FINAL REPORT

Socio-Economic Impacts of Shrimp Quota Reductions in Newfoundland and Labrador

DEPARTMENT OF FISHERIES AND AQUACULTURE MARCH 2015

Newfoundland Labrador

Report

Socio-Economic Impacts of Shrimp Quota Reductions in Newfoundland and Labrador

Submitted to:

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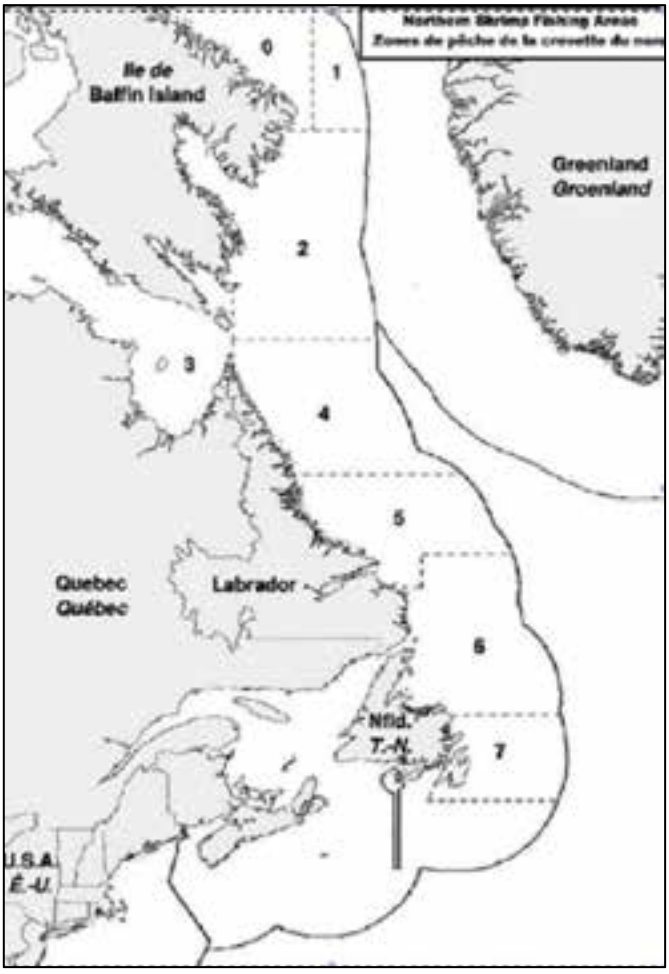
Executive Summary

Background: The purpose of this project is to review and assess the socio-economic importance of the NL shrimp industry, and determine the impact of current and possible further reductions in shrimp quotas for both the inshore and offshore sectors.

The outcome of the assessment identifies the scope of impacts as a result of anticipated quota reductions to both the inshore and offshore sectors. Mitigation measures to address some of the short and long term challenges faced by the shrimp sector are provided.

Structure of the shrimp industry: Export revenues generated by the shrimp industry in NL in 2013 were $278 M, comprising 25% of all NL seafood sector revenues. The estimated direct employment in the shrimp industry was 3,419 people, comprised of 1,325 inshore vessel crewmembers, 648 offshore crewmembers and 1,446 inshore plant production workers.

Exhibit E.1: Shrimp fishing areas



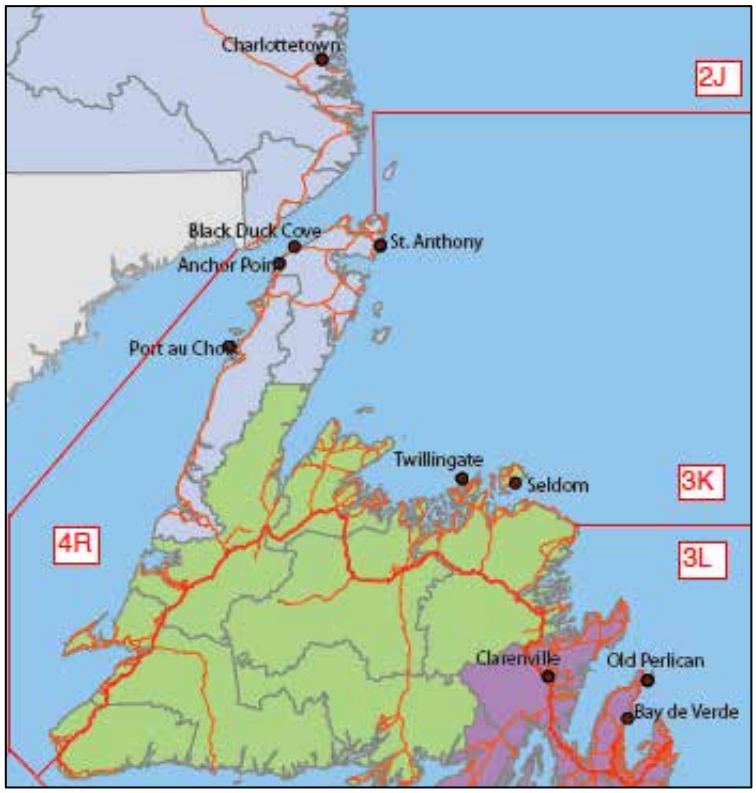
The shrimp fishery is currently carried out with up to 260 inshore enterprises, which supply 10 shore-based cooked and peeled processing plants, and 10 offshore vessels which process frozen raw and cooked shell-on shrimp. Annual shrimp allocations are assigned by Shrimp Fishing Areas (SFA's) to each harvest sector and to special allocation holders comprised of First Nations and community groups or companies.

The offshore sector currently harvests shrimp in SFA 2 through 7, whereas inshore enterprises fish in SFA 5 through 7 and on the west coast of Newfoundland. Shrimp is not currently harvested in SFA 0+1 due to the low abundance of shrimp in the areas.

Many special allocation holders assign their quota, under lease and/or profit sharing arrangements, to be harvested by offshore vessel operators. However, some special

allocations assigned in southern and northern Labrador are now harvested by inshore enterprises.

Exhibit E.2: Shrimp processing plant locations

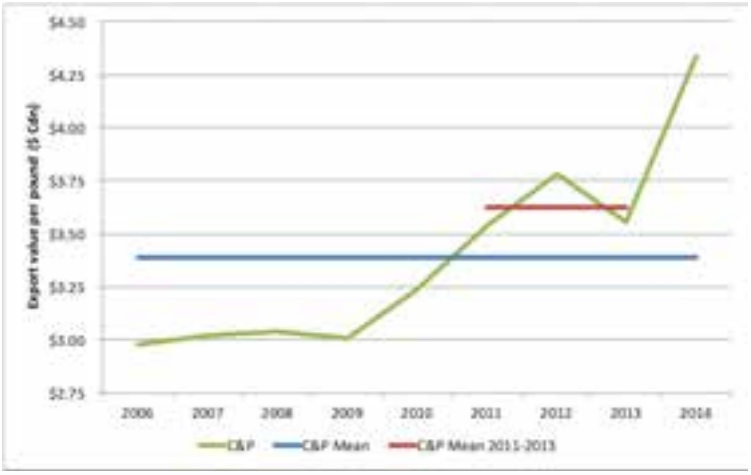


There are currently 10 shrimp plants operating in NL, down from a peak of 13. Landings from inshore harvesters are processed almost exclusively into cooked and peeled product form.

There were several value-added facilities in the past; however, there have never been any significant quantities of shrimp produced into value-added formats.

NL shrimp supplies are a coldwater northern species that comprise only a small part of world shrimp supplies. As such, they must compete with other wild and aquaculture supplies. Recent declines in coldwater shrimp and aquaculture supplies, coupled with favourable exchange rates have resulted in higher market returns to the coldwater shrimp sector over the past three years.

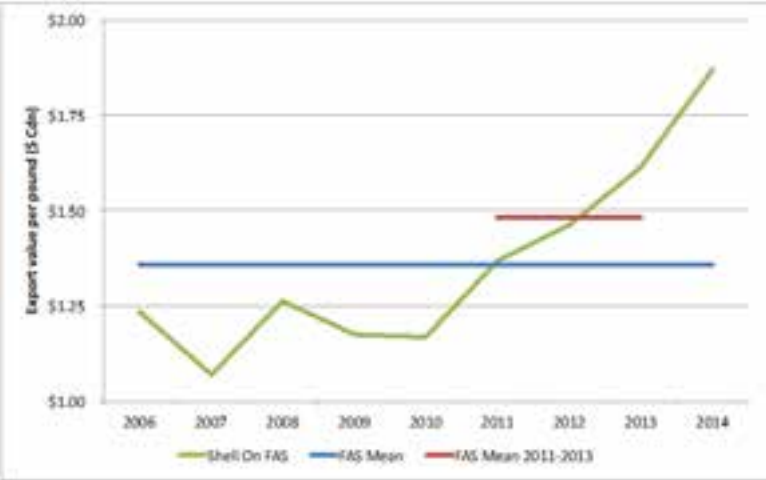
Exhibit E.3: Cooked and peeled (C&P) export prices



Favourable market conditions are likely not sustainable over the mid-term. Expectations are that aquaculture supplies will increase significantly over the next two years resulting in coldwater prices returning to normalized levels similar to returns realized from 2011-2013, albeit higher than long term average prices.

The offshore frozen sector has encountered additional challenges with the ban on Canadian seafood in Russia and the recent political unrest in the Ukraine. Combined, these two countries comprised 30% of the offshore export value in recent years.

Exhibit E.4: Frozen at sea (FAS) export prices



Methodology used for supply forecasts and economic models: The economic analysis projects the impact by sector of possible shrimp quota reductions in the short, medium and long-terms. The allocation of these quota reductions for the inshore and offshore sectors are based on historical allocations and fishing performance. For example, the NL offshore fleet has landed 56.5% of the total offshore quota shares in NL ports over the 2009-13 time period. This percentage is lower than that of inshore because the quotas in northern SFA's, 0+1, have not been harvested in recent years, and three offshore vessels land in Nova Scotia. The inshore fleet landed 97.5% of its available quotas in NL ports (Appendix VII) in 2012-13.

These allocation percentages were projected using three allocation models to determine sectoral and overall economic indicators for Gross Domestic Product (GDP), direct and indirect income, and Person Years (PY's) of full-time equivalent employment. The allocation models used for these projections include:

- **Model 1 – 'LIFO'**: The inshore bears 90% of SFA 6 reductions.
- **Model 2 – 'Inshore % Maintained':** The inshore share in SFA 6 remains at 65.6% of reduced quotas, which was the 2014 share.
- **Model 3 – 'Balanced Reduction':** The inshore and offshore equally share future SFA 6 quota reductions.

The supply forecasting process provides the basis for estimates of lost economic outputs for both harvesting sectors and the inshore processing sector. The estimated outputs are summarized in the following table for each model and time period.

Shrimp landings in the inshore sector could decline up to 60% from 2013 to 2015: Consultations with industry stakeholders and shrimp research scientists, coupled with

review of all recent documentation regarding the status of the shrimp stocks, indicates that shrimp allocations to inshore enterprises in NL may decrease up to 60% in 2015 versus 2013 using the existing allocation method.

The following exhibit illustrates the anticipated landings for each sector using the LIFO model and alternative allocation models. Given the short term prognosis of the stock, the 2016 (2016/17 season) outcome may well represent the 2015 fishery. Regardless of the allocation sharing method, there is an immediate short term challenge in the inshore sector, as shrimp landings are anticipated to decline 41% to 60% versus 2013.

Exhibit E.5: Forecasted landings by sector and percent reduction versus 2013

	2013	2016		2019		2024	
	MT	MT	Reduction	MT	Reduction	MT	Reduction
Model 1 - LIFO							
Inshore harvesting	50,768	20,213	60%	15,087	70%	14,996	70%
Offshore	40,571	33,071	18%	30,217	26%	29,225	28%
Total landings in NL	91,340	53,284	42%	45,304	50%	44,220	52%
Onshore processing	17,073	6,798	60%	5,074	70%	5,043	70%
Model 2 - Inshore % Maintained							
Inshore harvesting	50,768	25,496	50%	19,153	62%	19,062	62%
Offshore	40,571	32,422	20%	28,335	30%	27,343	33%
Total landings in NL	91,340	57,918	37%	47,488	48%	46,404	49%
Onshore processing	17,073	8,574	50%	6,441	62%	6,410	62%
Model 3 - Balanced Reduction							
Inshore harvesting	50,768	29,746	41%	23,462	54%	23,370	54%
Offshore	40,571	28,038	31%	25,852	36%	24,859	39%
Total landings in NL	91,340	57,784	37%	49,313	46%	48,229	47%
Onshore processing	17,073	10,004	41%	7,890	54%	7,859	54%

Note: 2016 = management year 2016/17 etc.

These projected quotas cuts will result in fewer shrimp processing plants and active inshore and offshore harvesting operations before the end of the ten-year projection horizon. Subsequently, this will result in fewer individuals being employed in the shrimp industry with the resulting loss of disposable income and spending in those rural areas associated with shrimp harvesting, processing or transshipment.

> ***Conclusion:*** *The short term impact to the inshore sector from stock declines will be significant, and mitigation measures to reduce the immediate impact must be considered.*

The economic impact of shrimp supply declines is very significant: The GDP impact to the region is significant, ranging from $96 to $167 M in the short and long term respectively, with only modest differences to the scale of impact by model. Similarly, labour impacts are anticipated to $62-$70 M in the short term and $93-$101 M in the long term.

These projected quota reductions indicate a considerable rationalization/consolidation of both fleet sectors and onshore processing capacity will be needed. The practical means of achieving this capacity reduction will likely come from a combination of voluntary exits, combining of enterprises, bankruptcies and development of alternative resource opportunities.

Exhibit E.6: Estimated economic impact of shrimp quota declines

Model	Impacts	Short Term 2016	Mid Term 2019	Long Term 2024
Model 1 LIFO	GDP ($ M)	$113.0	$147.6	$166.5
	Income ($ M)	$69.6	$89.1	$101.5
	PY's (#)	951	1,139	1,142
Model 2 Inshore % Maintaine	GDP ($ M)	$97.0	$139.0	$157.1
	Income ($ M)	$61.7	$85.2	$96.9
	PY's (#)	847	1,092	1,097
Model 3 Balanced Reduction	GDP ($ M)	$96.0	$131.6	$148.9
	Income ($ M)	$62.2	$81.7	$92.9
	PY's (#)	865	1,056	1,060

Conclusion: *In 2024 dollars, the long-term GDP impact is anticipated to be $149-$167 M, a loss of $93-$101 M of income and 1,060-1,142 full-time equivalent jobs.*

The most important finding is the significant level of impacts from the total lost industry outputs under any of the models. These are a direct function of the total projected quota reductions, independent of allocation arrangements. With general consensus in the industry that further quota declines are inevitable, the issue is how can governments and industry work jointly to prepare for this eventuality.

Social implications will be far reaching: The anticipated declines in shrimp landed in NL will have significant implications on all sectors directly involved in the shrimp industry and adversely affect communities. The shrimp industry affects many communities throughout rural Newfoundland and Labrador. There are 10 communities where processing plants are now located; three others where transshipment facilities operate; many ports where shrimp is landed; 100 or more communities where plant workers and harvesters reside and numerous communities that are the beneficiaries of offshore harvesting arrangements. The structure of the shrimp industry results in a wide spread proliferation of incomes earned and spent in rural areas where overall employment opportunities are lower than in urban centres.

The immediate impact of shrimp quota declines in 2014, 17% lower than 2013, were cushioned by extraordinary market prices, favourable exchange rates and continued high catch rates. Indications are that these favourable conditions may be short lived and prices

will return to a normalized, though higher than average, level as buyers resist prices and alternative warm water supplies become more abundant.

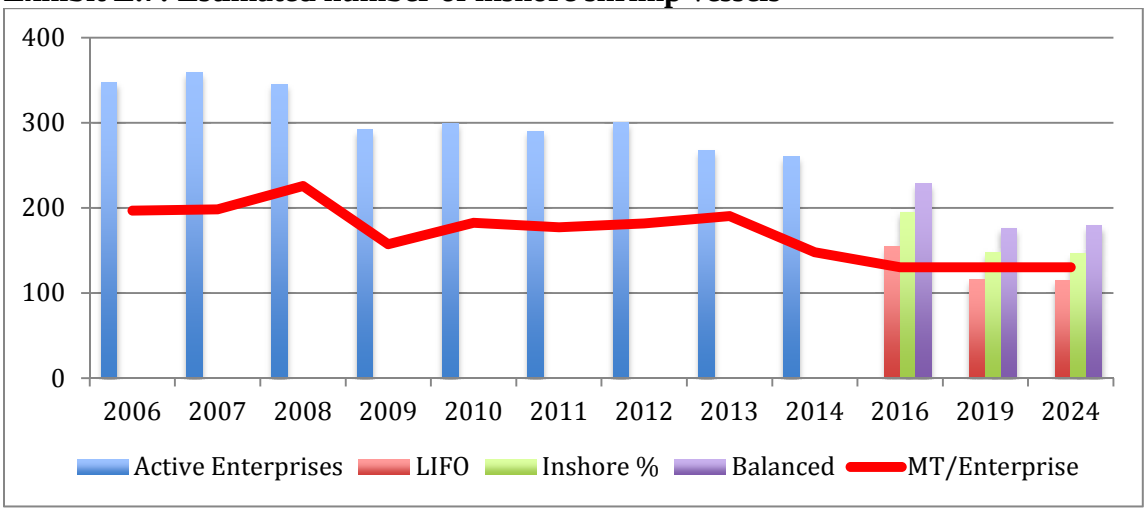
The implications of current supply reductions would have been much more acute had favourable market conditions not existed in 2014. Many harvesting and processing operations would either have operated at significant losses or not operated at all, as existing capacity exceeds current resource availability. With further resource declines and possible reductions in market prices, shrimp stakeholders will likely have to undergo a radical reduction in capacity in the short term. This will result in a significant number of job displacements, reduction in incomes for many remaining in the sector and plant closures in several communities.

The social impacts that come with declines in shrimp quotas are those that affect individuals and communities and which are either not picked up by impacts modeling or are not measurable. They are a function of several things that influence how individuals or communities fare going into the future.

Discussions with community leaders where shrimp plants have already closed indicate there has been a significant reduction in the tax base for the towns. These towns have had little success in replacing lost tax revenues; however, efforts continue to develop new opportunities. The plant closures have also affected local businesses as outmigration and reduction in disposable income has drastically affected spending.

Inshore sector impacts: The inshore fleet will need further capacity reduction as the supply per vessel declines due to anticipated quota reductions. The numbers of vessels that could be supported in the mid and long term will be less than 200 under the most favourable allocation model and slightly more than 100 vessels under the least favourable. The practical results of this need to rationalize will come from some combination of permanent voluntary exits, more combining of enterprises, development of other fishing opportunities and possibly bankruptcies.

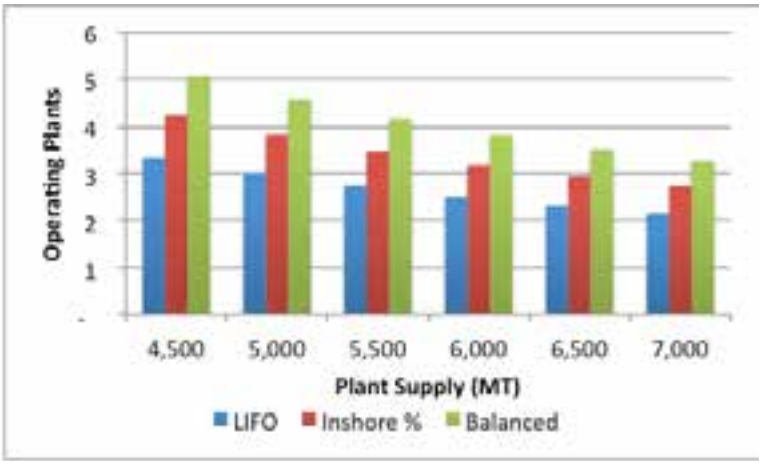
Exhibit E.7: Estimated number of inshore shrimp vessels



Currently, the cooked and peeled shrimp processing sector faces significant challenges, which will only become more acute as supply continues to decline. Some capacity reduction has already occurred with 10 plants operating in 2014, down from 13 in 2010.

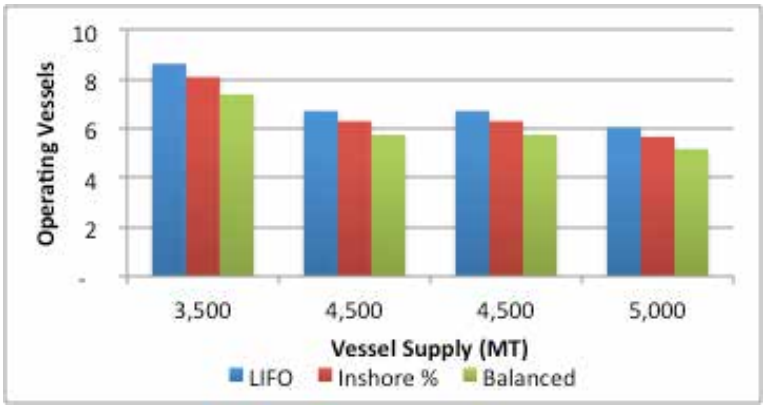
Supply to onshore processors has been reduced more than 50% since 2008, averaging an estimated 3,800 mt per plant in 2014. Anecdotal information suggests that a minimum of 4,500 mt of supply is required to sustain a plant given favourable market conditions and current operating practices. A processing sector that can maintain competitive advantage through ongoing modernization would need supply levels of 6,000-7,000 mt.

Exhibit E.8: Plants required at different supply thresholds



In 2014, 10 plants operated versus the three to five plants required in 2019 under the different supply models. However, with supply of 7,000 mt to maintain long term viability, only two to three plants would remain active in the mid to long term.

Exhibit E.9: NL offshore vessels at various supply levels



Offshore sector impacts: Some rationalization of the offshore sector has already occurred in response to recent supply reductions. One vessel has been retired and another may be decommissioned in the near future. Based on the model outputs and various breakeven volumes, the adjacent chart illustrates the number of vessels that will be required using projected allocations. When contrasted to current vessel activity, more than 50% of the existing capacity may have to be removed.

> ***Conclusion:*** *The shrimp industry is very geographically diverse, so declines in shrimp stocks will impact many communities in rural areas due to harvest and process capacity reductions and loss of income.*

Mitigation strategies are unlikely to address the scope of impacts in the short term: Several mitigation measures are proposed for consideration by governments and industry stakeholders. However, the economic losses, nearly 50%, due to shrimp stock reductions, are unlikely to be replaced by any individual measure in the short term.

Any consideration of reassignment of shrimp from the offshore to inshore sectors will have negligible effect on the provincial economy, as the GDP and income effects are very similar for each sector. Therefore, support for any strategy must give consideration to social factors, the number of people impacted, aging demographics within each sector, vessel age and harvesting options, and long term strategic growth considerations for the NL seafood sector.

- **Alternative allocation and management methods can be considered**. Inshore stakeholders have recommended alternative means of allocating shrimp, including the two methods examined. Other alternatives proposed by these stakeholders for consideration include:

  - ✓ Reallocate SABRI allocation in SFA 6 (3,000 mt) to another fishing area and provide this quota to inshore participants, or permit inshore enterprises to harvest the SABRI quota in SFA 6..

  - ✓ Combine SFA 6 and SFA 7 biomass estimates for determination of TAC in SFA 6.

  - ✓ Provide additional access in SFA 5 to those affected by SFA 6 reductions.

  - ✓ Provide all SFA 6 TAC exclusively to the inshore sector.

- **Increase utilization of species.** There are several species quotas that have not been fully utilized in recent years including cod, yellowtail and redfish. There has been up to 30,000 mt of these species left in the water annually. Though values are lower than shrimp, exploiting these species to a higher degree could offset the economic losses from shrimp stock declines. Current management policies in NL do not permit easy transfer of these stocks from one sector to another, resulting in lost economic opportunity.

- **Diversify shrimp supply streams at inshore plants**. The operating models of coldwater plants in other jurisdictions have increased dependence on frozen supplies when fresh supplies have declined. Further, in jurisdictions that have favourable trade regimes with the EU, plants produce many small consumer ready packs that result in higher per unit sales values. As inshore supplies continue to diminish, producers must consider alternative methods of utilizing capital to ensure the sector is financially sustainable in the future.

- **Debt reduction would benefit inshore enterprises.** Many inshore enterprise owners have stated that significant debt was accumulated through rationalization that commenced when licenses were granted permanent status by DFO, and licenses being recognized as collateral.

