaceans, nematodes and others
- Benthic species of the soft-substrate habitats on which the fishery operates are generally known from studies in areas near and presumably ecologically similar to this area (Gagnon and Haedrich 1991 for polychaetes; Gordon et al 2009 for sand-bottom benthos on the Grand Banks; Chabot et al 2007 for the northern Gulf of St. Lawrence; Ramey and Snelgrove 2003 for mud/sand habitats of Placentia Bay) and in other areas in which *Pandalus* fisheries operate (Hixon and Tissot 2006, Oregon; Simpson and Watling 2006, Gulf of Maine)

B. Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, and some have been investigated in detail (meets 80)

- With respect to “investigated in detail”, this part of the SG was scored at 80 in the certification report because of detailed studies available of the position of pandalid shrimp in trophic relationships in the fishery area
- Non-catch impacts on benthic communities have been reviewed for this fishery by Grant (MS 2010), although this review focused on sensitive areas and on fish species
- Impacts of shrimp trawling on benthic communities have been studied off Oregon (Hixon and Tissot 2007) and the Gulf of Maine (Simpson and Watling 2006), while a number of studies and reviews have examined impacts of trawls on bottom communities more generally (eg Rice 2006, Kaiser et al 2006, see references in Grant MS 2010).
- NEFMC (2011) summarised available information and expert judgment in a framework for assessing gear damage to habitats and communities, including for damage to species of soft-bottom habitats
- While there is great variability between available studies in terms of the types and severity of impacts, it can generally be concluded that repeated trawling on soft-bottom habitats affects species composition, size composition of species, and thus biodiversity and community structure. Recovery times of soft-substrate species were considered to be generally 1-3 years by NEMFC (2011). While soft-bottom habitats are generally considered relatively stable and not subject to physical stress (waves, currents etc), bioturbation may be an important background drive of change (eg Simpson and Watling 2006).

This SG does not meet 100 because not all ecosystem issues have been investigated in detail.

C. The main functions of the components... in the ecosystem are known

- This SG was scored at 80 in the certification report

D. Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred

- This SG was scored at 80 in the certification report
- E. 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) (meets 80)
- VMS monitoring of fishing locations continues and the client has committed to 5-year reanalyses of fishery footprint in relation to habitat types (and thus of distribution in relation to benthic communities)
  - The fishery does not meet 100 for this SG because the level of information is not sufficient to support the development of strategies to manage ecosystem impacts.

**Audit Trace References**

**CERTIFICATION REPORT**

Pedersen and Zeller 2001; Parsons 2005a, 2005b, 2006; Savenkoff 2006; Scott and Scott 1988; Fishbase; Stewart et al 1985; unpublished compilation of observer data provided by T. Siferd, DFO; Gordon et al 2009.

**4<sup>TH</sup> ANNUAL AUDIT**

CAPP 2015; Bundy et al 2000; Gagnon and Haedrich 1991; Gordon et al 2009; Chabot et al 2007; Ramey and Snelgrove 2003; Hixon and Tissot 2006; Simpson and Watling 2006; Stewart et al (1985)

		SG60	SG80	SG100
3.2.4	<b>Research plan</b>  The fishery has a research plan that addresses the information needs of management.	Research is undertaken, as required, to achieve the objectives consistent with MSC's Principles 1 and 2.          Research results are available to interested parties.	A research plan provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.          Research results are disseminated to all interested parties in a timely fashion.	A comprehensive research plan provides the management system with a coherent and strategic approach to research across P1, P2 and P3, and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.          Research plan and results are disseminated to all interested parties in a timely fashion and are widely and publicly available.

Scoring Comments

**CERTIFICATION REPORT**

Ongoing stock assessment research is described in detail in Annex D of the IFMP. For the purposes of stock assessment, the O+1 shrimp stock is monitored through Canadian and Greenlandic research surveys and sampling of the commercial catch. Catch rates of shrimp and fish species are recorded, and detailed observations are made on shrimp size distribution, sex, maturity and egg production. These data provide useful information on the distribution and abundance of the resource, the effects of fishing, changes in the environment, and potential for the fishery in the near future.

Other research, although not conducted in SFA 1 specifically, includes work directed towards age determination, estimation of mortality rates, effects of environmental parameters (e.g., temperature, currents) and relationships with major predators, especially Greenland halibut and cod.

A 5 year \$5 million research proposal by the Marine Institute of Memorial University has been developed and submitted for funding that has the objective of reducing the bottom impact of various trawls currently used in the industry. The approach for this project is to complete design and simulation using various trawl configurations, complete physical modeling using theflume tank, and then evaluate prototypes under commercial conditions.

A study is currently being undertaken by the Marine Institute to develop a methodology to use industry single beam sounders to collect bottom type data and compile these data to create an acoustic classification map for fishing grounds off Newfoundland and Labrador. The study will focus in particular on northern shrimp, although the results will be applicable to other benthic species. The study will help to guide more detailed investigation of sensitive habitats and the

correlation between shrimp abundance and seabed habitat.

Additional research is being conducted at the DFO Maurice Lamontagne Institute in Mont Joli, Quebec in tank rooms designed to simulate the natural living conditions of *Pandalus borealis*. The studies are exploring the effect of water temperature on the various stages in their life cycle.

NIPAG provides research recommendations in their regular stock assessments.

The research being conducted is circulated to all interested parties in a timely fashion, either directly to stakeholders, at advisory committee meetings or via the Canadian Science Advisory Secretariat (CSAS) system on the DFO website.

**Score = 75 (Original) 80 (Revised)**

**CERTIFICATION REPORT**

While there is significant ongoing research activity to support the fishery, there is no actual research plan that provides the management system with a strategic approach to research as is required by the 80 scoring guidepost.

The research survey and assessment program is described and published as part of the IFMP (Annex D) and provides management with necessary information. However it is not comprehensive, as it does not address all issues identified in the stock assessments as requiring resolution through research. In addition, although ecosystem issues are addressed in ongoing research and in the research plan, there is not a comprehensive range of research topics identified to resolve issues related to ecosystem impacts of fishing"

**4<sup>TH</sup> ANNUAL AUDIT**

While the IFMP remains incomplete, the thirteen points covered in the research plan approved by the NSAC in March 2015 provides a strategic approach to analysing key P1 and P2 issues related to the shrimp fishery. The fishery meets SG80 Sla. The lack of any definition of P3 work prevents the fishery meeting SG100 Sla. PI 3.2.4 is rescored to 80.

**Audit Trace References**

**CERTIFICATION REPORT**

Integrated Fisheries Management Plan - Northern Shrimp - Shrimp Fishing Areas (SFAs) 0-7 and the Flemish Cap, 2007; MSC Certification of the Offshore Shrimp Fisheries (>100') in areas 1, 2 ,3, 4, 5, 6 and 7. Submission for the Main Assessment by the 17 Offshore Licence Holders September 2, 2009

**4<sup>TH</sup> ANNUAL AUDIT**

Research Plan, DFO letter

6.2 **Pandalus borealis SFA 2, 3 & 4 Fishery**

2.4	Strategies have been developed within the fisheries management system to address and restrain any significant negative impacts of the fishery on the ecosystem			
		SG60	SG80	SG100
2.4.1	<b>Status</b> The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function.	The fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	There is evidence that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.
<b>Scoring Comments</b>				
<b><u>CERTIFICATION REPORT</u></b>				
<p>The fishery concentrates on mud bottoms (or sand, or mixed mud-sand), and vessels avoid hard bottoms to minimise the risk of damage to trawls. Trawl gear is relatively light and efforts are underway to further reduce gear contact with the bottom in order to reduce fuel costs. Bottom rollers and trawl doors are the principal parts of the trawl contacting the bottom, although in northern areas when twin trawls are used a heavy “shoe” would dig deeply into the bottom.</p> <p>Studies are unavailable on the impacts of shrimp gear on mud and mud-sand bottoms in this area, but some inferences can be made from studies on sand bottoms, recognising that impacts are to some extent site specific and that inference leaves some uncertainty about conclusions. In a 3-year study of impacts of trawl gear on the Grand Banks, there was no alteration to benthic communities and recovery of the sand habitat occurred within a year (results summarised in Gordon et al 2009). Soft bottoms are impacted relatively rapidly by trawling gear but recover relatively quickly (DFO 2006benthic).</p> <p>The fishery probably produces occasional impacts on hard-bottom areas with erect sessile fauna which may be important as habitat. Coral bycatch is low, suggesting that contact with such areas is relatively rare, but bycatch information probably under represents interactions with such sensitive areas since impacts may occur when coral is not retained. Such habitats probably recover relatively slowly as growth rates of hard corals are low (Gilkinson and Edinger eds 2009).</p> <p>A voluntary closed area to protect coral habitat is in place in SFAs 2 and 4, and two closed areas further south may help to reduce impacts on benthic habitats, but the benefits of these areas have not been assessed.</p>				

This PI is equivalent to PI 2.1.3.1 used in the ASP assessment of this overlapping fishery. It too failed to meet a score of 80 and resulted in a single Condition (Condition 2 in the ASP report) which was set for multiple PIs.

**Score = 60 (Original) 80 (Revised)**

**CERTIFICATION REPORT**

Given its mode of operation, this fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm, but analyses of fishery impacts would be required to increase certainty, particularly with respect to potential impacts on hard coral areas; accordingly it cannot be said that the fishery is “highly unlikely” to have unacceptable impacts.

**4<sup>TH</sup> ANNUAL AUDIT**

PI 2.4.1. The PI is rescored to 100, because there is evidence that the fishery is **highly unlikely** to reduce habitat structure and function to a point where there would be serious or irreversible harm.

- In the three years 2009-2011 the fishery impacted a maximum of 0.67% of bottom habitat in the fishery area (continental shelf between 100 and 600 m depth)(CAPP 2015 p. 19; Spatialanalysis 2013); thus the fishery leaves most of the habitat area undisturbed
- Actual area impacted was less than this because this figure does not account for overlapping tows
- A relatively high proportion (22.6%) of identified sensitive bottom habitat areas (significant coral concentrations as identified in Kenchington et al, 2010) was contacted, while 0.8% of identified sensitive sponge areas was contacted (CAPP 2015 p. 28)
  - Over 95% of the tows in identified sensitive areas occurred in a single coral area identified as C84 (CAPP 2015 p. 29)
  - Detailed examination of the footprint in relation to coral distributions showed very little overlap between the fishery footprint and known coral concentrations, as the fishery concentrates at depths shallower than those at which coral concentrations, in particular large gorgonians, occur (CAPP 2015 p. 35);
  - Of 3247 sets within the identified sensitive coral area, 2 took coral bycatch, but no gorgonians were observed in the bycatch - only soft or unknown corals (CAPP 2015 p. 30)
  - Of 7 sets within identified sensitive sponge areas, none had sponge bycatch (CAPP 2015 p. 31)
  - The interpolation technique used to identify sensitive areas based on distribution of large gorgonians in trawl survey catches is shown to extend the boundary of the identified sensitive area into shallower waters than is justified by coral distribution information alone (CAPP 2015 p. 31). Generally there is little overlap between depths fished (usually 150-450 m) and coral and sponge areas (500 m or greater)
  - As a result, the analysis concludes that the actual overlap between sensitive habitat and the fishery footprint is well below the 10% threshold considered to represent a risk of serious or irreversible harm to habitat
  - Three trawl survey catches of large gorgonians occurred within depths and areas impacted by the fishery (CAPP 2015 p. 35); these areas will be subject to a voluntary closure to fishing (see below 2.4.2).
- Based on available information (see 2.4.3) trawl impacts on the main “non-sensitive” habitat types impacted by the fishery (soft substrates, mud, silt and sand or mixtures thereof) are not such as to cause serious or irreversible harm

**Audit Trace References**

**CERTIFICATION REPORT**

Gordon et al 2009; DFO 2006benthic; interviews (see 2.4.2), IFMP; Gilkinson and Edinger eds 2009.

**4<sup>TH</sup> ANNUAL AUDIT**

CAPP 2015; Spatialanalysis 2013



		SG60	SG80	SG100
2.4.2	<b>Management strategy</b> There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types.	<p>There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.</p> <p>The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/habitats).</p>	<p>There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.</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>	<p>There is a strategy in place for managing the impact of the fishery on habitat types.</p> <p>The strategy is mainly based on information directly about the fishery and/or habitats involved, and testing supports high confidence that the strategy will work.</p> <p>There is clear evidence that the strategy is being implemented successfully, and intended changes are occurring. There is some evidence that the strategy is achieving its objective.</p>
<b>Scoring Comments</b>				
<b><u>CERTIFICATION REPORT</u></b>				
<p>Several measures are in place which would help to reduce impacts of the fishery on habitats. The fishery is concentrated on soft bottoms (mud and/or sand), preferred habitat for shrimp and with less risk of damage to trawls, and these types of habitats are generally considered relatively resilient to trawl impact (Rice 2006; Gordon et al 2006). Trawls and doors used are relatively low-impact, and work is under way to further lighten the gear in the interests of saving fuel (interviews at Newfound Pioneer , 2009; Marine Institute, 2007; Marine Institute n.d.) (however the shoe used between codends on twin trawls could cause substantial bottom damage). The relatively low proportion of trawl sets with corals as bycatch suggests that impacts on these habitats may be low, although presence in sets would underestimate impact since trawls may impact corals without retaining them.</p> <p>The offshore fleet has developed a coral conservation policy (GEAC et al 2007) including one voluntary closed area (12,500 km<sup>2</sup> ) to protect corals in SFAs 2-4. Two closed areas have been established in the fishery area which could have benefits for bottom habitat conservation (Hawke Channel; Funk Island deep).</p> <p>Steps are being taken toward developing a strategy for managing potential habitat impacts. A Closed Areas Working Group of the Northern Shrimp Advisory Committee has been established to consider closed areas and other ecosystem impacts of the fishery. DFO Newfoundland Region has committed to developing a coral/sponge conservation strategy for its continental shelf, and this is expected to be complete by 2012. DFO has developed a national policy for Managing the Impacts of Fishing on Sensitive Benthic Habitats (April 2009) (<a href="http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/benthi-eng.htm">http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/benthi-eng.htm</a> ), which is expected to provide an overall framework for actions to improve protection of sensitive habitats and species.</p>				

This PI is equivalent to PI 2.1.4.3 and 3B.2.1 used in the ASP assessment of this overlapping fishery. These also failed to meet a score of 80 and resulted in a single Condition (Condition 2 in the ASP report) which was set for multiple PIs.

**Score = 70 (Original) 80 (Revised)**

**CERTIFICATION REPORT**

All elements of the SG 60 are in place, as measures are in place to reduce impacts and these are considered likely to work. The suite of measures (light gear design; fishing mainly on mud-sand bottoms; coral conservation policy by the offshore fleet and developing DFO coral/sponge policy; voluntary closed areas) is considered a partial strategy as there is an understanding of how they work to conserve habitat and there is an awareness of the need to further modify the strategy if necessary. There is evidence that the strategy is being implemented successfully, since bycatch of corals and sponges is very low. However, further information on the fishery impacts on habitat would be necessary to provide a more objective basis for confidence that the strategy is meeting its objectives.

**4<sup>TH</sup> ANNUAL AUDIT**

PI 2.4.2 The PI is rescored to 80, because

A. There is a **partial strategy** in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above;

- Elements of the fishing strategy are such as to minimize harm to habitats: gear is relatively light; the fishery concentrates on relatively resilient soft substrates where shrimp are concentrated and where risk of gear damage is low; the fishery concentrates at depths shallower than those at which identified sensitive coral and sponge habitats occur;
- The analysis of CAPP (2015) shows that the existing fishing strategy is such as to ensure that serious or irreversible harm to sensitive habitats does not occur, since the low proportion of habitats impacted indicates that overall there is not serious or irreversible to habitats
- Industry has put in place a voluntary closed area of 12,500km<sup>2</sup> off the entrance to Hudson Strait with the objective of protecting coral and sponge concentrations (IFMP)
- Following the analysis of CAPP (2015) showing areas where large gorgonians were taken in surveys within the fishery footprint, industry has undertaken to close these areas to fishing (CAPP 2015 Section E p 43).
- A partial strategy document, approved by NSAC on March 4, 2015, summarizes fishery footprint in relation to habitats
- The document includes a commitment to monitor fishery footprint at 5 year intervals and to modify fishing practices if analyses show that identified critical thresholds are surpassed (CAPP 2015 p. 45)
- The fishery has shown the capacity to analyse and monitor habitat impacts and to put in place additional measures to protect habitat if necessary (voluntary closed areas in SFAs 2-4)(CAPP 2015)
- The partial strategy has been developed in the context of DFO national strategies on fishing in sensitive benthic habitats (DFO 2009) and on coral and sponge conservation (DFO 2015)
- As such, the fishery meets the MSC guidance on a partial strategy: a cohesive arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome and an awareness of the need to change the measures should they cease to be effective. It may not have been designed to manage the impact on that component specifically. (MSC 2013)

B. There is some **objective basis for confidence** that the partial strategy will work, based on **information directly about the fishery and/or habitats** involved.

- Analyses of the fishery, in particular its footprint in relation to sensitive and less-sensitive habitats, show that the fishery is highly likely to meet the SG 80 outcome indicator for PI 2.4.1 (see above)

C. There is **some evidence** that the partial strategy is being implemented successfully.

- Analyses of the fishery footprint in relation to sensitive and less-sensitive habitats show that the fishery is highly likely to meet the SG 80 outcome indicator for PI 2.4.1 (see above)

The fishery does not meet the 100 SG because the partial strategy in place does not meet the MSC definition of a “strategy” (MSC Guidance, GCB 3.3) - “a cohesive and strategic arrangement...designed to manage impact on that component specifically”, there has been no testing of the strategy, and there is no evidence to show that intended changes are occurring or that the strategy is achieving its objective.

**Audit Trace References**

**CERTIFICATION REPORT**

Interviews at FV Newfound Pioneer, Marine Institute, DFO, CAPP; DFO web site; Integrated Fisheries Management Plan; GEAC et al 2007

**4<sup>TH</sup> ANNUAL AUDIT**

CAPP 2015; MSC 2013; DFO 2015; DFO 2009; IFMP

		SG60	SG80	SG100
2.4.3	<b>Information / monitoring</b> Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types.	<p>There is a basic understanding of the types and distribution of main habitats in the area of the fishery.</p> <p>Information is adequate to broadly understand the main impacts of gear use on the main habitats, including spatial extent of interaction.</p>	<p>The nature, distribution and vulnerability of all main habitat types in the fishery area are known at a level of detail relevant to the scale and intensity of the fishery.</p> <p>Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent, timing and location of use of the fishing gear.</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>	<p>The distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types.</p> <p>Changes in habitat distributions over time are measured.</p> <p>The physical impacts of the gear on the habitat types have been quantified fully.</p>
<b>Scoring Comments</b>				
<b><u>CERTIFICATION REPORT</u></b>				
<p>No mapping of bottom sediments in the fishery area has been done (C-NOPB 2008), although some information is available and fishermen are aware of bottom type distribution and concentrate on preferred bottom types (mud and sand bottoms). Part of the area is outside areas reviewed by the Canada-Newfoundland Offshore Petroleum Board Strategic Environmental Assessments (eg C-NOPB 2008 on the Labrador Shelf), but in any case little information on bottom habitats is covered by the C-NOPB assessments. Information on bottom types may be improved through a project to use acoustic equipment on commercial shrimp vessels to type bottoms in the fishery area (Marine Institute, School of Ocean Technology 2008).</p> <p>Information on distribution of particularly sensitive habitat areas, i.e. coral concentration areas, is available and level of detail of this information continues to improve (Edinger et al 2007; Wareham and Edinger 2007; Wareham 2009). This information is mainly based on observations of corals in commercial trawl sets (observer program) and trawl survey programs.</p> <p>Observations have been mapped separately for the various groups of corals, including hard and branching corals (mainly associated with hard-bottom areas) and soft corals (often found on soft bottoms). Sampling covered the entire fishery area and corals were recorded in all areas, however hard and branching</p>				

corals (particularly important for habitat) are concentrated along the edge of the continental shelf. Areas of concentration of sponges, another type of sensitive habitat area, have been identified in preliminary fashion in areas near the Flemish Pass, based on trawl survey and observer data (CAPP submission; Kenchington et al 2009). Preliminary indications are that sponge concentration areas are at depths greater than those at which the shrimp fishery operates.

Distribution of fishing operations is very well known from VMS and logbook information and is compiled (Spatialanalysis 2009; Orr et al MS 2008. Corals were recorded in 1.8% of shrimp trawl sets in this and adjacent fishery areas, most of these being soft corals (Edinger et al. 2007).

Vulnerability of habitat types in the fishery area to bottom trawl gear is generally known (eg Rice 2006; Gordon et al 2006).

Available information has not been compiled into an overall summary which would provide adequate detail on the nature and distribution of habitat types relative to fishery operations, in relation to vulnerability of habitat types to impacts from trawl gear.

This PI is equivalent to PI 2.1.1.1 used in the ASP assessment of this overlapping fishery. It too failed to meet a score of 80 and resulted in a single Condition (Condition 2 in the ASP report) which was set for multiple PIs.

**Score = 70 (Original) 80 (Revised)**

**CERTIFICATION REPORT**

All elements of the 60 SG are met, as there is basic understanding of types and distribution of habitats in the fishery area, and information is adequate to understand interactions and impact of the fishery.

There is reliable information on spatial extent, timing and location of the fishery (observer information and VMS), and information on distribution of particularly sensitive habitats is available; since these elements of the 80 SG are met, a score of 70 is assigned.

**4<sup>TH</sup> ANNUAL AUDIT**

PI 2.4.3. The PI is rescored to 80, because:

A. The nature, distribution and **vulnerability** of all main habitat types in the fishery area are known at a level of detail relevant to the scale and intensity of the fishery.

- Maps of sediment types in the fishery area are available which show the nature and distribution of habitat types at a level of detail relevant to the scale and intensity of the fishery (CAPP 2015; Josenhans et al 1986; CNLOPB 2008)
- Maps of sensitive habitats, as defined by the presence of significant concentrations of corals and sponges, are available (Kenchington et al 2010; DFO 2010).
- Vulnerability of the various habitat types to bottom trawl fishing are known (NEFMC 2011 and others, see below)

B. Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent of interaction, and the timing and location of use of the fishing gear.

- A review of the mode of operation of Newfoundland shrimp gear and potential impacts on bottom habitats is available (Grant MS 2012).

- Impacts of shrimp trawl gear on habitats in which they most commonly operate (soft substrates) have been described in publications from Oregon and Maine (Hixon and Tissot 2007; Simpson and Watling 2006)
- Research on impacts of mobile bottom gear on habitats in the Newfoundland-Labrador area has been summarised and reviewed (Gilkinson et al 2006), as has research on impacts in a nearby marine area (Gordon et al 2006)
- More general reviews of impacts of mobile bottom gear on habitats are available (Kaiser et al 2006; Rice 2006)
- A framework for assessing fishing gear impacts on bottom habitats has been developed in an attempt to guide risk assessment (NEFMC 2011)
- Timing and location of use of the fishing gear are monitored by VMS on all vessels, and can be used in analyses of the fishery footprint (eg CAPP 2015)

C. 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).

- VMS monitoring of fishing locations continues and the client has committed to 5-year reanalyses of fishery footprint in relation to habitat types

The fishery does not meet the 100 SG because the distribution of habitat types is not known over their range (there are gaps in knowledge of habitat distributions, as habitats have been characterised based on information on bycatch from fisheries, not from a systematic sampling program), changes in habitat distributions are not monitored, and the physical impacts of the gear on habitats has not been quantified fully.

