DRAFT

DISCUSSION PAPER

INDIVIDUAL VESSEL QUOTAS

IN THE

COMMERCIAL PRAWN FISHERY

For consideration by the Commercial Prawn Industry Caucus

December 6, 2004

"All truth passes through three stages: First, it is ridiculed. Second, it is violently opposed. Third, it is accepted as being self-evident."

- Arthur Schopenhauer

What's the Purpose?

"Some men see things as they are and say 'Why'? I dream things that never were and say 'Why not'?" - George Bernard Shaw

This paper discusses the potential for individual vessel quotas (IVQs) in the prawn (Category W license) fishery. The paper provides background on IVQ management and considers how IVQs could be allocated, implemented and managed on a Pilot Program basis in the commercial prawn fishery. This paper is for discussion purposes only. Decisions regarding future management of the prawn fishery will be made by DFO in consultation with the Prawn Sectoral Committee, commercial industry caucus, commercial prawn license holders and other interested parties

What's the Problem?

"You can't solve a problem with the same mind that created it." - unknown

In 1990 DFO limited entry into the prawn fishery, resulting in the current 252 limited entry "W" licenses issued annually by the Minister of Fisheries and Oceans. Unfortunately, limited entry did not slow down the growth in harvesting capacity and catchability. In response, DFO implemented trap limits in 1995 allowing each vessel to fish a maximum of 300 traps on a single prawn licensed vessel or 450 traps on vessels with two prawn licenses (this has since been increased to 500 traps for a stacked license). Despite these measures, the fleet continued to find ways of increasing catch rates through improved fishing technology and more frequent hauling. Restrictions on the number of hauls per day were implemented in 2001 and have proven difficult to enforce with the current monitoring and enforcement resources. Continual increases in harvesting efficiency has led to shorter and shorter seasons, even though the total pounds landed has been generally increasing over time. Between 1990 and 2003 the season length declined from 276 to 72 days while the landed catch increased from 742 to 2321 tonnes. During this period the average catch per vessel day increased 185% from 62.3 to 177.9 kilograms and the average per vessel percentage participation in the prawn season jumped from 20% to 84%. Between 1995 and 2003 the CPUE (catch per unit effort) increased 291% going from 0.0221 to 0.0866 kilograms per trap per hour of soak time.

Clearly the competitive nature of the commercial prawn fishery has resulted in substantial investments (some would suggest excessive and wasteful investments) in fishing power and an ever shortening season. The shorter season has many negative impacts, including:

1. Health and safety concerns:
    a. Regardless of weather, prawn boats leave harbour to go fishing based on a predetermined opening date;
    b. Regardless of vessel carrying capacity, operators try to carry the full compliment of traps they are licensed for (300 for single license, 500 for a stacked license) resulting in possible stability problems;

   c. Time restrictions associated with single haul management forces operators to travel and fish when conditions may be dangerous;
   d. The intensity of the season leaves little or no opportunity for the skipper and crew to take time off.
2. Concerns for resource sustainability:
   a. Areas may be fished harder than they should because there is no incentive for operators to stop fishing or to make managers aware that an area is overharvested;
   b. As the fishing gear becomes increasingly efficient (due to bait and design changes), spawner index tests may not accurately reflect the true health of the resource and may fail to prompt timely management measures;
   c. There is no incentive to avoid bycatch of species that may be depleted (i.e. inshore rockfish) or to not harvest in areas of sensitive habitats (corral reefs).
3. Gear wars to attain and hold preferred fishing grounds:
   a. Resulting in lost gear from entanglement with other vessels' gear (also increases fishing costs and prawn mortality);
   b. Causes stress from ongoing confrontation with other vessels.
4. Continued investment in fishing power that consumes more fuel and adds to the costs of fishing:
   a. Ever more efficient vessels (speed, vessel size, electronics, gear, bait);
   b. Increased labour (especially at the start of the fishery).
5. Concentration of vessels and gear on "hot spots" and less or no effort on areas that are less productive or on new areas that have not been explored.
6. Could lose much or most of the season from a mechanical breakdown.
7. Improper servicing of the market:
   a. Too much live product at the beginning of the season and not enough live product near the end of the season, resulting in a less than optimal price for the total catch;
   b. Insufficient time to developed new markets and expand existing ones for live, fresh and frozen products;
   c. Too much product going to the frozen market which negatively influences the prices for fresh and live products;
   d. Not providing markets with the preferred size of prawns (current mesh size and management system provides for the capture of maximum amount of legal size prawns resulting in the capture of mostly medium sized lower valued product entering the market).
8. A reduced commercial presence on the fishing grounds leaving the areas open to increased utilization by other competing groups (First Nations, recreational fishers, and poachers) who are not subject to the same scrutiny and management.