Given forecast shrimp stock reductions, inshore enterprises will have challenges supporting debt that may result in some bankruptcies. Further, it has been demonstrated that further harvest capacity reduction is required, which likely will not occur to the degree necessary given current debt loads. Inshore stakeholders have suggested a government sponsored license buyback would ensure further rationalization, and debt reduction support would reduce bankruptcies.

- **Examine options for more access to traditional resources.** Options proposed by inshore shrimp harvesters include allocation of more Greenland Halibut to Canadian stakeholders, increase halibut bycatch allowances in inshore fisheries, and as cod quotas increase permit inshore vessels to fish using the gear most suited to the enterprise.

- **Improve understanding of shrimp stocks**. All stakeholders and DFO science branch, acknowledge that the understanding of shrimp stocks and their relation to key ecosystem factors can be improved. Though more of a mid or long term mitigation measure, an improved understanding of shrimp stocks by means of increased survey activity and/or alternative stock modeling techniques, may result in higher confidence in results and sustainably higher TAC's.

- **Markets for whole shrimp can be diversified.** Offshore stakeholders have stated the need for further market diversification and penetration to reduce market risk and increase returns. There appear to be opportunities to develop premium markets for whole shrimp in Korea, India, EU, and expand markets to inland China. Further, with increased montagui harvests and no outlet for this species in Russia, alternative markets should be sought to support long term sustainable development of this species.

- **Investigate opportunities for alternative fisheries.** Several inshore stakeholders cited the need to examine development opportunities for non-traditional species as a long term mitigation measure. Specific samples cited during consultation were spiny and porcupine crabs in 2J. However, other areas and species would be identified through further consultation with harvesting stakeholders.

It is unlikely that any one of these mitigation strategies can address the short term economic impact of anticipated shrimp stock reductions. However, if a number of these initiatives were adopted, there may be adequate cushioning for the inshore sector during the period necessary to transition from a shellfish based industry to a more groundfish dominant industry.

Concluding Recommendation: *The most significant over-riding conclusion is that a joint government/industry planning initiative should be undertaken to address short term challenges in the inshore shrimp sector, and develop a strategy for the expected transition from a shellfish based fishery to one more dominated by groundfish.*

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1.0 BACKGROUND

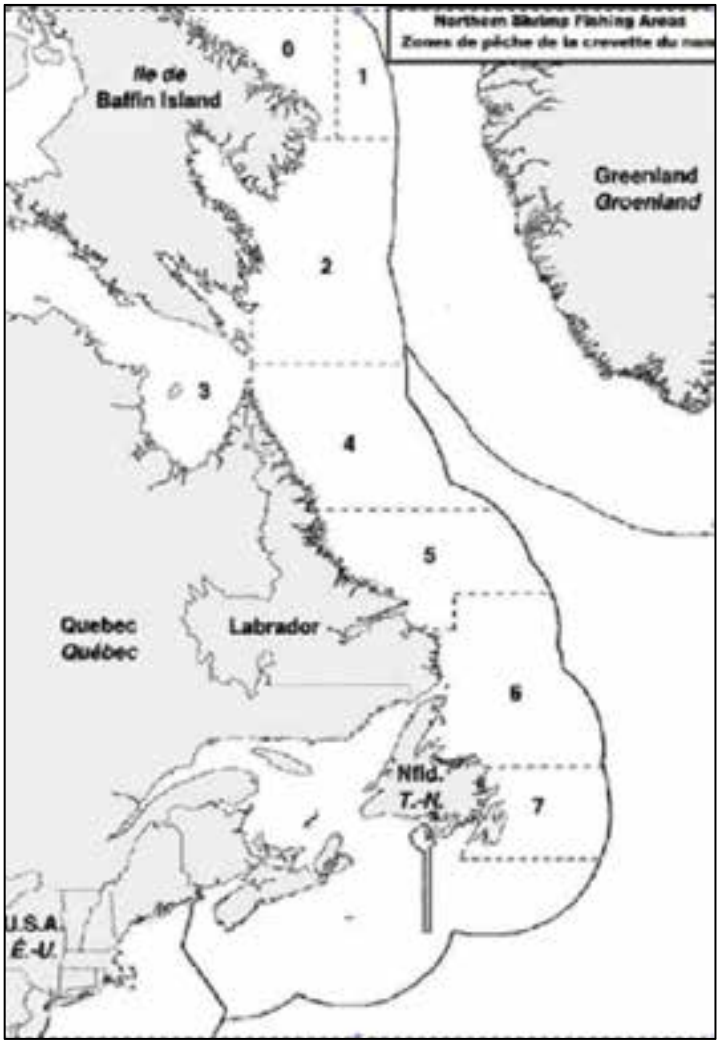
1.1 Project Purpose

The purpose of this project is to review and assess the socio-economic importance of the NL shrimp industry, and determine the impact of current and possible further reductions in shrimp quotas for both the inshore and offshore sectors.

The outcome of the assessment identifies the scope of impacts as a result of anticipated quota reductions to both the inshore and offshore sectors. Mitigation measures to address some of the short and long term challenges faced by the shrimp sector are provided.

1.2 History of the Shrimp Fishery

Exhibit 1.1: Shrimp Fishing areas (SFA's)



The first commercial shrimp fishery in Newfoundland and Labrador was established in the northern Gulf of St. Lawrence (4R) by <65' vessels from the northwest coast of the province. The "Northern Shrimp Fishery" commenced in the early 1970's after exploratory fishing operations confirmed the presence of commercial shrimp stocks from Baffin Island to the northeast coast of Newfoundland. Access to this new shrimp resource was distributed amongst various stakeholders in Newfoundland and Labrador, Nova Scotia, New Brunswick and Quebec. The first eleven offshore vessel licences were issued in 1978; one was added in 1979, four in 1987 and one in 1991 for a total of 17. Seven of the offshore licences are held by First Nation and other special interests groups. Initially, these offshore licences fished from NAFO 0+1 to northern 3K. They later received access to the Flemish Cap (3M) fishery (1993)

and to Shrimp Fishing Area (SFA) 7 in 2000. The 3M fishery was managed by allocations of days-on-ground instead of Total Allowable Catch (TAC's); however, Canadian fishing activity in the area was very limited prior to the area closing in 2010 and being put under moratorium in 2011.

Initially, the offshore licences received equal shares of the annual TAC's. These were formalized as individual quotas (IQ's) under an Enterprise Allocation regime in the late 1980's. Temporary transfers are permitted during the fishing year, permanent transfers are not permitted but the sale of companies holding the allocations is allowed, subject to ownership rules. Further, when the offshore northern shrimp fishery commenced, Canadian licence holders were permitted to utilize foreign owned vessels to fish their allocations. The Canadianization of this fishery eventually resulted in a fleet of 10-12 Canadian owned vessels that now fish the allocations held by the original 17 licence holders (14 companies), other First Nation and special interest groups. All the NL owned vessels are reported to use local crews while several owned outside the province employ a portion of Newfoundland and Labrador residents as crewmembers.

By 1997, northern shrimp abundance had increased significantly. To offset the groundfish that had been lost to the inshore fishery since the 1992/93 groundfish moratoria, temporary inshore licences were introduced giving priority access for quota increases to directly adjacent NL (2J, 3KL, 4R) <65' fleets and those on the lower Quebec North Shore (4S). These licences were categorized as temporary rather than permanent, implying that they might not be re-issued at some point in the future. Inshore operators of 45'-65' vessels had to "gear up" by a specified deadline to receive one of these temporary licences. The cost of converting and equipping a vessel for shrimp is reported to have ranged from $200,000 to $400,000.

The method of determining access and allocation has changed over time and these sharing principles and arrangements are detailed in the Northern Shrimp Management Plan (Annex F). A three-year fishing plan announced in 1997 gave significant quota increases to both the offshore and temporary inshore licences. Most of this increased access was located in SFA 6 which encompasses 2J and 3K. In addition to the new commercial fleet allocations, a series of First Nation and Special Interest allocations also began in 1997. These allocations occurred initially in SFA's 5 and 6; commenced in SFA 2 in 1999; in SFAs 2 and 3 in 2002 and SFA 4 in 2003. The shrimp fishery in SFA 7 commenced in 2000. The TAC in SFA 7 is set by NAFO, and National Allocations are given to Contracting Parties. Both the inshore and offshore fleets and some special interest groups were allocated shares of the Canadian National Allocation in SFA 7.

The TAC for northern shrimp in SFA's 0 to 7 increased from 85,000 mt in 1998 to just over 177,000 mt in 2009. Apart from 3M, the first declines in the overall TAC began in 2010 in SFA 6. After a slight increase in 2012 and 2013 the SFA 6 TAC was reduced again in 2014. Reductions in the SFA 7 TAC first began in 2011 and this fishery was

closed in 2015. There was also a 10% reduction in the SFA 5 TAC in 2014 and a slight increase for SFA 4. Overall, the 2014 TAC's for SFAs 0 to 7 totaled 99,500 mt, the first year since 1998 that northern shrimp TAC's were less than 100,000 mt.

The last additional First Nation and Special Interest allocations in this fishery occurred in 2003. Except for Land Claims based allocations, these shares in a given SFA are slated to be eliminated completely when the TAC for a specific SFA falls below the level at the time the allocation was granted. Since 1997, a total of 21 such allocations have been made. In 2014, a total of 16 remain in effect. These allocations are generally fished through an arrangement with one of the offshore vessel operators, though a small portion of special allocations in Labrador is now executed using inshore vessels.

The additional commercial access to the northern shrimp fishery granted in 1997 (and later) was indicated as being on a temporary basis and that these allocations would be removed in the order in which they were received. A total threshold of 37,600 mt across all SFA's, based on 1996 quota numbers, was established to ensure the continued viability of the 17 offshore licence holders. In addition, this overall threshold had a provision that any post-1996 commercial quota allocations would terminate when the TAC for any SFA fell below its 1996 level. In 2003, this was described as being the principle of "last in first out" and became known as LIFO. In 2006, additional access to the shrimp fishery was frozen to encourage short term stability. In 2007, temporary licences were converted to regular or permanent licences "to further promote stability in the inshore fleet." This meant the licence was now considered to be permanent in nature and not subject to sudden termination at some point as is the case with temporary licences or "permits".

1.3 Inshore Harvesting Sector

The inshore harvesting sector operates with vessel sizes of 45'-90' in length. Quotas assigned to the inshore sector in most years are fully exploited. Landings in 2014 declined to 50% of peak levels in 2008. The landed value in 2014 increased over 2013 providing an estimated $75 M of revenues to licensed enterprises.

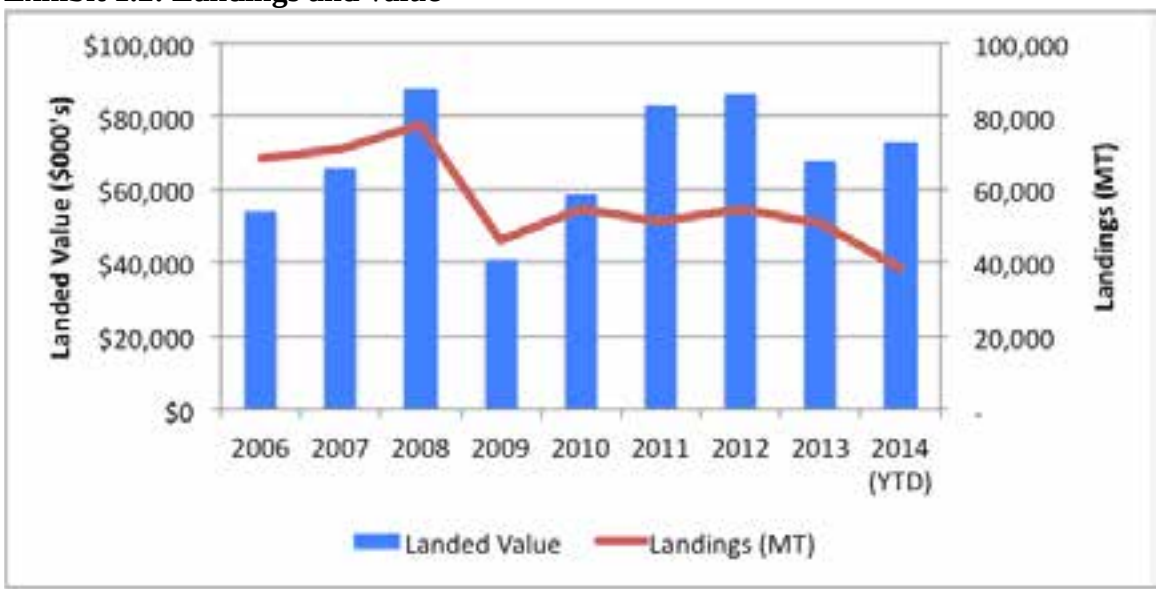
The inshore harvesting sector is comprised of three groups of vessels, each of which have different levels of reliance on SFA 6 shrimp access.

- 4R vessels are traditional shrimpers with access to shrimp in the Gulf region. The majority of these vessels are licensed to fish shrimp in SFA 8-12, and seven are licensed only for SFA 8. Though all vessels hold groundfish and most have pelagic licenses, the reliance on revenues is based on shrimp.

- 3L vessels have a high reliance on snow crab, and pursue other groundfish and pelagic species as available.

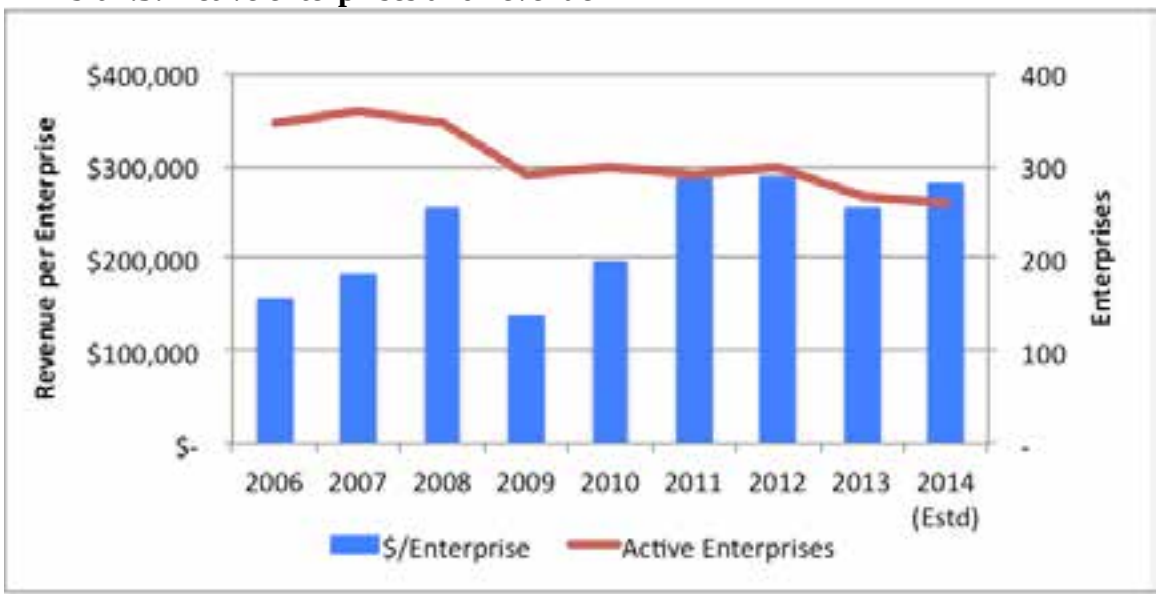
- 2J3K vessels have significant reliance on shrimp, particularly since recent declines in snow crab stocks in the area. Other groundfish and pelagic species are harvested, but have limited availability.

Exhibit 1.2: Landings and value



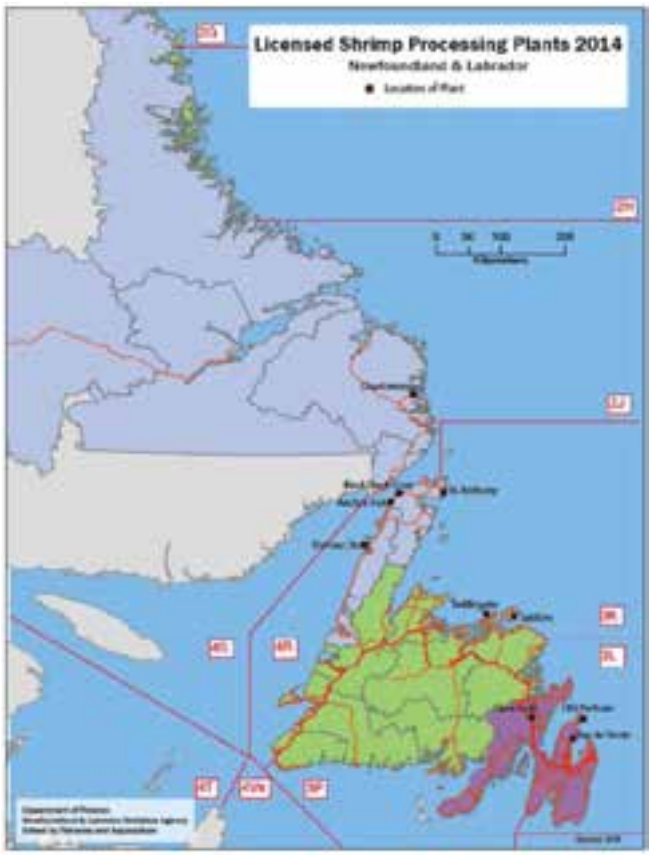
The number of enterprises has declined 25% since 2006 and is currently at ~260 active enterprises, which provide employment to at least 1,300 crew. The licence combining that has occurred since 2007, coupled with higher prices has permitted active enterprise revenues to remain strong for the past four years.

Exhibit 1.3: Active enterprises and revenue



1.4 Onshore Processing Sector

Exhibit 1.4: Plant locations and NAFO areas

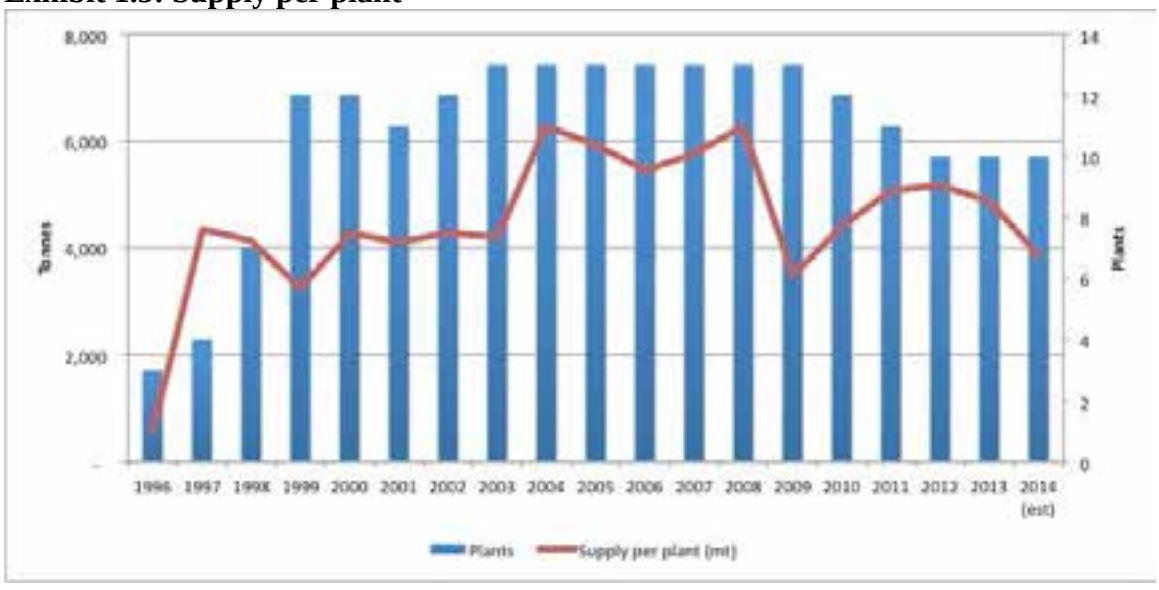


Inshore shrimp landings are processed almost exclusively into cooked and peeled products. Several value-added facilities undertook limited production in the period reviewed; however, the volumes and benefits of those operations are very limited and have been excluded from this analysis.

There are currently 10 shrimp plants operating in NL, down from a peak of 13. The three plant closures occurred from 2010-2012 when one was closed permanently by the operator due to logistical challenges, one was lost due to a storm flooding the facility, and the third, which license expired December 31 2014, lost to a fire.

To ensure viability of the inshore processing sector a shrimp supply threshold per plant (Vardy Report) was established at 8,000 mt and this has remained the threshold under the Fish Processing Licensing Board guidelines. As illustrated below, the sector is now at 50% of this threshold; indicating excess capacity exists, likely resulting in financial strain on the sector.

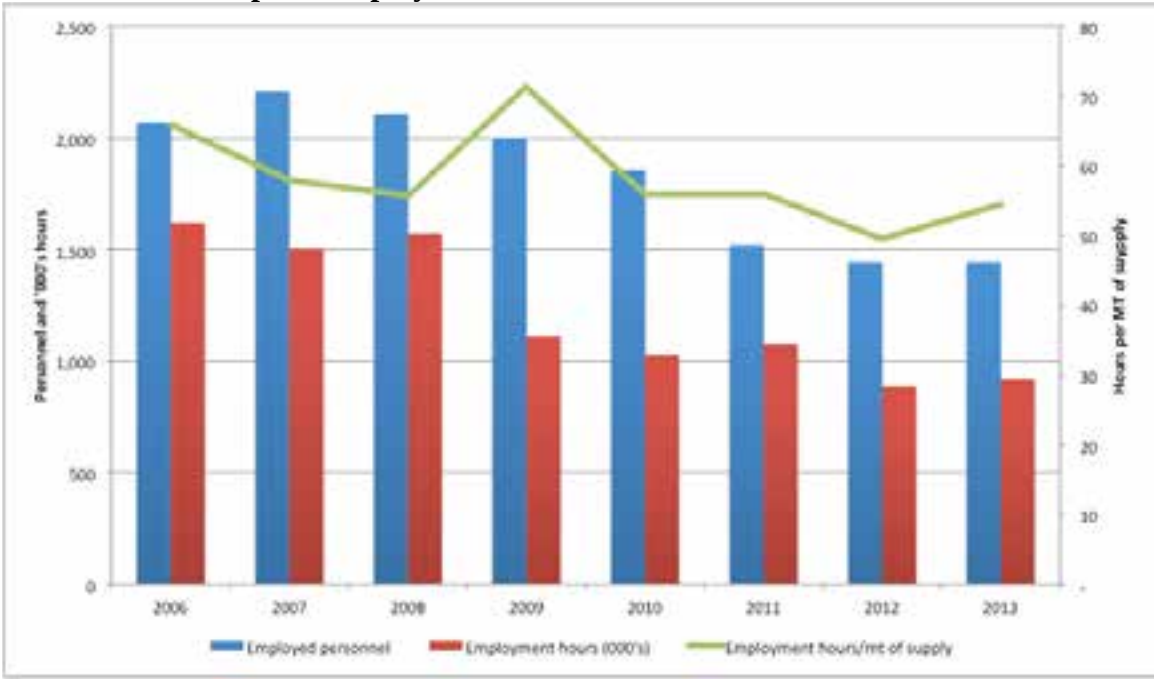
Exhibit 1.5: Supply per plant



Source: DFA
Notes: Excludes value added operations, lower supply per plant in 2009 was caused by price dispute.

Shrimp processing and direct related employment peaked at 2,207 individuals in 2007, declining 35% to 1,446 people in 2013. Employee hours have declined 7% over the period reviewed even though production volume declined 32%, indicating management of staff is challenging. This is further supported by the decline in the labour hours per mt of supply as shown in the following exhibit. Feedback from producers indicates there is a significant, (25%-35%), fixed portion of labour which is comprised of skilled staff including technicians, engineers, quality control and supervisory staff. In order to retain these skilled staff members, seasonal employment agreements are secured, meaning that even if the operating season were only 10 weeks, these staff would be retained for 16-24 weeks.