**Audit Trace References**

**CERTIFICATION REPORT**

C-NPOPB 2008; Marine Institute, School of Ocean Technology 2008; Edinger et al 2007; Wareham and Edinger 2007; Wareham 2009; Kenchington et al 2009; Rice 2006; Gordon et al 2006; information presented by CAPP pp 41-42; Spatialanalysis 2009; Orr et al MS 2008.

**4<sup>TH</sup> ANNUAL AUDIT**

CAPP 2015; Josenhans et al 1986; CNLOPB 2008; Kenchington et al 2010; DFO 2010; NEFMC 2011; (Grant MS 2012); Hixon and Tissot 2007; Simpson and Watling 2006; Gilkinson et al 2006; Gordon et al 2006; Kaiser et al 2006; Rice 2006

2.5	Ecosystem			
		SG60	SG80	SG100
2.5.1	<b>Status</b> The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function.	The fishery is <u>unlikely</u> to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The fishery is <u>highly unlikely</u> to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is <u>evidence</u> that the fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
<b>Scoring Comments</b>				
<b><u>CERTIFICATION REPORT</u></b>				
<p>The principal issues to be addressed here are (a) impact of removal of the target species, which are a key element in trophic webs and are forage for a wide range of predator species, on trophic relationships (b) non-catch impacts on biological diversity and community structure, particularly for benthic species. Impacts on hard coral and sponge communities have been addressed in 2.4 relative to habitat impacts, while bycatch impacts have been addressed in 2.2. In addition, overall impact on ecosystems is considered consistent with MSC FAM.</p> <p>Impact of removal of target species on trophic relationships. Shrimp abundance is currently high relative to historical levels, such that there should be no impacts on trophic relationships at present and in the near future. A guideline on exploitation rate to be used in the fishery (15%) in future is consistent with maintaining adequate forage, and is lower than has been practised in other fisheries where there have not been apparent impacts on predators (IFMP). The new exploitation framework based on reference points and decision rules (IFMP) appear to leave the way open to higher exploitation rates in future. The conclusion that removal of target species is highly unlikely to disrupt trophic relationships is based on quantitative information on population status.</p> <p>Non-catch impact on benthic species and communities. Given the configuration of the gear (light foot gear, “flying” codend, light doors) this fishery is unlikely to be having serious or irreversible impacts on benthic species and communities. However, no assessment has been done. An assessment of spatial distribution of the fishery has been done, suggesting that a low proportion of the continental shelf has been affected by shrimp trawling; this is a good initial step but additional analyses of communities in which the fishery operates and their sensitivity would be needed to assess impact. The conclusion that the fishery is unlikely to disrupt benthic communities is based on inference.</p> <p>Recent work on unobserved fishing mortality (Grant and Hiscock 2010, in press) produced in accordance with meeting a Condition in the existing certified Northern shrimp fishery in SFA 5, 6 &amp; 7 and reported in the second annual surveillance audit report for that fishery (Moody Marine Ltd 2010) concludes that unobserved mortality is likely to be low, thus bycatch information would assess impact of the gear on non-target species relatively well.</p> <p>Overall, it appears highly unlikely that the fishery is causing serious or irreversible at the level outlined in the MSC FAM (S. 7.1.12 – extinctions, trophic cascades, gross changes in species composition).</p> <p>This PI is equivalent to PI 2.1.3.2 and 2.1.4.4 used in the ASP assessment of this overlapping fishery. These also failed to meet a score of 80 and resulted in a</p>				



single Condition (Condition 2 in the ASP report) which was set for multiple PIs.

**Score = 70 (Original) 80 (Revised)**

**CERTIFICATION REPORT**

One identified ecosystem element (changes in trophic relationships due to removal of the target species) meets the 80 SG, another (non-catch impacts on benthic communities) meets the 60. Overall it appears highly unlikely that the fishery is causing serious or irreversible harm to ecosystems. Accordingly an intermediate score of 70 is assigned.

**4<sup>TH</sup> ANNUAL AUDIT**

PI 2.5.1. The PI is rescored to 100 for the relevant ecosystem issue because there is evidence that the fishery is **highly unlikely** to disrupt the relevant key elements underlying ecosystem structure and function (that is, benthic biological diversity and community structure) to a point where there would be a serious or irreversible harm.

- The ecosystem issue for which this fishery scored less than 80 on ecosystem PIs is non-catch impacts on biological diversity and community structure, particularly for benthic species.
- In the three years 2009-2011 the fishery impacted a maximum of 0.67% of bottom habitats (and thus benthic communities) in the fishery area (continental shelf between 100 and 600 m depth) (CAPP 2015 p. 19; Spatialanalysis 2013), thus leaving most areas and communities undisturbed
- Actual area impacted was less than this because this figure does not account for overlapping tows
- Based on available information (see 2.5.3), trawl impacts on benthic species (and thus biodiversity and community structure) in the main habitat types impacted by the fishery (soft substrates, mud, silt and sand or mixtures thereof) are known and may cause measurable changes in benthic community structure; however because more than 90% of the distribution area of benthic communities of the fishery area is not impacted by the fishery, the overall impact is not such as to cause serious or irreversible harm
- Impacts on benthic biodiversity and community structure in sensitive habitats are addressed under Habitats 2.4

Overall, the score for the PI is changed to 90, as the fishery scores 80 for one ecosystem issue (trophic relationships) and 100 for the other (benthic biodiversity)

**Audit Trace References**

**CERTIFICATION REPORT**

See sections 2.5.2 and 2.5.3; Grant & Hiscock in press; Moody Marine 2010

**4<sup>TH</sup> ANNUAL AUDIT**

CAPP 2015; Spatialanalysis 2013

		SG60	SG80	SG100
2.5.2	<b>Management strategy</b> There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function.	<p>There are measures in place, if necessary, that take into account potential impacts of the fishery on key elements of the ecosystem.</p> <p>The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ ecosystems).</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 so as 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>	<p>There is a strategy that consists of a plan, containing measures to address all main impacts of the fishery on the ecosystem, and at least some of these measures are in place. The plan and measures are based on well-understood functional relationships between the fishery and the Components and elements of the ecosystem.</p> <p>This plan provides for development of a full strategy that restrains impacts on the ecosystem to ensure the fishery does not cause serious or irreversible harm.</p> <p>The measures are considered likely to work based on prior experience, plausible argument or information directly from the fishery/ecosystems involved.</p> <p>There is evidence that the measures are being implemented successfully.</p>
<b>Scoring Comments</b>				
<b><u>CERTIFICATION REPORT</u></b>				
<p>Shrimp as a forage species. The IFMP does not make specific reference to the need to practice a conservative exploitation strategy to ensure that shrimp is available to predator species, although it provides evidence that the guideline exploitation rate (15%) is well below that practiced in other shrimp fisheries which have not had apparent impacts on predators, and it is considered low enough to ensure that predator needs are met. The new exploitation framework based on reference points and decision rules (IFMP) appear to leave the way open to higher exploitation rates in future. This new framework does not explicitly address predator requirements in setting exploitation rates.</p> <p>Impacts on biological diversity and benthic communities (other than bycatch species and habitat issues). The mode of operation of the fishery is consistent with</p>				

reducing potential impacts on biological diversity and on benthic communities. Fishing operations are concentrated on soft bottom areas, which have shorter recovery times than harder bottoms and whose mobile or infauna is generally less vulnerable to damage than erect, sessile, long-lived fauna of hard bottoms. Trawls are relatively light and fitted with rollers which should roll over rather digging into the bottom, although in areas where twin trawls are used the “shoe” would dig into soft bottom sediments. Recorded bycatch of benthic fauna is very low, but non-catch impacts on bottom fauna are not well known and some assessment of potential impacts would help to increase certainty that these are low.

This PI is equivalent to PI 2.1.4.5 used in the ASP assessment of this overlapping fishery. It also failed to meet a score of 80 and resulted in a single Condition (Condition 2 in the ASP report) which was set for multiple PIs.

**Score = 70 (Original) 80 (Revised)**

**CERTIFICATION REPORT**

A partial strategy is in place to ensure that adequate forage is maintained for predators (guideline exploitation rate, ongoing monitoring) (SG 80). Measures are in place to ensure that non-catch impacts on benthic communities are low (light gear, soft-bottom areas with communities which recover relatively quickly are fished) (SG 60). Accordingly a score of 70 is assigned.

**4<sup>TH</sup> ANNUAL AUDIT**

PI 2.5.2 The condition is rescored to 80 because:

A. There is a partial strategy in place (with respect to benthic biodiversity and community structure) (meets 80)

- Measures within the fishing strategy are such as to reduce harm to benthic biodiversity and community structure: gear is relatively light; the fishery operates on soft substrates whose benthic species are considered relatively resilient and of relatively short recovery time; the fishery does not impact over 90% of bottom areas in the fishery area
- Industry has put in place a voluntary closed area of 12,500km<sup>2</sup> off the entrance to Hudson Strait with the objective of protecting coral and sponge concentrations (IFMP), which should contribute to protecting benthic biodiversity and communities in this area
- A partial strategy document, approved by NSAC on March 4, 2015, summarizes fishery footprint in relation to habitats
- The document includes a commitment to monitor fishery footprint at 5 year intervals and to modify fishing practices if analyses show that identified critical thresholds are surpassed (CAPP 2015 p. 45)
- The fishery has shown the capacity to analyse and monitor ecosystem impacts and to put in place additional measures to protect the ecosystem if necessary
- As such, the fishery meets the MSC guidance on a partial strategy: a cohesive arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome and an awareness of the need to change the measures should they cease to be effective. It may not have been designed to manage the impact on that component specifically. (MSC 2013)

B. The partial strategy takes into account available information and is expected to restrain impacts of the fishery on the ecosystem (benthic biodiversity and

community structure) so as to achieve the Ecosystem Outcome 80 level of performance (meets 80)

- The partial strategy is based on an analysis of the fishery footprint in the fishery area, available information on groups of benthic species and communities in the fishery area, a review of non-catch impacts of this gear on benthic species and on inference from information in similar fisheries in other areas (see 2.5.3)
- Because the partial strategy ensures that less than 90% of the fishery area is impacted by the fishery and because of the inferred impact of the gear on those areas that are impacted, the partial strategy is expected to restrain impacts of the fishery such that there would not be serious or irreversible harm to benthic biodiversity and community structure.

C. The measures are considered likely to work based on prior experience, plausible argument or information directly from the fishery/ecosystems involved (meets 100)

- The partial strategy is considered likely based on analyses of the fishery footprint in relation to benthic communities (information directly from the fishery/ecosystems involved)

D. There is evidence that the measures comprising the partial strategy are being implemented successfully (meets 100).

- Distribution of fishing, monitored by VMS, shows that the footprint of the fishery on benthic communities is relatively small

The fishery does not meet the 100 SG for SIs A and B because the partial strategy in place does not meet the MSC definition of a “strategy” (MSC Guidance, GCB 3.3) - “a cohesive and strategic arrangement...designed to manage impact on that component specifically”,

Overall, the score for this PI is changed to 85, as the fishery meets 80 for one ecosystem element (trophic relationships), 90 for the other (benthic biodiversity).

**Audit Trace References**

**CERTIFICATION REPORT**

FMP; interviews Newfound Pioneer, DFO, CAPP.

**4<sup>TH</sup> ANNUAL AUDIT**

IFMP, CAPP 2015, MSC 2013

		SG60	SG80	SG100
2.5.3	<b>Information / monitoring</b> There is adequate knowledge of the impacts of the fishery on the ecosystem.	<p>Information is adequate to identify the key elements of the ecosystem (e.g. trophic structure and function, community composition, productivity pattern and biodiversity).</p> <p>Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, but have not been investigated in detail.</p>	<p>Information is adequate to broadly understand the functions of the key elements of the ecosystem.</p> <p>Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, but may not have been investigated in detail.</p> <p>The main functions of the Components (i.e. target, By-catch, Retained and ETP species and Habitats) in the ecosystem are known.</p> <p>Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred.</p> <p>Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).</p>	<p>Information is adequate to broadly understand the key elements of the ecosystem.</p> <p>Main interactions between the fishery and these ecosystem elements can be inferred from existing information, and have been investigated.</p> <p>The impacts of the fishery on target, By-catch, Retained and ETP species and Habitats are identified and the main functions of these Components in the ecosystem are understood.</p> <p>Sufficient information is available on the impacts of the fishery on the Components and elements to allow the main consequences for the ecosystem to be inferred.</p> <p>Information is sufficient to support the development of strategies to manage ecosystem impacts.</p>
<b>Scoring Comments</b>				
<b><u>CERTIFICATION REPORT</u></b>				
(a) Trophic role of the target species. The ecological role of the target species is relatively well known. Pandalus shrimps prey on, and are prey for a variety of				

species (Parsons 2005a, 2005b, 2006; Savenkoff et al 2006), although other species (such as capelin for cod, fishes for seals) may be preferred by predators when available. Trophic structures related to northern shrimp have not been studied in this area, but studies in nearby continental shelf areas (eg Savenkoff et al 2004) probably provide an adequate picture of trophic relationships in the fishery area. Quantitative information on abundance of the target species is available.

Recent work on unobserved fishing mortality (Grant and Hiscock 2010, in press ) produced in accordance with meeting a Condition in the existing certified Northern shrimp fishery in SFA 5, 6 & 7 and reported in the second annual surveillance audit report for that fishery (Moody Marine Ltd 2010) concludes that unobserved mortality is likely to be low, thus bycatch information would assess impact of the gear on non-target species relatively well.

(b) Non-catch impacts on benthic communities. Information on benthic and demersal communities in which the fishery operates is relatively general, with the exception of exploited groundfishes for which detailed stock assessments are available. Only basic life history information is available for non-commercial demersal fishes (eg Scott and Scott 1988; Fishbase).

Benthic community composition is generally known for the Grand Banks (C-NOPB 2003), although much of the available information is from a trawl impact study in a sand habitat and information specific to benthic communities of shrimp fishery habitat is not available. Information on benthic fauna on the Labrador Shelf is limited (C-NOPB 2008). Polychaete diversity and distribution is known for much of the Labrador Shelf (Gagnon and Haedrich 1991) while species composition of benthos, major species, and relations of distributions to environmental conditions are known for stations in SFAs 1, 2, 3 and 4 (Stewart et al 1985). Information on distribution of corals is available and is improving but was dealt with in 2.4.3.

Non-catch impacts on these species and others in the benthic community could result from gear passage, i.e. impact of rockhopper gear rollers or trawl doors; these impacts may be low, given that the gear is relatively light and large rollers are used, but have not been assessed. Twin trawling gear used in some parts of the fishery area requires use of a very heavy shoe which could damage benthic invertebrates over a relatively narrow strip (ca 3 m).

Ability of potentially impacted communities to recover from impacts is not available for the area. Ability to recover generally varies with lifespan; slow-growing, long-lived species (such as some species of hard corals) will recover more slowly than short-lived species (eg tube-dwelling worms). A 3-year study of trawl impacts on sand bottoms on the Grand Banks suggested that benthic communities were little altered over this period (summarised by Gordon et al 2009).

With respect to general ecosystem issues, sizes of shrimp in the population are monitored annually and there have been no indications of significant long-term shifts to smaller sizes.

Bycatch size spectra are focussed on small individuals (with high mortality) because of use of the Nordmore grate.

This PI is equivalent to PI 2.1.1.3, 2.1.1.4, 2.1.2.3, 2.1.4.1, and 2.1.4.2 used in the ASP assessment of this overlapping fishery. These also failed to meet a score of 80 and resulted in a single Condition (Condition 2 in the ASP report) which was set for multiple PIs.

**Score = 70 (Original) 80 (Revised)**

**CERTIFICATION REPORT**

Very good information is available on the ecological relationships of *Pandalus* and on abundance of this target species, such that impacts of the fishery on

predator-prey relationships can be assessed and mitigated if need be. Monitoring continues. As such the fishery meets the 80 SG for this issue.

Partial knowledge of potential non-catch impacts of the fishery on benthic species and general knowledge of benthic communities exists, however information has not been compiled in such a way as to allow consequences on benthic communities to be assessed. As such the fishery meets the 60 SG for this issue.

Overall, with respect to ecosystem impacts, the fishery is close to the 80 SG: information is adequate to broadly understand functions of key elements of the ecosystem, main impacts can be inferred, the functions of the components are understood, and some of the main consequences can be assessed.

**4<sup>TH</sup> ANNUAL AUDIT**

PI 2.5.3 This PI is rescored to 80 because:

A. Information is adequate to broadly understand the key elements of the ecosystem (meets 80)

- For this fishery, the elements for which a score of 80 was not achieved were benthic biodiversity and community structure
- Although studies of benthic species and communities have concentrated on sensitive areas (areas of sponge and coral concentration - see habitat 2.4), information is adequate to broadly understand the biodiversity and community structure of the soft-bottom habitats on which the fishery concentrates
- Maps of sediment types over the fishery area are available which show the nature and distribution of habitat types (CAPP 2015; Josenhans et al 1986; CNLOPB 2008)
- Information, while relatively sparse, on the benthic fauna of the Newfoundland-Labrador shelf has been reviewed and summarised to support a mass balance model of this area (Bundy et al 2000); major benthos groups identified for this model are echinoderms (brittle stars, sea urchins), molluscs (bivalves, gastropods), polychaetes (tube-dwelling and mobile), and others including crustaceans, nematodes and others
- Benthic species of the soft-substrate habitats on which the fishery operates are generally known from studies in the fishery area (Stewart et al 1985 for SFAs 1-4; Gagnon and Haedrich 1991 for polychaetes; Gordon et al 2009 for sand-bottom benthos on the Grand Banks), in areas near and presumably ecologically similar to this area (Chabot et al 2007 for the northern Gulf of St. Lawrence; Ramey and Snelgrove 2003) for mud/sand habitats of Placentia Bay) and in other areas in which *Pandalus* fisheries operate (Hixon and Tissot 2006, Oregon; Simpson and Watling 2006, Gulf of Maine)
- Species groupings observed by Stewart et al (1985) in the benthos of the fishery area were similar to those further south: ophiuroid echinoderms (brittle stars), polychaetes, bivalve molluscs and amphipod crustaceans were the major groups observed. The authors provided a species list by station and a summary of dominant species by station.
- Sand-bottom habitats of the Grand Banks have been the subject of most of the available studies in nearby areas, and are dominated by echinoderms and molluscs (Schneider et al 1987); mud-bottom habitats such as those where the shrimp fishery is concentrated have a high proportion of tube-dwelling polychaetes in shelf waters off southern Newfoundland (Ramey and Snelgrove 2003)

B. Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, and some have been investigated in detail (meets 80)

- With respect to “investigated in detail”, this part of the SG was scored at 80 in the certification report because of detailed studies of the position of pandalid shrimp in trophic relationships in the fishery area



- Non-catch impacts on benthic communities have been reviewed for this fishery by Grant (MS 2010), although this review focused on sensitive areas and on fish species
- Impacts of shrimp trawling on benthic communities have been studied off Oregon (Hixon and Tissot 2007) and the Gulf of Maine (Simpson and Watling 2006), while a number of studies and reviews have examined impacts of trawls on bottom communities more generally (eg Rice 2006, Kaiser et al 2006, see references in Grant MS 2010).
- NEFMC (2011) summarised available information and expert judgment in a framework for assessing gear damage to habitats and communities, including for damage to species of soft-bottom habitats
- While there is great variability between available studies in terms of the types and severity of impacts, it can generally be concluded that repeated trawling on soft-bottom habitats affects species composition, size composition of species, and thus biodiversity and community structure. Recovery times of soft-substrate species were considered to be generally 1-3 years by NEMFC (2011). While soft-bottom habitats are generally considered relatively stable and not subject to physical stress (waves, currents etc), bioturbation may be an important background drive of change (eg Simpson and Watling 2006).
- This SG does not meet 100 because not all ecosystem issues have been investigated in detail

C. The main functions of the components... in the ecosystem are known

- This SG was scored at 80 in the certification report

D. Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred

- This SG was scored at 80 in the certification report

E. 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) (meets 80)

- VMS monitoring of fishing locations continues and the client has committed to 5-year reanalyses of fishery footprint in relation to habitat types (and thus of distribution in relation to benthic communities)

The fishery does not meet 100 for this SG because the level of information is not sufficient to support the development of strategies to manage ecosystem impacts.

**Audit Trace References**

**CERTIFICATION REPORT**

Parsons 2005a, 2005b, 2006; Savenkoff 2006; Scott and Scott 1988; Fishbase; C-NOPB 2003, 2008; Gagnon and Haedrich 1991; Stewart et al 1985; Orr et al 2008bc; unpublished observer data compilation provided by T. Siferd, DFO; Gordon et al 2009; Grant and Hiscock 2010, in press ; Moody Marine 2010

**4<sup>TH</sup> ANNUAL AUDIT**

CAPP 2015; Josenhans et al 1986; CNLOPB 2008; Gagnon and Haedrich 1991; Gordon et al 2009; Chabot et al 2007; Ramey and Snelgrove 2003; Hixon and Tissot 2006; Simpson and Watling 2006; (Schneider et al 1987; Ramey and Snelgrove 2003; Grant MS 2010; Simpson and Watling 2006; Rice 2006; Kaiser et al 2006.

		SG60	SG80	SG100
3.2.4	<b>Research plan</b>  The fishery has a research plan that addresses the information needs of management.	Research is undertaken, as required, to achieve the objectives consistent with MSC's Principles 1 and 2.          Research results are available to interested parties.	A research plan provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.          Research results are disseminated to all interested parties in a timely fashion.	A comprehensive research plan provides the management system with a coherent and strategic approach to research across P1, P2 and P3, and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.          Research plan and results are disseminated to all interested parties in a timely fashion and are widely and publicly available.

Scoring Comments

**CERTIFICATION REPORT**

Ongoing stock assessment research is described in detail in Annex D of the IFMP. For the purposes of stock assessment, all shrimp fishing areas are monitored through research surveys and sampling of the commercial catch. Catch rates of shrimp and fish species are recorded, and detailed observations are made on shrimp size distribution, sex, maturity and egg production. These data provide useful information on the distribution and abundance of the resource, the effects of fishing, changes in the environment, and potential for the fishery in the near future.

Present research is directed towards age determination, estimation of mortality rates, effects of environmental parameters (e.g., temperature, currents) and relationships with major predators, especially Greenland halibut and cod.

Due to the lack of research activities and scientific data in the north, the offshore licence holders formed the Northern Shrimp Research Foundation (NSRF) to conduct scientific research surveys in the north. DFO provides the scientific advice on sample design and analysis of the data collected. The first of an on-going annual survey was conducted in the summer of 2005.