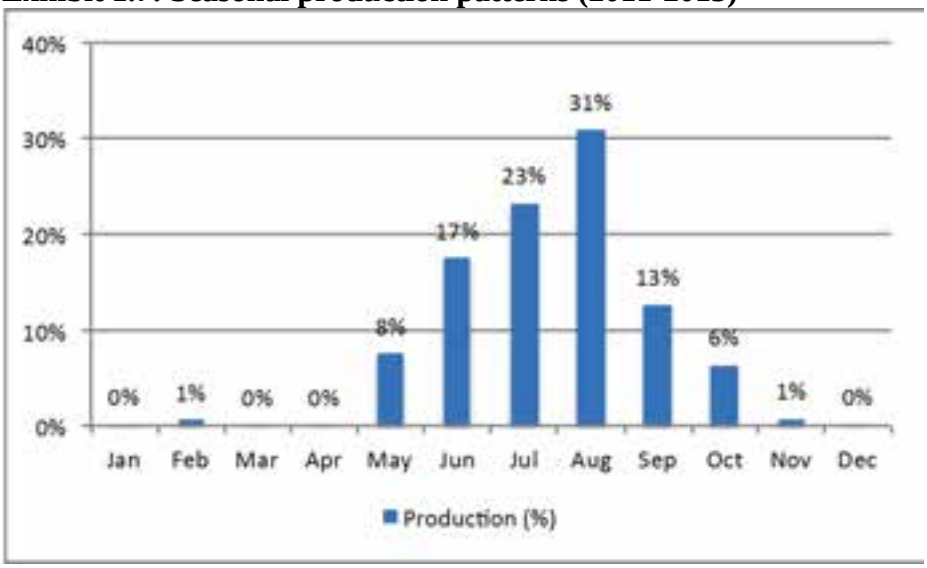
Exhibit 1.6: Total plant employment



Production of shrimp occurs primarily from May to October, though small quantities are processed in other months. In prior years there was higher levels of winter activity due to supplies coming from Maine; however, these supplies diminished as competition from producers in NB and NS increased. The Maine shrimp fishery was closed to commercial fishing in 2014.

Examination of monthly production over the past three years indicates two thirds of annual production is completed during the warmer months of the year, July through September, when product quality and yield recovery result in a lower average shore price of 4%-7% versus spring and fall respectively.

Exhibit 1.7: Seasonal production patterns (2011-2013)



Source: DFA plant production reports.

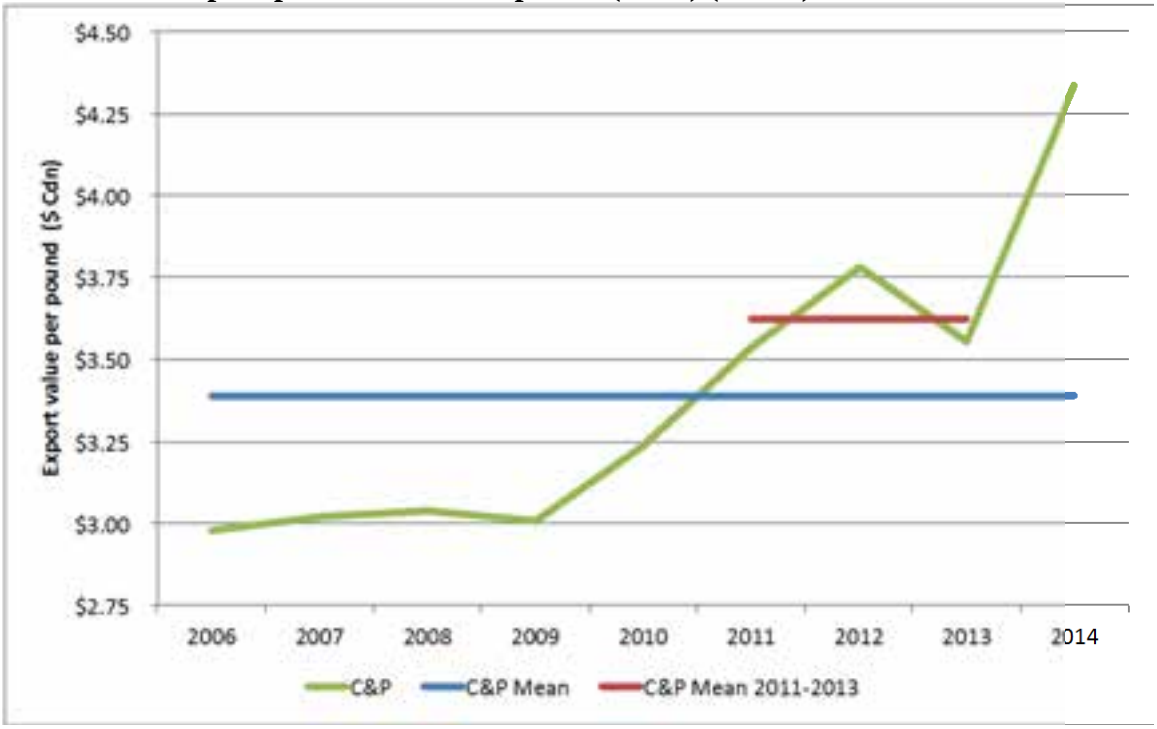
The primary market destinations being serviced remained the same over the period reviewed; however, the UK has become an increasingly important market destination for cooked and peeled product. This focus on the EU market is likely an outcome of change in the Autonomous Tariff Rate Quota (ATRQ) that decreased the tariff from 6% to 0% while increasing the quantity permitted to be imported for further processing from 6,000 mt to 20,000 mt as of January 1, 2010. The ATRQ was further increased to 30,000 mt for 2013-2015 at 0% tariff.

Exhibit 1.8: Export distribution by volume 2006 contrasted to 2013

Source: Export data

Export values remained relatively stable for the four years from 2006 to 2009, but have increased since 2010 with fall 2014 reportedly surpassing $5.00. There is general agreement amongst brokers and producers that the current high level of prices will fall back to levels experienced over the prior three years.

Exhibit 1.9: Export price cooked and peeled (C&P) ($ Cdn)



Source: Export data.
Note: 2014 is January to July

1.5 Offshore Processing Sector

The offshore processing sector is currently comprised of 10 vessels, down from 12, which harvest under 17 licenses. These same vessels harvest 'special allocation' shrimp under lease and/or profit sharing arrangements. These special allocation holders comprise primarily First Nations, some of which are recognized under Land Claims Agreements, or community groups.

The offshore sector is represented by the Canadian Association of Prawn Producers (CAPP), the Northern Coalition and the Baffin Fisheries Coalition (BFC). CAPP represents, for the most part the vessel owners, excluding the BFC, while the Northern Coalition represents license holders which, with the exception of the (LFUSCL), have no vessel interests. CAPP represents the following firms:

- Atlantic Shrimp Co. Ltd.
- Caramer Ltd.
- Crevettes Nordiques Ltee.
- Harbour Grace Shrimp Co.
- Mersey Seafoods Ltd.
- M.V. Osprey Ltd.
- Newfound Resources Ltd.
- Ocean Choice International Inc.

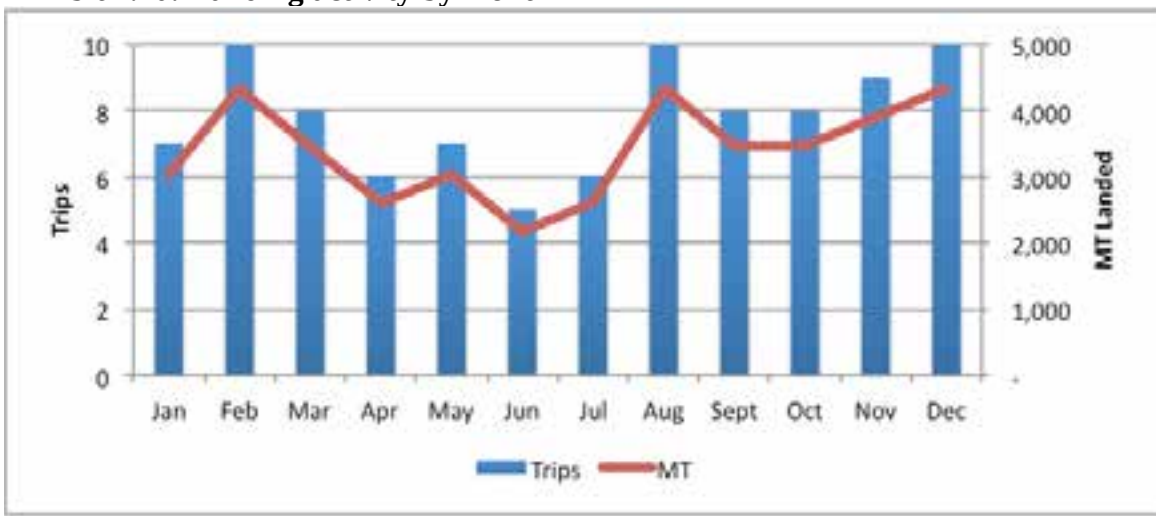
1.2

The Northern Coalition represents:

- Qikiqtaaluk Corporation
- Makivik Corporation
- Unaaq Fisheries Inc.
- Labrador Inuit Development Corporation (Pikalujak)
- Torngat Fish Producers Co-operative Society Limited
- Labrador Fishermen's Union Shrimp Company Limited
- Nataaqnak, which operates the Labrador Storm (now out of service), Saputi (managed by Newfound Resources Ltd.) , and Inuksuk

The offshore fleet fishes year round, harvesting in northern areas, SFA's 2 through 4 from June to December depending upon ice conditions, and SFA's 5 through 7 in the winter and spring. SFA's 0+1 are not fished due to extremely low catch rates and high fishing costs. Recent declines in SFA 1 stocks have resulted in the shrimp being present only in Greenland fishing areas, which are not currently accessible by Canadian vessels.

Exhibit 1.10: Landing activity by month



Source: DFO provided number of landings, landed volume was extrapolated from total landings.

Shrimp is frozen on board in either whole cooked or whole raw formats for sales primarily to Asia and Europe. These vessels hold up to 500 mt of finished product and complete 6-10 trips a year. Several of these vessels also harvest and process Greenland halibut (turbot) under either enterprise allocations or lease arrangements.

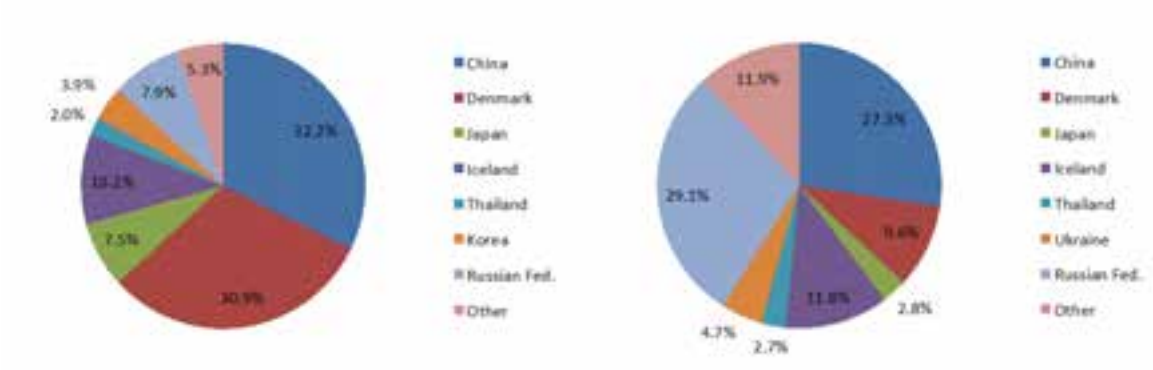
Appendix IV of the 2007 Integrated Fisheries Management Plan (IFMP) provides a detailed breakdown of offshore license holders, fleet structure, access provisions, stock assessment methods, historical allocations and management conditions for the fishery.

The primary markets for whole cooked frozen at sea shrimp are Russia, Ukraine and China. Whole frozen at sea raw shrimp is almost exclusively destined for the Japanese sushi market, though much of this is exported to other nations for hand peeling before being re-exported to Japan.

The Russia/Ukraine market in recent years has comprised more than 30% of the total export volume from offshore harvesters, diverting smaller shrimp from traditional peeling markets in Iceland, Denmark and Greenland. This eastern European market is now in jeopardy due to the Russians blocking imports and the current political situation in the Ukraine. Though many of the offshore suppliers had previously been banned due to apparent contamination of the shrimp (a non-tariff barrier), the current situation has affected all Canadian suppliers.

The current market situation has been challenging for the offshore; however, market diversification efforts in recent years and supply shortages in traditional markets have permitted the smaller shrimp, traditionally destined to Russia/Ukraine, to be sold to both non-traditional markets and other peeling markets servicing the EU.

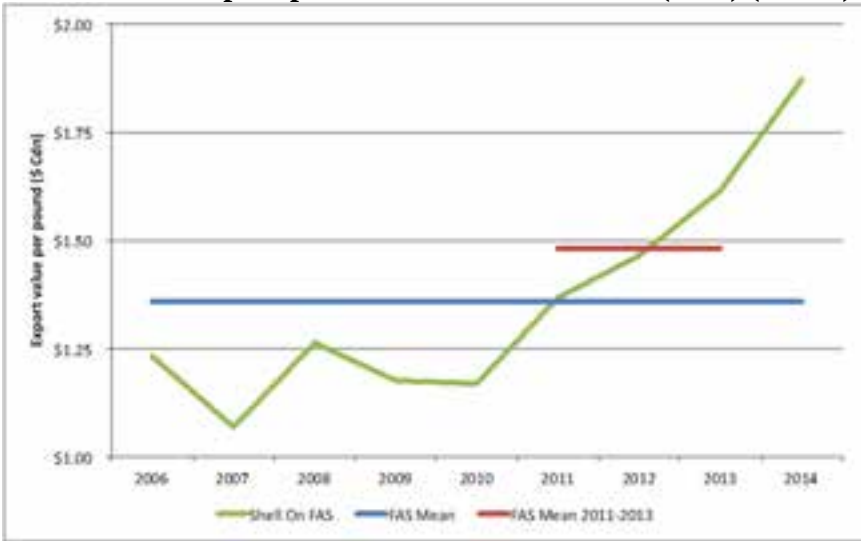
Exhibit 1.11: Export distribution by volume 2006 contrasted to 2013



Source: Export data

Export values remained quite low during the late 2000's, dipping significantly in 2007 and staying lower than average through 2009 and 2010. Market returns started to increase in 2011 and have been on an upward trend since that time.

Exhibit 1.12: Export price shell on frozen at sea (FAS) ($ Cdn)



Source: Export data.
Note: 2014 is January to July

2.0 LAST IN FIRST OUT (LIFO)

2.1 LIFO

Last in, first out (LIFO) is a book keeping term describing a method of inventory valuation where the quantity and value of a product last placed in inventory is recorded as the first sold out of inventory. The interpretation of LIFO for shrimp access in both policy and practice is the same, except instead of a product in inventory it refers to stakeholders that entered the fishery after 1996. A quota allocation threshold level, 37,600 mt, was established to provide the existing offshore license holders with a level of supply assurance intended to protect their investment. Subsequent increases in supply were allocated to inshore and offshore interests, special interest groups and First Nation communities or governments.

The following subsections provide a review of LIFO as it relates to the northern shrimp fishery and examines several other fisheries where management policy is not as explicit as LIFO regarding mechanisms for allocation as stock abundance changes.

2.2 Shrimp

In 1997, the first substantial TAC increases in SFAs 2, 5, and 6 occurred. These increases were allocated to the offshore fleet, temporary inshore licence holders and other special interest groups. For example, the quota increases in SFA 5 and 6 were shared among special allocations holders, Northern Coalition, SABRI, Innu, LIA and Cartwright harvesters. This was the starting point for new sharing arrangements of northern shrimp resources.

The federal Minister's press release announcing this initial expansion of access indicated it was governed by four fundamental principles:

- The conservation of the resource would be paramount.
- The viability of the existing enterprises would be protected. Current northern shrimp licence holders will retain their full 1996 allocation in all SFA's to a total of 37,600 mt. Existing licence holders would share the increase in SFA 2 and some would share the increase in SFA 5.
- The participation of new entrants would end in any SFA's where quotas decline to the established thresholds. The thresholds were defined as the 1996 quotas in each of the existing six Shrimp Fishing Areas (0 to 6) within Canadian jurisdiction.
- Adjacency would be respected, with those who live near the resource having priority in fishing it.

The third principle established that new entrants were temporary and would be removed as quotas decline back to the 1996 quota thresholds in each of the six SFA's. This

principle was communicated at the 1998 NSAC meeting by the Chair of the Committee and set the basis for what evolved to become the LIFO principle.

The 2003 IFMP for northern shrimp contained the following statement of allocation policy for this fishery:

> *"To ensure that the viability of the traditional, offshore fleet was not jeopardized, the 1996 quota levels in each SFA were set as thresholds. Sharing will only take place in a particular SFA, if the quota rises above the 1996 threshold in that SFA. If quotas decline in future years back down to the thresholds, the sharing will end and the new, temporary entrants will leave the fishery. The overall 1996 quota for all SFAs combined (37,600t (sic)) is also used as a threshold to determine sharing. Thus, a major decline in one or more SFAs could preclude further sharing in any SFA. Should there be a decline in the abundance of the resource in the future; temporary participants will be removed from the fishery in reverse order of gaining access last in, first out (LIFO)."*

The 2003 IFMP also introduced the New Access Framework that was recommended by the Independent Panel on Access Criteria and adopted by DFO. The New Access Framework replaced access principles that were in place from 1997-2002. As such, the principles regarding access were replaced by the New Access Framework. Whereas the LIFO principle is one of resource allocation, not resource access, the new criteria had no affect and the allocation principles continued to apply to the fishery.

The term "*last in, first out*" was first introduced in the 2003 IFMP. Although the viability of the traditional fleet was introduced and discussed previously, the term "*LIFO*" was not found in any documents prior to the 2003 IFMP.

The 2007 IFMP described access and allocation as the follows:

- Access is described as "*the opportunity to harvest or use fisheries resources, generally permitted by licences or leases issued by Fisheries and Oceans Canada under the authority of the Minister of Fisheries and Oceans. The department must take Aboriginal and treaty rights to fish into account when providing these opportunities*."

- Allocation indicated "*the amount of share of the fisheries resource and/or effort that is distributed or assigned by the Minister of Fisheries and Oceans to those permitted to harvest the resource*."

The 2007 IFMP defined LIFO as follows, "*The overall 1996 quota for all SFA's combined (37,600t) is used as a threshold to determine sharing. Thus, a major decline in one or more SFAs could preclude further sharing in any SFA. Should there be a decline*

in the abundance of the resource, new participants / allocations will be removed from the fishery in reverse order of gaining access last in, first out (LIFO)."

These new allocations were made available mainly in SFA 6 to the temporarily licensed <65' vessel operators from 2J3KL and 4RS who geared up for shrimp fishing by a specified deadline, and to a variety of First Nation and special interest groups. The latter two groups were provided shrimp allocations; but not fishing licences; they were permitted to engage existing offshore licence holders to catch their individual allotments. Quota thresholds for each SFA from 0 to 6, amounting to a total of 37,600 mt, were established to protect the viability of the original licence holders.

The allocations to First Nations (excluding Land Claim agreements) and special interest groups are eliminated completely when any SFA's TAC falls below the level when the allocation was granted. The allocations to the various <65' fleets are first reduced as SFA TAC's decline in proportion to the sharing ratio of the increase, and are eliminated completely when the threshold level for any applicable SFA is reached. Under this approach the inshore and offshore allocations in SFA 6 and 7 (and some in SFA 5) have been reduced since 2010. The fishery in SFA 7 will end for all participants in 2015. Likewise, five special allocations in SFA's 6 and 7 have been eliminated, while eight have been reduced in SFA's 5, 6 and 7.

LIFO is considered by DFO to be a matter of quota allocation policy as opposed to one of fishery access. Allocation policy determines how much participants are entitled to catch in a given area or fishery, whereas fishery access is provided through the issuing of fishing licences that authorize who may fish, how and where. The LIFO provision in the northern shrimp fishery for reducing and eventually totally eliminating quota allocations is unique in Canadian Atlantic fisheries.

2.3 Case Studies

There are several other cases where new access was granted as stocks increased but none include a general provision for eliminating the quota allocations to new entrants first through a quota threshold or similar provision. There was a provision in 3L snow crab outside 200 miles to reduce fleet shares disproportionately only above a specified threshold and an entrance level threshold for new entrants in 3K that was later eliminated. The Inshore Allowance in the 2J3KL cod fishery might have been a case of removing other allocations holders before the <65' fixed gear fleet, but that situation did not occur before the fishery was closed in 1992.

No similar arrangements for completely removing new access that was granted as resources increased are known to exist in other Canadian Atlantic fisheries. There are various Individual Transferrable Quota (ITQ) and Individual Quota (IQ) arrangements in

place in most significant fisheries. These quota arrangements have become the basis for different fleet rationalization schemes to essentially remove some participants. There are also provisions in most fisheries for the permanent transfer of fishing enterprises to qualified new entrants. These can change the numbers of enterprises downwards from the original licensed number and/or can change the licensed participants in a fishery through re-issuance of enterprise licences and associated quota shares.

2.3.1 Cod

The Inshore Allowance in the 2J3KL cod fishery permitted the <65' fixed gear fleet to fish without the limitation of a catch quota. This was rationalized on the variability of that fishery from year to year and from area to area within the same year. In that sense, it was intended to give all fixed gear operators from Cape St. Mary's to Hopedale an annual opportunity to fish without having some areas taking the total catch quota before other areas were able to fish. It was also designed to give priority of access to <65' fixed gear as that sector's allocation had to reach 115,000 mt before other fleets could receive allocations.

By the time this policy was fully implemented, the TAC was in excess of that limit. Conversely, as the TAC declined the allowance was meant to protect the inshore fixed gear fleet at that level of quota, meaning, other allocation holders would be removed from the fishery. This latter provision was never tested in practice as the TAC declined so rapidly before closure of the fishery (from about 200,000 mt in 1990 to zero by July 1992).

The expectation is that the inshore fixed gear allowance of 115,000 mt will apply if this fishery were to be fully re-opened at pre-1992 levels.

2.3.2 Snow Crab

Maritimes Region: Temporary access was granted in each of the three management areas of this fishery because of the decline in groundfish stocks and an upsurge in crab abundance. This new access was handled somewhat differently in each area, as further described:

- **Northeast N.S. (N-ENS):** Four temporary licenses (with an assigned quota allocation of 33.9 mt) were issued in N-ENS in 1999. These were the only such licenses issued in that area and were converted to permanent status in 2005 with five percent of the N-ENS TAC. There is no provision to remove them or their allocations from the fishery before the original participants.

- **Southeast N.S. (S-ENS)**: A small number of temporary permits (5-10 in each of the four Crab Fishing Areas (CFA's)) were issued annually by draw to eligible harvesters from 1995 to 1997. In 1998, the temporary access was issued to fishing

associations, and some First Nation groups, in initial units of 25 mt and a maximum of 250 mt in each CFA. These association shares were fished by selected harvesters on behalf of all eligible members. When the TAC tripled in 2002 this temporary access was changed to include all fishing associations in a quota sharing arrangement and expanded to give adjacent core harvesters from CFA's 21 and 22, without temporary access in their own area, access to outer areas of CFA 23. A threshold quota sharing arrangement in CFA 23 was ignored by a subsequent Minister. A court case upheld his authority to change the allocation arrangement. Also, over the 2001 to 2004 period, five harvesters were authorized to conduct trap surveys on the outer slopes of CFA 23 and 24.

In 2005, all these temporary access arrangements were converted to permanent status with 40% of the S-ENS quota being allocated. As well, the five harvesters who had conducted trap surveys on the slope areas of CFA 23 and 24 were given permanent status in S-ENS. Equal individual quota shares were established in all CFA's. In total, 24 licenses in CFA 23 and 19 licenses in CFA 24 were converted to permanent status.

Holders of these individual quota shares then could consolidate into CORE Companies with up to $1^{1/3}$ the quota holdings of an existing license. These CORE Companies were given a single permanent license and a percentage share of resource depending on the consolidation level. Members of the CORE companies determine who fishes their individual quotas and how profits are distributed.

In 1995, the first four First Nations communal licenses were issued as part of the temporary access to the snow crab fishery. In 1997, a commercial license in CFA 23 was acquired under the Allocation Transfer Program (ATP) and transferred as a communal commercial license to a consortium of three First Nations Bands on an equal-share basis. In 1997, DFO also issued two permanent licenses to First Nation Communities in both CFA 23 and CFA 24. In 1998, First Nations Communities received two temporary allocations of 25 mt in CFA 23.

In 2002, in response to the *Marshall* decision, DFO issued 13 First Nation permanent licenses in CFA 23 and eight in CFA 24. In addition, the Millbrook First Nation received a permanent 250 mt allocation in CFA 24. These licenses were introduced through the conversion of existing First Nation temporary access and the buyback of non-native temporary allocations. In 2005, First Nations held two of the exploratory licenses for the trap surveys on the slope areas of CFA 23 and 24 that were converted to permanent status. A license was provided to the Indian Brook First Nation Band prior to the 2006 season. First Nation access in the S-ENS snow crab fishery included 19 licenses in CFA 23 and 14 in CFA 24 as of 2005.

- **4X:** A four vessel exploratory fishery started in late 1994. The four operators were issued regular, commercial licenses in 2000. In response to the Marshall

decision two licenses were added to First Nations groups in 2001 and another in 2002. Two temporary licenses were issued in 2002 and converted to permanent status for the 2005/2006 season with a quota share of 50% of the previous license holders. This remains the licensing arrangement in this CFA.

Gulf Region: Until 1994, 130 mid-shore fish harvesters from New Brunswick, Québec and Nova Scotia exploited the snow crab fishery in CFA 12. In 1995, CFA's 12E and 12F were created for exploratory fisheries that were changed to commercial fisheries in 2002. Eight licensed enterprises from New Brunswick, Nova Scotia, PEI and Québec now fish in 12E while 18 enterprises from Québec and Nova Scotia fish 12F. The number of licenses in CFA 12 is now 261.

In 1978, CFA 19 was established for the exclusive use of Cape Breton inshore fish harvesters with vessels <45'. By 1992, the number of licensed fishers involved in the CFA 19 fishery had reached 74, comprised of 59 permanent and 15 temporary licenses. In 1995, individual trap allocations and ITQ's were reduced to provide for 37 new participants. There are now a total of 162 permanent licenses and a total of 1,699 traps in the CFA 19 crab fishery.

Various aboriginal fisheries initiatives have been undertaken in the SGSL crab fishery that has increased the participation of First Nation groups. In addition to these efforts, increased access was provided to commercial harvesters that were negatively impacted by the decline in groundfish stocks in the Southern Gulf. This was accomplished at slightly different timeframes and through different licensing arrangements in CFA 12 as compared to CFA 19. In all cases, these temporary access arrangements were converted into permanent status by the mid-2000's. Otherwise, there were no provisions to remove the later entrants before the original or traditional licence holders even though the TAC in the CFA declined, and then increased, since they were added to this fishery. The traditional crab fleet in CFA 12 has been in litigation against DFO for some years over the granting of new access to CFA 12 but it has not resulted in elimination of any of the additional licence holders.

Newfoundland Region: During the 1970's directed snow crab fisheries developed along the Northeast Coast of Newfoundland, primarily in Division 3L. The fishery in 3K began to develop in the mid-1970's. Snow crab fishing occurred sporadically in subdivision 3Ps in the 1970's but did not occur on a regular basis until the mid-1980's. The fishery in Division 2J also began in the mid-1980's while the first substantial landings in 4R occurred in the early 1990's.

The original snow crab licenses in 2J, 3K and 3L were designated 'fulltime' and initially operated in areas fairly close to shore. 'Supplementary' crab licences were implemented in 2J, 3K and 3Ps in 1985 and in Division 3L in 1987. These licences were initially to supplement incomes for harvesters affected by declining groundfish resources.

In 1994, the supplementary fleet in 3L was divided on the basis of gross registered tonnage (GRT). Operators of vessels 40 GRT or greater were designated as the large supplementary fleet, while those with vessels less than 40 GRT were designated the small supplementary fleet. The large supplementary and the original fulltime fleets were required to fish areas approximately 50 miles from land.

The quota access of both supplementary and full time fleets in Division 3L was divided by a series of CFA's in 1997. This resulted in the 3L small supplementary fleet and those with temporary seasonal permits in 3L and 3K having sole access to the snow crab resources inside 50 miles. In Divisions 2J and 3K, the supplementary and fulltime fleets fish in the same areas. There are no fulltime licences in 3Ps.

Temporary seasonal snow crab permits were first issued to operators of vessels <35' length overall vessels in 1995. From 1996 to 1998, temporary seasonal permits were made available to all heads of core enterprises with vessels <35' who opted to participate within the criteria established by harvesters. The number of participating enterprises increased annually as overall snow crab quotas increased and groundfish declines or moratoria continued.

In 2003, these temporary seasonal snow crab permits were converted to inshore licenses. Holders of a temporary seasonal permits in any one of 2000, 2001, or 2002 were eligible to receive an inshore licence in 2003. The resulting licences continue to be issued annually.

There are now no provisions in the policies for NL snow crab fishery to completely remove any of the later participants as TAC declines, except in the case of allocations outside 200 miles above a specified threshold. The 2009 IFMP for NL Snow Crab contains the following section on "*Principles for Declining Quotas*":

- "*Principles to guide allocation decisions in the event of quota declines are provided for two areas: outside 200 miles from land in Divisions 3LNO and inside 200 miles in all other areas. This separation was necessary because in the area outside 200 miles there were relatively new exploratory licenses and substantial replacement / compensatory quotas for 3L full-time and supplementary fleets.*"
- "*Principles for most areas: In the event of quota declines, these reductions will be shared pro-rata by fleets who share the allocations in the area where these declines occur.*"
- "*Principles for outside 200 miles - 3LNO: A threshold level for the area outside 200 miles is established and will include the 1999 allocations for the full-time*

(1,450 mt) and supplementary fleets (3,000 mt), and the 1998 allocations to exploratory license holders (800 mt) for a total of 5,250 mt. In the event of quota declines in this area all reductions will occur for the exploratory license holders in the reverse order that allocations were made until the overall 3LNO quota outside 200 miles is reduced to 5,250 mt. Quota reductions lower than this base level will be allocated on a pro-rata basis to all fleets fishing in this area."

The fulltime fleet in 3K took the Minister to court for eliminating a quota threshold below which they claimed later entrants were to be removed from the fishery in that area. The Supreme Court of Newfoundland concluded that the Minister of the day has the authority to manage the fisheries in a manner that he/she sees fit and is not bound by the decisions of any previous Minister. The Minister may, for reasons of conservation or for any other valid reasons, modify access, allocation and sharing arrangements pursuant to the Fisheries Act and cannot be fettered in this authority by the actions of a previous minister. Based on this decision the Minister can unilaterally change any policy, including that of LIFO.

It is noteworthy that there have been no challenges to the Minister's authority to allocate except for the case of using quota allocations to pay for services to the Department (The Larocque Decision). The Fisheries Act has been since amended to permit the use of quota allocations for this purpose.

3.0 ECONOMIC IMPACT

The quantitative economic analysis involved projecting possible levels of shrimp TAC's by SFA into the short, medium and long-terms. This was based on the best available data and various perceptions of future stock status garnered from scientists and industry participants. These future levels of TAC's were then translated into quota shares and catch levels for the inshore and offshore sectors based on historical allocations and fishing performance. For example, the NL offshore fleet has landed 56.5% of the total offshore quota shares in NL ports over the 2009-13 time period. This percentage is lower than that of inshore because the quotas in northern area, SFA's, 0+1, are not commercially viable and produce no landings, and three of the fishing vessels land in Nova Scotia. The inshore fleet landed 97.5% of its available quotas in NL ports in 2012-13. These NL based landing percentages were then applied to projected available quota shares under three allocation models, including:

- **Model 1 – 'LIFO'**: The inshore bears 90% of SFA 6 reductions.

- **Model 2 – 'Inshore % Maintained':** The inshore share in SFA 6 remains at 65.6% of reduced quotas, which is the 2014 share.

- **Model 3 – 'Balanced Reduction':** The inshore and offshore equally share future SFA 6 quota reductions.

An adjustment was made to crew payments in the offshore sector to account for the three Nova Scotia based vessels that are reported to be 70% crewed by residents of NL. In all references of years, the year stated is the commencement of any new management year. For example, 2013 is the management year 2013/14, 2016 is 2016/17, etc.

The following exhibit illustrates the anticipated landings for each sector under the three models. As indicated in the LIFO model, the inshore sector may have a 60% supply reduction in the short-term, possibly as early as the 2015/16 season. Overall, the industry may realize up to a 50% supply reduction in the mid term. The model outcomes illustrate that the economic impact of the 60% supply reduction to the inshore sector can be reduced significantly in the short-term using alternative sharing arrangements. However, these positive impacts to the inshore result in similar negative impacts to the offshore sector.

Exhibit 3.1: Landings estimates and landings percent reduction for three models

	2013	2016		2019		2024	
	MT	MT	Reduction	MT	Reduction	MT	Reduction
Model 1 - LIFO							
Inshore harvesting	50,768	20,213	60%	15,087	70%	14,996	70%
Offshore	40,571	33,071	18%	30,217	26%	29,225	28%
Total landings in NL	91,340	53,284	42%	45,304	50%	44,220	52%
Onshore processing	17,073	6,798	60%	5,074	70%	5,043	70%
Model 2 - Inshore % Maintained							
Inshore harvesting	50,768	25,496	50%	19,153	62%	19,062	62%
Offshore	40,571	32,422	20%	28,335	30%	27,343	33%
Total landings in NL	91,340	57,918	37%	47,488	48%	46,404	49%
Onshore processing	17,073	8,574	50%	6,441	62%	6,410	62%
Model 3 - Balanced Reduction							
Inshore harvesting	50,768	29,746	41%	23,462	54%	23,370	54%
Offshore	40,571	28,038	31%	25,852	36%	24,859	39%
Total landings in NL	91,340	57,784	37%	49,313	46%	48,229	47%
Onshore processing	17,073	10,004	41%	7,890	54%	7,859	54%

Notes: 1) 2013 landing data from DFO.
2) Processing output based on inshore harvest supply x 33.63% yield provided by DFA.
3) 2016 = 2016/17 management year etc.

The following economic analysis is based on the reduction of landings and onshore processing from 2013 versus the short, mid and long-term periods of 2016, 2019 and 2024. Each sector and model was assessed separately, and cumulative results represent the estimated amount of lost economic output and employment from the shrimp industry in NL.

These supply reductions were assessed for Gross Domestic Product (GDP), employment income and Person Years (PY's) impacts using modeling techniques developed by DFA and Department of Finance (DOF). The cost, revenue and primary employment data necessary for these models were updated using information available from the Memorandum of Understanding (MOU), DFO Cost and Earnings Survey, export data, reported production information, DFO landings data, professional knowledge of harvesting and processing operations and from discussions with various industry participants. Previous economic studies by Gardner-Pinfold were examined to ground truth some of the data elements and relationships to catch, effort and revenue parameters. The various ratios and multipliers developed by DOF were then applied to the revenues and costs associated with the projected reduction of landings and production losses calculated for the three models at the 2016, 2019 and 2024 datelines.

The following tables provide the estimates of total allowable catch (TAC) for each area, the share by harvest sector and estimated landings for each model and year.

Exhibit 3.2: Model 1 – LIFO continues to be applied, quota by area and estimated landings by sector

Model 1 - LIFO															
SFA	Threshold	2014					2016			2019			2024		
		TAC	Offshore Amount	NL Inshore Amount	Offshore %	NL Inshore %	TAC	Offshore Share	NL Inshore Share	TAC	Offshore Share	NL Inshore Share	TAC	Offshore Share	Inshore Share
0+1	9,000	14,746	14,746	-	100.0	-	14,746	14,746	-	14,746	14,746	-	14,746	14,746	-
2	3,500	11,250	5,526	-	49.1	-	11,250	5,526	-	11,250	5,526	-	11,250	5,526	-
3	1,200	6,500	2,500	-	38.5	-	6,500	2,500	-	6,500	2,500	-	6,500	2,500	-
4	5,200	14,971	13,219	702	88.3	4.7	13,000	11,479	611	10,000	8,830	470	8,000	7,064	376
5	7,650	20,970	15,540	-	74.1	-	16,000	11,856	-	15,000	11,115	-	15,000	11,115	-
6	11,050	48,196	13,559	31,637	28.1	65.6	30,000	12,739	14,261	20,000	11,050	8,950	20,000	11,050	8,950
7	-	3,582	716	1,791	20.0	50.0	-	-	-	-	-	-	-	-	-
8	-	8,249	-	5,366	-	65.1	9,000	-	5,859	9,300	-	6,054	9,300	-	6,054
Totals	37,600	128,464	65,807	39,496			100,496	58,846	20,731	86,796	53,767	15,474	84,796	52,001	15,380
Projected Landings in NL								33,071	20,213		30,217	15,087		29,225	14,996

Exhibit 3.3: Model 2– Inshore % Maintained at 2014 share, quota by area and estimated landings by sector

Model 2 - Inshore Maintained at 2014 Percentage Share													
SFA	Threshold	2014			2016			2019			2024		
		TAC	Offshore %	NL Inshore %	TAC	Offshore Share	Inshore Share	TAC	Offshore Share	Inshore Share	TAC	Offshore Share	Inshore Share
0+1	9,000	14,746	100.0	-	14,746	14,746	-	14,746	14,746	-	14,746	14,746	-
2	3,500	11,250	49.1	-	11,250	6,345	-	11,250	6,345	-	11,250	6,345	-
3	1,200	6,500	38.5	-	6,500	2,503	-	6,500	2,503	-	6,500	2,503	-
4	5,200	14,971	88.3	4.7	13,000	11,479	611	10,000	8,830	470	8,000	7,064	376
5	7,650	20,970	74.1	-	16,000	11,856	-	15,000	11,115	-	15,000	11,115	-
6	11,050	48,196	28.1	65.6	30,000	10,762	19,680	20,000	6,880	13,120	20,000	6,880	13,120
7	-	3,582	20.0	50.0	-	-	-	-	-	-	-	-	-
8	-	8,249	-	65.1	9,000	-	5,859	9,300	-	6,054	9,300	-	6,054
Totals	37,600	128,464			100,496	57,691	26,150	86,796	50,419	19,644	84,796	48,653	19,550
Projected Landings in NL						32,422	25,496		28,335	19,153		27,343	19,062

Exhibit 3.4: Model 3– Balanced reduction, quota by area and estimated landings by sector

Model 3 - Balanced Reduction													
SFA	Threshold	2014			2016			2019			2024		
		TAC	Offshore %	NL Inshore %	TAC	Offshore Share	Inshore Share	TAC	Offshore Share	Inshore Share	TAC	Offshore Share	Inshore Share
0+1	9,000	14,746	100	-	14,746	14,746	-	14,746	14,746	-	14,746	14,746	-
2	3,500	11,250	56.4	-	11,250	6,345	-	11,250	6,345	-	11,250	6,345	-
3	1,200	6,500	38.5	-	6,500	2,503	-	6,500	2,503	-	6,500	2,503	-
4	5,200	14,971	88.3	4.7	13,000	11,479	611	10,000	8,830	470	8,000	7,064	376
5	7,650	20,970	74.1	-	16,000	11,856	-	15,000	11,115	-	15,000	11,115	-
6	11,050	48,196	28.1	65.6	30,000	2,961	24,039	20,000	2,461	17,539	20,000	2,461	17,539
7	-	3,582	20.0	50.0	-	-	-	-	-	-	-	-	-
8	-	8,249	-	65.1	9,000	-	5,859	9,300	-	6,054	9,300	-	6,054
Totals	37,600	128,464			100,496	49,890	30,509	86,796	46,000	24,063	84,796	44,234	23,969
Projected Landings in NL						28,038	29,746		25,852	23,462		24,859	23,370

The key assumptions and variables used for the models and sources of information are summarized in the following exhibit. Elaboration on the key assumptions is provided in Appendix VI. Definitions of the economic terms used throughout this analysis are provided.

- **GDP:** Gross Domestic Product is the aggregate measure of production based on the value added to a product.
- **Income:** The income associated to the activity of harvesting and production.
- **PY's:** Person Years of employment generated by the income associated to the activity of harvesting and production. This is the full-time equivalent years of employment generated, which in seasonal operations results in a significantly lower number than persons employed.
- **Indirect and Induced:** Other economic benefits are realized based on the GDP and income realized from harvesting and production. This includes service sector support and the benefits realized regionally from income spent.

Exhibit 3.5: Assumptions used for the analysis

Common to all sectors and models	
Consumer price index (CPI)	**Increase 2% per year compounded. Used for all revenue and expense accounts except labour.**
Labour costs	Increase 3% per year compounded.
Shore prices	**Average 2011-2013 per DFO, indexed by CPI**
Market prices	Average 2011-2013 export prices, indexed by CPI
Induced GDP Ratio	**NL Department of Finance, 0.3**
Induced Labour income Ratio	NL Department of Finance, 0.3
Average Annual Labour Income in Service Sector	**NL Department of Finance, $55,916 indexed annually 3%**
Inshore harvesting sector	
Crew labour	**40% of landed value**
Vessel expenses	Inflated, based on CPI , 2010 memorandum of understanding costs
Other factors	
Number harvesters	Five per vessel
Weeks fished	**Quota ÷ vessel capacity x 5 days per trip.**
Person Years (PY's)	Weeks fished x crew ÷ 50 weeks, Indirect income = Direct x multiplier, Induced = Direct + Indirect x multiplier
Onshore processing sector	
Market price	**$4.27 per pound based on average export value 2010-2013, indexed annually.**
Selling expenses	Inflated, based on CPI , 2010 memorandum of understanding costs
Yield	**33.63% DFA**
Labour rate	$12.89 for 2013 indexed annually
Processing costs	**Inflated, based on CPI , 2010 memorandum of understanding costs**
Other factors	
Number plant workers	2,191 in 10 plants adjusted to 1,450 from DFA plant production reports
Annual person hours	**DFA plant production reports ÷ number plant workers**
Person Years (PY's)	Direct income from production, Indirect income = Direct x multiplier, Induced = Direct + Indirect x multiplier
Offshore processing sector	
Market price	**$1.68 per pound based on average export value 2010-2013, indexed annually.**
Selling expenses	12% of revenues. Industry sources and professional knowledge.
Crew labour	**24.1% of revenues. Industry sources and professional knowledge.**
Lease/profit sharing	9.2% of revenues. Estimated.
Other factors	
Number of crew.	54 per vessel.
Weeks worked	**26 weeks for each crew member.**
Direct Person Years (PY's)	Crew members impacted x hours worked / 1,750 hours per year, Indirect income = Direct x multiplier, Induced = Direct + Indirect x multiplier

3.1 Forecasted Impact of Shrimp Stock Declines

Determination of the most recent year, 2013, economic outputs provides context by which to examine the economic impacts calculated in the models. As illustrated in the following exhibit, in 2013 the total GDP was $227 M, income generated was $138 M and PY's of 1,939. The contribution by each sector to the GDP, income and PY's is provided to illustrate the proportion of each sector impact. In 2013, the GDP and income for both the inshore and offshore sectors are relatively the same, whereas, the inshore sector generated 56% higher PY's. In terms of people employed, the inshore sector comprises 84% and offshore 16%.

If shrimp availability remained at status quo, applying a CPI of 2% would result in GDP and income generated in 2024 of $282 M and $191 M respectively. It is this value of money over time that must be recognized when examining impacts in the short, mid and long period terms presented in the following tables.

Exhibit 3.6: 2013 Economic indicators by sector (Baseline Case)

Model	Sector	Impacts	2013
Baseline 2013	Inshore Harvesting	GDP ($ M)	$66.9
		Income ($ M)	$38.4
		PY's (#)	373
	Onshore Processing	GDP ($ M)	$47.1
		Income ($ M)	$30.9
		PY's (#)	808
	Total Inshore	GDP ($ M)	$114.0
		Income ($ M)	$69.3
		PY's (#)	1,181
	Offshore	GDP ($ M)	$113.0
		Income ($ M)	$68.5
		PY's (#)	758
	Grand Total	GDP ($ M)	$227.1
		Income ($ M)	$137.8
		PY's (#)	1,939

Model 1 outputs: The following exhibit shows the GDP, Income and PY impacts of the cumulative lost output under the LIFO, or status quo, scenario. The total GDP lost rises from $113.0 M in 2016 to $166.5 M in 2024. Total income lost rises to $101.5 M by 2024 while lost employment total 1,142 person years by the same date. Whereas the inshore sector bears most of the quota reductions in this model, its lost GDP represents 75.4% of the total cumulative loss in 2024. Income lost by the inshore sector is 74.7 % of the 2024 total while lost employment is 74.6% of the 2024 total.

Exhibit 3.7: Model 1 - LIFO economic impact

Model 1	Sector	Impacts	Short Term 2016	Mid Term 2019	Long Term 2024
LIFO Status Quo	Inshore Harvesting	GDP($ M)	$54.0	$69.5	$77.0
		Income ($ M)	$34.2	$42.0	$46.4
		PY's (#)	258	297	288
	Onshore Processing	GDP($ M)	$36.0	$44.4	$48.7
		Income ($ M)	$20.5	$25.9	$29.5
		PY's (#)	492	571	565
	Total Inshore	GDP($ M)	$90.0	$113.8	$125.7
		Income ($ M)	$54.7	$67.8	$75.9
		PY's (#)	750	867	853
	Offshore	GDP($ M)	$23.0	$33.7	$40.8
		Income ($ M)	$14.9	$21.3	$25.6
		PY's (#)	201	271	289
	Grand Total	GDP($ M)	$113.0	$147.6	$166.5
		Income ($ M)	$69.6	$89.1	$101.5
		PY's (#)	951	1,139	1,142

Model 2 outputs: The Model 2 Inshore % Maintained outputs provides more favourable allocations for the inshore sector, and consequently all economic indicators for this sector are less impacted than under the LIFO model.

By 2024, the total inshore sector has a total GDP loss that is $16.2 M less than under LIFO. The offshore GDP impact is of course higher ($6.8 M) under this option than under LIFO. The NL shrimp industry GDP loss is $9.4 M (5.6%) less under this option than under LIFO.

Exhibit 3.8: Model 2 – Inshore % Maintained economic impact

Model 2	Sector	Impacts	Short Term 2016	Mid Term 2019	Long Term 2024
Inshore % Maintained	Inshore Harvesting	GDP($ M)	$42.2	$59.9	$66.3
		Income ($ M)	$28.7	$37.5	$41.5
		PY's (#)	221	267	260
	Onshore Processing	GDP($ M)	$29.7	$39.3	$43.2
		Income ($ M)	$17.0	$22.9	$26.1
		PY's (#)	407	506	501
	Total Inshore	GDP($ M)	$72.0	$99.2	$109.5
		Income ($ M)	$45.6	$60.4	$67.6
		PY's (#)	629	773	761
	Offshore	GDP($ M)	$25.0	$39.9	$47.6
		Income ($ M)	$16.1	$24.8	$29.3
		PY's (#)	218	319	336
	Grand Total	GDP($ M)	$97.0	$139.0	$157.1
		Income ($ M)	$61.7	$85.2	$96.9
		PY's (#)	847	1,092	1,097

Model 3 outputs: The Balanced Reduction allocation model evaluates the impact if the inshore and offshore harvesting sectors equally share quota reductions in SFA 6. This is an even more favourable allocation arrangement for the inshore sector; therefore, the impacts to this sector are less severe than in the previous two models.

The total GDP loss under this model is the lowest of the three cases assessed. The overall difference between the high and low GDP loss is $17.6 M or a difference of 10.6%. The

difference for income is 8.5% while PY's change 7.2%. These are not significant relative differences considering the magnitude of error that should be attached to these types of long-term projections.

Exhibit 3.9: Model 3 – Balanced Reduction economic impact

Model 3	Sector	Impacts	Short Term 2016	Mid Term 2019	Long Term 2024
Balanced Reduction	Inshore Harvesting	GDP ($ M)	$32.7	$49.6	$55.0
		Income ($ M)	$24.2	$32.7	$36.2
		PY's (#)	194	237	231
	Onshore Processing	GDP ($ M)	$24.7	$34.0	$37.3
		Income ($ M)	$14.1	$19.8	$22.6
		PY's (#)	339	437	433
	Total Inshore	GDP ($ M)	$57.5	$83.6	$92.3
		Income ($ M)	$38.3	$52.5	$58.8
		PY's (#)	533	674	663
	Offshore	GDP ($ M)	$38.5	$48.0	$56.5
		Income ($ M)	$23.9	$29.2	$34.1
		PY's (#)	332	382	396
	Grand Total	GDP ($ M)	$96.0	$131.6	$148.9
		Income ($ M)	$62.2	$81.7	$92.9
		PY's (#)	865	1,056	1,060

***Conclusion**: In 2024 dollars, the long-term GDP impact is anticipated to be $149-$167 M, a loss of $93-$102 M of income and 1,060-1,142 full time equivalent jobs. In comparison to the 2013 baseline, the losses will be as much as 59% in the long term, and 47% in the short term.*

The following exhibit summarizes the indirect impacts of supply reductions for each sector and model. Overall, the percent impact on the service sector in similar across all models and years, comprising 25%-28% of sector GDP and labour income and 27%-30% of the sector PY's. These affected services include, but are not limited to, the following:

- Direct labour services including unloading, dockside monitoring, dockside grading, and offshore observers.
- Provision services including groceries, fuel, and fishing gear.
- Maintenance services including electricians, welders, refrigeration mechanics, etc.