Currently three study areas are being surveyed including the Resolution Island Study Area (RISA), the SFA 2 Exploratory and SFA 4 southeast of RISA.

A 5 year \$CAD5million research proposal by the Marine Institute of Memorial University has been developed and submitted for funding that has the objective of reducing the bottom impact of various trawls currently used in the industry. The approach for this project is to complete design and simulation using various trawl configurations, complete physical modeling using the flume tank, and then evaluate prototypes under commercial conditions.

A study is currently being undertaken by the Marine Institute to develop a methodology to use industry single beam sounders to collect bottom type data and compile these data to create an acoustic classification map for fishing grounds off Newfoundland and Labrador. The study will focus in particular on northern shrimp, although the results will be applicable to other benthic species. The study will help to guide more detailed investigation of sensitive habitats and the correlation between shrimp abundance and seabed habitat.

Additional research is being conducted at the DFO Maurice Lamontagne Institute in Mont Joli, Quebec in tank rooms designed to simulate the natural living conditions of *P. borealis*. The studies are exploring the effect of water temperature on the various stages in their life cycle.

It should be noted that while research was an important factor in the assessment tree for the ASP assessment there was no PI with a specific requirement for a “plan” or “strategic approach”, hence, there was no condition set in the ASP certification.

**Score = 75 (Original) 80 (Revised)**

**CERTIFICATION REPORT**

While there is significant ongoing research activity to support the fishery, there is no actual research plan that provides the management system with a strategic approach to research as is required by the 80 scoring guidepost.

The research survey and assessment program is described and is published as part of the IFMP (Annex D) and, such as to provides management with necessary information. However this it is not comprehensive, as it does not address all issues identified in the stock assessments as requiring resolution through research. In addition, although ecosystem issues are addressed in ongoing research, there is not a comprehensive range of research topics identified to resolve issues related to ecosystem impacts of fishing".

The research being conducted is circulated to all interested parties in a timely fashion, either directly to stakeholders, at advisory committee meetings or via the Canadian Science Advisory Secretariat (CSAS) system on the DFO website. The annual stock assessment is also posted on the NAFO website.

It should be noted that the need for a research plan that provides the management system with a strategic approach to research was not a specific requirement in the assessment tree for the overlapping ASP assessment, hence, there was no condition set in the ASP certification.

**4<sup>TH</sup> ANNUAL AUDIT**

While the iFMP remains incomplete, the thirteen points covered in the research plan approved by the NSAC in March 2015 provides a strategic approach to analysing key P1 and P2 issues related to the shrimp fishery. The fishery meets SG80 Sla. The lack of any definition of P3 work prevents the fishery meeting SG100 Sla. PI 3.2.4 is rescored to 80.

**Audit Trace References**

**CERTIFICATION REPORT**

Integrated Fisheries Management Plan - Northern Shrimp - Shrimp Fishing Areas (SFAs) 0-7 and the Flemish Cap, 2007; MSC Certification of the Offshore Shrimp Fisheries (>100') in areas 1, 2 ,3, 4, 5, 6 and 7. Submission for the Main Assessment by the 17 Offshore Licence Holders September 2, 2009

**4<sup>TH</sup> ANNUAL AUDIT**

Research Plan, DFO letter

6.3 Pandalus borealis SFA 5 & 6 Fishery

2.4	Strategies have been developed within the fisheries management system to address and restrain any significant negative impacts of the fishery on the ecosystem			
		SG60	SG80	SG100
2.4.1	<b>Status</b> The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function.	The fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	There is evidence that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.
<b>Scoring Comments</b>				
<b><u>CERTIFICATION REPORT</u></b>				
<p>The fishery concentrates on mud bottoms (or sand, or mixed mud-sand), and vessels avoid hard bottoms to minimise the risk of damage to trawls. Trawl gear is relatively light and efforts are underway to further reduce gear contact with the bottom in order to reduce fuel costs. Bottom rollers and trawl doors are the principal parts of the trawl contacting the bottom, although in northern areas when twin trawls are used a heavy “shoe” would dig deeply into the bottom.</p> <p>Studies are unavailable on the impacts of shrimp gear on mud and mud-sand bottoms in this area, but some inferences can be made from studies on sand bottoms, recognising that impacts are to some extent site specific and that inference leaves some uncertainty about conclusions. In a 3-year study of impacts of trawl gear on the Grand Banks, there was no alteration to benthic communities and recovery of the sand habitat occurred within a year (results summarised in Gordon et al 2009). Soft bottoms are impacted relatively rapidly by trawling gear but recover relatively quickly (DFO 2006benthic).</p> <p>The fishery probably produces occasional impacts on hard-bottom areas with erect sessile fauna which may be important as habitat. Coral bycatch is low, suggesting that contact with such areas is relatively rare, but bycatch information probably under represents interactions with such sensitive areas since impacts may occur when coral is not retained. Such habitats probably recover relatively slowly as growth rates of hard corals are low (Gilkinson and Edinger eds 2009).</p> <p>A voluntary closed area to protect coral habitat is in place in SFAs 2 and 4, and two closed areas further south may help to reduce impacts on benthic habitats, but the benefits of these areas have not been assessed.</p> <p>This PI is equivalent to PI 2.1.3.1 used in the ASP assessment of this overlapping fishery. It too failed to meet a score of 80 and resulted in a single Condition (Condition 2 in the ASP report) which was set for multiple PIs.</p>				

**Score = 60 (Original) 80 (Revised)**

**CERTIFICATION REPORT**

Given its mode of operation, this fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm, but analyses of fishery impacts would be required to increase certainty, particularly with respect to potential impacts on hard coral areas; accordingly it cannot be said that the fishery is “highly unlikely” to have unacceptable impacts.

**4<sup>TH</sup> ANNUAL AUDIT**

PI 2.4.1. The PI is rescored to 100, because there is evidence that the fishery is **highly unlikely** to reduce habitat structure and function to a point where there would be serious or irreversible harm.

- in the three years 2009-2011 the fishery impacted a maximum of 6.97% of bottom habitat in the fishery area (continental shelf between 100 and 600 m depth)(CAPP 2015 p. 19; Spatialanalysis 2013); thus the fishery leaves most of the habitat area undisturbed.
- Actual area impacted was less than this because this figure does not account for overlapping tows.
- a very small proportion of sensitive bottom habitat areas (significant coral and sponge concentrations as identified in Kenchington et al, 2010) were contacted: 0.8% for coral areas, 0.1% for sponge areas (CAPP 2015 p. 28).
- there is very little overlap between areas trawled and sensitive bottom habitat areas as defined, since the latter were almost entirely at greater depths than those exploited in the fishery (CAPP 2015 p. 28).
- based on available information (see 2.4.3) trawl impacts on the main habitat types impacted by the fishery (soft substrates, mud, silt and sand or mixtures thereof) are not such as to cause serious or irreversible harm.

**Audit Trace References**

**CERTIFICATION REPORT**

Gordon et al 2009; DFO 2006benthic; interviews (see 2.4.2), IFMP; Gilkinson and Edinger eds 2009.

**4<sup>TH</sup> ANNUAL AUDIT**

CAPP 2015; Spatialanalysis 2013

		SG60	SG80	SG100
2.4.2	<b>Management strategy</b> There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types.	<p>There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.</p> <p>The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/habitats).</p>	<p>There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.</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>	<p>There is a strategy in place for managing the impact of the fishery on habitat types.</p> <p>The strategy is mainly based on information directly about the fishery and/or habitats involved, and testing supports high confidence that the strategy will work.</p> <p>There is clear evidence that the strategy is being implemented successfully, and intended changes are occurring. There is some evidence that the strategy is achieving its objective.</p>
<b>Scoring Comments</b>				
<b><u>CERTIFICATION REPORT</u></b>				
<p>Several measures are in place which would help to reduce impacts of the fishery on habitats. The fishery is concentrated on soft bottoms (mud and/or sand), preferred habitat for shrimp and with less risk of damage to trawls, and these types of habitats are generally considered relatively resilient to trawl impact (Rice 2006; Gordon et al 2006). Trawls and doors used are relatively low-impact, and work is under way to further lighten the gear in the interests of saving fuel (interviews at Newfound Pioneer, 2009; Marine Institute, 2007; Marine Institute n.d.) (however the shoe used between codends on twin trawls could cause substantial bottom damage). The relatively low proportion of trawl sets with corals as bycatch suggests that impacts on these habitats may be low, although presence in sets would underestimate impact since trawls may impact corals without retaining them.</p> <p>The offshore fleet has developed a coral conservation policy (GEAC et al 2007) including one voluntary closed area (12,500 km<sup>2</sup> ) to protect corals in SFAs 2-4. Two closed areas have been established in the fishery area which could have benefits for bottom habitat conservation (Hawke Channel; Funk Island deep).</p> <p>Steps are being taken toward developing a strategy for managing potential habitat impacts. A Closed Areas Working Group of the Northern Shrimp Advisory Committee has been established to consider closed areas and other ecosystem impacts of the fishery. DFO Newfoundland Region has committed to developing a coral/sponge conservation strategy for its continental shelf, and this is expected to be complete by 2012. DFO has developed a national policy for Managing the Impacts of Fishing on Sensitive Benthic Habitats (April 2009) (<a href="http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/benthi-eng.htm">http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/benthi-eng.htm</a> ), which is expected to provide an overall framework for actions to improve protection of sensitive habitats and species.</p>				



This PI is equivalent to PI 2.1.4.3 and 3B.2.1 used in the ASP assessment of this overlapping fishery. These also failed to meet a score of 80 and resulted in a single Condition (Condition 2 in the ASP report) which was set for multiple PIs.

**Score = 70 (Original) 80 (Revised)**

**CERTIFICATION REPORT**

All elements of the SG 60 are in place, as measures are in place to reduce impacts and these are considered likely to work. The suite of measures (light gear design; fishing mainly on mud-sand bottoms; coral conservation policy by the offshore fleet and developing DFO coral/sponge policy; voluntary closed areas) is considered a partial strategy as there is an understanding of how they work to conserve habitat and there is an awareness of the need to further modify the strategy if necessary. There is evidence that the strategy is being implemented successfully, since bycatch of corals and sponges is very low. However, further information on the fishery impacts on habitat would be necessary to provide a more objective basis for confidence that the strategy is meeting its objectives.

**4<sup>TH</sup> ANNUAL AUDIT**

PI 2.4.2 The PI is rescored to 80, because

A. There is a **partial strategy** in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above;

- Elements of the fishing strategy are such as to minimize harm to habitats: gear is relatively light; the fishery concentrates on relatively resilient soft substrates where shrimp are concentrated and where risk of gear damage is low; the fishery concentrates at depths shallower than those at which identified sensitive coral and sponge habitats occur;
- Two areas are closed to trawling in the fishery area, in Hawke Channel (2,500 nm<sup>2</sup>) and in Funk Island Deep (approximately the same size) (IFMP); while these were not closed to protect bottom habitats (the objective was to assess trawl impacts on snow crab populations), they do represent habitat areas unaffected by trawling;
- A partial strategy document, approved by NSAC on March 4, 2015, summarizes fishery footprint in relation to habitats
- The document includes a commitment to monitor fishery footprint at 5 year intervals and to modify fishing practices if analyses show that identified critical thresholds are surpassed (CAPP 2015 p. 45);
- The fishery has shown the capacity to analyse and monitor habitat impacts and to put in place additional measures to protect habitat if necessary (voluntary closed areas in SFAs 2-4)(CAPP 2015);
- The partial strategy has been developed in the context of DFO national strategies on fishing in sensitive benthic habitats (DFO 2009) and on coral and sponge conservation (DFO 2015);
- As such, the fishery meets the MSC guidance on a partial strategy: a cohesive arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome and an awareness of the need to change the measures should they cease to be effective. It may not have been designed to manage the impact on that component specifically. (MSC 2013).

B. There is some **objective basis for confidence** that the partial strategy will work, based on **information directly about the fishery and/or habitats** involved.

- Analyses of the fishery, in particular its footprint in relation to sensitive and less-sensitive habitats, show that the fishery is highly likely to meet the SG 80 outcome indicator for PI 2.4.1 (see above).

C. There is **some evidence** that the partial strategy is being implemented successfully.

- Analyses of the fishery footprint in relation to sensitive and less-sensitive habitats show that the fishery is highly likely to meet the SG 80 outcome indicator for PI 2.4.1 (see above).

The fishery does not meet the 100 SG because the partial strategy in place does not meet the MSC definition of a “strategy” (MSC Guidance, GCB 3.3) - “a cohesive and strategic arrangement...designed to manage impact on that component specifically”, there has been no testing of the strategy, and there is no evidence to show that intended changes are occurring or that the strategy is achieving its objective.

**Audit Trace References**

**CERTIFICATION REPORT**

Interviews at FV Newfound Pioneer, Marine Institute, DFO, CAPP; DFO web site; Integrated Fisheries Management Plan; GEAC et al 2007

**4<sup>TH</sup> ANNUAL AUDIT**

CAPP 2015; MSC 2013; DFO 2015; DFO 2009; IFMP

		SG60	SG80	SG100
2.4.3	<b>Information / monitoring</b> Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types.	<p>There is a basic understanding of the types and distribution of main habitats in the area of the fishery.</p> <p>Information is adequate to broadly understand the main impacts of gear use on the main habitats, including spatial extent of interaction.</p>	<p>The nature, distribution and vulnerability of all main habitat types in the fishery area are known at a level of detail relevant to the scale and intensity of the fishery.</p> <p>Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent, timing and location of use of the fishing gear.</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>	<p>The distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types.</p> <p>Changes in habitat distributions over time are measured.</p> <p>The physical impacts of the gear on the habitat types have been quantified fully.</p>
<b>Scoring Comments</b>				
<b><u>CERTIFICATION REPORT</u></b>				
<p>No mapping of bottom sediments in the fishery area has been done (C-NOPB 2008), although some information is available and fishermen are aware of bottom type distribution and concentrate on preferred bottom types (mud and sand bottoms). Part of the area is outside areas reviewed by the Canada-Newfoundland Offshore Petroleum Board Strategic Environmental Assessments (eg C-NOPB 2008 on the Labrador Shelf), but in any case little information on bottom habitats is covered by the C-NOPB assessments. Information on bottom types may be improved through a project to use acoustic equipment on commercial shrimp vessels to type bottoms in the fishery area (Marine Institute, School of Ocean Technology 2008).</p> <p>Information on distribution of particularly sensitive habitat areas, i.e. coral concentration areas, is available and level of detail of this information continues to improve (Edinger et al 2007; Wareham and Edinger 2007; Wareham 2009). This information is mainly based on observations of corals in commercial trawl sets (observer program) and trawl survey programs.</p> <p>Observations have been mapped separately for the various groups of corals, including hard and branching corals (mainly associated with hard-bottom areas) and soft corals (often found on soft bottoms). Sampling covered the entire fishery area and corals were recorded in all areas, however hard and branching</p>				

corals (particularly important for habitat) are concentrated along the edge of the continental shelf. Areas of concentration of sponges, another type of sensitive habitat area, have been identified in preliminary fashion in areas near the Flemish Pass, based on trawl survey and observer data (CAPP submission; Kenchington et al 2009). Preliminary indications are that sponge concentration areas are at depths greater than those at which the shrimp fishery operates.

Distribution of fishing operations is very well known from VMS and logbook information and is compiled (Spatialanalysis 2009; Orr et al MS 2008. Corals were recorded in 1.8% of shrimp trawl sets in this and adjacent fishery areas, most of these being soft corals (Edinger et al. 2007).

Vulnerability of habitat types in the fishery area to bottom trawl gear is generally known (eg Rice 2006; Gordon et al 2006).

Available information has not been compiled into an overall summary which would provide adequate detail on the nature and distribution of habitat types relative to fishery operations, in relation to vulnerability of habitat types to impacts from trawl gear.

This PI is equivalent to PI 2.1.1.1 used in the ASP assessment of this overlapping fishery. It too failed to meet a score of 80 and resulted in a single Condition (Condition 2 in the ASP report) which was set for multiple PIs.

**Score = 70 (Original) 80 (Revised)**

**CERTIFICATION REPORT**

All elements of the 60 SG are met, as there is basic understanding of types and distribution of habitats in the fishery area, and information is adequate to understand interactions and impact of the fishery.

There is reliable information on spatial extent, timing and location of the fishery (observer information and VMS), and information on distribution of particularly sensitive habitats is available; since these elements of the 80 SG are met, a score of 70 is assigned.

**4<sup>TH</sup> ANNUAL AUDIT**

PI 2.4.3. The PI is rescored to 80, because:

A. The nature, distribution and **vulnerability** of all main habitat types in the fishery area are known at a level of detail relevant to the scale and intensity of the fishery.

- Maps of sediment types in the fishery area are available which show the nature and distribution of habitat types at a level of detail relevant to the scale and intensity of the fishery (CAPP 2015; Josenhans et al 1986; CNLOPB 2008)
- Maps of sensitive habitats, as defined by the presence of significant concentrations of corals and sponges, are available (Kenchington et al 2010; DFO 2010).
- Vulnerability of the various habitat types to bottom trawl fishing are known (NEFMC 2011 and others, see below)

B. Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent of interaction, and the timing and location of use of the fishing gear.

- A review of the mode of operation of Newfoundland shrimp gear and potential impacts on bottom habitats is available (Grant MS 2012).

- Impacts of shrimp trawl gear on habitats in which they most commonly operate (soft substrates) have been described in publications from Oregon and Maine (Hixon and Tissot 2007; Simpson and Watling 2006)
- Research on impacts of mobile bottom gear on habitats in the Newfoundland-Labrador area has been summarised and reviewed (Gilkinson et al 2006), as has research on impacts in a nearby marine area (Gordon et al 2006)
- More general reviews of impacts of mobile bottom gear on habitats are available (Kaiser et al 2006; Rice 2006)
- A framework for assessing fishing gear impacts on bottom habitats has been developed in an attempt to guide risk assessment (NEFMC 2011)
- Timing and location of use of the fishing gear are monitored by VMS on all vessels, and can be used in analyses of the fishery footprint (eg CAPP 2015)

C. 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).

- VMS monitoring of fishing locations continues and the client has committed to 5-year reanalyses of fishery footprint in relation to habitat types

The fishery does not meet the 100 SG because the distribution of habitat types is not known over their range (there are gaps in knowledge of habitat distributions, as habitats have been characterised based on information on bycatch from fisheries, not from a systematic sampling program), changes in habitat distributions are not monitored, and the physical impacts of the gear on habitats has not been quantified fully.

**Audit Trace References**

**CERTIFICATION REPORT**

C-NPOPB 2008; Marine Institute, School of Ocean Technology 2008; Edinger et al 2007; Wareham and Edinger 2007; Wareham 2009; Kenchington et al 2009; Rice 2006; Gordon et al 2006; information presented by CAPP pp 41-42; Spatialanalysis 2009; Orr et al MS 2008.

**4<sup>TH</sup> ANNUAL AUDIT**

CAPP 2015; Josenhans et al 1986; CNLOPB 2008; Kenchington et al 2010; DFO 2010; NEFMC 2011; (Grant MS 2012); Hixon and Tissot 2007; Simpson and Watling 2006; Gilkinson et al 2006; Gordon et al 2006; Kaiser et al 2006; Rice 2006

2.5	Ecosystem			
		SG60	SG80	SG100
2.5.1	<b>Status</b> The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function.	The fishery is <u>unlikely</u> to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The fishery is <u>highly unlikely</u> to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is <u>evidence</u> that the fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
<b>Scoring Comments</b>				
<b><u>CERTIFICATION REPORT</u></b>				
<p>The principal issues to be addressed here are (a) impact of removal of the target species, which are a key element in trophic webs and are forage for a wide range of predator species, on trophic relationships (b) non-catch impacts on biological diversity and community structure, particularly for benthic species. Impacts on hard coral and sponge communities have been addressed in 2.4 relative to habitat impacts, while bycatch impacts have been addressed in 2.2. In addition, overall impact on ecosystems is considered consistent with MSC FAM.</p> <p>Impact of removal of target species on trophic relationships. Shrimp abundance is currently high relative to historical levels, such that there should be no impacts on trophic relationships at present and in the near future. A guideline on exploitation rate to be used in the fishery (15%) in future is consistent with maintaining adequate forage, and is lower than has been practised in other fisheries where there have not been apparent impacts on predators (IFMP). The new exploitation framework based on reference points and decision rules (IFMP) appear to leave the way open to higher exploitation rates in future. The conclusion that removal of target species is highly unlikely to disrupt trophic relationships is based on quantitative information on population status.</p> <p>Non-catch impact on benthic species and communities. Given the configuration of the gear (light foot gear, “flying” codend, light doors) this fishery is unlikely to be having serious or irreversible impacts on benthic species and communities. However, no assessment has been done. An assessment of spatial distribution of the fishery has been done, suggesting that a low proportion of the continental shelf has been affected by shrimp trawling; this is a good initial step but additional analyses of communities in which the fishery operates and their sensitivity would be needed to assess impact. The conclusion that the fishery is unlikely to disrupt benthic communities is based on inference.</p> <p>Recent work on unobserved fishing mortality (Grant and Hiscock 2010, in press) produced in accordance with meeting a Condition in the existing certified Northern shrimp fishery in SFA 5, 6 &amp; 7 and reported in the second annual surveillance audit report for that fishery (Moody Marine Ltd 2010) concludes that unobserved mortality is likely to be low, thus bycatch information would assess impact of the gear on non-target species relatively well.</p> <p>Overall, it appears highly unlikely that the fishery is causing serious or irreversible at the level outlined in the MSC FAM (S. 7.1.12 – extinctions, trophic cascades, gross changes in species composition).</p> <p>This PI is equivalent to PI 2.1.3.2 and 2.1.4.4 used in the ASP assessment of this overlapping fishery. These also failed to meet a score of 80 and resulted in a</p>				

single Condition (Condition 2 in the ASP report) which was set for multiple PIs.

**Score = 70 (Original) 80 (Revised)**

**CERTIFICATION REPORT**

One identified ecosystem element (changes in trophic relationships due to removal of the target species) meets the 80 SG, another (non-catch impacts on benthic communities) meets the 60. Overall it appears highly unlikely that the fishery is causing serious or irreversible harm to ecosystems. Accordingly an intermediate score of 70 is assigned.

**4<sup>TH</sup> ANNUAL AUDIT**

PI 2.5.1. The PI is rescored to 100 for the relevant ecosystem issue because there is evidence that the fishery is **highly unlikely** to disrupt the relevant key elements underlying ecosystem structure and function (benthic biological and community structure) to a point where there would be a serious or irreversible harm.