Exhibit 3.10: Indirect impacts

		Model 1 - LIFO			Model 2 - Inshore % Maintained			Model 3 - Balanced Reduction		
Sector	**Impacts**	**2016**	**2019**	**2024**	**2016**	**2019**	**2024**	**2016**	**2019**	**2024**
Inshore Harvesting	GDP ($ M)	$3.9	$4.2	$4.7	$3.8	$4.1	$4.6	$3.8	$4.1	$4.5
	Income ($ M)	$2.5	$2.7	$3.0	$2.5	$2.7	$3.0	$2.4	$2.6	$2.9
	PY's (#)	42	41	39	41	41	39	40	40	38
Onshore Processing	GDP ($ M)	$17.9	$22.3	$25.0	$14.8	$19.8	$22.1	$12.3	$17.1	$19.1
	Income ($ M)	$10.8	$13.5	$15.1	$8.9	$11.9	$13.4	$7.4	$10.3	$11.6
	PY's (#)	163	187	180	135	165	160	112	143	138
Total Inshore	GDP ($ M)	$21.8	$26.5	$29.6	$18.6	$23.9	$26.7	$16.1	$21.2	$23.6
	Income ($ M)	$13.3	$16.2	$18.1	$11.4	$14.6	$16.3	$9.8	$12.9	$14.5
	PY's (#)	205	228	220	176	206	199	153	183	176
Offshore	GDP ($ M)	$6.3	$9.3	$11.2	$6.9	$10.9	$13.1	$10.6	$13.2	$15.5
	Income ($ M)	$4.5	$6.5	$7.8	$4.9	$7.6	$9.0	$7.3	$9.0	$10.5
	PY's (#)	74	97	101	80	113	116	119	134	136
Grand Total	GDP ($ M)	$28.1	$35.8	$40.8	$25.5	$34.9	$39.8	$26.6	$34.3	$39.2
	Income ($ M)	$17.8	$22.7	$25.9	$16.3	$22.2	$25.3	$17.2	$21.9	$25.0
	PY's (#)	279	325	320	256	320	315	272	317	312

3.2 Evaluation of Risks

The primary risk facing the shrimp sector is supply declines. Though there may be some periods of supply stability, the general trend is for further declines in the short and mid term. The other significant risks are operational and market prices. Each of these is further discussed.

3.2.1 Supply Risks

A summary of the shrimp stocks including TAC, catch and stock indicators are provided for each SFA in Appendix II. The following provides a synopsis of these results and stock abundance risk for each SFA, and indicates which harvest sectors participate in the SFA.

- **SFA 0 (Offshore)** The TAC of 500 mt is for developmental purposes only, as there has been no commercial fishery in this area. The last science surveys in this area were in 2006 and 2009, which indicated there were no commercial quantities available. There is no intention to survey this area again in the near future.

- **SFA 1 (Offshore):** This is a joint Canada-Greenland stock with no formal sharing arrangement between the two countries. Canada sets its quota at 17% of 5/6 of the TAC recommended by NAFO Scientific Council, as 1/6 is considered resident inshore stock available only to Greenland. Overall, Canada receives 14.16% of the total TAC. However, as the shrimp are only present in the Canadian fishing area when stock levels are very high, shrimp are currently not available in commercial quantities.

  Since 1981, the West Greenland fishery was limited to Greenlandic vessels in NAFO Sub-area 1 and to Canadian vessels in NAFO Division 0A. TAC's have been declining in recent years due to a resurgence of cod stocks, and it is anticipated a further 25% reduction will be imposed in 2015.

  Negotiations between Canada and Greenland are ongoing regarding providing Canada access to fishing areas east of 0A. The outcomes of these negotiations is expected over the next two years and Canada will likely have access to some modest level of harvest in SFA 1 in the mid-term.

- **SFA 2 (Offshore):** Assessment results for SFA 2 are quite variable which has resulted in conservative management and exploitation of this stock. The consensus seems to be that this stock abundance will remain static over the short and mid term. A warming trend has been observed and appears to have caused *Pandalus montagui* to move west into SFA 3 and northern areas of SFA 4 where cooler waters are more prevalent. Whereas this species is a retained bycatch, the overall shrimp CPUE in this area may decline.

- **SFA 3 (Offshore):** This area is populated predominantly by *Pandalus*

montaqui, 5,000 mt TAC, and renewed commercial fishing activity began in 2010. This area has been surveyed every second year resulting in high variability of results and a conservative exploitation rate; however, it is now surveyed annually, starting in 2014, which may reduce uncertainty and permit increases in the exploitation rate in future years.

The fishable biomass of borealis is quite low, ~15,000mt, compared to other SFA's and survey results have been quite variable. The spatial extent and overall population of this stock is not well understood. A directed fishery with a 1,500 mt TAC was first established for the 2013/14 season.

Fishing access in SFA 3 has been allocated exclusively to Nunavut and Nunavik, though lease arrangements with current commercial operators are in place for fishing in this area.

- **SFA 4 (Offshore & Some Inshore):** Though survey results are quite variable, the stock is currently in the healthy zone, and the biomass in this area has remained above historical levels. Exploitation rates have remained low due to variability of results and associated risk. Given the limited spatial distribution of fishing effort, shrimp in this area are likely to return to more traditional stock levels in the mid term, and may decline further in the long term.

- **SFA 5 (Offshore 100%):** This stock had maintained a steady biomass estimate until 2013 when it declined almost 50% with high confidence of results compared to more northern areas. This area has been subject to warming water temperatures and an increase in predator abundance. Based on the 2013 survey results, the estimated exploitation rate for 2014/15 is expected to be well above previous levels.

  Though views differ, it is thought the stock will be sustainable at somewhat lower levels than currently.

- **SFA 6 (Offshore & Inshore):** The stock abundance estimates have continued to decline in the period reviewed and exploitation rates have been 15%-20%, even given the cautious state of the stock. Warming temperatures appear to have reduced the amount of suitable habitat for shrimp, particularly in the more southern areas. Anecdotal information indicates that fishing in 2014 has concentrated in the St. Anthony Basin area where the stock appears to be congregated, resulting in good catch rates from the inshore sector. Exploitation rates for the current year are anticipated to be above previous estimates.

  Given the survey result trends and comments from stakeholders, the SFA 6 stock is expected to continue to decline in the short term and may be sustainable at a low level in the long term.

- **SFA 7 (Closed - Offshore & Inshore):** This NAFO managed stock provides

83% of the TAC to Canadian interests. The stock in this area declined steadily from 2007, entering the cautious zone in 2010. The continued downward trend has resulted in a recommendation from the NAFO Scientific Council for closure of the fishery in 2015.

Given the trend of warming water in this area, it is not anticipated that stock increases will be adequate to justify reopening of the fishery in the mid to long term.

- **SFA 8 (Inshore, 47 vessels):** Shrimp in this fishery are managed as part of the Gulf stock. The fishery is long standing and has recovered from stock declines previously. The stock has remained in the healthy zone throughout the period reviewed. Though the 2014 TAC was reduced based on the harvest control rules for this stock, it is anticipated that catches will be similar to those of the previous levels.

***Conclusion**: The supply risk is higher for the inshore sector which fish in fewer SFA's. The offshore harvest sector can fish in seven shrimp fishing areas (0 through 6), though SFA 0+1 have not been fished in recent years, whereas the inshore sector has access to two, with very limited access in SFA 4 and SFA 5.*

3.2.2 Operating Risks

There are several operating risks going forward. The foremost one involves a reduction in catch per unit effort (CPUE). Other risks include operating cost increases such as fuel and capital cost increases incurred with new vessel or quota acquisitions.

CPUE reductions: Reductions in stock abundance have been demonstrated to be reflected in CPUE declines in the preceding years. For example, in SFA 7 CPUE's have declined 43% and 74% for the inshore and offshore respectively over a five year period (Appendix 2).

Reduction in CPUE has almost a linear relationship with operating costs as vessels must stay out longer to catch the same quantity of shrimp. This impact is more severe the further a vessel fishes from port, which is why harvesting in SFA 0+1 is not feasible.

Many vessel operators have introduced gear changes over the years to improve the CPUE. These changes have included larger nets, use of two or three trawls fishing at the same time, fishing the trawl at different heights during the night and day, adopting improved fish finding equipment and utilizing net sensors to determine catch while the net is fishing.

CPUE's have remained relatively stable in most SFA's over the period of review. However, SFA 4 results have declined 32% over the two most recent years, and 12% measured against the long term average.

Fuel prices: Fuel prices comprise a significant portion of direct operating costs, 15%-20%, at approximately $2,000 and up to $5,000 per fishing day for the inshore and offshore vessels respectively. Any sustained increase from the current price of $0.85/liter (net taxes), would have a direct linear impact on operating costs. For example, if prices increased 10%, the daily fishing cost would increase by $200 and $500 for each the inshore and offshore vessels.

Capital costs: To improve viability, many inshore vessel operators started to acquire additional shrimp quota after DFO granted permanent license status in 2007. Once licenses were recognized as collateral, chartered banks more readily provided loans for further fleet rationalization. In many cases, these acquisitions have been financed by either the BDC or chartered banks, and some of these loans have been guaranteed through the Fisheries Loan Guarantee Program (FLGP). Based on information from the FLGP, the average cost of quota acquisition was $2,000/MT ($0.91/pound). Those that recently acquired additional quota have seen it devalued by up to 50% and further devaluation is likely to occur in the short term.

Depending upon the balance sheet position of individual operators, this may leave some operators highly levered, and unable to meet loan commitments going forward. The FLGP has an exposure of up to $5.5 M directly for shrimp combining and license acquisition. Given that shrimp comprises only 11% of the loans portfolio, the exposure is actually higher if enterprise bankruptcies occur, as the FLGP may have underwritten loans for other species for the same operators.

The average age of the vessels in the offshore fleet is 22 years, with the oldest vessel being 29 years and newest 10 years. Prior to 2005, there was a new vessel commissioned every 20 months on average. However, due to market and stock uncertainty and the increasing cost of acquiring a new vessel, offshore stakeholders have not invested in a new vessel in over 10 years.

It is reported that a new offshore vessel would cost more than $50 M. Whereas the offshore sector does not qualify for the FLGP, the operator must be able to guarantee the loan. Investment in a new boat requires a 25% down payment, ($12.5 M) and repayment terms would be 15 years or less, requiring annual payments of $3.5-$3.8 M, at a interest rate of 5% and 6% respectively. The principle and interest payment would be 15%-25% of average gross revenues.

Most offshore vessels should be fully amortized and debt obligations reduced; therefore, operators should have higher than average cash reserves given the strong market returns in recent years. As a result, it is highly likely that new vessel builds are being considered at this time, making it an opportune time to further consolidate this fleet sector.

3.2.3 Market Risks

The market situation: Wild coldwater shrimp is a niche product as it comprises less than 4% of total world shrimp supply of 7.7m mt (FAO FIGIS 2012) including aquaculture and wild supplies. The majority of world traded shrimp is from aquaculture supplies, ~4.5m mt. These aquaculture operators can control the size to which shrimp

grow and when it is harvested. This meets the needs of buyers much more so than wild fisheries which are subject to limited sizes and seasonal constraints.

The current record high prices being realized in the market are a result of a temporary shortage in aquaculture shrimp supplies in the past two years, although the declining supply of coldwater shrimp has also had a positive influence on prices. The most recent disease problems in the shrimp aquaculture sector now appears to have been overcome and production is anticipated to ramp up quickly. The total supply of aquaculture shrimp may increase as much as 75% over the next 10 years. This is anticipated to have a significant effect on the coldwater shrimp markets.

The unique attributes of wild coldwater shrimp have been successfully promoted and, as a result, it has consumer confidence and is preferred in many markets. Diversification of markets has been accomplished successfully; however, there are still significant opportunities available both in the EU with CETA and in other emerging markets.

Market access, for the most part, has improved through trade agreements with the U.S., and soon with Korea and the EU. However, non-tariff barriers such as Russia excluding, even prior to closing their markets, nine of 11 Canadian freezer trawlers for apparent high bacteria has had a detrimental effect on markets.

It is only through continued market diversification and promotional efforts that the NL shrimp industry will maintain reasonable market prices in the future. This will require collaboration among all members in the industry and support by government in order to meet this long term objective.

The market risk: It is likely that the current prices being received for both cooked and peeled and whole frozen shrimp will decline. Fall 2014 information suggests that current prices for premium C&P shrimp exceed $6.00 per pound at the plant door. This is a 20% increase over starting prices in May 2014 and 55% higher than in July 2013. Whole frozen shrimp are currently receiving as much as $2.00 per pound, 23% higher than average prices received in 2013.

Given the rapid increase in prices, much of the shrimp produced during the peak summer months is only now entering the retail chains. It is anticipated there will be market resistance as these supplies continue to move to the consumer.

Due to the uncertainty over short-term market prices, the economic forecast completed for this study used a three year average of export prices. Using these historical prices reduced 2014 prices 25% for C&P and 21% for whole frozen versus current prices.

> ***Conclusion****: Though market risk is significant, the conservative prices, 2011-2013 average, used for the economic impact analysis likely represents the outcomes that will be realized.*

4.0 SOCIAL IMPACT

With anticipated declines in shrimp landings of up to 50% versus 2013, the social impact will be far reaching. Significant declines of harvest effort and processing capacity must be achieved in tandem to ensure viability of those stakeholders remaining in the shrimp industry.

Short term cushioning of the impact was realized in 2014 with the extraordinary market prices realized, favourable exchange rates and reportedly strong catch rates. Indications are that these favourable conditions may be short lived and prices will return to a normalized, though higher than average, level, as buyers resist current prices and alternative warm water supplies become more abundant.

The implications of current supply reductions would have been much more acute had favourable conditions not existed in 2014. Many harvesting and processing operations would either have operated at significant losses or not operated at all, as existing capacity exceeds current resource availability. With further resource declines and reduction in market prices anticipated, shrimp stakeholders may have to undergo a radical reduction in capacity in the short term. This will result in a significant number of job displacements, reduction in incomes for many remaining in the sector, and plant closures in several communities.

4.1 Community Impacts

The social impacts that come with declines in shrimp quotas are those that affect individuals and communities and which are either not picked up by impacts modeling or are not measurable. They are a function of several things that influence how individuals or communities fare going into the future.

Discussions with community leaders where shrimp plants have already closed indicate there has been a significant reduction in the tax base for the towns. These towns have had little success in replacing the lost tax revenues, despite continued efforts to develop new opportunities. The plant closures have also affected local businesses as outmigration and reduction in disposable income has drastically affected spending.

Inshore sector: The shrimp industry affects many communities throughout rural NL. There are 10 communities where processing plants are now located; three others where transshipment facilities operate; nearly 100 ports where shrimp is landed, Appendix VII, and another hundred or more where plant workers and harvesters reside. This results in a wide spread proliferation of incomes earned and spent in rural areas where overall employment opportunities are lower than in urban centres.

There are several areas where inshore shrimp processing operations have become concentrated. These are the Northern Peninsula from Port au Choix to St. Anthony, Twillingate/Fogo Island, Clarenville, the Bay de Verde peninsula, and southern Labrador. The obvious beneficial effects of these operations are the provision of employment, incomes and spending in the general areas where plant workers and harvesters reside. Some of the more obvious negative impacts of quota reductions on these processing operations include increasing difficulty in retaining plant workers, declining revenue as throughput falls, and increasing competition for raw material which will eventually make supply more costly and force plant closures. As operations are forced to cut back, local service providers such as trucking and general repair operators will suffer a loss of business.

When fishery earnings decline local areas/communities are affected by lower tax revenues, reduced local spending and employment levels. This often results in further out-migration and the eventual loss of rural population. Community services become harder to maintain as the tax revenues decline. As community services deteriorate, population decline is likely to follow. When population decline reaches the point where certain public services such as health and education become more centralized, increased local de-population results as individuals move closer to such amenities. As local businesses suffer a loss of sales as fishery earnings decline they eventually offer a smaller range of goods and services. This often results in a further leakage of spending in certain localities as consumers go farther afield to acquire products. There may be some lessening of these incomes/spending effects if displaced workers or harvesters find employment in the oil and gas sector or other major projects but continue to reside in their original community.

> ***Conclusion****: The significant points to note about the projected quota cuts are two-fold; there will be fewer shrimp processing plants and active inshore enterprises before the end of the ten-year projection horizon. That means fewer individuals will continue to be employed in the shrimp industry with the resulting loss of disposable income and spending in those rural areas associated with shrimp harvesting, processing or transshipment.*

Offshore sector: The offshore sector provides high income full-time positions for individuals working aboard vessels, directly supports land-based logistics operations, unloading, cold storage, transshipment operations, and through lease and/or income arrangements provide benefits to SABRI, Innu, the LFUSCL and Torngat.

Crew members aboard offshore shrimp vessels currently earn >$100,000 annually and most are residents of NL. Due to the high incomes, attracting and retaining crew in this sector does not pose the same challenges as the inshore sector.

Supply reductions will have significant impacts on the service sector in both St. Anthony

and Bay Roberts where landings occur and at transshipment points.

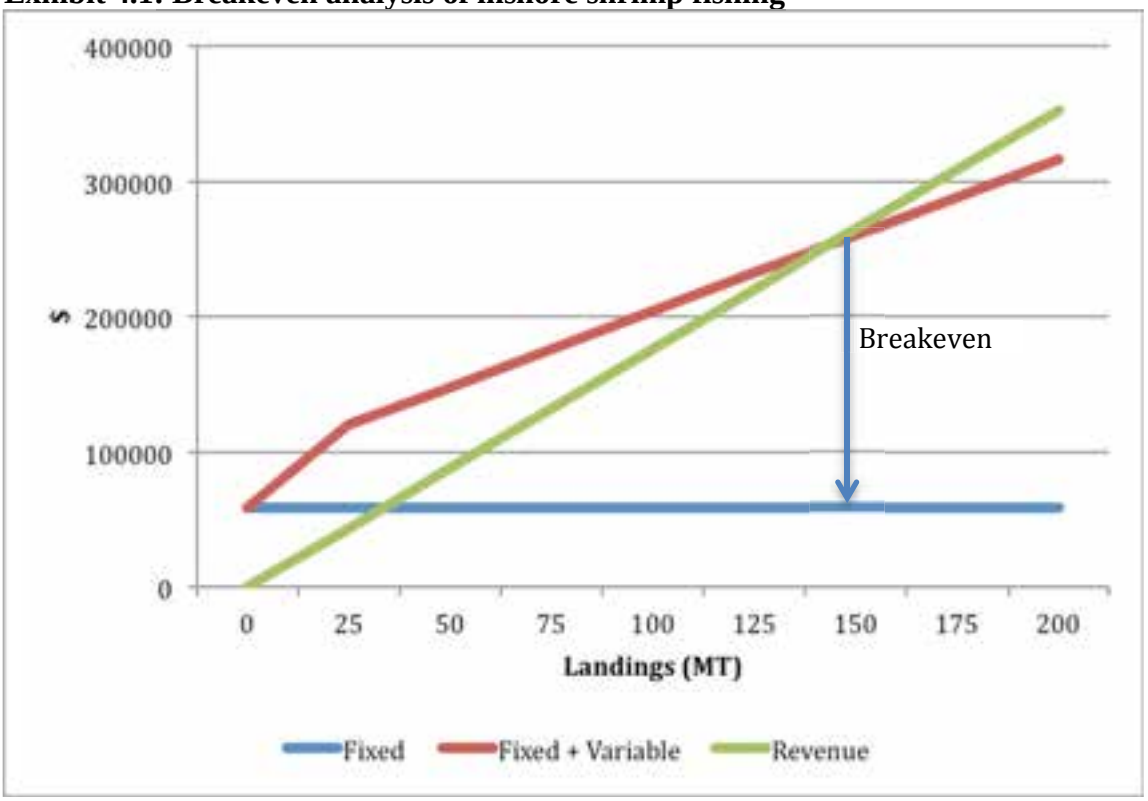
> ***Conclusion**: Reducing the offshore shrimp fleet will reduce the number of harvester positions and negatively impact communities that hold licenses or special allocations, and communities that provide support services for these vessels.*

4.2 Inshore Harvesting Impacts

It is obvious from the quota and allocation reductions projected under the various scenarios that the viability of the inshore shrimp fleet is in peril and the number of active enterprises should decline significantly over the next 10 years. Barring a sustainable increase in landed price, it is not possible for the current number of active vessels to continue in this fishery at the projected level of quota available under even the most favourable of the reduction scenarios.

The following breakeven analysis, based on available financial information, suggests a breakeven requirement of 150 mt of catch for the average inshore shrimp vessel, assuming other species revenues and expenses remain unchanged. In turn, this permits determination of the number of vessels that can be supported for each model in the short, medium and long- term. This analysis may be optimistic, as some of the fleet groups within the inshore sector are highly dependent on snow crab, which in recent years have generally shown poor recruitment, with significant stock reductions in 2J3K.

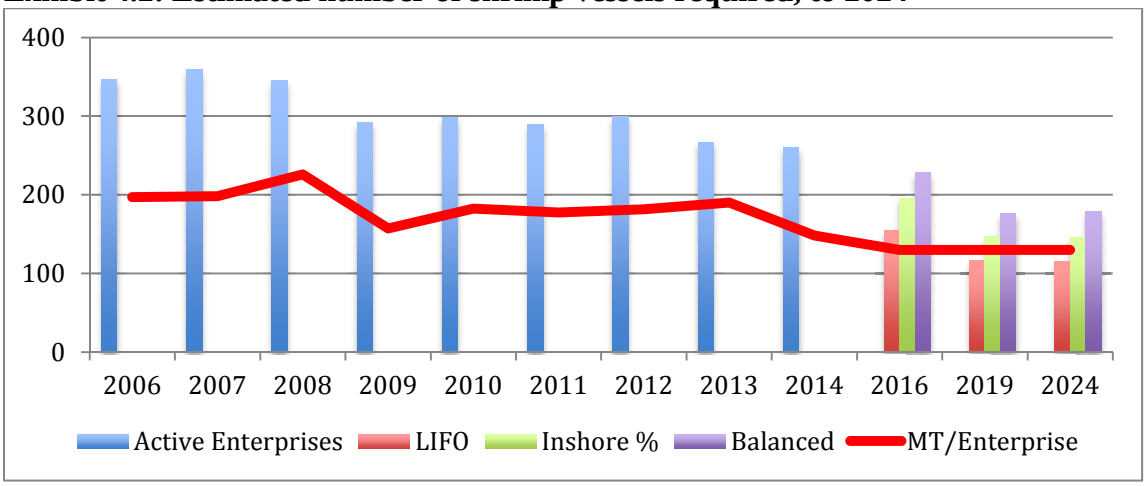
Exhibit 4.1: Breakeven analysis of inshore shrimp fishing



The reduction in the inshore shrimp fleet will likely incur delays through self-

rationalization measures. Though a viability target of 150 mt minimum has been demonstrated, these exit delays will likely result in vessels fishing an average 130 mt. In other words, catch levels below the breakeven requirements will be accepted for a time before exiting the fishery. Even under this flexible assumption, the numbers of vessels that could be supported under the most favourable allocation scenario (Balanced reduction) will be less than 200 by 2024. Under the most unfavourable allocation scenario (LIFO), the fleet size that could be supported by 2024 will be slightly over 100 vessels. The numbers that would remain under the intermediate allocation option (Maintain Inshore %) would be less than 150 by the same time.

Exhibit 4.2: Estimated number of shrimp vessels required, to 2024



These two charts above are a guide to likely events under the allocation scenarios that were examined. They do indicate that a considerable fleet rationalization/consolidation will be needed, especially in the medium and long term periods. The practical results of this need to rationalize will come from some combination of permanent voluntary exit, more combining of enterprises, bankruptcies and development of other fishing opportunities. Each of these options are briefly discussed:

- **Voluntary exit**: At some point, enterprise owners will decide to permanently exit the shrimp fishery because a viable operation can no longer be maintained. This form of exit will depend on access to other more lucrative fisheries, the lack of possibilities to dispose of the enterprise's assets and quota allocations and the financial status of the owner. The higher the level of equity (lack of debt), the more likely is this type of exit out of the shrimp fishery to occur as quotas and fishing returns decline. This is a more likely possibility in areas where operators have access to other more profitable fisheries, such as crab. That would seem to imply this is a more likely option in 3L than in other areas, 4R and 2J3K.