- The ecosystem issue for which this fishery scored less than 80 on ecosystem PIs is non-catch impacts on biological diversity and community structure, particularly for benthic species.
- In the three years 2009-2011 the fishery impacted a maximum of 6.97% of bottom habitats (and thus benthic communities) in the fishery area (continental shelf between 100 and 600 m depth)(CAPP 2015 p. 19; Spatialanalysis 2013), thus leaving most areas and communities undisturbed.
- Actual area impacted was less than this because this figure does not account for overlapping tows.
- Based on available information (see 2.5.3), trawl impacts on benthic species (and thus biodiversity and community structure) in the main habitat types impacted by the fishery (soft substrates, mud, silt and sand or mixtures thereof) are known and may cause measurable changes in benthic community structure; however because more than 90% of the distribution area of benthic communities of the fishery area is not impacted by the fishery, the overall impact is not such as to cause serious or irreversible harm.

Overall, the score for the PI is changed to 90, as the fishery scores 80 for one ecosystem issue (trophic relationships) and 100 for the other (benthic biodiversity)

**Audit Trace References**

**CERTIFICATION REPORT**

See sections 2.5.2 and 2.5.3; Grant & Hiscock in press; Moody Marine 2010

**4<sup>TH</sup> ANNUAL AUDIT**

CAPP 2015; Spatialanalysis 2013



		SG60	SG80	SG100
2.5.2	<b>Management strategy</b> There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function.	<p>There are measures in place, if necessary, that take into account potential impacts of the fishery on key elements of the ecosystem.</p> <p>The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).</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 so as 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>	<p>There is a strategy that consists of a plan, containing measures to address all main impacts of the fishery on the ecosystem, and at least some of these measures are in place. The plan and measures are based on well-understood functional relationships between the fishery and the Components and elements of the ecosystem.</p> <p>This plan provides for development of a full strategy that restrains impacts on the ecosystem to ensure the fishery does not cause serious or irreversible harm.</p> <p>The measures are considered likely to work based on prior experience, plausible argument or information directly from the fishery/ecosystems involved.</p> <p>There is evidence that the measures are being implemented successfully.</p>
<b>Scoring Comments</b>				
<b><u>CERTIFICATION REPORT</u></b>				
<p>Shrimp as a forage species. The IFMP does not make specific reference to the need to practice a conservative exploitation strategy to ensure that shrimp is available to predator species, although it provides evidence that the guideline exploitation rate (15%) is well below that practiced in other shrimp fisheries which have not had apparent impacts on predators, and it is considered low enough to ensure that predator needs are met. The new exploitation framework based on reference points and decision rules (IFMP) appear to leave the way open to higher exploitation rates in future. This new framework does not explicitly address predator requirements in setting exploitation rates.</p> <p>Impacts on biological diversity and benthic communities (other than bycatch species and habitat issues). The mode of operation of the fishery is consistent with</p>				

reducing potential impacts on biological diversity and on benthic communities. Fishing operations are concentrated on soft bottom areas, which have shorter recovery times than harder bottoms and whose mobile or infauna is generally less vulnerable to damage than erect, sessile, long-lived fauna of hard bottoms. Trawls are relatively light and fitted with rollers which should roll over rather digging into the bottom, although in areas where twin trawls are used the “shoe” would dig into soft bottom sediments. Recorded bycatch of benthic fauna is very low, but non-catch impacts on bottom fauna are not well known and some assessment of potential impacts would help to increase certainty that these are low.

This PI is equivalent to PI 2.1.4.5 used in the ASP assessment of this overlapping fishery. It also failed to meet a score of 80 and resulted in a single Condition (Condition 2 in the ASP report) which was set for multiple PIs.

**Score = 70 (Original) 80 (Revised)**

**CERTIFICATION REPORT**

A partial strategy is in place to ensure that adequate forage is maintained for predators (guideline exploitation rate, ongoing monitoring) (SG 80). Measures are in place to ensure that non-catch impacts on benthic communities are low (light gear, soft-bottom areas with communities which recover relatively quickly are fished) (SG 60). Accordingly a score of 70 is assigned.

**4<sup>TH</sup> ANNUAL AUDIT**

PI 2.5.2 This PI is rescored to 80 because

A. There is a partial strategy in place (with respect to benthic biodiversity and community structure) (meets 80)

- Measures within the fishing strategy are such as to reduce harm to benthic biodiversity and community structure: gear is relatively light; the fishery operates on soft substrates whose benthic species are considered relatively resilient and of relatively short recovery time; the fishery does not impact over 90% of bottom areas in the fishery area
- Two areas are closed to trawling in the fishery area, in Hawke Channel (2,500 nm<sup>2</sup>) and in Funk Island Deep (approximately the same size) (IFMP); while these were not closed to protect benthic biodiversity and community structure (the objective was to assess trawl impacts on snow crab populations), they do represent habitat areas unaffected by trawling
- A partial strategy document, approved by NSAC on March 4, 2015, summarizes fishery footprint in relation to habitats
- The document includes a commitment to monitor fishery footprint at 5 year intervals and to modify fishing practices if analyses show that identified critical thresholds are surpassed (CAPP 2015 p. 45)
- The fishery has shown the capacity to analyse and monitor ecosystem impacts and to put in place additional measures to protect the ecosystem if necessary
- As such, the fishery meets the MSC guidance on a partial strategy: a cohesive arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome and an awareness of the need to change the measures should they cease to be effective. It may not have been designed to manage the impact on that component specifically. (MSC 2013)

B. The partial strategy takes into account available information and is expected to restrain impacts of the fishery on the ecosystem (benthic biodiversity and community structure) so as to achieve the Ecosystem Outcome 80 level of performance (meets 80)

- The partial strategy is based on an analysis of the fishery footprint in the fishery area, available information on distribution of benthic species and communities in the fishery area, a review of non-catch impacts of this gear on benthic species and on inference from information in similar fisheries in other areas (see 2.5.3)
- Because the partial strategy ensures that less than 90% of the fishery area is impacted by the fishery and because of the inferred impact of the gear on those areas that are impacted, the partial strategy is expected to restrain impacts of the fishery such that there would not be serious or irreversible harm to benthic biodiversity and community structure.

C. The measures are considered likely to work based on prior experience, plausible argument or information directly from the fishery/ecosystems involved (meets 100 for benthic biodiversity)

- The partial strategy is considered likely to work based on analyses of the fishery footprint in relation to benthic communities (information directly from the fishery/ecosystems involved)

D. There is evidence that the measures comprising the partial strategy are being implemented successfully (meets 100 for benthic biodiversity)

- Distribution of fishing, monitored by VMS, shows that the footprint of the fishery on benthic communities is relatively small

The fishery does not meet the 100 SG for SIs A and B (benthic biodiversity) because the partial strategy in place does not meet the MSC definition of a “strategy” (MSC Guidance, GCB 3.3) - “a cohesive and strategic arrangement...designed to manage impact on that component specifically”,

Overall, the score for this PI is changed to 85, as the fishery meets 80 for one ecosystem element (trophic relationships), 90 for the other (benthic biodiversity).

**Audit Trace References**

**CERTIFICATION REPORT**

FMP; interviews Newfoundland Pioneer, DFO, CAPP.

**4<sup>TH</sup> ANNUAL AUDIT**

IFMP, CAPP 2015, MSC 2013

		SG60	SG80	SG100
2.5.3	<b>Information / monitoring</b> There is adequate knowledge of the impacts of the fishery on the ecosystem.	<p>Information is adequate to identify the key elements of the ecosystem (e.g. trophic structure and function, community composition, productivity pattern and biodiversity).</p> <p>Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, but have not been investigated in detail.</p>	<p>Information is adequate to broadly understand the functions of the key elements of the ecosystem.</p> <p>Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, but may not have been investigated in detail.</p> <p>The main functions of the Components (i.e. target, By-catch, Retained and ETP species and Habitats) in the ecosystem are known.</p> <p>Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred.</p> <p>Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).</p>	<p>Information is adequate to broadly understand the key elements of the ecosystem.</p> <p>Main interactions between the fishery and these ecosystem elements can be inferred from existing information, and have been investigated.</p> <p>The impacts of the fishery on target, By-catch, Retained and ETP species and Habitats are identified and the main functions of these Components in the ecosystem are understood.</p> <p>Sufficient information is available on the impacts of the fishery on the Components and elements to allow the main consequences for the ecosystem to be inferred.</p> <p>Information is sufficient to support the development of strategies to manage ecosystem impacts.</p>
<b>Scoring Comments</b>				
<b><u>CERTIFICATION REPORT</u></b>				
(a) Trophic role of the target species. The ecological role of the target species is relatively well known. Pandalus shrimps prey on, and are prey for a variety of				

species (Parsons 2005a, 2005b, 2006; Savenkoff et al 2006), although other species (such as capelin for cod, fishes for seals) may be preferred by predators when available. Trophic structures related to northern shrimp have not been studied in this area, but studies in nearby continental shelf areas (eg Savenkoff et al 2004) probably provide an adequate picture of trophic relationships in the fishery area. Quantitative information on abundance of the target species is available.

Recent work on unobserved fishing mortality (Grant and Hiscock 2010, in press ) produced in accordance with meeting a Condition in the existing certified Northern shrimp fishery in SFA 5, 6 & 7 and reported in the second annual surveillance audit report for that fishery (Moody Marine Ltd 2010) concludes that unobserved mortality is likely to be low, thus bycatch information would assess impact of the gear on non-target species relatively well.

(b) Non-catch impacts on benthic communities. Information on benthic and demersal communities in which the fishery operates is relatively general, with the exception of exploited groundfishes for which detailed stock assessments are available. Only basic life history information is available for non-commercial demersal fishes (eg Scott and Scott 1988; Fishbase).

Benthic community composition is generally known for the Grand Banks (C-NOPB 2003), although much of the available information is from a trawl impact study in a sand habitat and information specific to benthic communities of shrimp fishery habitat is not available. Information on benthic fauna on the Labrador Shelf is limited (C-NOPB 2008). Polychaete diversity and distribution is known for much of the Labrador Shelf (Gagnon and Haedrich 1991) while species composition of benthos, major species, and relations of distributions to environmental conditions are known for stations in SFAs 1, 2, 3 and 4 (Stewart et al 1985). Information on distribution of corals is available and is improving but was dealt with in 2.4.3.

Non-catch impacts on these species and others in the benthic community could result from gear passage, i.e. impact of rockhopper gear rollers or trawl doors; these impacts may be low, given that the gear is relatively light and large rollers are used, but have not been assessed. Twin trawling gear used in some parts of the fishery area requires use of a very heavy shoe which could damage benthic invertebrates over a relatively narrow strip (ca 3 m).

Ability of potentially impacted communities to recover from impacts is not available for the area. Ability to recover generally varies with lifespan; slow-growing, long-lived species (such as some species of hard corals) will recover more slowly than short-lived species (eg tube-dwelling worms). A 3-year study of trawl impacts on sand bottoms on the Grand Banks suggested that benthic communities were little altered over this period (summarised by Gordon et al 2009).

With respect to general ecosystem issues, sizes of shrimp in the population are monitored annually and there have been no indications of significant long-term shifts to smaller sizes.

Bycatch size spectra are focussed on small individuals (with high mortality) because of use of the Nordmore grate.

This PI is equivalent to PI 2.1.1.3, 2.1.1.4, 2.1.2.3, 2.1.4.1, and 2.1.4.2 used in the ASP assessment of this overlapping fishery. These also failed to meet a score of 80 and resulted in a single Condition (Condition 2 in the ASP report) which was set for multiple PIs.

**Score = 70 (Original) 80 (Revised)**

**CERTIFICATION REPORT**

Very good information is available on the ecological relationships of Pandalus and on abundance of this target species, such that impacts of the fishery on

predator-prey relationships can be assessed and mitigated if need be. Monitoring continues. As such the fishery meets the 80 SG for this issue.

Partial knowledge of potential non-catch impacts of the fishery on benthic species and general knowledge of benthic communities exists, however information has not been compiled in such a way as to allow consequences on benthic communities to be assessed. As such the fishery meets the 60 SG for this issue.

Overall, with respect to ecosystem impacts, the fishery is close to the 80 SG: information is adequate to broadly understand functions of key elements of the ecosystem, main impacts can be inferred, the functions of the components are understood, and some of the main consequences can be assessed.

**4<sup>TH</sup> ANNUAL AUDIT**

PI 2.5.3 This PI is rescored to 80 because:

A. Information is adequate to broadly understand the key elements of the ecosystem (meets 80)

- For this fishery, the elements for which a score of 80 was not achieved were benthic biodiversity and community structure
- Although studies of benthic species and communities have concentrated on sensitive areas (areas of sponge and coral concentration - see habitat 2.4), information is adequate to broadly understand the biodiversity and community structure of the soft-bottom habitats on which the fishery concentrates
- Maps of sediment types over the fishery area are available which show the nature and distribution of habitat types (CAPP 2015; Josenhans et al 1986; CNLOPB 2008)
- Information, while relatively sparse, on the benthic fauna of the Newfoundland-Labrador shelf has been reviewed and summarised to support a mass balance model of this area (Bundy et al 2000); major benthos groups identified for this model are echinoderms (brittle stars, sea urchins), molluscs (bivalves, gastropods), polychaetes (tube-dwelling and mobile), and others including crustaceans, nematodes and others
- Benthic species of the soft-substrate habitats on which the fishery operates are generally known from studies in the fishery area (Stewart et al 1985 for SFAs 1-4; Gagnon and Haedrich 1991 for polychaetes; Gordon et al 2009 for sand-bottom benthos on the Grand Banks), in areas near and presumably ecologically similar to this area (Chabot et al 2007 for the northern Gulf of St. Lawrence; Ramey and Snelgrove 2003) for mud/sand habitats of Placentia Bay) and in other areas in which *Pandalus* fisheries operate (Hixon and Tissot 2006, Oregon; Simpson and Watling 2006, Gulf of Maine)
- Species groupings observed by Stewart et al (1985) in the benthos of the fishery area were similar to those further south: ophiuroid echinoderms (brittle stars), polychaetes, bivalve molluscs and amphipod crustaceans were the major groups observed. The authors provided a species list by station and a summary of dominant species by station.
- Sand-bottom habitats of the Grand Banks have been the subject of most of the available studies in nearby areas, and are dominated by echinoderms and molluscs (Schneider et al 1987); mud-bottom habitats such as those where the shrimp fishery is concentrated have a high proportion of tube-dwelling polychaetes in shelf waters off southern Newfoundland (Ramey and Snelgrove 2003)

B. Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, and some have been investigated in detail (meets 80)

- With respect to “investigated in detail”, this part of the SG was scored at 80 in the certification report because of detailed studies of the position of pandalid shrimp in trophic relationships in the fishery area

- Non-catch impacts on benthic communities have been reviewed for this fishery by Grant (MS 2010), although this review focused on sensitive areas and on fish species
- Impacts of shrimp trawling on benthic communities have been studied off Oregon (Hixon and Tissot 2007) and the Gulf of Maine (Simpson and Watling 2006), while a number of studies and reviews have examined impacts of trawls on bottom communities more generally (eg Rice 2006, Kaiser et al 2006, see references in Grant MS 2010).
- NEFMC (2011) summarised available information and expert judgment in a framework for assessing gear damage to habitats and communities, including for damage to species of soft-bottom habitats
- While there is great variability between available studies in terms of the types and severity of impacts, it can generally be concluded that repeated trawling on soft-bottom habitats affects species composition, size composition of species, and thus biodiversity and community structure. Recovery times of soft-substrate species were considered to be generally 1-3 years by NEMFC (2011). While soft-bottom habitats are generally considered relatively stable and not subject to physical stress (waves, currents etc), bioturbation may be an important background drive of change (eg Simpson and Watling 2006).
- This SG does not meet 100 because not all ecosystem issues have been investigated in detail.

C. The main functions of the components... in the ecosystem are known

- This SG was scored at 80 in the certification report

D. Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred

- This SG was scored at 80 in the certification report

E. 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)(meets 80)

- VMS monitoring of fishing locations continues and the client has committed to 5-year reanalyses of fishery footprint in relation to habitat types (and thus of distribution in relation to benthic communities)
- The fishery does not meet 100 for this SG because the level of information is not sufficient to support the development of strategies to manage ecosystem impacts.

**Audit Trace References**

**CERTIFICATION REPORT**

Parsons 2005a, 2005b, 2006; Savenkoff 2006; Scott and Scott 1988; Fishbase; C-NOPB 2003, 2008; Gagnon and Haedrich 1991; Stewart et al 1985; Orr et al 2008bc; unpublished observer data compilation provided by T. Siferd, DFO; Gordon et al 2009; Grant and Hiscock 2010, in press ; Moody Marine 2010

**4<sup>TH</sup> ANNUAL AUDIT**



CAPP 2015; Josenhans et al 1986; CNLOPB 2008; Gagnon and Haedrich 1991; Gordon et al 2009; Chabot et al 2007; Ramey and Snelgrove 2003; Hixon and Tissot 2006; Simpson and Watling 2006; (Schneider et al 1987; Ramey and Snelgrove 2003; Grant MS 2010; Simpson and Watling 2006; Rice 2006; Kaiser et al 2006.

		SG60	SG80	SG100
3.2.4	<b>Research plan</b>  The fishery has a research plan that addresses the information needs of management.	Research is undertaken, as required, to achieve the objectives consistent with MSC's Principles 1 and 2.          Research results are available to interested parties.	A research plan provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.          Research results are disseminated to all interested parties in a timely fashion.	A comprehensive research plan provides the management system with a coherent and strategic approach to research across P1, P2 and P3, and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.          Research plan and results are disseminated to all interested parties in a timely fashion and are widely and publicly available.

Scoring Comments

CERTIFICATION REPORT

Ongoing stock assessment research is described in detail in Annex D of the IFMP. For the purposes of stock assessment, all shrimp fishing areas are monitored through research surveys and sampling of the commercial catch. Catch rates of shrimp and fish species are recorded, and detailed observations are made on shrimp size distribution, sex, maturity and egg production. These data provide useful information on the distribution and abundance of the resource, the effects of fishing, changes in the environment, and potential for the fishery in the near future.

Present research is directed towards age determination, estimation of mortality rates, effects of environmental parameters (e.g., temperature, currents) and relationships with major predators, especially Greenland halibut and cod.

Due to the lack of research activities and scientific data in the north, the offshore licence holders formed the Northern Shrimp Research Foundation (NSRF) to conduct scientific research surveys in the north. DFO provides the scientific advice on sample design and analysis of the data collected. The first of an on-going annual survey was conducted in the summer of 2005.

Currently three study areas are being surveyed including the Resolution Island Study Area (RISA), the SFA 2 Exploratory and SFA 4 southeast of RISA.

A 5 year \$CAD5million research proposal by the Marine Institute of Memorial University has been developed and submitted for funding that has the objective of reducing the bottom impact of various trawls currently used in the industry. The approach for this project is to complete design and simulation using various trawl configurations, complete physical modeling using the flume tank, and then evaluate prototypes under commercial conditions.

A study is currently being undertaken by the Marine Institute to develop a methodology to use industry single beam sounders to collect bottom type data and compile these data to create an acoustic classification map for fishing grounds off Newfoundland and Labrador. The study will focus in particular on northern shrimp, although the results will be applicable to other benthic species. The study will help to guide more detailed investigation of sensitive habitats and the correlation between shrimp abundance and seabed habitat.

Additional research is being conducted at the DFO Maurice Lamontagne Institute in Mont Joli, Quebec in tank rooms designed to simulate the natural living conditions of *P. borealis*. The studies are exploring the effect of water temperature on the various stages in their life cycle.

It should be noted that while research was an important factor in the assessment tree for the ASP assessment there was no PI with a specific requirement for a “plan” or “strategic approach”, hence, there was no condition set in the ASP certification.

**Score = 75 (Original) 80 (Revised)**

CERTIFICATION REPORT

While there is significant ongoing research activity to support the fishery, there is no actual research plan that provides the management system with a strategic approach to research as is required by the 80 scoring guidepost.

The research survey and assessment program is described and is published as part of the IFMP (Annex D) and, such as to provides management with necessary information. However this it is not comprehensive, as it does not address all issues identified in the stock assessments as requiring resolution through research. In addition, although ecosystem issues are addressed in ongoing research, there is not a comprehensive range of research topics identified to resolve issues related to ecosystem impacts of fishing”.

The research being conducted is circulated to all interested parties in a timely fashion, either directly to stakeholders, at advisory committee meetings or via the Canadian Science Advisory Secretariat (CSAS) system on the DFO website. The annual stock assessment is also posted on the NAFO website.

It should be noted that the need for a research plan that provides the management system with a strategic approach to research was not a specific requirement in the assessment tree for the overlapping ASP assessment, hence, there was no condition set in the ASP certification.

4<sup>TH</sup> ANNUAL AUDIT

While the iFMP remains incomplete, the thirteen points covered in the research plan approved by the NSAC in March 2015 provides a strategic approach to analysing key P1 and P2 issues related to the shrimp fishery. The fishery meets SG80 Sla. The lack of any definition of P3 work prevents the fishery meeting SG100 Sla. PI 3.2.4 is rescored to 80.

**Audit Trace References**

## **CERTIFICATION REPORT**

Integrated Fisheries Management Plan - Northern Shrimp - Shrimp Fishing Areas (SFAs) 0-7 and the Flemish Cap, 2007; MSC Certification of the Offshore Shrimp Fisheries (>100') in areas 1, 2, 3, 4, 5, 6 and 7. Submission for the Main Assessment by the 17 Offshore Licence Holders, September 2, 2009

## **4<sup>TH</sup> ANNUAL AUDIT**

Research Plan, DFO letter

6.4 Pandalus borealis SFA 7 Fishery

		SG60	SG80	SG100
1.2.2	Harvest control rules and tools: There are well defined and effective harvest control rules in place	<p>Generally understood harvest control rules are in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached.</p> <p>There is some evidence that tools used to implement harvest control rules are appropriate and effective in controlling exploitation.</p>	<p>Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.</p> <p>The selection of the harvest control rules takes into account the main uncertainties.</p> <p>Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules</p>	<p>Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.</p> <p>The design of the harvest control rules take into account a wide range of uncertainties.</p> <p>Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the harvest control rules.</p>

Scoring Comments

**CERTIFICATION REPORT**

Harvest control is based on TACs set by NAFO’s Fisheries Commission, considering a guideline exploitation rate of 14%. NAFO Scientific Council recently advised that, since stock\_abundance is declining, TACs corresponding to exploitation rates of 14% and above have a higher risk of leading to further stock decline. This protocol can be considered to represent a\_generally understood and consistently applied harvest control rule, but not a well-defined harvest control rule. Although the guideline exploitation rate does not explicitly decline monotonically\_as the limit reference point is reached, the intent of the exploitation rate level chosen is to keep the stock above the limit reference point and near a level equivalent to a target reference point.

The harvest control rule takes uncertainty on biomass estimates into account as the exploitation rate guideline is applied to survey biomass estimates, whose catchability is certainly less than one, and which are therefore underestimates of actual biomass. Uncertainty on biomass estimates would be the main uncertainty as catches are known with a high degree of certainty from observers, logbooks and port monitoring.

Harvest control tools are license limitation, catch limits (individual TACs), monitoring (observers, logbooks and port monitoring), a protection and surveillance program. Stock assessments compile the various forms of evidence on appropriateness and effectiveness of tools, and these have been shown to be both

appropriate and effective in limiting catches to the required levels.

It should be noted that the first scoring issue requirement in the 80 SG was not specifically incorporated within any PI in the existing certified ASP fishery that overlaps with this assessment.

**Score = 70 (Original) 80 (Revised)**

**CERTIFICATION REPORT**

Generally understood harvest control rules are in place, consistent with the harvest strategy; although the exploitation rate is not monotonically decreased as the limit reference point is reached, the intent of the exploitation rate is to keep the stock above the limit reference point and at a level equivalent to a target reference point. Thus the 60 SG is met. The selection of the harvest control rule takes the main uncertainty into account, and available evidence indicates that tools in use are appropriate and effective in achieving the exploitation levels required under the harvest

control rule, meeting the second and third scoring issues for the 80 SG. A score of 70 is thus assigned.

**4<sup>TH</sup> ANNUAL AUDIT**

PI 1.2.2 - This Condition is rescored to 80 because:

**A. Well defined** harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.

- A set of harvest control rules is included in the Integrated Fisheries Management Plan (IFMP, Annex I), consistent with those used in management of fisheries in SFAs 2-6
  - the goal of the HCRs is not to exceed Fmsy in the healthy zone, and to reduce exploitation rate in the cautious zone as stock declines toward the LRP (to a base level of 15%)
  - a rebuilding plan is required when the stock is in the critical zone, below the LRP, with a maximum exploitation rate of 10%
- While these HCRs are not currently used in stock management by NAFO, which is responsible for managing this fishery, NAFO is using a more conservative harvest control strategy in management - its LRP is higher than that in the IFMP (SSB 19,300t vs 9,000t), and following an SSB decline in the latest survey (2013) to a level of 11,780t (NAFO 2014a) the fishery was closed for 2015
- Although work to develop formal HCRs in NAFO has been suspended because of the fishery closure, the requirements of the PI have been met as the Canadian IFMP includes well-defined HCRs and NAFO is managing based on a de facto strategy which is more conservation than the Canadian HCRs

**B. The selection** of the harvest control rules takes into account the **main** uncertainties.

- The main uncertainty underlying application of the HCRs is uncertainty around spawning biomass estimates from the survey
- Since survey catchability of shrimp is less than 1, exploitation rate indices based on catches and survey biomass are overestimates, thus there is inherent

precaution in the HCRs which addresses this uncertainty
<b>C. Available evidence indicates</b> that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules. <ul style="list-style-type: none"><li>This SG was scored at 80 in the certification report</li><li>We confirm that catches have continued to be at or below TACs in this fishery for the past 10 years, indicating that harvest control tools are appropriate and effective in achieving the exploitation levels required under the harvest control rules</li></ul>
<b>Audit Trace References</b>
<b><u>CERTIFICATION REPORT</u></b> NAFO 2010. Report of the Fisheries Commission and its subsidiary body (STACTIC). 32nd Annual General Meeting, 20-24 September 2010. NAFO/FC Doc. 10/29. 115 pp. <a href="http://archive.nafo.int/open/fc/2010/fcdoc10-29.pdf">http://archive.nafo.int/open/fc/2010/fcdoc10-29.pdf</a> , NAFO/ICES 2010. Report of the NAFO/ICES Pandalus assessment group 20–27 October 2010. NAFO SCS Doc. 10/22: 79pp.
<b><u>4<sup>TH</sup> ANNUAL AUDIT</u></b> IFMO, NAFO 2014 a,

2.4	Strategies have been developed within the fisheries management system to address and restrain any significant negative impacts of the fishery on the ecosystem			
		SG60	SG80	SG100
2.4.1	<b>Status</b> The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function.	The fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	There is evidence that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.
<b>Scoring Comments</b>				
<b><u>CERTIFICATION REPORT</u></b>				
<p>The fishery concentrates on mud bottoms (or sand, or mixed mud-sand), and vessels avoid hard bottoms to minimise the risk of damage to trawls. Trawl gear is relatively light and efforts are underway to further reduce gear contact with the bottom in order to reduce fuel costs. Bottom rollers and trawl doors are the principal parts of the trawl contacting the bottom.</p> <p>Studies are unavailable on the impacts of shrimp gear on mud and mud-sand bottoms in this area, but some inferences can be made from studies on sand bottoms, recognising that impacts are to some extent site specific and that inference leaves some uncertainty about conclusions. In a 3-year study of impacts of trawl gear on the Grand Banks, there was no alteration to benthic communities and recovery of the sand habitat occurred within a year (results summarised in Gordon et al 2009). Soft bottoms are impacted relatively rapidly by trawling gear but recover relatively quickly (DFO 2006benthic).</p> <p>The fishery probably produces occasional impacts on hard-bottom areas with erect sessile fauna which may be important as habitat. Coral bycatch is low, suggesting that contact with such areas is relatively rare, but bycatch information probably under represents interactions with such sensitive areas since impacts may occur when coral is not retained. Such habitats probably recover relatively slowly as growth rates of hard corals are low (Gilkinson and Edinger eds 2009)</p> <p>This PI is equivalent to PI 2.1.3.1 used in the ASP assessment of this overlapping fishery. It too failed to meet a score of 80 and resulted in a single Condition (Condition 2 in the ASP report) which was set for multiple PIs.</p>				
<b>Score = 60 (Original) 80 (Revised)</b>				



**CERTIFICATION REPORT**

Given its mode of operation, this fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm, based on interpretation of “serious or irreversible harm” in the FAM v. 2.1. thus meeting the 60 SG.

**4<sup>TH</sup> ANNUAL AUDIT**

PI 2.4.1. The PI is rescored to 100, because there is evidence that the fishery is **highly unlikely** to reduce habitat structure and function to a point where there would be serious or irreversible harm.

- In the three years 2009-2011 the fishery impacted a maximum of 4.97% of bottom habitat in the fishery area (continental shelf between 100 and 600 m depth)(CAPP 2015 p. 19; Spatialanalysis 2013); thus the fishery leaves most of the habitat area undisturbed
- Actual area impacted was less than this because this figure does not account for overlapping tows
- A relatively high proportion (32.0%) of identified sensitive bottom habitat areas (significant coral concentrations as identified in Kenchington et al, 2010) was contacted, while 0% of identified sensitive sponge areas was contacted (CAPP 2015 p. 28).
  - Over 95% of the tows in identified sensitive areas occurred in a single coral area identified as C70 (CAPP 2015 p. 29)
  - Detailed examination of the footprint in relation to coral distributions showed very little overlap between the fishery footprint and known coral concentrations, as the fishery concentrates at depths shallower than those at which coral concentrations, in particular large gorgonians, occur (CAPP 2015 p. 36);
  - Of 1607 sets within the identified sensitive area, 16 took coral bycatch, but no gorgonians were observed in the bycatch - only soft corals (CAPP 2015 p. 30)
  - The interpolation technique used to identify sensitive areas based on distribution of large gorgonians in trawl survey catches is argued to extend the boundary of the identified sensitive area into shallower waters than is justified by coral distribution (CAPP 2015 p. 31)
  - As a result, the analysis concludes that the actual overlap between sensitive habitat and the fishery footprint is well below the 10% threshold considered to represent a serious risk of serious or irreversible harm to habitat
- Based on available information (see 2.4.3) trawl impacts on the main “non-sensitive” habitat types impacted by the fishery (soft substrates, mud, silt and sand or mixtures thereof) are not such as to cause serious or irreversible harm

**Audit Trace References**

**CERTIFICATION REPORT**

Gordon et al 2009; DFO 2006benthic; interviews (see 2.4.2), IFMP; Gilkinson and Edinger eds 2009.

**4<sup>TH</sup> ANNUAL AUDIT**

CAPP 2015; Spatialanalysis 2013

		SG60	SG80	SG100
2.4.2	<b>Management strategy</b> There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types.	<p>There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.</p> <p>The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/habitats).</p>	<p>There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.</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>	<p>There is a strategy in place for managing the impact of the fishery on habitat types.</p> <p>The strategy is mainly based on information directly about the fishery and/or habitats involved, and testing supports high confidence that the strategy will work.</p> <p>There is clear evidence that the strategy is being implemented successfully, and intended changes are occurring. There is some evidence that the strategy is achieving its objective.</p>

**Scoring Comments**

**CERTIFICATION REPORT**

Several measures are in place that help to reduce impacts of the fishery on habitats. The fishery is concentrated on soft bottoms (mud and/or sand), preferred habitat for shrimp and with less risk of damage to trawls, and these types of habitats are generally considered relatively resilient to trawl impact (Rice 2006; Gordon et al 2006). Trawls and doors used are relatively low impact, and work is under way to further lighten the gear in the interests of saving fuel (interviews at Newfound Pioneer , 2009; Marine Institute, 2007; Marine Institute n.d.). The relatively low proportion of trawl sets with corals as bycatch suggests that impacts on these habitats may be low, although presence in sets would underestimate impact since trawls may impact corals without retaining them.

Steps are being taken toward developing a strategy for managing potential habitat impacts. NAFO’s Fisheries Commission requested advice from NAFO’s Scientific Council on identifying vulnerable marine ecosystem areas in the NAFO Regulatory area on the Grand Banks and Flemish Cap, and the Scientific Council identified a number of such areas based on information on significant bycatches of corals (NAFO 2008). A Closed Areas Working Group of the Northern Shrimp Advisory Committee has been established to consider closed areas and other ecosystem impacts of the fishery. DFO Newfoundland/Labrador Region has committed to developing a coral/sponge conservation strategy for the Newfoundland/Labrador continental shelf, and this is expected to be complete by 2012. DFO has developed a national policy for Managing the Impacts of Fishing on Sensitive Benthic Habitats (April 2009) (<http://www.dfo-mpo.gc.ca/fmgp/peches-fisheries/fish-ren-peche/sff-cpd/benthi-eng.htm> ), which is expected to provide an overall framework for actions to improve protection of sensitive habitats and species.

This PI is equivalent to PI 2.1.4.3 and 3B.2.1 used in the ASP assessment of this overlapping fishery. These also failed to meet a score of 80 and resulted in a single Condition (Condition 2 in the ASP report) which was set for multiple PIs.

**Score = 60 (Original) 80 (Revised)**

**CERTIFICATION REPORT**

Measures are in place (e.g., the fishery is concentrated on soft bottoms, work is underway to reduce seabed contact of gear, a working group has been established to consider closed areas and ecosystem impacts of the fishery, there is a commitment to develop a sponge/coral conservation strategy and there is a national policy for Managing the Impacts of Fishing on Sensitive Benthic Habitats which is expected to provide an overall framework for actions to improve protection of sensitive habitats and species) that are likely to ensure that the fishery does not cause serious or irreversible harm to habitats thereby meeting the 60 SG.

**4<sup>TH</sup> ANNUAL AUDIT**

PI 2.4.2 The PI is rescored to 80, because

A. There is a **partial strategy** in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above;

- Elements of the fishing strategy are such as to minimize harm to habitats: gear is relatively light; the fishery concentrates on relatively resilient soft substrates where shrimp are concentrated and to minimise gear damage, the fishery concentrates at depths shallower than those at which identified sensitive coral and sponge habitats occur;
- A partial strategy document, approved by NSAC on March 4, 2015, summarizes fishery footprint in relation to habitats
- The document includes a commitment to monitor fishery footprint at 5 year intervals and to modify fishing practices if analyses show that identified critical thresholds are surpassed (CAPP 2015 p. 45)
- The fishery has shown the capacity to analyse and monitor habitat impacts and to put in place additional measures to protect habitat if necessary (voluntary closed areas in SFAs 2-4)(CAPP 2015)
- The partial strategy has been developed in the context of DFO national strategies on fishing in sensitive benthic habitats (DFO 2009) and on coral and sponge conservation (DFO 2015), and of NAFO's initiatives to identify and close vulnerable marine ecosystems (VMEs) (NAFO 2015)
- As such, the fishery meets the MSC guidance on a partial strategy: a cohesive arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome and an awareness of the need to change the measures should they cease to be effective. It may not have been designed to manage the impact on that component specifically. (MSC 2013)

B. There is some **objective basis for confidence** that the partial strategy will work, based on **information directly about the fishery and/or habitats** involved.

- Analyses of the fishery, in particular its footprint in relation to sensitive and less-sensitive habitats, show that the fishery is highly likely to meet the SG 80 outcome indicator for PI 2.4.1 (see above)

C. There is **some evidence** that the partial strategy is being implemented successfully.

- Analyses of the fishery footprint in relation to sensitive and less-sensitive habitats show that the fishery is highly likely to meet the SG 80 outcome indicator for PI 2.4.1 (see above)

The fishery does not meet the 100 SG because the partial strategy in place does not meet the MSC definition of a “strategy” (MSC Guidance, GCB 3.3) - “a cohesive and strategic arrangement...designed to manage impact on that component specifically”, there has been no testing of the strategy, and there is no evidence to show that intended changes are occurring or that the strategy is achieving its objective.

**Audit Trace References**

**CERTIFICATION REPORT**

Interviews at Newfound Pioneer , Marine Institute, DFO, CAPP; DFO web site.; NAFO 2008; Marine Institute n.d.

**4<sup>TH</sup> ANNUAL AUDIT**

CAPP 2015, DFO 2015, MSC 2013

		SG60	SG80	SG100
2.4.3	<b>Information / monitoring</b> Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types.	<p>There is a basic understanding of the types and distribution of main habitats in the area of the fishery.</p> <p>Information is adequate to broadly understand the main impacts of gear use on the main habitats, including spatial extent of interaction.</p>	<p>The nature, distribution and vulnerability of all main habitat types in the fishery area are known at a level of detail relevant to the scale and intensity of the fishery.</p> <p>Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent, timing and location of use of the fishing gear.</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>	<p>The distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types.</p> <p>Changes in habitat distributions over time are measured.</p> <p>The physical impacts of the gear on the habitat types have been quantified fully.</p>

**Scoring Comments**

**CERTIFICATION REPORT**

No mapping of bottom sediments in the fishery area has been done (C-NOPB 2003), although some information is available and fishermen are aware of bottom type distribution and concentrate on preferred bottom types (mud and sand bottoms). Memorial University's Geography Department and DFO are conducting a project to determine shrimp habitat preferences in NAFO 3L, in the same area as SFA 7 (Marine Institute, School of Ocean Technology 2008).

Information on distribution of particularly sensitive habitat areas, i.e. coral concentration areas, is available and level of detail of this information continues to improve (Edinger et al 2007; Wareham and Edinger 2007; Wareham 2009; NAFO 2008). This information is mainly based on observations of corals in commercial trawl sets (observer program) and trawl survey programs.

Observations have been mapped separately for the various groups of corals, including hard and branching corals (mainly associated with hard-bottom areas) and soft corals (often found on soft bottoms). Areas of concentration of sponges, another type of sensitive habitat area, have been identified in preliminary fashion based on trawl survey and observer data (Kenchington et al 2009). Preliminary indications are that sponge concentration areas are at depths greater than those at which the shrimp fishery operates.

Distribution of fishing operations is very well known from VMS and logbook information and is compiled (Spatialanalysis 2009; Orr et al MS 2008).

Vulnerability of habitat types in the fishery area to bottom trawl gear is generally known (e.g. Rice 2006; Gordon et al 2006).

Available information has not been compiled into an overall summary which would provide adequate detail on the nature, distribution and vulnerability of habitat types relative to fishery operations.

This PI is equivalent to PI 2.1.1.1 used in the ASP assessment of this overlapping fishery. It too failed to meet a score of 80 and resulted in a single Condition (Condition 2 in the ASP report) which was set for multiple PIs.

**Score = 70 (Original) 80 (Revised)**

**CERTIFICATION REPORT**

The fishery meets all elements of the 60 SG in that there is a basic understanding of types and distribution of habitats in the fishery, and of the impacts of the fishery on habitats. The fishery is assigned a score above 60 because there is detailed information on nature and distribution of sensitive habitats (coral and sponge areas) and reliable information on spatial extent, timing and location of the fishery.

**4<sup>TH</sup> ANNUAL AUDIT**

PI 2.4.3. The PI is rescored to 80, because:

A. The nature, distribution and **vulnerability** of all main habitat types in the fishery area are known at a level of detail relevant to the scale and intensity of the fishery.

- Maps of sediment types in the fishery area are available which show the nature and distribution of habitat types at a level of detail relevant to the scale and intensity of the fishery (CAPP 2015; CNLOPB 2014)
- Maps of sensitive habitats, as defined by the presence of significant concentrations of corals and sponges, are available (Kenchington et al 2010; DFO 2010).
- Vulnerability of the various habitat types to bottom trawl fishing are known (NEFMC 2011 and others, see below)

B. Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent of interaction, and the timing and location of use of the fishing gear.

- A review of the mode of operation of Newfoundland shrimp gear and potential impacts on bottom habitats is available (Grant MS 2012).
- Impacts of shrimp trawl gear on habitats in which they most commonly operate (soft substrates) have been described in publications from Oregon and Maine (Hixon and Tissot 2007; Simpson and Watling 2006)
- Research on impacts of mobile bottom gear on habitats in the Newfoundland-Labrador area has been summarised and reviewed (Gilkinson eg al 2006), as have impacts in a nearby marine area (Gordon et al 2006)
- More general reviews of impacts of mobile bottom gear on habitats are available (Kaiser et al 2006; Rice 2006)

- A framework for assessing fishing gear impacts on bottom habitats has been developed in an attempt to guide risk assessment (NEFMC 2011)
- Timing and location of use of the fishing gear are monitored by VMS on all vessels, and can be used in analyses of the fishery footprint (eg CAPP 2015)

C. 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).

- VMS monitoring of fishing locations continues and the client has committed to 5-year reanalyses of fishery footprint in relation to habitat types

The fishery does not meet the 100 SG because the distribution of habitat types is not known over their range (there are gaps in knowledge of habitat distributions, as habitats have been characterised based on information on bycatch from fisheries, not from a systematic sampling program), changes in habitat distributions are not monitored, and the physical impacts of the gear on habitats has not been quantified fully.

**Audit Trace References**

**CERTIFICATION REPORT**

C-NPOPB 2008; Marine Institute, School of Ocean Technology 2008; Edinger et al 2007; Wareham and Edinger 2007; Wareham 2009; Kenchington et al 2009; Rice 2006; Gordon et al 2006; Spatialanalysis 2009; Orr et al MS 2008.

**4<sup>TH</sup> ANNUAL AUDIT**

CAPP 2015; Josenhans et al 1986; CNLOPB 2008; Kenchington et al 2010; DFO 2010; NEFMC 2011; (Grant MS 2012); Hixon and Tissot 2007; Simpson and Watling 2006; Gilkinson et al 2006; Gordon et al 2006; Kaiser et al 2006; Rice 2006



2.5	Ecosystem			
		SG60	SG80	SG100
2.5.1	<b>Status</b> The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function.	The fishery is <u>unlikely</u> to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The fishery is <u>highly unlikely</u> to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is <u>evidence</u> that the fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
<b>Scoring Comments</b>				
<b><u>CERTIFICATION REPORT</u></b>				
<p>The principal issues identified to be addressed here are (a) impact of removal of the target species, which are forage for a wide range of predator species, on trophic relationships (b) non-catch impacts on biological diversity and community structure, particularly for benthic species. In addition, overall impact on ecosystems is considered consistent with the MSC FAM.</p> <p>Impact of removal of target species on trophic relationships . Shrimp abundance is currently high relative to historical levels, such that there should be no impacts on trophic relationships at present and in the near future. Exploitation rates have been set at a level consistent with maintaining adequate forage, based on experience in other fisheries where higher exploitation rates have not resulted in predator impacts (IFMP). It is expected that similar exploitation rates will be practiced in future. The conclusion that removals of the target species are highly unlikely to disrupt trophic relationships is based on quantitative information on population status of the target species.</p> <p>Non-catch impacts on benthic species and communities . Given the configuration of the gear (light foot gear and doors, use of rollers and toggle chains), this fishery is unlikely to be having serious or irreversible impacts on benthic species and communities. However, no assessment has been done. An assessment of spatial distribution of the fishery has been done, suggesting that a low proportion of the continental shelf has been affected by shrimp trawling; this is a good initial step but additional analyses of communities and their sensitivity would be needed to assess impact. The conclusion that the fishery is unlikely to disrupt benthic communities is based on inference.</p> <p>Recent work on unobserved fishing mortality (Grant and Hiscock 2010, in press ) produced in accordance with meeting a Condition in the existing certified Northern shrimp fishery in SFA 5, 6 &amp; 7 and reported in the second annual surveillance audit report for that fishery (Moody Marine Ltd 2010) concludes that unobserved mortality is likely to be low, thus bycatch information would assess impact of the gear on non-target species relatively well.</p> <p>Overall, it appears highly unlikely that the fishery is causing serious or irreversible at the level outlined in the MSC FAM (S. 7.1.12 – extinctions, trophic cascades, gross changes in species composition).</p> <p>This PI is equivalent to PI 2.1.3.2 and 2.1.4.4 used in the ASP assessment of this overlapping fishery. These also failed to meet a score of 80 and resulted in a single Condition (Condition 2 in the ASP report) which was set for multiple PIs.</p>				

**Score = 70 (Original) 80 (Revised)**

**CERTIFICATION REPORT**

One identified ecosystem element (changes in trophic relationships due to removal of the target species) meets the 80 SG, another (non-catch impacts on benthic communities) meets the 60.

Overall it appears highly unlikely that the fishery is causing serious or irreversible harm to ecosystems. Accordingly an intermediate score of 70 is assigned.

**4<sup>TH</sup> ANNUAL AUDIT**

PI 2.5.1. The PI is rescored to 100 for the relevant ecosystem issue because there is evidence that the fishery is **highly unlikely** to disrupt the relevant key elements underlying ecosystem structure and function (that is, benthic biodiversity and community structure) to a point where there would be a serious or irreversible harm.