- **Combining of enterprises**: Assuming a policy of allowing additional combining of enterprises exists, this option will be constrained by the cost of acquiring additional allocations and the availability of financing the acquisition. The acquisition cost will increase capitalization and debt burden of the enterprise but some number of operators will view this as an option to continue in the fishery.

The incremental cost of additional combining will increase the breakeven requirement and result in fewer vessels being supportable by the declining allocations. The extent to which favourable financing is available to the fleet will be a significant factor in determining the scope of self-rationalization.

- **Bankruptcies**: These may occur as fishing returns from shrimp decline and debt can no longer be serviced. The extent to which these occur will depend on the level of debt, the possibility of selling the individual enterprise or its allocations and the degree to which debt forgiveness may be available.

  The degree of combining in the future will likely be constrained by costs of allocations and availability of financing. While future allocation shares will be worth less as quota declines, there will still be upward pressure on the purchase price as existing holders attempt to recoup their acquisition costs and competition continues to acquire additional access to a declining resource.

  A suggestion was made in consultations that bankruptcies could be averted or reduced if the current loan guarantee program were adjusted to buy out allocations that have been acquired under it. This would remove the enterprise from the shrimp fishery and relieve the owner of the debt burden. But, in general, bankruptcies are unlikely to be totally avoidable as a fleet reduction mechanism.

- **Other fishing opportunities:** The extent to which other fishing opportunities can be made available to all shrimp operators is constrained by the lack of such possibilities on a wide scale. A number of such options were described in consultations, including access to un-harvested groundfish resources, providing for more turbot allocations inside the Canadian zone; pursuing new species opportunities; determining if it is possible to combine the biomass estimates for shrimp in SFAs 6 and 7 resulting in a higher SFA 6 TAC; and increasing by-catch allowances in certain groundfish fisheries to produce higher catches of valuable halibut.

  One common view is that a transformation back to a groundfish fishery is likely in the long term. It is viewed as inevitable that as the shrimp resource declines the groundfish abundance will increase. This is likely to be a ten-year process that requires significant investment as the industry moves from a shellfish dominated to a groundfish dominated fishery. A fairly long transition period is envisaged that will require financial assistance and forward planning to get the inshore sector from where they are today to where they will need to be when groundfish returns. <u>This may be the biggest challenge and priority resulting from shrimp stock declines</u>.

  Taken overall, these are not measures that will eliminate the reduction in shrimp enterprises that must come with declines in allocation to the inshore fleet. They will ameliorate the effects of lost revenues for some number of operators who will remain in the shrimp fishery or who will abandon it in favour of other opportunities.

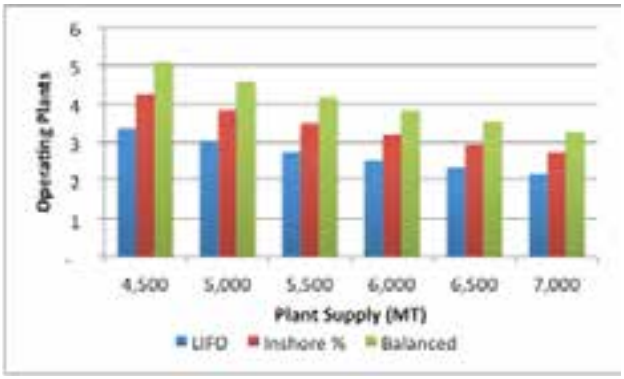
- **Change in shrimp allocation policy:** A change in management policy from

LIFO to a more balanced approach would significantly mitigate the severity of impacts to the inshore harvesting sector.

4.3 Inshore Processing Impacts

The cooked and peeled shrimp processing sector faces significant challenges currently, and as supply continues to decline. Currently, 10 plants are operating, albeit at much lower supply levels than prior years. Supply to onshore processors has reduced more than 50% since 2008, averaging an estimated 3,800 mt of supply per plant in 2014. Anecdotal information suggests that a minimum of 4,500 mt of supply is required to sustain a plant given favourable market conditions and if debt levels are low. A processing sector which can maintain competitive advantage through ongoing modernization would likely need supply levels of 6,000-7,000 mt to withstand market price variations and support additional capital for modernization.

Exhibit 4.3: Estimated plants required



Currently 10 plants are operating versus the three to five plants required in 2019 under the different supply models. However, to maintain long term viability, 7,000 mt of supply, only two to three plants would remain active.

The impact on communities where plants close could be severe, as many of these towns have no alternative industry or seafood supplies to sustain an economic foundation. With a minimum of five and maximum of eight communities affected, some mitigation measures for the short to mid term must be established.

Displaced workers will range from 670–1,072, with the majority coming from the community or the catchment area for the plants. Given the high average age of the workforce in these plants, many of the processing labour staff is more likely to seek retirement than alternative employment or moving. The skilled labour staff should be absorbed into the broader labour pool in the seafood or other sectors.

The options available for these cooked and peeled plants are very limited, including:

- **Voluntary closure:** With further stock reductions or a downward market price adjustment, operators must consider closing plants. The rationale for remaining open currently may be predicated on servicing suppliers of other species.

  Given that SFA 6 landings are concentrating more on the Northern Peninsula and the relative importance of the Gulf fishery as the stock declines, plants in this region should have the competitive advantage of adjacency. This area of the province has very few employment alternatives, so there is a much more captive workforce versus some other areas.

  The rate and extent of plant closures will depend upon the financial capacity of

individual operators to sustain ongoing operational losses. Operators with the weakest balance sheet (high debt load) will likely be the first to exit. Also, those operators who fail to meet minimum processing requirements may have their license revoked.

- **Collaborative partnerships:** Maintaining supply of all species is essential to the business model of all shrimp producers. Therefore, many are reluctant to relinquish the relationship with harvesters for even one species. Structuring collaborative partnerships whereby two or more companies agree to operate only one plant could work to preserve these supply relationships.

  This type of partnership can take two basic forms or combinations thereof. One is simply a supply relationship where the operating plant purchases, including commission, supplies from the partner, that has forfeited their processing license or permitted it to lapse, under an agency agreement. Also, equity partnerships are possible whereby the operator of a closing plant could transfer assets or make an investment in the second party's plant.

- **Process alternative shrimp supplies:** With the impending elimination of tariffs into the EU under CETA and elimination of minimum processing requirement, producer viability may no longer be driven by producing once frozen cooked and peeled product. Purchasing Canadian industrial shrimp or alternative shrimp species on the world market would permit processors to supplement their current supplies without impeding their ability to meet peak supply periods for the local fishery. If alternative species were targeted to the EU, to qualify for tariff relief they would have to meet the Rules of Origin under the agreement and import requirements. If not applicable for tariff relief, these alternative species may be best destined to other markets.

  Many plants are not well equipped to process small frozen shrimp supplies, lacking thawing capability for frozen shrimp and materials handling systems for small shrimp. Most plants would have to be retrofitted to some degree to be capable to meet this need.

  The challenge of entering this sector of the business is the ability to compete with existing producers in Iceland, Norway and Denmark. Their current trade arrangements permit them to supply twice frozen or once frozen brine shrimp to lucrative EU markets. Most of these operators process year round and do various retail and food service products. Further, these producers and marketing associations within these countries, have close relationships and more effective marketing support mechanisms than many Canadian producers. The main supply stream at many of these plants is industrial shrimp from Canadian producers. Therefore, it would be beneficial to NL peeling plants to source this supply, improving their asset utilization while negatively impacting asset use of competing plants abroad.

  Though supply of Canadian industrial shrimp is abundant in 2014, if and when the Eastern European market opens again, much of this industrial supply may be

diverted back to this market.

- **Change in shrimp allocation policy:** A change in management policy from LIFO to a more balanced approach would significantly mitigate the severity of impacts to the inshore processing sector.

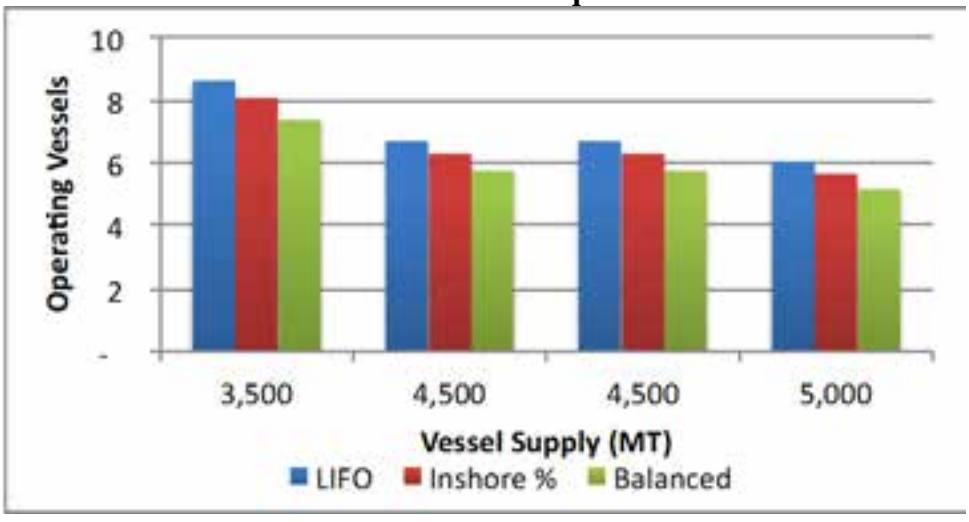
- **Other opportunities:** There were several suggestions put forward by stakeholders which they believe would reduce the impact of shrimp supply reductions. These include measures to address processing inefficiencies through development and adoption of innovative technology to permit production of frozen shrimp supplies; eliminate the cooked and peeled requirements to permit producers to seek alternative production methods; support harvesting at times of the year when product quality and yields are better.

4.4 Offshore Impacts

Some rationalization of the offshore sector has already occurred in response to recent supply reductions. One vessel has been retired and another may be decommissioned in the near future. Whereas the fixed cost component (refit, leases, and overheads) can be high for operators and many need to generate funds for replacement vessels, stakeholders indicate year round operation of vessels is essential. With the closure of 3M and SFA 7 and the reductions anticipated in SFA 6, the opportunities for fishing in ice-free areas in the winter has been reduced, compromising the ability of all vessels to fish year round.

Based on the economic model outputs and a range of breakeven volumes that reflect the various vessel efficiencies and market risk, the following chart illustrates the number of offshore vessels landing in NL that will be required using projected allocations. When contrasted to current vessel activity, continued rationalization of the offshore sector must occur under any operating scenario.

Exhibit 4.4: Estimated offshore vessels required at various breakeven supply levels



Some of the supply currently harvested is leased from other license holders or special allocations. These lease arrangement provide jobs and an income stream to communities

and companies with a mandate to support fishing activities and development. These direct payments to NL communities, First Nations or development groups which hold these special allocations is estimated to be $20-$25 M per year. These lease obligations generate direct business development and employment within these communities. Further, under these lease arrangements many individuals from coastal Labrador and the Northern Peninsula are guaranteed crew positions. Therefore, the economic multipliers in these communities would be much higher than the provincial average used in the analysis.

Though not verifiable, CAPP estimates that up to 2,500 indirect jobs are generated by these lease arrangements in Quebec, Nunavut, and all Atlantic provinces. Information from some locally impacted non-fishing quota and license holders is provided to illustrate some of the benefits realized regionally.

- Lease of the SABRI shrimp allocation, (3,000 mt) provides 21 onboard jobs for local workers, supports 150 people that are employed in the local shrimp/crab plant that is operated under the allocation access agreement, and an additional 40-50 seasonal jobs are provided through shore based activities. In addition, SABRI has invested $15.9 M in infrastructure in the area.

- Torngat Fish Producers Co-operative license allocation (~3,400 mt) is leased, providing up to 16 onboard jobs, and revenue to subsidize fishing and processing operations in Northern Labrador. These operations employ up to 200 local residents annually, comprised of nearly 100 plant associated employees and up to 100 harvesters.

The Leslie Harris Centre completed a report in 2013, Fisheries Allocation Policies and Regional Development: Successes from the Newfoundland and Labrador Shrimp Fishery, which outlines the successes realized through shrimp allocations for the purposes of regional development. The case studies presented include SABRI, LFUSCL and Fogo Coop. Though the LFUSCL is now an active fishing license holder through their partnership in M.V. Osprey, the revenues previously realized through lease of their shrimp license allocations were used to successfully establish five processing plants and support further inshore harvesting participation in Southern Labrador. Fogo Co-op used funds realized through leasing their shrimp allocation to fund establishing a shrimp processing plant and modernize their crab operations.

Other NL based community and First Nation allocations fished by offshore vessels include, or recently included, Fogo Co-op (0 MT), Miawpukek (0 MT), and Labrador Innu (1,260 MT). The allocations to these groups declined by 1,845 mt in 2014, eliminating all allocation from both Fogo Co-op and Miawpukek and all SFA 6 for the Innu.

There is also local employment and incomes generated in the four communities that have transshipments facilities. Three of these facilities are located near active industrial areas, which will provide alternative sources of income and employment in the instance of a supply downturn.

The options available to the offshore sector are limited as most vessels are purpose built for harvesting and processing of shrimp and many of the vessels in the fleet are reaching the end of their useful life. The short term response to supply reductions will be capacity reduction in the fleet. In the mid to long term there may be other resource opportunities in northern areas including other shrimp fishing areas, redfish and Greenland halibut. Further, a continued ocean warming trend should support increased abundance of flatfish species adjacent NL, which will benefit at least one major offshore shrimp stakeholder.

The result of supply reductions and possible mitigation measures are discussed:

- **Self rationalization will occur:** Operators of offshore vessels will continue to reduce harvest capacity as supply declines. These reductions will likely occur through a combination of voluntary exit of vessels, combining of licenses and allocations on fewer vessels, and combining licenses through new builds with higher capacity. Given the age of the fleet it is likely vessels are fully amortized, resulting in higher than average cash reserves, thus providing an opportunity for further fleet consolidation as new vessel builds go forward.

- **Other fishing opportunities:** Currently, there is no species of adequate abundance to support conversion of some of the shrimp fleet. The status of species which may offer opportunity in the mid to long term are discussed:

  - ✓ ***Pandalus montagui*** **shrimp in SFA 2&3**: Though similar to *Pandalus borealis*, the montagui species is smaller and not the preferred species in any markets. In the past, montagui has been sold almost exclusively to Russia, at discounted rates compared to borealis. With the recent closure of Russia to Canadian imports, it has been suggested that montagui harvested in 2014 in SFA's 2 and 3 all still remains in inventory.

    The montagui fishery in SFA 2 and 3 is allocated almost exclusively to Nunavut and Nunavik interests, though much of the quota in the past two years has been harvested by NL and NS based offshore harvesting interests.

    Without re-opening of the Russian market there does not appear to be a short-term option for sales of this species. Completing promotional efforts to develop alternative market destinations for either whole frozen or cooked and peeled may provide a long term opportunity for continuing expansion of directed harvesting efforts.

  - ✓ **Redfish in Subarea 2J and Division 3K**: The limit reference point for the 2+3K *Sebastes fasciatus* is 29,000 mt with the 2011 biomass estimated to be 8,000 mt or 28% of the LRP. For *Sebastes mentella* the LRP is 116,000 mt with an associated 2011 biomass estimate of 16,000 t (14% of the LRP).

    While there has been some improvement in the estimated biomass for these two redfish stocks in recent years, both stocks are still well below the LRP and catches should remain at their lowest possible level in the mid-term.

  - ✓ **Redfish in Subareas 2GH and O+1:** There has been no research conducted

in 2GH adjacent Northern Labrador, and research findings for Divisions 0+1 are gleaned primarily from shrimp and turbot survey and bycatch encounters in directed fisheries for shrimp and turbot. The distinction between redfish in these areas versus 2J+3K is unknown; they could be one stock or two separate stocks.

With stable bycatch levels (127-240 mt) in the past 10 years, it does not appear that stock growth has been hindered. Limit reference points would need to be developed in the future, though this would be challenging given the limited data available.

- ✓ **Greenland Halibut in Subarea 2 and Divisions 3KLMNO:** The current TAC for 2015 for this stock is 15,578 t based on the HCR using the most recent five years of survey data (2009-2013). Based on the HCR, the TAC's in the next two years will change by a maximum of ± 5% of the 2015 and 2016 TAC's respectively.
- ✓ **Greenland Halibut in Subareas 0+1:** Stock indicators remain strong, well above the preliminary limit reference point, in most areas accessible to Canadian harvesters. Catches are at the highest levels seen and the entire TAC has been taken in recent years. Allocation of quotas in 0A are assigned to Nunavut, and 0B are shared among several stakeholders including company allocations.

A review of demersal fish stocks from Greenland surveys indicate that Greenland halibut biomass is currently near average; however, there is strong indications of recruitment. Cod abundance and biomass estimates are the highest in the time series, driven primarily by a strong 2009 year-class. Redfish species (*S. marinus* and *mentella*) biomass (33,301 mt) has increased after a period of relative stability through the 2000's.

5.0 MITIGATION STRATEGIES

A summary of all survey responses from individual stakeholders, and discussions with association representatives and individuals are summarized in Appendix V. The following mitigation strategies are provided based on the stakeholder recommendations, supplemented with observations based on the outcome of the socio-economic analysis.

Mitigation strategies are unlikely to address the scope of impacts in the short term: Several mitigation measures are proposed for consideration by governments and industry stakeholders. However, the economic losses, nearly 50%, due to shrimp stock reductions are unlikely to be replaced by any individual measure in the short term.

The mitigation strategies are discussed in relation to a subjective 'Strategy Impact', ranked as low, mid or high, that gives consideration to economic and social factors. Any consideration of reassignment of shrimp from the offshore to inshore sectors will have limited effect on the overall provincial economy, as the GDP and income effects are very similar for each sector. Therefore, support for any strategy must give consideration to social factors, the number of people impacted, aging demographics within each sector, vessel age and harvesting options, and long term strategic growth considerations for the NL seafood sector.

Alternative allocation and management methods can be considered – It has been demonstrated that DFO management decisions have followed their LIFO established policy, which is unique to the northern shrimp fishery. However, inshore stakeholders support management options that provide a more equitable sharing of shrimp to reduce the significant impacts to the inshore sector in the short and long term. To some measure, these options have been examined through the economic modeling completed.

- **SABRI:** Assign the SABRI allocation to a different SFA, reassigning the SFA 6 SABRI allocation (3,000 mt) to the inshore sector. Assignment of quota from another SFA would have to be taken from existing offshore allocations and/or special allocations in the SFA. Further, the current value of the SABRI allocation would likely be reduced, as fishing would occur further north, increasing harvesting costs. Alternatively, consideration could be given to having inshore enterprises harvest the SABRI quota.

  Strategy Impact – Mid. Re-assignment of the SABRI quota to the inshore sector would sustain 20 vessels, 100 crew, and contribute additional supply to inshore peeling plants.

- **SFA 7 Stock**: Combine the stock biomass estimates for SFA 6 and 7, which should provide an increase in the SFA 6 TAC. The rationale is that shrimp is essentially one stock; so including the biomass from SFA 7 stock in 2015 allocation decisions would support a higher TAC in SFA 6.

  Strategy Impact – Mid. The relative fishable biomass of SFA 7 versus combined SFA 6&7 is ~10% or ~3,000 mt. The benefits realized by the inshore harvesting sector result in sustaining up to 20 enterprises and 100 crew, and contribute additional supply to inshore peeling plants.

- **Access to SFA 5:** Provide additional access to SFA 5 to those affected by SFA 6 reductions. Depending upon the 2015/16 TAC established, additional resource may be available and could be assigned to inshore interests. Alternatively, the allocation to affected inshore SFA 6 license holders would have to be reassigned from either the offshore sector or Special Allocations.

  Strategy Impact – Low to Mid. Given the TAC in SFA 5 is much lower than SFA 6, a significant benefit could only be realized by the inshore sector if a large portion of the TAC was transferred from the other stakeholders to SFA 6 inshore interests.

- **SFA 6 Exclusively Inshore:** Provide all SFA 6 TAC exclusively to the existing inshore stakeholders. This would adversely effect all offshore license holders and Special Allocations, resulting in offshore enterprises having to tie up during the winter and early spring when these SFA 6 stocks are normally harvested. Discussions with offshore representatives indicate this would dramatically impact established fishing plans, possibly compromising fleet viability.

Exhibit 5.1: Economic impact of assigning SFA 6 offshore allocation to inshore

Sensitivity	Sector	Impacts	Short Term 2016	Mid Term 2019	Long Term 2024
Offshore excluded from SFA 6	Inshore Harvesting	GDP ($ M)	$29.8	$47.2	$52.3
		Income ($ M)	$20.6	$29.5	$32.7
		PY's (#)	166	211	204
	Onshore Processing	GDP ($ M)	$21.3	$31.0	$34.1
		Income ($ M)	$12.2	$18.0	$20.6
		PY's (#)	292	398	395
	Total Inshore	GDP ($ M)	$51.1	$78.1	$86.4
		Income ($ M)	$32.8	$47.6	$53.3
		PY's (#)	458	609	599
	Offshore	GDP ($ M)	$45.0	$54.0	$63.2
		Income ($ M)	$27.4	$32.3	$37.5
		PY's (#)	386	428	441
	Grand Total	GDP ($ M)	$96.1	$132.1	$149.5
		Income ($ M)	$60.2	$79.9	$90.8
		PY's (#)	844	1,037	1,040

> **Strategy Impact** – High. This one measure would reduce economic impacts to the inshore sector more than any other option. Contrasted to long term impacts from the balanced reduction model, the inshore sector would provide 6.5% higher GDP, 9.3% higher income, and 9.7% more PY's. However, with an additional ~10,000 mt of supply some 67 vessels, 335 crew, and two peeling plants would be sustained with a workforce of approximately 290.

Increase utilization of species. There are several species quotas that have not been fully utilized in recent years including cod, yellowtail and redfish. There has been up to 30,000 mt of these species left in the water annually. Though values of these species are lower than shrimp, exploiting these species to a higher degree could offset some of the provincial economic losses from shrimp stock declines.

Current management policies in NL do not permit easy transfer of fish stocks from one sector to another, resulting in lost economic opportunity. In other regions, jurisdictions and in enterprise allocated resources, transfer of resources between and amongst fleet sectors is done regularly and on a broad basis in order to ensure available stocks are not underutilized. This can be done in different manners including leasing fish in the water, trading of similar or different species as needed to supplement quotas, or trading volumes of one species for volumes of another. Regardless of the method employed, the result ensures that resources are fully utilized and a higher economic value available is realized.

> **Strategy Impact** – Low to Mid. Depending on the degree to which fish may be leased or transferred to the inshore shrimp trawlers, the benefits realized to inshore harvesters, onshore producers and the province could be significant.

Diversify shrimp supply streams at inshore plants. - In the medium-term, inshore producers could mitigate risk by moving to an operating model that permits processing frozen at sea industrial shrimp supplies, *Pandalus montagui* shrimp, and possibly alternative shrimp species. With small shrimp no longer being exported to Russia, there is likely ~5,000 of industrial supplies currently available. Further, montagui supplies were also traditionally sold into Russia, which may provide further supplies for on shore peeling.

With EU tariff elimination there will be opportunities to produce different product forms and smaller/retail packs that should increase per unit value and extend operating seasons significantly.

Currently, most onshore shrimp processing facilities are not adequately equipped to process frozen shrimp supplies. Processors would have to make investments in thawing equipment and modify in plant handling systems to accommodate small shrimp and more advanced packaging methods. Given the inshore supply outlook, investment is unlikely

occur without encouragement and financial support. However, the impending EU trade deal provides the opportunity to become competitive with other twice frozen and consumer ready producers in jurisdictions that currently have preferential trade access.

> **Strategy Impact** –Mid. Benefits to the shrimp processing sector could be significant, 5,000 mt of supply, and may permit a more diversified, sustainable operating model going forward. This could have positive outcomes for fresh shrimp suppliers, as higher prices may be realized as producers reduce overheads by increasing operating seasons, and increasing per unit values by producing smaller/retail packs. This increased supply equates to maintaining one shrimp peeling plant sustaining employment of 145 workers.