- The ecosystem issue for which this fishery scored less than 80 on ecosystem PIs is non-catch impacts on biological diversity and community structure, particularly for benthic species.
- In the three years 2009-2011 the fishery impacted a maximum of 4.97% of bottom habitats (and thus benthic communities) in the fishery area (continental shelf between 100 and 600 m depth)(CAPP 2015 p. 19; Spatialanalysis 2013), thus leaving most areas and communities undisturbed
- Actual area impacted was less than this because this figure does not account for overlapping tows
- Based on available information (see 2.5.3), trawl impacts on benthic species (and thus biodiversity and community structure) in the main habitat types impacted by the fishery (soft substrates, mud, silt and sand or mixtures thereof) are known and may cause measurable changes in benthic community structure; however because more than 90% of the distribution area of benthic communities of the fishery area is not impacted by the fishery, the overall impact is not such as to cause serious or irreversible harm

Overall, the score for the PI is changed to 90, as the fishery scores 80 for one ecosystem issue (trophic relationships) and 100 for the other (benthic biodiversity)

**Audit Trace References**

**CERTIFICATION REPORT**

See sections 2.5.2 and 2.5.3; Grant & Hiscock in press; Moody Marine 2010

**4<sup>TH</sup> ANNUAL AUDIT**

CAPP 2015; Spatialanalysis 2013

		SG60	SG80	SG100
2.5.2	<b>Management strategy</b> There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function.	<p>There are measures in place, if necessary, that take into account potential impacts of the fishery on key elements of the ecosystem.</p> <p>The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ ecosystems).</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 so as 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>	<p>There is a strategy that consists of a plan, containing measures to address all main impacts of the fishery on the ecosystem, and at least some of these measures are in place. The plan and measures are based on well-understood functional relationships between the fishery and the Components and elements of the ecosystem.</p> <p>This plan provides for development of a full strategy that restrains impacts on the ecosystem to ensure the fishery does not cause serious or irreversible harm.</p> <p>The measures are considered likely to work based on prior experience, plausible argument or information directly from the fishery/ecosystems involved.</p> <p>There is evidence that the measures are being implemented successfully.</p>
<b>Scoring Comments</b>				
<b><u>CERTIFICATION REPORT</u></b>				
<p>Shrimp as a forage species. The IFMP does not make specific reference to the need to practice a conservative exploitation strategy to ensure that shrimp is available to predator species, although it provides evidence that the guideline exploitation rate (15%) is well below that practiced in other shrimp fisheries which have not had apparent impacts on predators, and it is considered low enough to ensure that predator needs are met. The new exploitation framework based on reference points and decision rules (IFMP) appear to leave the way open to higher exploitation rates in future. This new framework does not explicitly address predator requirements in setting exploitation rates.</p> <p>Impacts on biological diversity and benthic communities (other than bycatch species and habitat issues). The mode of operation of the fishery is consistent with</p>				

reducing potential impacts on biological diversity and on benthic communities. Fishing operations are concentrated on soft bottom areas, which have shorter recovery times than harder bottoms and whose mobile or infauna is generally less vulnerable to damage than erect, sessile, long-lived fauna of hard bottoms. Trawls are relatively light and fitted with rollers which should roll over rather than digging into the bottom, although in areas where twin trawls are used the “shoe” would dig into soft bottom sediments. Recorded bycatch of benthic fauna is very low, but non-catch impacts on bottom fauna are not well known and some assessment of potential impacts would help to increase certainty that these are low.

This PI is equivalent to PI 2.1.4.5 used in the ASP assessment of this overlapping fishery. It also failed to meet a score of 80 and resulted in a single Condition (Condition 2 in the ASP report) which was set for multiple PIs.

**Score = 70 (Original) 80 (Revised)**

**CERTIFICATION REPORT**

A partial strategy is in place to ensure that adequate forage is maintained for predators (guideline exploitation rate, ongoing monitoring) (SG 80). Measures are in place to ensure that non-catch impacts on benthic communities are low (light gear, soft-bottom areas with communities which recover relatively quickly are fished) (SG 60). Accordingly a score of 70 is assigned.

**4<sup>TH</sup> ANNUAL AUDIT**

PI 2.5.2 The PI is rescored to 80.

A. There is a partial strategy in place (with respect to benthic biodiversity and community structure) (meets 80)

- Measures within the fishing strategy are such as to reduce harm to benthic biodiversity and community structure: gear is relatively light; the fishery operates on soft substrates whose benthic species are considered relatively resilient and of relatively short recovery time; the fishery does not impact over 90% of bottom areas in the fishery area;
- A partial strategy document, approved by NSAC on March 4, 2015, summarizes fishery footprint in relation to habitats;
- The document includes a commitment to monitor fishery footprint at 5 year intervals and to modify fishing practices if analyses show that identified critical thresholds are surpassed (CAPP 2015 p. 45);
- The fishery has shown the capacity to analyse and monitor ecosystem impacts and to put in place additional measures to protect the ecosystem if necessary
- As such, the fishery meets the MSC guidance on a partial strategy: a cohesive arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome and an awareness of the need to change the measures should they cease to be effective. It may not have been designed to manage the impact on that component specifically. (MSC 2013)

B. The partial strategy takes into account available information and is expected to restrain impacts of the fishery on the ecosystem (benthic biodiversity and

community structure) so as to achieve the Ecosystem Outcome 80 level of performance (meets 80)

- The partial strategy is based on an analysis of the fishery footprint in the fishery area, available information on distribution of benthic species and communities in the fishery area, a review of non-catch impacts of this gear on benthic species and on inference from information in similar fisheries in other areas (see 2.5.3)
- Because the partial strategy ensures that less than 90% of the fishery area is impacted by the fishery and because of the inferred impact of the gear on those areas that are impacted, the partial strategy is expected to restrain impacts of the fishery such that there would not be serious or irreversible harm to benthic biodiversity and community structure.

C. The measures are considered likely to work based on prior experience, plausible argument or information directly from the fishery/ecosystems involved (meets 100 for benthic biodiversity)

- The partial strategy is considered likely to work analyses of the fishery footprint in relation to benthic communities (information directly from the fishery/ecosystems involved)

D. There is evidence that the measures comprising the partial strategy are being implemented successfully (meets 100 for benthic biodiversity)

- Distribution of fishing, monitored by VMS, shows that the footprint of the fishery on benthic communities is relatively small

The fishery does not meet the 100 SG for SIs A and B (benthic biodiversity) because the partial strategy in place does not meet the MSC definition of a “strategy” (MSC Guidance, GCB 3.3) - “a cohesive and strategic arrangement...designed to manage impact on that component specifically”,

Overall, the score for this PI is changed to 85, as the fishery meets 80 for one ecosystem element (trophic relationships), 90 for the other (benthic biodiversity).

**Audit Trace References**

**CERTIFICATION REPORT**

FMP; interviews Newfound Pioneer , DFO, CAPP.

**4<sup>TH</sup> ANNUAL AUDIT**

IFMP, CAPP 2015, MSC 2013

		SG60	SG80	SG100
2.5.3	<b>Information / monitoring</b> There is adequate knowledge of the impacts of the fishery on the ecosystem.	<p>Information is adequate to identify the key elements of the ecosystem (e.g. trophic structure and function, community composition, productivity pattern and biodiversity).</p> <p>Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, but have not been investigated in detail.</p>	<p>Information is adequate to broadly understand the functions of the key elements of the ecosystem.</p> <p>Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, but may not have been investigated in detail.</p> <p>The main functions of the Components (i.e. target, By-catch, Retained and ETP species and Habitats) in the ecosystem are known.</p> <p>Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred.</p> <p>Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).</p>	<p>Information is adequate to broadly understand the key elements of the ecosystem.</p> <p>Main interactions between the fishery and these ecosystem elements can be inferred from existing information, and have been investigated.</p> <p>The impacts of the fishery on target, By-catch, Retained and ETP species and Habitats are identified and the main functions of these Components in the ecosystem are understood.</p> <p>Sufficient information is available on the impacts of the fishery on the Components and elements to allow the main consequences for the ecosystem to be inferred.</p> <p>Information is sufficient to support the development of strategies to manage ecosystem impacts.</p>
<b>Scoring Comments</b>				
<b>CERTIFICATION REPORT</b>				
(a) Trophic role of the target species. The ecological role of the target species is relatively well known. Pandalus shrimps prey on, and are prey for a variety of				

species (Parsons 2005a, 2005b, 2006; Savenkoff et al 2006), although other species (such as capelin for cod, fishes for seals) may be preferred by predators when available. Trophic structures related to northern shrimp have not been studied in this area, but studies in nearby continental shelf areas (eg Savenkoff et al 2004) probably provide an adequate picture of trophic relationships in the fishery area. Quantitative information on abundance of the target species is available.

Recent work on unobserved fishing mortality (Grant and Hiscock 2010, in press ) produced in accordance with meeting a Condition in the existing certified Northern shrimp fishery in SFA 5, 6 & 7 and reported in the second annual surveillance audit report for that fishery (Moody Marine Ltd 2010) concludes that unobserved mortality is likely to be low, thus bycatch information would assess impact of the gear on non-target species relatively well.

(b) Non-catch impacts on benthic communities. Information on benthic and demersal communities in which the fishery operates is relatively general, with the exception of exploited groundfishes for which detailed stock assessments are available. Only basic life history information is available for non-commercial demersal fishes (eg Scott and Scott 1988; Fishbase).

Benthic community composition is generally known for the Grand Banks (C-NOPB 2003), although much of the available information is from a trawl impact study in a sand habitat and information specific to benthic communities of shrimp fishery habitat is not available. Information on benthic fauna on the Labrador Shelf is limited (C-NOPB 2008). Polychaete diversity and distribution is known for much of the Labrador Shelf (Gagnon and Haedrich 1991) while species composition of benthos, major species, and relations of distributions to environmental conditions are known for stations in SFAs 1, 2, 3 and 4 (Stewart et al 1985). Information on distribution of corals is available and is improving but was dealt with in 2.4.3.

Non-catch impacts on these species and others in the benthic community could result from gear passage, i.e. impact of rockhopper gear rollers or trawl doors; these impacts may be low, given that the gear is relatively light and large rollers are used, but have not been assessed. Twin trawling gear used in some parts of the fishery area requires use of a very heavy shoe which could damage benthic invertebrates over a relatively narrow strip (ca 3 m).

Ability of potentially impacted communities to recover from impacts is not available for the area. Ability to recover generally varies with lifespan; slow-growing, long-lived species (such as some species of hard corals) will recover more slowly than short-lived species (eg tube-dwelling worms). A 3-year study of trawl impacts on sand bottoms on the Grand Banks suggested that benthic communities were little altered over this period (summarised by Gordon et al 2009).

With respect to general ecosystem issues, sizes of shrimp in the population are monitored annually and there have been no indications of significant long-term shifts to smaller sizes.

Bycatch size spectra are focussed on small individuals (with high mortality) because of use of the Nordmore grate.

This PI is equivalent to PI 2.1.1.3, 2.1.1.4, 2.1.2.3, 2.1.4.1, and 2.1.4.2 used in the ASP assessment of this overlapping fishery. These also failed to meet a score of 80 and resulted in a single Condition (Condition 2 in the ASP report) which was set for multiple PIs.

**Score = 70 (Original) 80 (Revised)**

**CERTIFICATION REPORT**

Very good information is available on the ecological relationships of *Pandalus* and on abundance of this target species, such that impacts of the fishery on



predator-prey relationships can be assessed and mitigated if need be. Monitoring continues. As such the fishery meets the 80 SG for this issue.

Partial knowledge of potential non-catch impacts of the fishery on benthic species and general knowledge of benthic communities exists, however information has not been compiled in such a way as to allow consequences on benthic communities to be assessed. As such the fishery meets the 60 SG for this issue.

Overall, with respect to ecosystem impacts, the fishery is close to the 80 SG: information is adequate to broadly understand functions of key elements of the ecosystem, main impacts can be inferred, the functions of the components are understood, and some of the main consequences can be assessed.

#### **4<sup>TH</sup> ANNUAL AUDIT**

PI 2.5.3 This PI is rescored to 80 because:

A. Information is adequate to broadly understand the key elements of the ecosystem (meets 80)

- For this fishery, the elements for which a score of 80 was not achieved were benthic biodiversity and community structure
- Although studies of benthic species and communities have concentrated on sensitive area (areas of sponge and coral concentration - see habitat 2.4), information is adequate to broadly understand the biodiversity and community structure of the soft-bottom habitats on which the fishery concentrates
- Maps of sediment types over the fishery area are available which show the nature and distribution of habitat types (CAPP 2015; CNLOPB 2014)
- Information, while relatively sparse, on the benthic fauna of the Newfoundland-Labrador shelf has been reviewed and summarised to support a mass balance model of this area (Bundy et al 2000); major benthos groups identified for this model are echinoderms (brittle stars, sea urchins), molluscs (bivalves, gastropods), polychaetes (tube-dwelling and mobile), and others including crustaceans, nematodes and others
- Benthic species of the soft-substrate habitats on which the fishery operates are generally known from studies in the fishery area (Gagnon and Haedrich 1991 for polychaetes; Gordon et al 2009 for sand-bottom benthos on the Grand Banks), in areas near and presumably ecologically similar to this area (Stewart et al 1985 for SFAs 1-4 further north; Chabot et al 2007 for the northern Gulf of St. Lawrence; Ramey and Snelgrove 2003) for mud/sand habitats of Placentia Bay) and in other areas in which *Pandalus* fisheries operate (Hixon and Tissot 2006, Oregon; Simpson and Watling 2006, Gulf of Maine)
- Sand-bottom habitats of the Grand Banks have been the subject of most of the available studies, and are dominated by echinoderms and molluscs (Schneider et al 1987); mud-bottom habitats such as those where the shrimp fishery is concentrated have a high proportion of tube-dwelling polychaetes in shelf waters off southern Newfoundland (Ramey and Snelgrove 2003)

B. Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, and some have been investigated in detail (meets 80)

- With respect to “investigated in detail”, this part of the SG was scored at 80 in the certification report because of detailed studies of the position of pandalid shrimp in trophic relationships in the fishery area
- Non-catch impacts on benthic communities have been reviewed for this fishery by Grant (MS 2010), although this review focused on sensitive areas and fish species
- Impacts of shrimp trawling on benthic communities have been studied off Oregon (Hixon and Tissot 2007) and the Gulf of Maine (Simpson and Watling

2006), while a number of studies and reviews have examined impacts of trawls on bottom communities more generally (eg Rice 2006, Kaiser et al 2006, see references in Grant MS 2010).

- NEFMC (2011) summarised available information and expert judgment in a framework for assessing gear damage to habitats and communities, including for damage to species of soft-bottom habitats
- While there is great variability between available studies in terms of the types and severity of impacts, it can generally be concluded that repeated trawling on soft-bottom habitats affects species composition, size composition of species, and thus biodiversity and community structure. While soft-bottom habitats are generally considered relatively stable and not subject to physical stress (waves, currents etc), bioturbation may be an important background drive of change (eg Simpson and Watling 2006).
- This SG does not meet 100 because not all ecosystem issues have been investigated in detail.

C. The main functions of the components... in the ecosystem are known

- This SG was scored at 80 in the certification report

D. Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred

- This SG was scored at 80 in the certification report

E. 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) (meets 80)

- VMS monitoring of fishing locations continues and the client has committed to 5-year reanalyses of fishery footprint in relation to habitat types (and thus of distribution in relation to benthic communities)
- The fishery does not meet 100 for this SG because the level of information is not sufficient to support the development of strategies to manage ecosystem impacts.

**Audit Trace References**

**CERTIFICATION REPORT**

Parsons 2005a, 2005b, 2006; Savenkoff 2006; Scott and Scott 1988; Fishbase; C-NOPB 2003, 2008; Gagnon and Haedrich 1991; Stewart et al 1985; Orr et al 2008bc; unpublished observer data compilation provided by T. Siferd, DFO; Gordon et al 2009; Grant and Hiscock 2010, in press ; Moody Marine 2010

**4<sup>TH</sup> ANNUAL AUDIT**

CAPP 2015; Josenhans et al 1986; CNLOPB 2008; Gagnon and Haedrich 1991; Gordon et al 2009; Chabot et al 2007; Ramey and Snelgrove 2003; Hixon and Tissot 2006; Simpson and Watling 2006; (Schneider et al 1987; Ramey and Snelgrove 2003; Grant MS 2010; Simpson and Watling 2006; Rice 2006; Kaiser et al 2006.

		SG60	SG80	SG100
3.2.4	<b>Research plan</b>  The fishery has a research plan that addresses the information needs of management.	Research is undertaken, as required, to achieve the objectives consistent with MSC's Principles 1 and 2.          Research results are available to interested parties.	A research plan provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.          Research results are disseminated to all interested parties in a timely fashion.	A comprehensive research plan provides the management system with a coherent and strategic approach to research across P1, P2 and P3, and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.          Research plan and results are disseminated to all interested parties in a timely fashion and are widely and publicly available.

Scoring Comments

CERTIFICATION REPORT

Ongoing stock assessment research is described in detail in Annex D of the IFMP. For the purposes of stock assessment, all shrimp fishing areas are monitored through research surveys and sampling of the commercial catch. Catch rates of shrimp and fish species are recorded, and detailed observations are made on shrimp size distribution, sex, maturity and egg production. These data provide useful information on the distribution and abundance of the resource, the effects of fishing, changes in the environment, and potential for the fishery in the near future. Additional research surveys are conducted in the NRA by other Contracting Parties of NAFO.

Present research is directed towards age determination, estimation of mortality rates, effects of environmental parameters (e.g., temperature, currents) and

relationships with major predators, especially Greenland halibut and cod. A 5 year \$CAD5million research proposal by the Marine Institute of Memorial University has been developed and submitted for funding that has the objective of reducing the bottom impact of various trawls currently used in the industry. The approach for this project is to complete design and simulation using various trawl configurations, complete physical modeling using the flume tank, and then evaluate prototypes under commercial conditions.

A study is currently being undertaken by the Marine Institute to develop a methodology to use industry single beam sounders to collect bottom type data and compile these data to create an acoustic classification map for fishing grounds off Newfoundland and Labrador. The study will focus in particular on northern shrimp, although the results will be applicable to other benthic species. The study will help to guide more detailed investigation of sensitive habitats and the correlation between shrimp abundance and seabed habitat.

Additional research is being conducted at the DFO Maurice Lamontagne Institute in Mont Joli, Quebec in tank rooms designed to simulate the natural living conditions of *P. borealis*. The studies are exploring the effect of water temperature on the various stages in their life cycle.

It should be noted that while research was an important factor in the assessment tree for the ASP assessment there was no PI with a specific requirement for a “plan” or “strategic approach”, hence, there was no condition set in the ASP certification.

**Score = 75 (Original) 80 (Revised)**

**CERTIFICATION REPORT**

While there is significant ongoing research activity to support the fishery, there is no actual research plan that provides the management system with a strategic approach to research as is required by the 80 scoring guidepost.

The research survey and assessment program is described and published as part of the IFMP (Annex D) and provides management with important information. However it is not comprehensive in that it does not address all issues identified in the stock assessments as requiring resolution through research. In addition, although some ecosystem issues are addressed in ongoing research, there is not a comprehensive range of research topics identified to resolve issues related to ecosystem impacts of fishing".

The research being conducted is circulated to all interested parties in a timely fashion, either directly to stakeholders, at advisory committee meetings or via the Canadian Science Advisory Secretariat (CSAS) system on the DFO website.

The score would have been higher if there was a research plan that provided the management system with a strategic approach to research as is required by the 80 scoring guidepost.

**4<sup>TH</sup> ANNUAL AUDIT**

While the iFMP remains incomplete, the thirteen points covered in the research plan approved by the NSAC in March 2015 provides a strategic approach to analysing key P1 and P2 issues related to the shrimp fishery. The fishery meets SG80 Sla. The lack of any definition of P3 work prevents the fishery meeting SG100 Sla. PI 3.2.4 is rescored to 80.

**Audit Trace References**

**CERTIFICATION REPORT**

Integrated Fisheries Management Plan - Northern Shrimp - Shrimp Fishing Areas (SFAs) 0-7 and the Flemish Cap, 2007; MSC Certification of the Offshore Shrimp Fisheries (>100') in areas 1, 2, 3, 4, 5, 6 and 7. Submission for the Main Assessment by the 17 Offshore Licence Holders September 2, 2009

**4<sup>TH</sup> ANNUAL AUDIT**

Research Plan, DFO letter

**6.5 Pandalus montagui SFA 2, 3 & 4 Fishery**

2.4	Strategies have been developed within the fisheries management system to address and restrain any significant negative impacts of the fishery on the ecosystem			
		SG60	SG80	SG100
2.4.1	<b>Status</b> The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function.	The fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	There is evidence that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.

**Scoring Comments**

**CERTIFICATION REPORT**

The fishery concentrates on mud bottoms (or sand, or mixed mud-sand), and vessels avoid hard bottoms to minimise the risk of damage to trawls. Trawl gear is relatively light and efforts are underway to further reduce gear contact with the bottom in order to reduce fuel costs. Bottom rollers and trawl doors are the principal parts of the trawl contacting the bottom.

Studies are unavailable on the impacts of shrimp gear on mud and mud-sand bottoms in this area, but some inferences can be made from studies on sand bottoms, recognising that impacts are to some extent site specific and that inference leaves some uncertainty about conclusions. In a 3-year study of impacts of trawl gear on the Grand Banks, there was no alteration to benthic communities and recovery of the sand habitat occurred within a year (results summarised in Gordon et al 2009). Soft bottoms are impacted relatively rapidly by trawling gear but recover relatively quickly (DFO 2006benthic).

*P. montagui* is generally taken at depths less than those for *P. borealis*, where hard corals are less abundant. The fishery probably produces occasional impacts on hard-bottom areas with erect sessile fauna which may be important as habitat. Coral bycatch is low, suggesting that contact with such areas is relatively rare, but bycatch information probably underrepresents interactions with such sensitive areas since impacts may occur when coral is not retained. Such habitats probably recover relatively slowly as growth rates of hard corals are low (Edinger et al 2007; Wareham 2009). A voluntary closed area to protect coral habitat is in place in SFAs 2 and 4, and industry is developing a coral conservation strategy (GEAC/CAPP/Northern Coalition 2007).

**Score = 60 (Original) 80 (Revised)**

**CERTIFICATION REPORT**

Given its mode of operation, this fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm, but analyses of fishery impacts would be required to increase certainty, particularly with respect to potential impacts on hard coral areas; accordingly it cannot be said that the fishery is “highly unlikely” to have unacceptable impacts.

**4<sup>TH</sup> ANNUAL AUDIT**

PI 2.4.1. The PI is rescored to 100, because there is evidence that the fishery is **highly unlikely** to reduce habitat structure and function to a point where there would be serious or irreversible harm.

- In the three years 2009-2011 the fishery impacted a maximum of 0.67% of bottom habitat in the eastern part of the fishery area, and 0.5% of the fishery area in the western part (west of 63° W) (continental shelf between 100 and 600 m depth)(CAPP 2015 p. 19; Spatialanalysis 2013); thus the fishery leaves most of the habitat area undisturbed
- Actual area impacted was less than this because this figure does not account for overlapping tows
- A relatively high proportion (22.6%) of identified sensitive bottom habitat areas (significant coral concentrations as identified in Kenchington et al, 2010) was contacted, while 0.8% of identified sensitive sponge areas was contacted (CAPP 2015 p. 28)
  - Over 95% of the tows in identified sensitive areas occurred in a single coral area identified as C84 (CAPP 2015 p. 29)
  - Detailed examination of the footprint in relation to coral distributions showed very little overlap between the fishery footprint and known coral concentrations, as the fishery concentrates at depths shallower than those at which coral concentrations, in particular large gorgonians, occur (CAPP 2015 p. 35);
  - Of 3247 sets within the identified sensitive coral area, 2 took coral bycatch, but no gorgonians were observed in the bycatch - only soft or unknown corals (CAPP 2015 p. 30)
  - Of 7 sets within identified sensitive sponge areas, none had sponge bycatch (CAPP 2015 p. 31)
  - The interpolation technique used to identify sensitive areas based on distribution of large gorgonians in trawl survey catches is shown to extend the boundary of the identified sensitive area into shallower waters than is justified by coral distribution information alone (CAPP 2015 p. 31). Generally there is little overlap between depths fished (usually 150-450 m) and coral and sponge areas (500 m or greater)
  - As a result, the analysis concludes that the actual overlap between sensitive habitat and the fishery footprint is well below the 10% threshold considered to represent a serious risk of serious or irreversible harm to habitat
  - Three trawl survey catches of large gorgonians occurred within depths and areas impacted by the fishery (CAPP 2015 p. 35); these areas will be subject to

- a voluntary closure to fishing (see below 2.4.2).
- Based on available information (see 2.4.3) trawl impacts on the main “non-sensitive” habitat types impacted by the fishery (soft substrates, mud, silt and sand or mixtures thereof) are not such as to cause serious or irreversible harm.

**Audit Trace References**

**CERTIFICATION REPORT**

Gordon et al 2009; DFO 2006benthic; interviews (see 2.4.2), IFMP; Gilkinson and Edinger eds 2009.

**4<sup>TH</sup> ANNUAL AUDIT**

CAPP 2015; Spatialanalysis 2013

		SG60	SG80	SG100
2.4.2	<b>Management strategy</b> There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types.	<p>There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.</p> <p>The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/habitats).</p>	<p>There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.</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>	<p>There is a strategy in place for managing the impact of the fishery on habitat types.</p> <p>The strategy is mainly based on information directly about the fishery and/or habitats involved, and testing supports high confidence that the strategy will work.</p> <p>There is clear evidence that the strategy is being implemented successfully, and intended changes are occurring. There is some evidence that the strategy is achieving its objective.</p>
<b>Scoring Comments</b>				
<b><u>CERTIFICATION REPORT</u></b>				
Several measures are in place that help to reduce impact of the fishery on habitats. The fishery is concentrated on soft bottoms (mud and/or sand), preferred				



habitat for shrimp and with less risk of damage to trawls, and these types of habitats are generally considered relatively resilient to trawl impact (Rice 2006; Gordon et al 2006). Trawls and doors used are relatively low impact, and work is under way to further lighten the gear in the interests of saving fuel. However the shoe used between codends on twin trawls could cause substantial bottom damage over a narrow swathe of around 3 m wide.. The relatively low proportion of trawl sets with corals as bycatch suggests that impacts on these habitats may be low, although presence in sets would underestimate impact since trawls may impact corals without retaining them.

The offshore fleet has developed a coral conservation policy (GEAC et al 2007) including one voluntary closed area (12,500 km<sup>2</sup>) to protect corals in SFAs 2-4. While this closed area is considered a good first step, biological studies suggest that a wider closed area would be necessary to fully protect coral hot spots in the fishery area (Wareham 2009; Edinger and Gilkinson 2009).

Steps are being taken toward developing a strategy for managing potential habitat impacts. A Closed Areas Working Group of the Northern Shrimp Advisory Committee has been established to consider closed areas and other ecosystem impacts of the fishery. DFO Newfoundland Region has committed to developing a coral/sponge conservation strategy for its continental shelf, and this is expected to be complete by 2012. DFO has developed a national policy for Managing the Impacts of Fishing on Sensitive Benthic Habitats (April 2009) (<http://www.dfompo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/benthi-eng.htm>), which is expected to provide an overall framework for actions to improve protection of sensitive habitats and species

gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/benthi-eng.htm ), which is expected to provide an overall framework for actions to improve protection of sensitive habitats and species

**Score 70 (Original) 80 (Revised)**

**CERTIFICATION REPORT**

All scoring issues of the SG 60 are in place, as measures are in place to reduce impacts and these are considered likely to work. The suite of measures (light gear design; fishing mainly on mud-sand bottoms; coral conservation policy by the offshore fleet and developing DFO coral/sponge policy; voluntary closed areas) is considered a partial strategy as there is an understanding of how they work to conserve habitat and there is an awareness of the need to further modify the strategy if necessary. There is evidence that the strategy is being implemented successfully, since bycatch of corals and sponges is very low. However, further information on the fishery impacts on habitat would be necessary to provide a more objective basis for confidence that the strategy is meeting its objectives.

**4<sup>TH</sup> ANNUAL AUDIT**

PI 2.4.2 The PI is rescored to 80, because

A. There is a **partial strategy** in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above;

- Elements of the fishing strategy are such as to minimize harm to habitats: gear is relatively light; the fishery concentrates on relatively resilient soft substrates where shrimp are concentrated and where risk of gear damage is low; the fishery concentrates at depths shallower than those at which identified sensitive coral and sponge habitats occur;
- The analysis of CAPP (2015) shows that the existing fishing strategy is such as to ensure that serious or irreversible harm to sensitive habitats does not occur, since the low proportion of habitats impacted indicates that overall there is not serious or irreversible to habitats
- Industry has put in place a voluntary closed area of 12,500km<sup>2</sup> off the entrance to Hudson Strait with the objective of protecting coral and sponge

concentrations (IFMP)

- Following the analysis of CAPP (2015) showing areas where large gorgonians were taken in surveys within the fishery footprint area, industry has undertaken to close these areas to fishing (CAPP 2015 Section E p 43).
- A partial strategy document, approved by NSAC on March 4, 2015, summarizes fishery footprint in relation to habitats
- The document includes a commitment to monitor fishery footprint at 5 year intervals and to modify fishing practices if analyses show that identified critical thresholds are surpassed (CAPP 2015 p. 45)
- The fishery has shown the capacity to analyse and monitor habitat impacts and to put in place additional measures to protect habitat if necessary (voluntary closed areas in SFAs 2-4)(CAPP 2015)
- The partial strategy has been developed in the context of DFO national strategies on fishing in sensitive benthic habitats (DFO 2009) and on coral and sponge conservation (DFO 2015)
- As such, the fishery meets the MSC guidance on a partial strategy: a cohesive arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome and an awareness of the need to change the measures should they cease to be effective. It may not have been designed to manage the impact on that component specifically. (MSC 2013)

B. There is some **objective basis for confidence** that the partial strategy will work, based on **information directly about the fishery and/or habitats** involved.

- Analyses of the fishery, in particular its footprint in relation to sensitive and less-sensitive habitats, show that the fishery is highly likely to meet the SG 80 outcome indicator for PI 2.4.1 (see above)

C. There is **some evidence** that the partial strategy is being implemented successfully.

- Analyses of the fishery footprint in relation to sensitive and less-sensitive habitats show that the fishery is highly likely to meet the SG 80 outcome indicator for PI 2.4.1 (see above)

The fishery does not meet the 100 SG because the partial strategy in place does not meet the MSC definition of a “strategy” (MSC Guidance, GCB 3.3) - “a cohesive and strategic arrangement...designed to manage impact on that component specifically”, there has been no testing of the strategy, and there is no evidence to show that intended changes are occurring or that the strategy is achieving its objective.

**Audit Trace References**

**CERTIFICATION REPORT**

Interviews at Newfound Pioneer , Marine Institute, DFO, CAPP; DFO web site.; NAFO 2008; Marine Institute n.d.

**4<sup>TH</sup> ANNUAL AUDIT**

CAPP 2015, DFO 2015, MSC 2013

		SG60	SG80	SG100
2.4.3	<b>Information / monitoring</b> Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types.	<p>There is a basic understanding of the types and distribution of main habitats in the area of the fishery.</p> <p>Information is adequate to broadly understand the main impacts of gear use on the main habitats, including spatial extent of interaction.</p>	<p>The nature, distribution and vulnerability of all main habitat types in the fishery area are known at a level of detail relevant to the scale and intensity of the fishery.</p> <p>Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent, timing and location of use of the fishing gear.</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>	<p>The distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types.</p> <p>Changes in habitat distributions over time are measured.</p> <p>The physical impacts of the gear on the habitat types have been quantified fully.</p>
<b>Scoring Comments</b>				
<b><u>CERTIFICATION REPORT</u></b>				
<p>No mapping of bottom sediments in the fishery area has been done (C-NOPB 2008), although some information is available and fishermen are aware of bottom type distribution and concentrate on preferred bottom types (mud and sand bottoms). Information on bottom types may be improved through a project to use acoustic equipment on commercial shrimp vessels to type bottoms in the fishery area (Marine Institute, School of Ocean Technology 2008).</p> <p>Information on distribution of particularly sensitive habitat areas, coral concentration areas, is available and level of detail of this information continues to improve (Edinger et al 2007; Wareham and Edinger 2007; Wareham 2009). This information is mainly based on observations of corals in commercial trawl sets (observer program) and trawl survey programs.</p> <p>Observations have been mapped separately for the various groups of corals, including hard and branching corals (mainly associated with hard-bottom areas) and soft corals (often found on soft bottoms). Sampling covered the entire fishery area and corals were recorded in all areas, however hard and branching corals (particularly important for habitat) are concentrated along the edge of the continental shelf in waters deeper than those where the <i>P. montagui</i> fishery is concentrated. Based on a detailed study off the Grand Banks (Kenchington et al 2009) and on observations of bycatch, it appears that sponge concentration</p>				

areas are at depths greater than those at which the shrimp fishery operates.

Distribution of fishing operations is very well known from VMS and logbook information and is compiled (Spatialanalysis 2009; Orr et al MS 2008). Corals were recorded in 1.8% of shrimp trawl sets in this and adjacent fishery areas, most of these being soft corals which are not considered to contribute significantly to habitat (Edinger et al. 2007).

Vulnerability of habitat types in the fishery area to bottom trawl gear is generally known (eg Rice 2006; Gordon et al 2006). Ground gear and trawl doors are relatively light in this fishery, and trawls are fitted with rollers, all of which would tend to minimise bottom impacts. However when twin trawls are used (on some tows), gear is fitted with a heavy (4 t) “shoe” which would dig deeply into soft bottom sediments and damage hard bottom communities which could contribute to habitat.

*P. montagui* is generally taken at shallower depths than *P. borealis* , in areas where hard coral communities are not as highly developed as in deeper waters. As such, the *P. montagui* fishery probably has a lower impact on coral communities than the *P. borealis* fishery. However, available information has not been compiled into an overall

Score 70 (Original) 80 (Revised)

CERTIFICATION REPORT

All scoring issues of the 60 SG are met, as there is basic understanding of types and distribution of habitats in the fishery area, and information is adequate to understand interactions and impact of the fishery.

There is reliable information on spatial extent, timing and location of the fishery (observer information and VMS), and detailed information on distribution of particularly sensitive habitats (hard coral areas); since these scoring issues of the 80 SG are met, a score of 70 is assigned.

4<sup>TH</sup> ANNUAL AUDIT

PI 2.4.3. The PI is rescored to 80, because:

A. The nature, distribution and **vulnerability** of all main habitat types in the fishery area are known at a level of detail relevant to the scale and intensity of the fishery.

- Maps of sediment types in the fishery area are available which show the nature and distribution of habitat types at a level of detail relevant to the scale and intensity of the fishery (CAPP 2015; Josenhans et al 1986; CNLOPB 2008)
- Maps of sensitive habitats, as defined by the presence of significant concentrations of corals and sponges, are available (Kenchington et al 2010; DFO 2010).
- Vulnerability of the various habitat types to bottom trawl fishing are known (NEFMC 2011 and others, see below)

B. Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent of interaction, and the timing and location of use of the fishing gear.

- A review of the mode of operation of Newfoundland shrimp gear and potential impacts on bottom habitats is available (Grant MS 2012).
- Impacts of shrimp trawl gear on habitats in which they most commonly operate (soft substrates) have been described in publications from Oregon and Maine (Hixon and Tissot 2007; Simpson and Watling 2006)
- Research on impacts of mobile bottom gear on habitats in the Newfoundland-Labrador area has been summarised and reviewed (Gilkinson et al 2006), as has research on impacts in a nearby marine area (Gordon et al 2006)
- More general reviews of impacts of mobile bottom gear on habitats are available (Kaiser et al 2006; Rice 2006)
- A framework for assessing fishing gear impacts on bottom habitats has been developed in an attempt to guide risk assessment (NE FMC 2011)
- Timing and location of use of the fishing gear are monitored by VMS on all vessels, and can be used in analyses of the fishery footprint (eg CAPP 2015)

C. 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).

- VMS monitoring of fishing locations continues and the client has committed to 5-year reanalyses of fishery footprint in relation to habitat types

The fishery does not meet the 100 SG because the distribution of habitat types is not known over their range (there are gaps in knowledge of habitat distributions, as habitats have been characterised based on information on bycatch from fisheries, not from a systematic sampling program), changes in habitat distributions are not monitored, and the physical impacts of the gear on habitats has not been quantified fully.

**Audit Trace References**

**CERTIFICATION REPORT**

C-NPOPB 2008; Marine Institute, School of Ocean Technology 2008; Edinger et al 2007; Wareham and Edinger 2007; Wareham 2009; Kenchington et al 2009; Rice 2006; Gordon et al 2006; Spatialanalysis 2009; Orr et al MS 2008.

**4<sup>TH</sup> ANNUAL AUDIT**

CAPP 2015; Josenhans et al 1986; CNLOPB 2008; Kenchington et al 2010; DFO 2010; NEFMC 2011; (Grant MS 2012); Hixon and Tissot 2007; Simpson and Watling 2006; Gilkinson et al 2006; Gordon et al 2006; Kaiser et al 2006; Rice 2006

2.5	Ecosystem			
		SG60	SG80	SG100
2.5.1	<b>Status</b> The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function.	The fishery is <u>unlikely</u> to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The fishery is <u>highly unlikely</u> to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is <u>evidence</u> that the fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
<b>Scoring Comments</b>				
<b><u>CERTIFICATION REPORT</u></b>  The principal issues to be addressed here are (a) impact of removal of the target species, which probably provides forage for a wide range of predator species, on trophic relationships (b) impacts on biological diversity and community structure, particularly for benthic species. Impacts on hard coral and sponge communities have been addressed in 2.4 relative to habitat impacts.  Impact of removal of target species on trophic relationships. There is no indication that recent fisheries are having a negative impact on biomass of P. montagui. although some concern has been expressed about exploitation rates being higher than guidelines (ca. 22%) in the RISA area of SFA 2 (DFO 2008/0-3). TACs have been set at levels which are considered conservative but which allow exploration of impact of fishing. The management system has moved to an approach based on reference points and harvest control rules, which use a base exploitation rate of 15% or less to help ensure that forage will be available for predators.  Impact on benthic species and communities. This fishery is unlikely to be having serious or irreversible impacts on benthic species but no assessment has been done. An assessment of spatial distribution of the fishery has been done, suggesting that a low proportion of the continental shelf has been affected by shrimp trawling; this is a good initial step but additional analyses of communities and their sensitivity would be needed to assess impact.  Recent work on unobserved fishing mortality (Grant and Hiscock 2010, in press ) produced in accordance with meeting a Condition in the existing certified Northern shrimp fishery in SFA 5, 6 & 7 and reported in the second annual surveillance audit report for that fishery (Moody Marine Ltd 2010) concludes that unobserved mortality is likely to be low, thus bycatch information would assess impact of the gear on non-target species relatively well.				
<b>Score = 70 (Original) 80 (Revised)</b>				
<b><u>CERTIFICATION REPORT</u></b>  One identified ecosystem element (changes in trophic relationships due to removal of the target species) meets the 80 SG, another (non-catch impacts on benthic communities) meets the 60.  Overall it appears highly unlikely that the fishery is causing serious or irreversible harm to ecosystems. Accordingly an intermediate score of 70 is assigned.				

**4<sup>TH</sup> ANNUAL AUDIT**

PI 2.5.1. The PI is rescored to 100 for the relevant ecosystem issue because there is evidence that the fishery is **highly unlikely** to disrupt the relevant key elements underlying ecosystem structure and function (that is, benthic biodiversity and community structure) to a point where there would be a serious or irreversible harm.

- The ecosystem issue for which this fishery scored less than 80 on ecosystem PIs is non-catch impacts on biological diversity and community structure, particularly for benthic species.
- In the three years 2009-2011 the fishery impacted a maximum of 0.67% of bottom habitats (and thus benthic communities) in the fishery area (continental shelf between 100 and 600 m depth) (CAPP 2015 p. 19; Spatialanalysis 2013), thus leaving most areas and communities undisturbed
- Actual area impacted was less than this because this figure does not account for overlapping tows
- based on available information (see 2.5.3), trawl impacts on benthic species (and thus biodiversity and community structure) in the main habitat types impacted by the fishery (soft substrates, mud, silt and sand or mixtures thereof) are known and may cause measurable changes in benthic community structure; however because more than 90% of the distribution area of benthic communities of the fishery area is not impacted by the fishery, the overall impact is not such as to cause serious or irreversible harm
- Impacts on benthic biodiversity and community structure in sensitive habitats are addressed under Habitats 2.4

Overall, the score for the PI is changed to 90, as the fishery scores 80 for one ecosystem issue (trophic relationships) and 100 for the other (benthic biodiversity)

**Audit Trace References**

**CERTIFICATION REPORT**

See sections 2.5.2 and 2.5.3; Grant & Hiscock in press; Moody Marine 2010

**4<sup>TH</sup> ANNUAL AUDIT**

CAPP 2015; Spatialanalysis 2013



		SG60	SG80	SG100
2.5.2	<b>Management strategy</b> There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function.	<p>There are measures in place, if necessary, that take into account potential impacts of the fishery on key elements of the ecosystem.</p> <p>The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ ecosystems).</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 so as 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>	<p>There is a strategy that consists of a plan, containing measures to address all main impacts of the fishery on the ecosystem, and at least some of these measures are in place. The plan and measures are based on well-understood functional relationships between the fishery and the Components and elements of the ecosystem.</p> <p>This plan provides for development of a full strategy that restrains impacts on the ecosystem to ensure the fishery does not cause serious or irreversible harm.</p> <p>The measures are considered likely to work based on prior experience, plausible argument or information directly from the fishery/ecosystems involved.</p> <p>There is evidence that the measures are being implemented successfully.</p>
<b>Scoring Comments</b>				
<b><u>CERTIFICATION REPORT</u></b>				
<p>(a) Shrimp as a forage species. The new management framework for <i>P. montagui</i> (IFMP Annex I) is based on use of a base exploitation rate of 15% which is lower than that practiced in other pandalid fisheries which have had no apparent impacts on predator populations. TACs in the past have been set at levels which are considered to be fairly low relative to biomass, with a view to exploring impact of fishing on this species, which should help to ensure that predator needs are met. Recent exploitation rates in SFA 2 (RISA area) are in the range of 22% which is higher than the 15% notional level which would ensure an adequate allocation to predators, but there are several uncertainties underlying this estimate (DFO 2008/018)</p> <p>(b) Non-catch impacts on biological diversity and benthic communities. The mode of operation of the fishery is consistent with reducing potential impacts on</p>				

biological diversity and on benthic communities: fishing operations are concentrated on soft bottom areas, which have shorter recovery times than harder bottoms and mobile or infauna that is generally less vulnerable to damage than the erect, sessile, long-lived fauna of hard bottoms; trawls are relatively light and fitted with rollers which should roll over rather digging into the bottom, although the “shoe” used in twin trawling would dig deeply into soft sediments. The voluntary closed area in SFAs 2-4 should help to protect benthic communities.

**Score = 70 (Original) 80 (Revised)**

**CERTIFICATION REPORT**

A partial strategy is in place to ensure that adequate forage is maintained for predators (guideline exploitation rate, ongoing monitoring) (SG 80). Measures are in place to ensure that non-catch impacts on benthic communities are low (light gear, soft-bottom areas with communities which recover relatively quickly are fished) (SG 60). Accordingly a score of 70 is assigned.

**4<sup>TH</sup> ANNUAL AUDIT**

PI 2.5.2 The condition is rescored to 80 because:

A. There is a partial strategy in place (with respect to benthic biodiversity and community structure) (meets 80)

- Measures within the fishing strategy are such as to reduce harm to benthic biodiversity and community structure: gear is relatively light; the fishery operates on soft substrates whose benthic species are considered relatively resilient and of relatively short recovery time; the fishery does not impact over 90% of bottom areas in the fishery area
- Industry has put in place a voluntary closed area of 12,500km<sup>2</sup> off the entrance to Hudson Strait with the objective of protecting coral and sponge concentrations (IFMP), which should contribute to protecting benthic biodiversity and communities in this area
- A partial strategy document, approved by NSAC on March 4, 2015, summarizes fishery footprint in relation to habitats
- The document includes a commitment to monitor fishery footprint at 5 year intervals and to modify fishing practices if analyses show that identified critical thresholds are surpassed (CAPP 2015 p. 45)
- The fishery has shown the capacity to analyse and monitor ecosystem impacts and to put in place additional measures to protect the ecosystem if necessary
- As such, the fishery meets the MSC guidance on a partial strategy: a cohesive arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome and an awareness of the need to change the measures should they cease to be effective. It may not have been designed to manage the impact on that component specifically. (MSC 2013)

B. The partial strategy takes into account available information and is expected to restrain impacts of the fishery on the ecosystem (benthic biodiversity and community structure) so as to achieve the Ecosystem Outcome 80 level of performance (meets 80)

- The partial strategy is based on an analysis of the fishery footprint in the fishery area, available information on groups of benthic species and communities in the fishery area, a review of non-catch impacts of this gear on benthic species and on inference from information in similar fisheries in other areas (see 2.5.3)
- Because the partial strategy ensures that less than 90% of the fishery area is impacted by the fishery and because of the inferred impact of the gear on those

areas that are impacted, the partial strategy is expected to restrain impacts of the fishery such that there would not be serious or irreversible harm to benthic biodiversity and community structure.

C. The measures are considered likely to work based on prior experience, plausible argument or information directly from the fishery/ecosystems involved (meets 100 for benthic biodiversity)

- The partial strategy is considered likely to work based on analyses of the fishery footprint in relation to benthic communities (information directly from the fishery/ecosystems involved)

D. There is evidence that the measures comprising the partial strategy are being implemented successfully. (meets 100 for benthic biodiversity)

- Distribution of fishing, monitored by VMS, shows that the footprint of the fishery on benthic communities is relatively small

The fishery does not meet the 100 SG for SIs A and B (benthic biodiversity) because the partial strategy in place does not meet the MSC definition of a “strategy” (MSC Guidance, GCB 3.3) - “a cohesive and strategic arrangement...designed to manage impact on that component specifically”,

Overall, the score for this PI is changed to 85, as the fishery meets 80 for one ecosystem element (trophic relationships), 90 for the other (benthic biodiversity).

**Audit Trace References**

**CERTIFICATION REPORT**

FMP; interviews Newfound Pioneer , DFO, CAPP.