Debt reduction would benefit inshore enterprises. Many inshore enterprise owners have stated that significant debt was accumulated through rationalization that commenced when licenses were granted permanent status by DFO.

Given forecast shrimp stock reductions, inshore enterprises will have challenges supporting debt that may result in some bankruptcies. Further, it has been demonstrated that further harvest capacity reduction is required, which likely will not occur to the degree necessary given current debt loads. Inshore stakeholders have suggested a government sponsored license buyback would ensure further rationalization, and support for debt reduction would reduce bankruptcies.

> **Strategy Impact –** Low. Restructuring of debt and continued rationalization of harvesting capacity could provide long lasting stability to the sector.

Examine options for more access to traditional resources. – Though there are no species available in the short or mid term to replace the value and margins realized by shrimp, stakeholders consulted during the study have requested examination of several management measures that could supplement inshore harvester supplies, thus reducing the impact of shrimp supply declines.

- Examine the Canadian management options for Greenland Halibut (turbot) in 2+ 3 to determine if the TAC available to be fished inside the Canadian Zone could be increased. Further, include an exclusive allocation of the existing turbot TAC for 2J harvesters that would permit them access to that fishery after their crab quotas are taken.

- Permit an increased halibut bycatch in other fisheries such as skate (15% vs. 5%). This would fundamentally change the economics of these groundfish fisheries for some <65’ vessels.

Strategy Impact – Low. The limited volumes of these species contrasted with the large volumes of shrimp that may not be available results in modest benefits to be realized by inshore interests.

Improve understanding of shrimp stocks – It is recognized by all stakeholders and DFO science branch that understanding of shrimp stocks and their relation to the key ecosystem factors can be improved. In 2005, there was a conference regarding ecosystem considerations of shrimp stocks. This resulted in some changes to how science at the time was done. However, it would be beneficial to now complete inter-regional meetings to focus on important factors and outcome of experiments defined in 2005. This may result in moving toward a more holistic approach of modeling in the future.

Currently, habitat and ecosystem considerations are not incorporated into stock modeling. Modeling continues to be done using traditional approaches of stock abundance by depth strata from surveys extrapolated to the entire depth strata, then strata results accumulated to determine SFA biomass estimates. Shrimp assessments are done using length weight frequencies from samples collected during the survey, a new method of aging crustaceans is currently being evaluated to determine the applicability of an age modeling technique in place of the current method. During the previous ZAP, discussions were completed regarding ecosystem connectivity (Koen), including stock forecasts to 2047.

There are several areas of research that have commenced including monitoring of chlorophyll blooms and determination of relationship of these blooms with larvae survivability and recruitment.

There are calls for a thorough reassessment of the measurable factors effecting shrimp abundance. It is believed this would identify the need for development of a more robust assessment model. Whereas, DFO has only one staff working part-time on shrimp, a contracted approach for development of this model may be more expeditious.

Strategy Impact – Low. Though beneficial to the long term interests of both governments and stakeholders, it is unlikely that any alternative assessment methods will result in significant increases of shrimp to be harvested.

Investigate opportunities for alternative fisheries – Though a long term mitigation strategy, there is a need to examine the opportunity for developing fisheries for other species, especially in northern areas where existing resources, mainly crab, have declined. Specific examples cited were spiny and porcupine crabs in 2J.

In a re-opened cod or other groundfish fishery, permit <65' vessels to use any available or currently licensed fishing gear to catch assigned allocations. Currently, there are very few groundfish trawl licenses in the inshore sector, yet all those fishing inshore shrimp have the capability to easily convert to trawling for groundfish. This capability did not exist on the northeast coast on inshore enterprises during the previous commercial cod fishery. Stakeholders have stated that use of trawls permits a more economically viable fishery and if prosecuted properly can provide superior quality fish versus gillnet or

longline.

> **Strategy Impact** – Low. Due to the long term nature of developing new fisheries, it is unlikely that this mitigation strategy would have any impact in the short term, minimal impact in the mid-term, and only moderate impact in the long-term.

Markets for whole shrimp can be diversified – Offshore stakeholders have stated the need for further market diversification into such areas as Korea, India, EU, and further market expansion to inland China. Further, with closure of the Russian market, montagui supplies are reportedly not moving, indicating that alternative markets should be developed for this species.

South Korea tariffs on shrimp are scheduled to reduce 4% annually from the current 20%. The only exception is shrimp prepared or preserved in airtight containers (HS code 1605290000), which has a more accelerated reduction to 13.34% in year one, 6.66% in year two and 0% in year three. South Korea currently imports $350 M of shrimp annually, and with a population of 70 M people and a burgeoning middle class, Korea is a market of opportunity for Canadian producers.

Another emerging market is India, where shrimp is well known a large population, 1.25 B, exists and there is a growing middle class. This market is opportune for a high-end niche product such as coldwater shrimp. With a current tariff of 35%, this opportunity may be best exploited under a more favourable tariff regime.

Coldwater shrimp has been successfully marketed in high population centers of coastal China. With the recent improvements in cold storage infrastructure and frozen food distribution to other more inland markets from seafood entry points, the opportunity for market expansion is now possible.

EU tariff elimination will offer some opportunity to expand markets for value-added products and supply of whole shrimp to hand peeling operations in Eastern Europe.

> **Strategy Impact** – Low. It has been successfully demonstrated that significant volumes of shrimp can be sold into new markets and realize a competitive return. Though unlikely to provide any significant benefit in the short term, in the mid term market diversification efforts could benefit the shrimp industry.

Other suggestions include:

- In the event that the offshore sector commences new builds to replace the aging fleet, other vessel uses should be considered to reduce year round dependency of shrimp fishing. For example, in Norway some seasonal operators have designed or modified their vessels to service the offshore oil and gas, or conduct fisheries research.

- Human resource development – Industry has stated there is high demand for both stationary and marine engineers. It is suggested that a specific program be

developed and implemented to recruit, train and retain these people.

Skills upgrading for factory workers would be beneficial, specifically supporting for training in QMP and equipment technology.

It is unlikely that any one of these mitigation strategies can address the short term economic impact of anticipated shrimp stock reductions. However, if a number of these initiatives were adopted, there may be adequate cushioning for the inshore sector during the period necessary to transition from a shellfish based industry to a more groundfish dominant industry.

Concluding Recommendation: *The most significant over-riding conclusion is that a joint government/industry planning initiative should be undertaken to address short term challenges in the inshore shrimp sector, and develop a strategy for the expected transition from a shellfish based fishery to one more dominated by groundfish.*

6.0 CONCLUSIONS

Page v — The short term impact to the inshore sector from stock declines will be significant, and mitigation measures to reduce the immediate impact must be considered.

Page vi — In 2024 dollars, the long-term GDP impact is anticipated to be $149-$167 M, a loss of $93-$101 M of income and 1,060-1,142 full-time equivalent jobs.

Page viii — The shrimp industry is very geographically diverse, so declines in shrimp stocks will impact many communities in rural areas due to harvest and process capacity reductions and loss of income.

Page 28 — In 2024 dollars, the long-term GDP impact is anticipated to be $149-$167 M, a loss of $93-$102 M of income and 1,060-1,142 full time equivalent jobs. In comparison to the 2013 baseline, the losses will be as much as 59% in the long term, and 47% in the short term.

Page 32 — The offshore harvest sector can fish in seven shrimp fishing areas (0 through 6), though SFA 0+1 have not been fished in recent years, whereas the inshore sector has access to three, with very limited allocation in SFA 5.

Page 34 — Though market risk is significant, the conservative prices, 2011-2013 average, used for the economic impact analysis likely represents the outcomes that will be realized.

Page 36 — The significant points to note about the projected quota cuts are two-fold; there will be fewer shrimp processing plants and active inshore enterprises before the end of the ten-year projection horizon. That means fewer individuals will continue to be employed in the shrimp industry with the resulting loss of disposable income and spending in those rural areas associated with shrimp harvesting, processing or transshipment.

Page 37 — Reducing the offshore shrimp fleet will reduce the number of harvester positions and negatively impact communities that hold licenses or special allocations, and communities that provide support services for these vessels.

Page 52 — The most significant over-riding conclusion is that a joint government/industry planning initiative should be undertaken to address short term challenges in the inshore shrimp sector, and develop a strategy for the expected transition from a shellfish based fishery to one more dominated by groundfish.

APPENDIX I CONTACTS

Following is a list of non-provincial government individuals consulted during this project.

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Karl Sullivan	Barry Group and Nu Sea Products Inc.
Phil Barnes	Fogo Island Co-op
Ken Budden	Fogo Island Co-op
Derrick Philpott	Gulf Shrimp/Quin-Sea Fisheries
Jason Eveleigh	Notre Dame Bay Seafoods
Robin Quinlan	Quinlan Brothers Ltd.
Daisy Bromley	St. Anthony Seafoods
Keith Watts	Torngat Fish Producers Co-operative
Ron Johnson	Torngat Fish Producers Co-operative
Randy Bishop	Whitecaps Trading
Fraser Russell	Town of Clarenville
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Ina Jeffries	Town of Charlottetown
Gordon Noseworthy	Town of Twillingate
Carolyn Lavers	Town of Port aux Choix
Gerard Murphy	Town of Bay de Verde
Bruce Button	Town of Old Perlican
Ernest Simms	Town of St. Anthony
Vincent Parsons	Town of Jacksons Arm
Donald Butt	Port Union Service District

APPENDIX II STOCK STATUS

Fishing Area	Indictor	2006	2007	2008	2009	2010	2011	2012	2013
0	Fishing Effort								
	TAC	500	500	500	500	500	500	500	500
	Catch								
	Utilization	0%	0%	0%	0%	0%	0%	0%	
	Stock Indicators								
	Stock Status	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
	Fishable biomass	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
	High								
	Low								
	Recruitment	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
	CPUE	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
1	Fishing Effort								
	TAC	140,500	140,200	135,200	108,800	138,500	128,000	110,000	100,000
	Catch	157,300	144,200	153,900	135,500	134,000	124,000	116,000	
	Utilization	112%	103%	114%	125%	97%	97%	105%	
	Stock Indicators								
	Stock Status	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
	Fishable biomass	451,000	336,100	262,600	256,100	318,700	247,800	178,700	218,100
	High								
	Low								
	Recruitment								
	CPUE (index '90)	0.879	0.921	0.961	0.839	0.82	0.85	0.767	0.63
2	Fishing Effort								
	TAC	8,727	8,750	8,692	8,125	9,280	8,503	9,092	
	Catch	5,986	6,310	5,111	5,429	6,523	7,855	5,079	
	Utilization	68%	72%	59%	67%	70%	92%	56%	
	Stock Indicators								
	Stock Status	Cautious	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
	Fishable biomass	32,816	43,306	51,053	78,754	71,064	78,530	60,533	49,637
	High	44,152	58,346	66,708	110,115	108,703	135,037	79,960	60,631
	Low	21,969	31,015	37,117	48,850	40,234	23,900	43,074	38,427
	Recruitment ($X10^6$)	7	4	4	25	4	8	1	
	CPUE (kg/hr)	2,334	2,444	2,218	2,909	3,116	2,841	2,931	
3	Fishing Effort								
	TAC (borealis)	400	400	400	400	400	400	400	1,500
	Catch	90	406	-	-	53	161	173	
	Utilization	23%	102%	0%	0%	13%	40%	43%	
	Stock Indicators								
	Stock Status		Cautious	Cautious	Healthy	Healthy	Healthy	Healthy	Healthy
	Fishable biomass		14,615		15,543		29,692		15,906
	High		28,872		25,529		27,961		28,519
	Low		4,907		7,613		12,468		15,906
	Recruitment								
	CPUE (montague kg/hr)					610	956	2,340	
4	Fishing Effort								
	TAC	10,320	10,320	11,320	11,320	11,320	11,320	13,018	14,971
	Catch	10,084	10,009	9,682	10,656	11,134	10,441	13,148	
	Utilization	98%	97%	86%	94%	98%	92%	101%	
	Stock Indicators								
	Stock Status	Cautious	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
	Fishable biomass	92,424	113,970	119,004	179,512	127,058	129,777	191,393	151,221
	High	135,717	176,593	194,715	370,603	255,324	248,176	301,537	296,805
	Low	10,084	10,009	9,682	10,656	11,134	10,441	13,147	65,110
	Exploitation	11%	9%	9%	6%	9%	8%	7%	10%
	Recruitment ($X10^6$)	3,609	3,050	7,729	8,319	5,638	5,621	6,064	
	CPUE - Offshore	2,348	2,690	2,899	4,007	4,222	3,443	2,878	
5	Fishing Effort								
	TAC	23,300	23,300	23,300	23,300	23,300	23,300	23,300	23,300
	Catch	22,612	23,768	20,503	25,094	23,425	25,264	23,300	23,300
	Utilization	97%	102%	88%	108%	92%	108%	100%	100%
	Stock Indicators								
	Stock Status (SSB)	Healthy		Healthy		Healthy	Healthy	Healthy	Healthy
	Fishable biomass	155,349		128,367		144,979	144,677	147,194	75,913
	High	196,024		198,440		226,832	184,446	182,533	101,083
	Low	125,548		73,063		76,003	133,466	110,547	46,303
	Exploitation		15%		20%	17%	16%	16%	
	Recruitment ($X10^6$)	11,448		11,925		13,711	11,852	12,972	
	CPUE - Inshore								
	CPUE - Offshore (kg/h)	2,107	2,048	2,059	2,114	2,023	2,177	2,585	

Fishing Area	Indicator	2006	2007	2008	2009	2010	2011	2012	2013
6	Fishing Effort								
	TAC	77,932	77,932	85,725	85,725	61,632	52,387	60,245	60,245
	Catch	75,673	80,775	74,506	45,527	61,501	59,685	51,049	51,782
	Utilization	97%	104%	87%	53%	100%	114%	85%	86%
	Stock Indicators								
	Stock Status (SSB)	Healthy	Healthy	Healthy	Cautious	Cautious	Healthy	Cautious	Cautious
	Fishable biomass	669,824	566,224	509,944	310,698	295,395	408,660	316,236	212,032
	High	791,445	638,613	585,555	422,957	343,117	472,290	408,660	268,111
	Low	555,250	476,720	434,031	232,368	247,371	348,554	245,458	166,518
	Exploitation	15%	12%	13%	9%	20%	20%	15%	19%
	Recruitment	68,719	64,882	49,730	42,999	28,713	34,804	31,411	
	CPUE - Inshore	459	479	428	341	384	409	412	
	CPUE - Offshore	1,596	1,478	1,368	1,170	1,237	1,336	1,438	
7	Fishing Effort								
	TAC	22,000	22,000	25,000	30,000	30,000	19,700	12,000	8,600
	Catch	25,689	23,570	26,649	27,527	20,536	13,316	10,108	6,020
	Utilization	117%	107%	107%	92%	68%	69%	84%	70%
	Stock Indicators								
	Stock Status (SSB)	Healthy	Healthy	Healthy	Healthy	Healthy	Cautious	Cautious	Critical
	Fishable biomass	161,692	264,930	187,970	100,579	113,366	56,280	47,420	24,667
	High	222,805	352,682	235,893	155,047	160,182	96,331	74,503	33,899
	Low	94,277	160,484	171,055	55,132	66,258	26,429	25,140	14,337
	Exploitation	14%	14%	11%	13%	22%	22%	16%	19%
	Recruitment ($X10^6$)	6,331	6,638	4,093	1,763	797	1,065	845	671
	CPUE <65 ' (kg/hr)	508	438	467	388	307	261	251	287
	CPUE >65' (kg/hr)	1,611	1,548	1,392	1,802	981	676	408	
8	Fishing Effort								
	TAC	9,000	9,200	9,100	9,500	9,500	9,200	10,200	9,200
	Catch	8,957	9,208	9,110	9,473	9,541	9,177	10,244	9,145
	Utilization	100%	100%	100%	100%	100%	100%	100%	99%
	Stock Indicators								
	Stock Status	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
	Total biomass	50,490	31,715	29,739	35,065	32,857	47,116	31,074	
	High								
	Low								
	Exploitation	20%	30%	31%	30%	32%	20%	38%	
	Recruitment ($X10^6$)	84	383	41	64	146	565	81	
	CPUE <65 ' (kg/hr)	701	492	465	545	602	650	692	585

Note: Stock status in several SFA's are based on Spawning Stock Biomass (SSB), which is not comparable to the fishable biomass.

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APPENDIX IV OFFSHORE LICENSES

Following are the license holders for the offshore allocations.

Offshore Licence Holder	Number Licenses
Canadian Association of Prawn Producers (CAPP)	
Ocean Choice International Inc.	2
Mersey Seafoods Ltd.	2
M.V. Osprey Ltd.	1
Crevettes Nordiques	1
Atlantic Shrimp Co. Ltd.	1
Caramer Ltd.	1
Newfound Resources Ltd.	1
Harbour Grace Shrimp Co.	1
Total licence holders represented by CAPP	**10**
Northern Coalition	
Labrador Fishermen's Union Shrimp Company Ltd	2
Torngat Fish Producers Coop Society Ltd	1
Nunatsiavut Government	0
Qikiqtaaluk Corporation	1
Unaaq Fisheries	1
Makivik Corporation	1
Total licence holders represented by the Northern Coalition	**6**
Pikalujak Fisheries Ltd.	1
Total Offshore License Holders	**17**

Source: DFO

APPENDIX V SECTOR RESPONSES

On-Shore Processors

1. **What are the main impacts of current and future shrimp quota reductions on you and your industry sector?**

   Overall, the processors indicated that the most significant impacts are economic and social. Less raw material has resulted in lower revenues and more intense competition for raw material. Processors indicated they need 8 to 15 million pounds (3,600 to 6,800 mt) of raw material to be viable. Currently the industry is averaging 3.7 mt, therefore economic viability is precarious. Processors indicated that there were too many operations and there is a need to rationalize; with current supply levels requiring only seven or eight plants.

   Lower supply levels have resulted in a reduction in the available hours for employees, particularly in shrimp only plants. This has impacted employees' ability to qualify for EI benefits and further challenges the prospects for maintaining employees. One processor indicated that one positive outcome of reduced quotas is that supply gluts have reduced resulting in improved product quality.

   If further supply reductions occur, most operators concur that rationalization will occur. The concerns however is that the rationalization will not occur quickly and will results in significant losses in the meantime.

2. **Can you put a dollar value on these impacts?**

   Most indicated they were unable to quantify the impacts in terms of dollar value. It was indicated that the value would vary depending on the particular volume a specific plant actually lost or will lose. There were several producers that indicated that the cuts have driven overhead cost on a per unit basis up by as much as 40%-60% as all of the skilled staff (engineers, quality control, supervisory) have seasonal employment agreements and this is making the economics of the business very difficult.

3. **Are there other recent policy initiatives that have impacted your industry sector and in what manner?**

   A range of responses were put forward, however not all relate to recent policies but to policies and regulations in general. Overall it is felt that a number of polices and regulation both provincially and federally do not reflect the needs of the industry to be as efficient and economically viable as it could. Some of the policies indicated include the "use it or lose it" policy related to licensing as it is felt it is impractical and not in the best interest of maximizing the value of the industry. Other policies and regulation such as fleet separation, enterprise combining, vessel size, fishing seasons and areas were indicated as requiring change to permit vessel operators an more suitable investment environment permitting them to respond to changes in supply

patterns by all species.

Some indicated community quotas (special allocations) were causing issues related to processors ability to compete as these community quotas are leveraged to attract open market supplies. The EI policy was indicated as an issue for processors as it supports a false economy around shrimp only producer. Further, having the price-setting panel in place is thought by many to deter the parties from actual negotiations; as one stated 'we are busy preparing a submission to the panel rather than negotiating'. One processor indicated that the inaction of DFO to deal with the issue of "trust agreements" was having an impact on the ability of some processors to compete.

4. What do you see as the future prospects for you and your industry sector in the overall fishery?

Potential for future prospects varied significantly, with several processors indicating opportunities through changes in government (provincial and federal) policy and regulation. These changes included reduced regulation, structural changes and greater collaboration to allow the industry to adapt faster to changes that are occurring. This, the industry indicated, would lead to improved productivity and economics in the industry.

Processor also indicated the need address long-term viability through adoption of new and improved technologies. This would also assist in addressing the workforce aging challenges, which must also be supplemented with temporary foreign workers in the short to mid term.

5. What are your and your industry sector's most likely alternative processing opportunities in the short-, medium- and long- term if LIFO is changed or if it is left unchanged?

The responses to this question to some extent depended on the particular processors situation, i.e. if the company had an offshore shrimp interest. Some companies indicated that LIFO should not change as it is important for the greater good of the industry to have a stable policy environment.

A couple of processors indicated the need to consider the potential for processing industrial shrimp in NL and the need to have it made available to the NL processors. Suggestions on this issue referred to supporting legislation or policy requiring local production of offshore industrial supplies, or a portion thereof, and/or financial support for the capital investment required to be competitive with Iceland/Norway/Denmark in this sector. Some indicated this isn't a viable alternative. The resultant product is smaller for retail (300-400 g bags) and does not come under the current tariff relief. Further, current plants are not winterized and would have issues. It may be a possibility for a few plants for a few weeks. Also, until the ban on product by Russia, there was not a lot of industrial being packed as the size was going to Russia.

One processor indicated that there was a need to change LIFO to allow for a

reasonable transition away from shrimp if the resource continues to decline and cod to reappear. Otherwise, there would be a considerable gap and the likelihood for a successful processing component for cod would be a greater challenge.

6. If quotas continue to decline do you anticipate further price increases in the market? How much?

Only one of the processors responded that a further increase was likely, up to 15 to 20%; however, they feared the risk of abandonment once it reached a particular level. Most felt prices are at the maximum level and there is significant risk of prices dropping off. Whereas retail prices have not yet been affected by recent price increases there is concern of major retailers delisting cold water shrimp once these prices are passed on. Upcoming Christmas season promotions will indicate the level of support by major retailers. One processor indicated, that a price increase would likely be a reflection of any further declines in resource while the market was adjusting to more to alternative supplies or species.

7. What are your views regarding supply and markets over the next 2, 5 and 10 years?

Environmental factors will continue to impact the available resource. One company indicated that environmental factors will also affect the shrimp supplies in SFA 5.
It is generally felt that the market, after a downward price adjustment, will be stable to strong over the next few years. Supply will be a factor. One processor indicated that without LIFO changes, there will be little left of the shrimp sector over the next few years.

8. Should the current LIFO policy be amended? In what way? Why?

The response to this question depends on the particular processor, i.e. those with offshore interest versus those with only inshore operations. Those with offshore interest support LIFO, stating the policy provides much needed predictability and should not be changed mid-stream. Inshore stakeholders support changes to LIFO to soften the impact on the inshore processing industry and to allow for a fair distribution of the increases in the adjacent northern shrimp resource. Generally, they suggest proportionate reductions to fleet quotas in area 5 and 6 quota to lessen the impact on the inshore operations while respecting the overall thresholds outlined in 1997.

9. What government intervention measures do you feel are warranted if LIFO continues to be upheld and quotas continue to decline?

There are many views of possible government intervention measures. Some of the responses included:

- Permit vertical integration that will result in industry re-alignment.
- Establish joint federal/provincial custody of the resource.
- Apply the adjacency principle for rigorously so those in areas directly adjacent

will be less impacted by the reduction, i.e. off Labrador.

- Through legislation or policy provide access to offshore supplied industrial shrimp to shore based peeling plants. Alternatively, support through subsidy and/or capital funds the ability for inshore peeling plants to secure industrial shrimp on world markets.
- Provide a means to invest in new and innovative technologies.
- Look to other forms of manufacturing for plants who want to diversify away from the fishery.
- Support bringing in foreign workers as a transitional measure while automation programs are implemented.
- DFO needs to policy changes to allow the harvesting sector to adjust and subsequently the processing sector can adjust.
- The provincial government must resist attempts to save plants/communities through make-work projects as this will impact the industry's ability to become more competitive.
- Government needs to consider means to divert people from the industry into retirement.

In the overall fleet, how much revenue does borealis represent? What constitutes the remainder, at what %?

The majority indicated borealis constituted the totality of revenue although a few did mention involvement with montagui, which was noted to be a less profitable species to harvest.

What are the main impacts of current and future shrimp quota reductions on you and your fleet sector?

Impacts are being felt in both the inshore and offshore sectors. There is a serious impact on the overhead cost per pound as most of the overheads remain year around. Much of this is related to salaries of key people who are well compensated and must be kept on year around in order to maintain them. Some operators have been impacted by the reductions in special allocations which they had been engaged to harvest.