**4<sup>TH</sup> ANNUAL AUDIT**

IFMP, CAPP 2015, MSC 2013

		SG60	SG80	SG100
2.5.3	<b>Information / monitoring</b> There is adequate knowledge of the impacts of the fishery on the ecosystem.	<p>Information is adequate to identify the key elements of the ecosystem (e.g. trophic structure and function, community composition, productivity pattern and biodiversity).</p> <p>Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, but have not been investigated in detail.</p>	<p>Information is adequate to broadly understand the functions of the key elements of the ecosystem.</p> <p>Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, but may not have been investigated in detail.</p> <p>The main functions of the Components (i.e. target, By-catch, Retained and ETP species and Habitats) in the ecosystem are known.</p> <p>Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred.</p> <p>Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).</p>	<p>Information is adequate to broadly understand the key elements of the ecosystem.</p> <p>Main interactions between the fishery and these ecosystem elements can be inferred from existing information, and have been investigated.</p> <p>The impacts of the fishery on target, By-catch, Retained and ETP species and Habitats are identified and the main functions of these Components in the ecosystem are understood.</p> <p>Sufficient information is available on the impacts of the fishery on the Components and elements to allow the main consequences for the ecosystem to be inferred.</p> <p>Information is sufficient to support the development of strategies to manage ecosystem impacts.</p>

Scoring Comments

CERTIFICATION REPORT

(a) Impact of prey removal on trophic relationships. The ecological role of the target species has been the subject of a targeted study in the northwest Atlantic (Hudon et al 1992), which concluded that, like other pandalid shrimp, *P. montagui* is an opportunistic predator which feeds both near bottom and in the water column. Size, habitat and life cycle are generally similar to *P. borealis*, so the ecological role is probably similar. Pandalus shrimps prey on, and are prey for a variety of species (Parsons 2005a, 2005b, 2006; Savenkoff et al 2006; all for *P. borealis* ), although other species (such as capelin for cod, fishes for seals) may be preferred prey. Trophic structures related to striped shrimp have not been studied in this area, but studies in nearby continental shelf areas (eg Savenkoff et al 2004) probably provide a general picture of trophic relationships in the fishery area.

Recent work on unobserved fishing mortality (Grant and Hiscock 2010, in press) produced in accordance with meeting a Condition in the existing certified Northern shrimp fishery in SFA 5, 6 & 7 and reported in the second annual surveillance audit report for that fishery (Moody Marine Ltd 2010) concludes that unobserved mortality is likely to be low, thus bycatch information would assess impact of the gear on non-target species relatively well.

(b) Non-catch impacts on benthic species and communities. Information on benthic and demersal communities in which the fishery operates is relatively general. Some stock assessment information is available for exploited groundfishes, but little detail is available for the most northerly area (SFAs 2 and 3). Basic life history information is available for non-commercial demersal fishes (eg Scott and Scott 1988; Fishbase). Information on benthic fauna on the Labrador Shelf is limited (C-NOPB 2008). Polychaete diversity and distribution is known for much of the Labrador Shelf (Gagnon and Haedrich 1991) while species composition of benthos, major species, and relations of distributions to environmental conditions are known for stations in Davis and Hudson Straits and Ungava Bay, in SFAs 1, 2, 3 and 4 (Stewart et al 1985). As noted above (2.4.3), information on distribution of corals, including soft and non-erect species (not covered in consideration of habitat 2.4 series) is available and is improving.

Sponge fragments, cnidarians, anthozoans, anemones, molluscs, non-Pandalus shrimps, crabs, sea cucumbers, sea stars, and hard corals are recorded but all (except unidentified crustacea at 0.03%) at less than 0.01% of the shrimp catch and in very low absolute numbers (Orr et al 2008bc; Siferd 2010). Non-catch impacts on these species and others in the benthic community could result from gear passage, i.e. impact of rockhopper gear rollers or trawl doors; these impacts may be low, given that the gear is relatively light and large rollers are used, but have not been assessed. In areas where twin trawls are used, the heavy shoe separating the codends could cause substantial damage to invertebrates over a narrow band (ca 3 m).

Ability of potentially impacted communities to recover from impacts is not known for the area, with the exception of commercial groundfishes (although there is some uncertainty about ability to recover from current low abundance levels). Inferences on recovery ability of other groups can be made from work in other areas. Ability to recover generally varies with lifespan; slow growing, long-lived species (such as some species of hard corals) will recover more slowly than short-lived species (eg tube-dwelling worms). Recovery times of hard branching corals may be in the hundreds of years (Edinger and Wilkinson 2009). A 3-year study of trawl impacts on sand bottoms on the Grand Banks suggested that benthic communities were little altered over this period (summarised by Gordon et al 2009).

With respect to general ecosystem issues, sizes of shrimp in the population are monitored annually and there have been no indications of significant long-term

shifts to smaller sizes. Bycatch size spectra are focussed on small individuals (with high mortality) because of use of the Nordmore grate.

**Score = 60 (Original) 80 (Revised)**

**CERTIFICATION REPORT**

Knowledge of ecological relationships is considered relatively good, based on a directed study on trophic relationships and by inference from *P. borealis*.

General knowledge is available on potential impacts of the fishery on benthic species and of benthic communities in the area, although this is less known for the more northerly parts of the fishery area.

The fishery meets the 60 SG in that information is available on the key elements of the ecosystem and the impacts of the fishery on these elements can be inferred.

**4<sup>TH</sup> ANNUAL AUDIT**

PI 2.5.3 This PI is rescored to 80 because:

A. Information is adequate to broadly understand the key elements of the ecosystem (meets 80)

- For this fishery, the elements for which a score of 80 was not achieved were benthic biodiversity and community structure
- Although studies of benthic species and communities have concentrated on sensitive areas (areas of sponge and coral concentration - see habitat 2.4), information is adequate to broadly understand the biodiversity and community structure of the soft-bottom habitats on which the fishery concentrates
- Maps of sediment types over the fishery area are available which show the nature and distribution of habitat types (CAPP 2015; Josenhans et al 1986; CNLOPB 2008)
- Information, while relatively sparse, on the benthic fauna of the Newfoundland-Labrador shelf has been reviewed and summarised to support a mass balance model of this area (Bundy et al 2000); major benthos groups identified for this model are echinoderms (brittle stars, sea urchins), molluscs (bivalves, gastropods), polychaetes (tube-dwelling and mobile), and others including crustaceans, nematodes and others
- Benthic species of the soft-substrate habitats on which the fishery operates are generally known from studies in the fishery area (Stewart et al 1985 for SFAs 1-4; Gagnon and Haedrich 1991 for polychaetes; Gordon et al 2009 for sand-bottom benthos on the Grand Banks), in areas near and presumably ecologically similar to this area (Chabot et al 2007 for the northern Gulf of St. Lawrence; Ramey and Snelgrove 2003) for mud/sand habitats of Placentia Bay) and in other areas in which *Pandalus* fisheries operate (Hixon and Tissot 2006, Oregon; Simpson and Watling 2006, Gulf of Maine)
- Species groupings observed by Stewart et al (1985) in the benthos of the fishery area were similar to those further south: ophiuroid echinoderms (brittle stars), polychaetes, bivalve molluscs and amphipod crustaceans were the major groups observed. The authors provided a species list by station and a summary of dominant species by station.
- Sand-bottom habitats of the Grand Banks have been the subject of most of the available studies in nearby areas, and are dominated by echinoderms and molluscs (Schneider et al 1987); mud-bottom habitats such as those where the shrimp fishery is concentrated have a high proportion of tube-dwelling polychaetes in shelf waters off southern Newfoundland (Ramey and Snelgrove 2003)

B. Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, and some have been investigated in detail (meets

80)

- With respect to “investigated in detail”, this part of the SG was scored at 80 in the certification report because of detailed studies of the position of pandalid shrimp in trophic relationships in the fishery area
- Non-catch impacts on benthic communities have been reviewed for this fishery by Grant (MS 2010), although this review focused on sensitive areas and on fish species
- Impacts of shrimp trawling on benthic communities have been studied off Oregon (Hixon and Tissot 2007) and the Gulf of Maine (Simpson and Watling 2006), while a number of studies and reviews have examined impacts of trawls on bottom communities more generally (eg Rice 2006, Kaiser et al 2006, see references in Grant MS 2010).
- NEFMC (2011) summarised available information and expert judgment in a framework for assessing gear damage to habitats and communities, including for damage to species of soft-bottom habitats
- While there is great variability between available studies in terms of the types and severity of impacts, it can generally be concluded that repeated trawling on soft-bottom habitats affects species composition, size composition of species, and thus biodiversity and community structure. Recovery times of soft-substrate species were considered to be generally 1-3 years by NEMFC (2011). While soft-bottom habitats are generally considered relatively stable and not subject to physical stress (waves, currents etc), bioturbation may be an important background drive of change (eg Simpson and Watling 2006).
- This SG does not meet 100 because not all ecosystem issues have been investigated in detail.

C. The main functions of the components... in the ecosystem are known

- This SG was scored at 80 in the certification report

D. Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred

- This SG was scored at 80 in the certification report

E. 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) (meets 80)

- VMS monitoring of fishing locations continues and the client has committed to 5-year reanalyses of fishery footprint in relation to habitat types (and thus of distribution in relation to benthic communities)
- The fishery does not meet 100 for this SG because the level of information is not sufficient to support the development of strategies to manage ecosystem impacts.

**Audit Trace References**

**CERTIFICATION REPORT**

Parsons 2005a, 2005b, 2006; Savenkoff 2006; Scott and Scott 1988; Fishbase; C-NOPB 2003, 2008; Gagnon and Haedrich 1991; Stewart et al 1985; Orr et al



2008bc; unpublished observer data compilation provided by T. Siferd, DFO; Gordon et al 2009; Grant and Hiscock 2010, in press ; Moody Marine 2010

**4<sup>TH</sup> ANNUAL AUDIT**

CAPP 2015; Josenhans et al 1986; CNLOPB 2008; Gagnon and Haedrich 1991; Gordon et al 2009; Chabot et al 2007; Ramey and Snelgrove 2003; Hixon and Tissot 2006; Simpson and Watling 2006; (Schneider et al 1987; Ramey and Snelgrove 2003; Grant MS 2010; Simpson and Watling 2006; Rice 2006; Kaiser et al 2006.

		SG60	SG80	SG100
3.2.4	<b>Research plan</b> The fishery has a research plan that addresses the information needs of management.	Research is undertaken, as required, to achieve the objectives consistent with MSC's Principles 1 and 2.  Research results are available to interested parties.	A research plan provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.  Research results are disseminated to all interested parties in a timely fashion.	A comprehensive research plan provides the management system with a coherent and strategic approach to research across P1, P2 and P3, and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.  Research plan and results are disseminated to all interested parties in a timely fashion and are widely and publicly available.

**Scoring Comments**

**CERTIFICATION REPORT**

The research survey and assessment program is described in detail in Annex D of the IFMP. For the purposes of stock assessment, all shrimp fishing areas are monitored through research surveys and sampling of the commercial catch, although the work focuses more on *pandalus borealis* than *pandalus montagu*i. Catch rates of shrimp and fish species are recorded, and detailed observations are made on shrimp size distribution, sex, maturity and egg production. These data provide useful information on the distribution and abundance of the resource, the effects of fishing, changes in the environment, and potential for the

fishery in the near future.

Other research is directed towards age determination, estimation of mortality rates, effects of environmental parameters (e.g., temperature, currents) and relationships with major predators, especially Greenland halibut and cod.

Due to the lack of research activities and scientific data in the north, the offshore licence holders formed the Northern Shrimp Research Foundation (NSRF) to conduct scientific research surveys in the north. DFO provides the scientific advice on sample design and analysis of the data collected. The first of an on-going annual survey was conducted in the summer of 2005.

Currently three study areas are being surveyed including the Resolution Island Study Area (RISA) in SFA 3, 4, the SFA 2 Exploratory and SFA 4 southeast of RISA.

A 5 year \$CAD5million research proposal by the Marine Institute of Memorial University has been developed and submitted for funding that has the objective of reducing the bottom impact of various trawls currently used in the industry. The approach for this project is to complete design and simulation using various trawl configurations, complete physical modeling using the flume tank, and then evaluate prototypes under commercial conditions.

A study is currently being undertaken by the Marine Institute to develop a methodology to use industry single beam sounders to collect bottom type data and compile these data to create an acoustic classification map for fishing grounds off Newfoundland and Labrador. The study will focus in particular on northern shrimp, although the results will be applicable to other benthic species. The study will help to guide more detailed investigation of sensitive habitats and the correlation between shrimp abundance and seabed habitat.

These research initiatives are conducted by a variety of agencies and parties and contribute to the total body of science. However, there is no plan per se that takes a strategic approach to research as is required by the 80 scoring guidepost.

**Score = 70 (Original) 80 (Revised)**

**CERTIFICATION REPORT**

The score would have been higher if there was a research plan that provided the management system with a strategic approach to research as is required by the 80 scoring guidepost.

A survey research plan is available and is published as part of the IFMP (Annex D), such as to provide management with necessary information. However, it is not comprehensive and it does not address all issues identified in the stock assessments as requiring resolution through research, especially for this pandalus montagui stock. In addition, although ecosystem issues are addressed in ongoing research, there is not a comprehensive range of research topics identified to resolve issues related to ecosystem impacts of fishing".

The research being conducted is circulated to all interested parties in a timely fashion, either directly to stakeholders, at advisory committee meetings or via the Canadian Science Advisory Secretariat (CSAS) system on the DFO website.

Research conducted in the Resolution Island Study Area (RISA) in SFA 3, 4, and in SFA 4 southeast of RISA is generally not species specific (environmental, predator study, bottom impact, etc). There is much less direct research on P. montagui than on P. borealis and the IFMP notes that there is concern about the

future of the stock as there is no fishery independent data.

4<sup>TH</sup> ANNUAL AUDIT

While the iFMP remains incomplete, the thirteen points covered in the research plan approved by the NSAC in March 2015 provides a strategic approach to analysing key P1 and P2 issues related to the shrimp fishery. The fishery meets SG80 Sla. The lack of any definition of P3 work prevents the fishery meeting SG100 Sla. PI 3.2.4 is rescored to 80.

**Audit Trace References**

CERTIFICATION REPORT

Integrated Fisheries Management Plan - Northern Shrimp - Shrimp Fishing Areas (SFAs) 0-7 and the Flemish Cap, 2007; MSC Certification of the Offshore Shrimp Fisheries (>100') in areas 1, 2, 3, 4, 5, 6 and 7. Submission for the Main Assessment by the 17 Offshore Licence Holders, September 2, 2009

4<sup>TH</sup> ANNUAL AUDIT

Research Plan, DFO letter

7. **Appendix 2: Stakeholder submissions**

No submissions were received from stakeholders for the annual surveillance audit.

8. Appendix 3: Surveillance audit information  
Marine Stewardship Council Surveillance Announcement

IFC now propose to carry out the 4<sup>th</sup> annual surveillance audit for the Canada Northern and Striped Shrimp Trawl Fishery, in accordance with MSC Certification Requirements. The audit will be carried out on site between 24-25<sup>th</sup> June 2015.

Name of Fishery	Canada Northern and Striped Shrimp Trawl Fishery			
Surveillance level and type	Level	6	Type	On-site
	Any changes in surveillance activity since PCDR / previous surveillance report		The northern shrimp ( <i>Pandalus borealis</i> ) fisheries in Shrimp Fishing Areas (SFA) 2, 3, 4, 5, 6 & 7 and the striped shrimp ( <i>Pandalus montagu</i> ) fishery in SFA 2, 3 & 4 were certified on 24 <sup>th</sup> June 2011.  The northern shrimp fishery in SFA 1 was certified on 20 <sup>th</sup> March 2012.  The fisheries have been subject to annual surveillance audits undertaken jointly through variation in the final ¼ of the year. The last audit was undertaken between 26-28 <sup>th</sup> November 2014.	
Surveillance number (tick one)	1st Surveillance		<input type="checkbox"/>	
	2nd Surveillance		<input type="checkbox"/>	
	3rd Surveillance		<input type="checkbox"/>	
	4th Surveillance		<input checked="" type="checkbox"/>	
	Other (expedited etc)		<input type="checkbox"/>	
Proposed Team Leader	Name		Ian Scott	
	Areas of responsibility		Principle 3	
	Competency criteria fulfilment details		Ian has successfully completed and passed the MSC training for Lead Assessors and undertaken more than two MSC fishery assessments within the last two years.  Ian has demonstrated an ability to: <ul style="list-style-type: none"><li>• identify likely problems for fishery under P1 and P2 that would arise from poor management ;</li><li>• understand the types of management system(s) and laws applicable to the fishery under assessment;</li><li>• Communicate effectively with stakeholders in the country in a common language; and,</li><li>• explain the elements of traceability which are relevant to fishery assessments.</li></ul>	
	Onsite?		<input checked="" type="checkbox"/>	Offsite?

Proposed team members <i>[remove if not applicable]</i>	Surveillance team member 2			
	Name		Howard Powles	
	Competency criteria fulfilment details		Howard has undertaken more than two MSC fishery assessment site visits in the last 5 years. In so doing, he has demonstrated: <ul style="list-style-type: none"><li>• The ability to describe the intent and requirements of the MSC fisheries standard;</li><li>• His ability to score a fishery using the default assessment tree;</li><li>• How conditions are set and monitored;</li><li>• A knowledge of, and ability to interpret, scientific information relating to the biological processes of the target species;</li><li>• His ability to undertake a stock assessment using stock assessment techniques relevant to the fishery;</li><li>• His knowledge of, and ability to interpret, scientific data relating to fishery impacts on the ecosystem.</li><li>• His ability to communicate effectively with stakeholders in the country in a common language; and,</li><li>• Explain the geographical, cultural, and ecological context of the fishery under assessment.</li></ul>	
	Onsite?	<input checked="" type="checkbox"/>	Offsite?	<input type="checkbox"/>
	Surveillance team member 3			
	Name			
	Competency criteria fulfilment details			
	Onsite?	<input type="checkbox"/>	Offsite?	<input type="checkbox"/>
Audit/review time and location	The audit will place the week of 22 <sup>nd</sup> June 2015. Meetings with DFO and the client will take place in St John's Newfoundland.			
Assessment/ review activities	The audit will include a review of: a. Changes to the fishery and its management; b. Performance in relation to any relevant conditions of certification; c. Any developments or changes within the fishery which impact traceability and the ability to segregate MSC from non-MSC products; and d. Any other significant changes in the fishery.			

IFC would like to encourage all stakeholders with an interest in this fishery to contact us at [fco@intertek.com](mailto:fco@intertek.com) - either to submit comments for consideration by the surveillance team or to ask to speak with the surveillance team directly. If you would like to do this please let us know as soon as possible so that we may schedule a suitable time and venue for this.

The MSC provides guidance and forms for submission of any stakeholder comments, which can be found here:

<http://www.msc.org/documents/get-certified/stakeholders>

**Submitted by:** Paul Knapman  
**Date:** 20<sup>th</sup> May 2015



**Surveillance Team**

Ian Scott

Ian is a fisheries consultant specialising in fisheries certifications, fisheries policy and fishery management issues with over 30 years of experience in the fishery sector. In recent years he has advised the Governments of Turkey, Montenegro, Serbia, Mauritius and Yemen on fisheries policy, including fisheries management, fleet development, the need for scientific research and fishery related environmental issues. He has co-prepared fisheries management plans for Turkey, Serbia and Montenegro. Ian has completed or is completing work as lead auditor and P3 specialist on assessments of Portuguese sardine, Canadian sablefish, Scotia Fundy haddock, BC dogfish, Mexican skipjack and yellowfin, UK beam trawl fisheries, U.S. dogfish, Maldives skipjack and yellowfin, Lake Waterhen walleye and Northern pike, Chilean hake and shellfish. He has completed a large number of pre-assessments in Ecuador, Mexico, the USA, Canada, Portugal, Greenland and Spain. He is trained in the use of RBF. He was a key member of the MSC field trial RBF evaluation team for Peruvian and Ecuadorian mahi mahi. He is a trained chain of custody auditor.


Howard Powles

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

**9. Appendix 4. Revised Surveillance Programme**

See recertification report.

10. Appendix 5. DFO Letter



Fisheries and Oceans  
Canada

Pêches et Océans  
Canada

Your File

Voire référence

Our File

Notre référence

JUN 09 2015

Mr. Bruce Chapman  
Canadian Association of Prawn Producers  
1362 Revell Drive  
Manotick, Ontario  
K4M 1K8  
bchapman@sympatico.ca

Dear Mr. Chapman:

RE: Northern Shrimp MSC Fourth Annual Audit and Recertification

Please find the Department's written response to your request to provide information required for the upcoming Marine Stewardship Council's (MSC) fourth annual audit and recertification of the Northern Shrimp fishery for Shrimp Fishing Areas 1-7 that will occur June 24, 2015, in St. John's, NL. We understand this audit will assess this fishery against required certification conditions, and will also examine if there have been any significant changes in the fishery and/or in the management approach since the last annual audit, completed in November 2014. In my capacities as Chair of the Northern Shrimp Advisory Committee (NSAC) and Acting Director General of Fisheries Resource Management, I would like to provide some points on the management aspects of this fishery from Fisheries and Oceans Canada's (DFO's) perspective.

The Department can confirm that there have been no material changes in the strategic management approach to this fishery. The process used for the assessment of the Northern Shrimp resource in the Eastern and Western Assessment Zones (formerly SFAs 2 and 3), SFAs 4, 5 and 6 has not changed; it continues to encompass the provision of stock status advice via departmental Science Advisory Reports. The assessment of the resource in SFAs 1 and 7 continues to occur by NAFO's Scientific Council. Conditions of licence and data collection for the Canadian fishery have remained the same. The governance structure and consultative processes remain the same, with the NSAC convening face to face every second year unless there is a need to meet during the interim year (as was the case in 2014). NSAC is scheduled to next meet in 2017.

A process to update the Harvest Control Rules for SFAs 1-6 is ongoing through a committee of NSAC. Due to the closure to commercial fishing for 2015, NAFO has suspended the development of HCRs for 3LNO (SFA7).


.../2

Canada

Ottawa, Canada  
K1A 0E6

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 Acoura

## SFA 1

In July, 2014 Canada and Greenland held preliminary discussions regarding a potential conservation and management agreement for the transboundary Northern shrimp stock that in Canadian waters comprises SFA 1.

Encouraged by Greenland's indication of support for a potential agreement, departmental officials and some industry members met face to face with Greenlandic counterparts in late February, 2015 for formal negotiations. Negotiations are ongoing, albeit slowly, however it should be noted that it is unlikely an agreement can be expected in 2015.

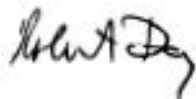
In the absence of an agreement with Greenland, Canada established a 60,000t TAC for 2015 based on NAFO's Scientific Council. Consequently, Canada's share is 8,500t (14.2% of the TAC).

## Integrated Fisheries Management Plan

The current *Integrated Fisheries Management Plan* (IFMP) continues to be updated and has undergone substantive revisions. However, at this juncture the IFMP is not sufficiently developed to be released. The Department plans to have a revised IFMP in place for the 2016 fishery. Should a draft be completed in the interim, this will be made available. Stakeholders will be provided the opportunity to provide input and comments on the updated draft IFMP over the coming months. The current IFMP in use for Northern Shrimp became operational in 2007, and as an evergreen document still serves to describe the important components and management measures in place for the fishery and is updated as necessary.

In summary, there have not been any material changes to the assessment of the resource, the management environment or management measures that would negatively affect the status of this certification.

Sincerely,



Sylvie Lapointe  
A/Director General  
Fisheries Resource Management