Can you put a dollar value on these impacts?

Response to this question was generally scarce and variable. Some would not venture an estimate of the impacts; others offered estimates that ranged from about $4200 to $5000 per mt as lost revenues.

Are there recent policy initiatives that have positively or negatively impacted your fleet sector and in what manner?

A wide range of policies were mentioned in this instance. Most of the specific examples seem to be more related to management of the inshore sector. Some such were the sharing of allocations through the inshore Harvest Cap system keeps vessels inactive, inshore cod allocations are considered too low and combining provisions should be more flexible.

In the short (2 yr), mid (5 yr) and long term (10 yr) what expectations do you anticipate for quotas?

The most common view was that more reductions in quotas are likely and will be significant over the next five years. Some indicated that 0+1 and 7 have not been viable fishing areas. Few if any quota increases were expected in the near future. Options to harvest montagui are considered limited because of available quotas, costly harvesting and limited market returns.

A view was expressed that stock decline might lead to loss of MSC certification and markets would be lost if the stock to decline to critical levels under the Precautionary Approach.

Do you have confidence that markets will remain strong? Why?

The most prevalent view was that the current high market prices are not sustainable as the point of consumer resistance is being reached. These prices will probably moderate somewhat and then remain stable for the next 2-4 years. Further reduction in quotas should help to maintain current price levels.

If quotas go down further, do you anticipate further market upticks?
The most common view was that there is possibly room for a little movement upward.

What do you see as the future prospects, or most likely alternative opportunities, for you and your fleet sector in the overall fishery in the short-, medium- and long- term as shrimp quotas decline?

The general view was that future shrimp prospects are not all that bright and that alternative fishing opportunities are scarce. Vessels are getting old. No new vessels have been brought into the fishery since 2003. As a result, maintenance costs are very high and negatively impacting economics and making decisions to invest in new vessels very difficult. The offshore vessel fleet is expected to continue to decline in numbers as quotas reduce.

What do you think are the risks and opportunities for your shrimp interests going forward?

The following risks were identified:

- Exchange rate is always a risk, so diversification is essential to reduce this risk.
- The market may see consumer resistance and a move back to Warm Water Shrimp if prices go much higher.
- If LIFO is changed fishing in SFA 6 Jan to May would likely be eliminated and result in an unprofitable offshore fishery. An immediate result will be that boats tie up.
- Fuel prices are now 4 times higher than 20 years ago causing increased harvest effort through double/triple trawls.
- A significant CPUE decline would have a substantial impact and the whole structure of the industry would have to change. Value added is not really an option, as there is no space on the vessels.
- The resource: Further quota cuts would result in further rationalization. Must modernize the fleet, average age is 22 years. Having some form of tax rebate or underwriting for financing would assist the industry to modernize and remain competitive in these challenging times.
- Dark head shrimp provide lower value, very little space or applicable technology to remove heads onboard. Markets still prefer shell on as they believe it keeps the meat fresher.

- Industrial counts currently are 90-120 ct/lb (at $1.50/lb +) mostly purchased by Iceland who are peeling 47 weeks per year. They do have market access advantage but also have lower overheads because of use of capital. Some Canadian peelers are trying, but more difficult with their cost structure; may be viable if they committed to purchase large quantities, but they must be competitive with world markets.

Other Comments: Some needs identified by the offshore sector are:

- Promotion support for expanding markets.
- Research capability – high variability of annual survey results have not been good to industry, need significant investment in primary science research.
- Some form of tax rebate or underwriting for financing would assist the industry to modernize and remain competitive in these challenging times.

1. **How much of total revenues are shrimp now versus five years ago? What are the main impacts of current and future shrimp quota reductions on your fleet sector?**

   Shrimp had become a large part of nearly every 45-65 ft harvester's income that have built up and kept up their enterprises through volume.

   In some areas such as 4R, shrimp is the sole species harvested. In 2J and 3K, shrimp became more of a mainstay as crab quotas continued to decline. The 3L situation is a little better in so far as the crab resource is in relatively better shape. The substantial rise in landed price has helped the viability of many enterprises.

   Those who have combined licences indicated total revenue is down slightly because of the current strong prices. However, those who have combined allocations now have higher debt, especially those who purchased quota recently. Some 30% of the shrimp fleet is believed to have taken part to some degree of combining.

2. **How much shrimp revenue have you lost versus 5 years ago?**

   Most enterprises, especially those who combined, have not lost a whole lot of revenue as higher prices help offset the loss in volume. Had prices remained nearly the same as in prior years, the loss of revenues would have been so detrimental, that some fishermen would already be out of business

3. **What other recent policy initiatives have impacted your fleet sector and in what manner?**

   The ending of the Temporary Vessel Replacement Program (TVRP) eliminated some groundfishing opportunities.

   The Owner/operator policy has not been enforced and producers buying licenses under controlling agreements have driven the prices for quota to artificial levels.

   Combining was encouraged and has increased debt.

   In 2J and 3K, due to overcapacity and climate change, crab stocks are at an all time low. DFO policy created this problem and there has been no policy to correct it, only quota cuts.

   The post season crab pot survey in 2J and 3K negatively affects fishers in that quota is taken for the total to pay the few who do these surveys.

4. **What do you see as the future prospects for your fleet sector in the fishery?**

   Bankruptcies will occur in the long term. In the short term cutting expenses will

result in losing crews because the seasons are becoming so short that the annual income levels are declining.

5. What are your fleet sector's most likely alternative fishing opportunities in the short-, medium- and long- term if Li-FO is not changed?

The inshore fleets must transition back to groundfish. The transition will take several years; at least 10 years will be required to make the transition, as the groundfish stocks continue to increase over time. The fleet needs significant quantities of groundfish to replace shellfish species.

No one knows at this point how the fishery will be prosecuted or how groundfish, especially cod, will be marketed.

6. Should the current LI-FO policy be amended? In what way? Why?

The overall preference is to have SFA 6 for the inshore fleet. A fallback is to look at the offshore's 10 year history prior to 1997.

It was suggested to combine the estimates of biomass in SFA 6 and 7 together and increase exploitation in SFA 6. This would add the SFA 7 licenses to SFA 6. There is sign of recruitment in SFA 7 and this may build a resident stock. SFA 7 is overflow stock from SFA 6.

Access to SFA 5 for SFA 6 and 7 vessels should be considered. Exploitation rate is very low.

The inshore fleet would never have knowingly agreed to take themselves out of the fishery.

7. What government intervention measures do you feel are warranted if LI-FO continues to be upheld and quotas continue to decline?

A voluntary buy-back of crab licenses was suggested for 2J and maybe parts of 3K where the existing crab resources cannot support the current fishing fleets.

The province should suspend capital and/or interest payments on loans for combining for the ten year transition period mentioned above. An alternative would be to retire the license/allocations so acquired through a buyback that involves loan forgiveness.

There are short term opportunities in harvesting redfish allocations such as those held by the province.

Some 70% of the turbot resource is actually in the Canadian zone but NAFO sets 2J, 3K and 3L TAC. The outside (Foreign) surveys weigh down the biomass estimate. A way might be found to increase the allowable catch inside the Canadian zone.

A Halibut bycatch in other fisheries such as monkfish and skate should be increased (15% vs. 5%). This fundamentally changes the economics of these fisheries.

The TVRP should be re-instituted for the fishing of some offshore Enterprise Allocations. Refits would be required to enable boxing of fish and the use of slurry ice, etc.

Other comments

Markets: Russian restrictions will ease off, so available markets will remain similar. Warm Water Shrimp will always have disease issues. Cold Water Shrimp therefore should be able to maintain strong markets. The once frozen product should keep a competitive advantage.

Science: fishery performance is significantly different than biomass estimates. There should be better science and establish the Exploitation Rate to 15% of biomass. It is an ecosystem change and it should be proven to be the cause of change.

Offshore could not economically fish in SFA 7 in recent years, whereas the inshore did very well there. It may be that the offshore CPUE was lower and they just didn't pursue it as they had stock in other areas.

There is a tremendous sense of frustration regarding the inshore sector closing down while the offshore is fishing more than ever. SFA 6 is now hit hard in the winter when spawning is occurring. Perhaps if the fishery was closed in the winter the recruitment would increase. The offshore couldn't fish there this winter and the inshore saw better catch rates than the past 3 years.

Groundfish: there is a need to invest in gear etc. All fleets will want the same amount of cod they had in the past when it is opened. TAC should be more tilted in favour of the inshore shrimp fleets as they are the ones who have lost revenues. This investment will be impossible without relief of existing shrimp debt.

1. **What are the main impacts of current and future shrimp quota reductions on your community?**

The recent cuts have resulted is less hours for plant worker and less weeks of work. In some cases, some of the weeks that employees did receive were not full weeks, which will have an impact on the EI benefits they will receive this year. Harvesters fared better this year as the prices were up and offset the loss of volume. The impact on the plant workers will be felt in the local retail businesses in the communities. Other local business is also impacted such as local truckers, etc. Depending on the communities tax arrangement with the companies, some towns will be impacted as they have a tax on water and water volume will be down with less production.

One community indicated that their community will feel a double impact from reduced quotas they have both offshore and on-shore interest in their town.

2. **Can you put a value on these impacts? On a percent basis, what comprises this impact?**

Most felt that it was difficult to put a dollar value on the impacts. While some communities offered that their plants had lost 2,000,000 pounds of raw material that equated to over $2,000,000 in sales to the company, they did not have specifics for the towns. In general it was felt to be in the millions. One town offered that the most recent reduction meant as much as $3,000 per plant worker this year.

3. **Have any other recent fishery policy initiatives impacted your operation and in what manner?**

This question drew varying responses. Some mentioned the Cod Moratorium of 1992-93. Others indicated policies around seasons was an issue, in particular the opening of the Gulf shrimp fishing season in April as being too early. One town indicated that some harvesters felt that the policy around processing crab caught in Labrador was restricting their competitive ability. Another indicted that the reduction in crab quotas on the northeast coast was seriously impacting small boast harvesters. One community indicated the sharing arrangement on Turbot, i.e. NAFO and Canada has seriously disadvantaged harvesters in that community.

4. **What do you see as the future prospects for your community as shrimp quotas decline?**

Generally, those communities that are not or adjacent to larger communities felt further quota reductions would devastate the community resulting in significant outmigration and tax base loss.

Some communities indicated that there were limited prospects, particularly to replace the impact that shrimp has. Some communities indicated that workers would be hoping to find work on various industrial projects such as Muskrat Falls, or Voisey's Bay. A few

indicated that we must continue to explore other species opportunities. Tourism is felt to be a good add-on but not a replacement.

5. Should the current LIFO policy be amended? In what way? Why?

Though many recognize that the LIFO policy would adversely affect their community when quotas reduced, most communities agreed it should be amended. These communities feel that a more even distribution of the cuts is required in order for communities to survive. Some communities indicated that the principle of adjacency should play a role in the reductions, while one community feels that allocations to communities rather than enterprises would ensure long-term viability.

6. What government intervention measures do you feel are warranted if LIFO continues to be upheld and quotas continue to decline?

Some communities indicated that the province must continue to push the federal government to amend LIFO. Others indicated that if the status quo continues and LIFO is not amended, government will need to consider some financial assistance. Several measures were mentioned including retraining, buy-outs, and retirements. Some communities indicated they did not want to see another TAGS as they felt the money did not get into the proper hands and as a result we still have issues in the fishery. One community felt some positives came from TAGS in that many were retrained and have gone on to have good careers. Some communities indicated they wanted policy changes and not programs.

7. What are your community's most likely alternative fiscal opportunities in the short-, medium- and long- term if the LI-FO policy is not changed to accommodate inshore harvesters or onshore processors?

One community indicated they are working with the operator to find a means to diversify the plant operation. A few towns indicated that processing industrial shrimp may be an option. Other towns, depending on location, indicated that there might be some add-on opportunities in tourism, non-timber forest products, and mining; however, none would replace the impact of shrimp.

Communities Where Plants Have Closed

The closure of the plants has resulted in a significant reduction in the tax base for the towns. There is little the towns can do to replace the tax base but are both working to attract new opportunities. The plant closures have also affected local businesses as outmigration and reduction in disposable income has drastically affected spending.

Government support programs provided relief for only one year and people responded very quickly thereafter. Some people have moved away to find work, while others have found work by commuting the Alberta, Labrador, and industrial sites such as Bull Arm and Long Harbour.

APPENDIX VI ASSUMPTIONS

Inshore Harvesting

Baseline Parameters

- Activity – Fishing licenses, active enterprises, landed volumes were sourced from DFO. The latter is projected as per estimated TAC reductions and sharing.

- Shore price – Calculated from average of 2012-14 prices reported from DFO and contrasted to seasonally adjusted FFAW prices.

Costs

- Crew Labour Cost is set at the industry standard of 40% of landed value.

- Fuel & Lube Costs, Bait/Ice Costs, Fees and Other Variable Costs are based on weighted MOU average costs and expressed as % as landed value. They are first inflated to the 2014 cost level and then out to 2016, 2019 and 2024 at 2% compounded annually.

- R&M, Nets & Gear, Insurance and Other Fixed Costs are based on weighted MOU average costs and expressed on a per vessel basis. They are first inflated to the 2014 cost level and then out to 2016, 2019 and 2024 at 2% compounded annually.

Model Inputs

- The number of harvesters after 2014 is based on calculated numbers of vessels in 2016, 2019 and 2024 at five crew per vessel.

- Average weeks worked is calculated on basis of average catch ÷ average vessel capacity x 5 days/trip.

- Direct Employment PY's are Calculated as number of weeks x Number of crew members ÷ 50.

- GDP, Incomes and Employment Ratios are from Department of Finance.

- Service Sector Wage is from Department of Finance, first inflated to the 2014 cost level and then out to 2016, 2019 and 2024 at 3% annually compounded.

Onshore Processing

Baseline Parameters

- Landed Value and Reduced Volume (kg) from 2013 are taken from the Inshore Harvesting Model.

- The existing number of plants and processing workers are from DFA. Reductions in process capacity is forecasted based on supply reductions.

- Total Production Volume is calculated from landed volume at yield of 33.63%, sourced by DFA.

- Average Annual Person Hours, Average pounds final production ÷ hours and Total number of processing hours are calculated.

- Labour rate is from DFA.

- Average Market Price is calculated from three-year average from Strategis, converted to $ Cdn. and inflated out to 2016, 2019 and 2024 at 2% compounded annually.

Costs

- Trucking Wharf to Plant, Ice and Packaging Costs are inflated to 2014 cost based on MOU average costs adjusted by industry information and expressed per pound. Inflated out to 2016, 2019 and 2024 at 2% compounded annually.

- Fixed Overheads are expressed per pound based on MOU average costs adjusted downward to account for debt retirement and inflated out to 2016, 2019 and 2024 at 2% compounded annually.

- Brokerage Fees, Freight Costs, Offsite Storage and License Fees are inflated to 2014 cost based on MOU average costs adjusted by industry information and expressed as % of Sales . Not inflated out to 2016, 2019 and 2024 because sale prices are increased 2% compounded annually.

- WCC and EI Premiums for Harvesters are inflated to 2014 cost based on DFA data as % of landed value. Inflated out to 2016, 2019 and 2024 at 2% compounded annually.

- WCC EI and CPP for processing workers are inflated to 2014 cost based on DFA data as % of labour costs. Inflated out to 2016, 2019 and 2024 at 2% compounded annually.

Model Inputs

- GDP, Incomes and Employment Ratios are from Department of Finance.

- Service Sector Wage is from Department of Finance, first inflated to the 2014 cost level and then out to 2016, 2019 and 2024 at 3% compounded annually.

Offshore Sector

Baseline Parameters

- Landed Volume is from DFO, expressed in Round Weight and then projected by estimated TAC reductions.

- Revenue is calculated at DFO three-year average landed price and projected at 2% compounded annually.

Costs

- Selling Expenses, Crew share and other crew costs are based on various industry sources and professional knowledge. Expressed as percent of Revenue and forecast based on changes in revenue.

- Total Operating, Repairs and Maintenance, All Other Operating and Adjustment for amortizing a new vessel are based on various industry sources and professional knowledge. Expressed on per mt basis and extrapolated at 2 % compounded annually.

- Profit sharing and Leases based on various industry sources and professional knowledge. Expressed as percent of Revenue and extrapolated by change in revenue.

Model Inputs

- Numbers of Vessels are projected by one less for each 5,500 mt reduction.

- Number of Crewmembers are 27 per shift; 54 per vessel.

- Weeks worked are 26 weeks per each shift.

- Direct employment PYs are determined based on impacted number of harvesters x hours worked / 1,750 hours per year.

- Service Sector Wage is from Department of Finance, first inflated to the 2014 cost level and then out to 2016, 2019 and 2024 at 3% compounded annually.

- GDP, Incomes and Employment Ratios are those for the Onshore Processing sector from Department of Finance on assumption Offshore is a factory vessel operation landing a finished product.

APPENDIX VII LANDING PORTS

SFA 6 harvested inshore landing ports

Port	2007	2008	2009	2010	2011	2012	2013	2014
St. Anthony	27,519,097	29,692,615	12,561,365	24,160,899	20,913,576	22,957,590	22,093,720	18,392,296
Twillingate	5,939,462	8,991,202	6,232,326	10,111,798	8,241,034	9,142,776	10,994,795	7,567,822
Charlottetown	9,107,664	9,025,038	9,021,509	7,539,588	7,160,988	7,547,357	7,796,339	6,149,641
Seldom	7,225,092	9,738,075	4,353,033	8,276,406	6,086,533	7,482,282	7,288,728	5,540,078
St. Lunaire	9,768,272	10,174,978	4,324,729	7,470,553	7,519,846	6,104,938	4,986,002	4,238,524
LaScie	5,752,954	5,713,392	3,947,183	4,180,616	4,117,987	6,290,727	5,377,294	5,667,618
Bay de Verde	6,065,883	7,828,158	2,675,633	3,468,541	2,806,585	5,064,878	4,622,658	2,365,462
Carmanville	4,606,334	6,018,580	3,052,627	3,062,884	4,183,712	4,077,394	4,117,879	3,513,990
Old Perlican	5,223,573	4,563,895	2,215,248	3,859,761	3,021,927	3,914,536	3,828,515	2,608,270
Cook's Harbour	4,519,082	5,410,016	1,381,069	3,433,332	2,850,015	2,953,363	2,539,296	2,272,330
Catalina	7,861,170	5,769,940	1,061,820	1,435,815	1,323,773	1,941,774	2,199,714	1,181,298
Port de Grave/Ship C	4,890,389	4,603,285	938,347	1,014,144	1,223,178	1,791,178	2,173,917	1,482,583
Port Union	7,443,639	6,679,904	1,776,287	1,666,114				
Valleyfield	67,052	1,445,417	605,444	1,270,719	1,488,091	2,014,298	2,650,176	2,177,925
Musgrave Harbour	859,301	886,496	461,059	857,341	1,019,076	1,262,728	1,370,067	1,187,599
St. John's	925,674	1,587,756	376,147	1,103,491	786,961	700,128	717,047	532,193
Lumsden	221,561	667,296	349,802	811,593	813,258	1,268,528	1,137,142	1,043,110
Cupids	1,214,695	1,123,933	216,253	262,740	457,233	266,645	118,674	
Fogo	259,110	153,982	96,242	409,966	112,017	813,184	446,206	37,938
Joe Batt's Arm	86,327	95,815	215,071	579,320	372,860	309,759	346,867	200,913
Bonavista		4,179			660,471	167,494	380,514	388,294
Black Duck Cove	682,138	180,650	106,290	187,278	138,039	19,233		244,096
Hant's Hr.	150,496	289,480	97,019		160,663	31,304	126,759	100,267
Trinon				685,070		61,697		
Bridegeport								657,011
Englee	159,712	270,547		170,413				
Port Saunders	124,942	94,918	29,989		48,393		114,893	125,269
Port au Choix	150,537	54,441	12,009				15,670	123,705
Harbour Grace	194,647	141,253				4,447		9,110
Wesleyville		49,927		187,921	102,554			
Fleur de Lys	189,482				120,070			
Salvage	57,253				109,921	59,790		
Herring Neck		16,127		117,462				
Anchor Point					3,228		68,370	
St. Josephs			70,276					
Jackson's Arm				36,772	20,361			
Mary's Harbour			19,875		46,101			
Goose Cove	59,831							
Carbonear	53,752							
St Lewis	5,275	51,231						
Lanse au Loup						38,162		
Comfort Cove		28,207						
Fernouse		7,606						
Flowers Cove			5,157					
Cottlesville	3,816							
Happy Adventure						1,753		
Annual Landings (lbs)	**111,388,212**	**121,358,339**	**56,201,809**	**86,360,537**	**75,918,451**	**86,287,943**	**85,511,242**	**67,897,342**
Annual Landings (MT)	**50,525**	**55,047**	**25,493**	**39,173**	**34,436**	**39,140**	**38,787**	**30,757**
Inshore SFA6 Quota (MT)	**52,599**	**59,613**	**59,613**	**41,529**	**35,459**	**41,293**	**41,293**	**31,637**

Note: Inshore quota totals for 2007, 2008 and 2009 do not include 4000 MT allocated to Inshore aff. cod fishers (N Peninsula and LNS).
Source: DFA

SFA 7 harvested inshore landing ports

Port	2007	2008	2009	2010	2011	2012	2013	2014
Bay de Verde	**4,916,110**	**4,393,455**	**6,240,957**	**4,136,141**	**3,228,904**	**3,050,231**	**790,503**	**648,722**
Old Perlican	3,474,872	3,785,340	3,753,239	3,326,048	2,400,164	2,128,581	1,997,750	692,962
Port de Grave/Ship C	**4,233,150**	**3,975,802**	**3,469,443**	**2,877,478**	**2,051,459**	**1,657,783**	**1,285,161**	**767,054**
St. John's	2,734,535	3,450,350	3,673,854	2,233,641	3,292,919	1,893,366	722,280	144,503
Catalina	**3,794,951**	**4,221,304**	**3,270,275**	**1,275,266**	**1,354,172**	**1,518,316**	**1,199,202**	**462,788**
Port Union	3,360,377	4,039,688	6,407,387	1,005,485				
Valleyfield	**171,652**	**950,196**	**111,948**	**927,236**	**523,634**	**1,390,523**	**1,224,683**	**481,998**
Cupids	1,028,776	1,248,508	726,966	662,162	1,066,995	603,176	247,172	
Seldom	**1,067,416**	**1,759,924**	**304,912**	**163,666**	**58,671**	**41,442**	**65,993**	**117,218**
Twillingate	716,617	1,153,202	58,133	95,451	122,856	160,936	450,195	56,499
Carmanville	**627,808**	**777,396**	**119,183**	**36,816**	**243,647**	**127,885**		**149,575**
Lumsden	69,368	116,538		222,050	284,569	367,020	285,816	41,571
St. Josephs	**69,221**		**805,464**	**68,241**				
LaScie	142,352	438,300	43,752	38,253		48,197	190,354	
Hant's Hr.	**158,106**	**417,076**	**134,350**		**120,118**	**10,360**		**52,270**
St. Anthony	325,941	227,157			41,805	159,899	15,112	
Bonavista	**5,125**		**23,250**		**291,222**	**184,827**	**120,474**	
Musgrave Harbour		168,165	28,626		52,544	28,017	229,820	
Witless Bay	**269,793**	**115,187**	**19,105**	**47,794**				
Harbour Grace	145,234	104,842						
St. Lunaire		**154,421**				**25,091**		
Salvage	30,662				10,821	121,621		
Fogo	**10,085**	**135,383**						
Joe Batt's Arm	21,233	60,675		32,156				
Fermeuse	**33,141**		**42,350**					
Port Saunders							73,441	
Calvert		**48,930**						
Briguss						30,551		
White Bay				**22,173**				
Glovertown		18,071						
O'Donnells					**11,336**			
Happy Adventure						7,603		
Cape Broyle				**2,008**	**3,227**			
Annual Landings (lbs)	**27,406,525**	**31,759,910**	**29,233,194**	**17,172,065**	**15,159,063**	**13,555,125**	**8,897,956**	**3,615,160**
Annual Landings (MT)	**12,431**	**14,406**	**13,260**	**7,789**	**6,876**	**6,149**	**4,036**	**1,640**
Inshore SFA7 Quota (MT)	**12,297**	**14,209**	**17,396**	**17,396**	**10,514**	**5,585**	**4,007**	**1,791**

Note: Inshore quota totals do not include NRA allocation.
Source: DFA