What do we need?

"We generally change ourselves for one of two reasons: inspiration or desperation."
- Jim Rohn

Individual accountability, long term planning, and enhanced stability and security are unachievable under the current management system. The prawn fishery needs a system that addresses the above problems and provides the framework and incentives to deliver on conservation and sustainability objectives and discourages recruitment and growth overfishing, A system is needed that improves the economic viability of the commercial prawn fishery, better services the markets, develops new markets, and provides greater flexibility so that individual operations can determine how best to conduct their fishing safely, responsibly, selectively, and in a cost effective manner. There are also equity considerations. A new management system should consider the costs of management (and that more of the costs will be borne by industry in the future), the relationship the fishery has with people and coastal communities, and where possible seek to avoid significant changes in the distribution of benefits that are currently derived from the fishery.

What are IVQs?

" An invasion of armies can be resisted, but not an idea whose time has come."
- Victor Hugo

Individual Vessel Quotas (IVQs) is a management system that allocates to each individual licensed vessel a pre-determined share of a specified amount of total allowable catch (TAC) for the fishery. For example, a licensed commercial prawn vessel may be allocated 0.4% of a conservatively estimated 2005 total allowable catch of 1,678 tonnes, which equates to an IVQ of 14,797 lbs.

IVQs change the focus of fishing. Rather than racing to catch as many prawns as quickly as possible in an increasingly expensive and somewhat risky gamble, IVQs encourage fishermen to be safe, cost-effective, and market-conscious so as to maximize the value of their catch. In many other BC fisheries, IVQs have shown to offer numerous benefits. Some of the benefits that may be realized in the commercial prawn fishery include:

- Safer fishing
- Timely inseason information on landed catch
- Catch and spawner-index information throughout a longer period of the year
- Improved selectivity
- Less gear loss
- Increased season length
- Increased prawn growth during season
- Increased landed value
- Greater cost efficiency
- Improved operational flexibility

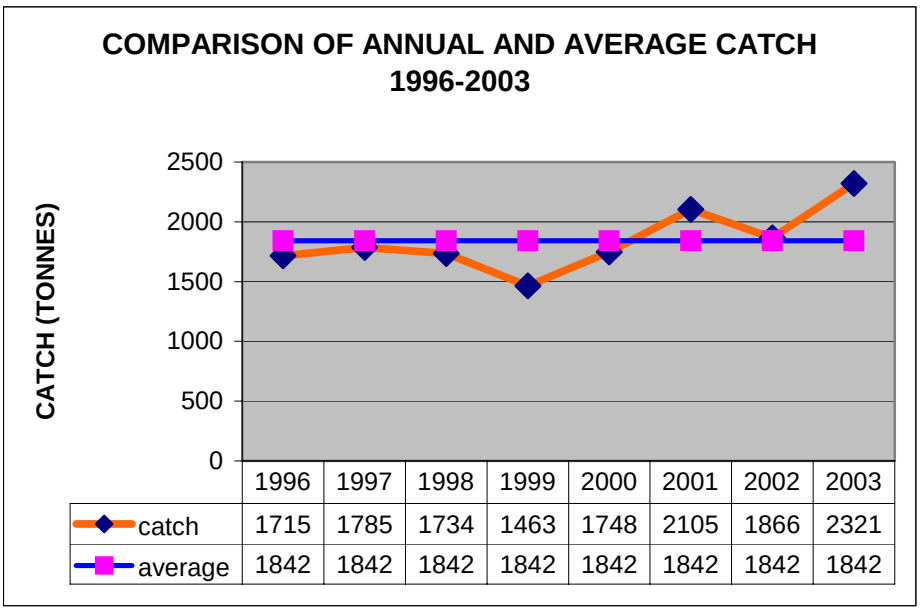
- Greater security and reduced financial risk

Of course IVQs, or any management system, are not going to solve all of the problems associated with managing the commercial prawn fishery. Various traditional management measures (spawner index testing, area closures, trap limits, size limits, gear restrictions, logbooks, etc.) and new management tools (hails, dockside monitoring) will also be required to ensure that the fishery is well managed with strong compliance.

How do you calculate a prawn TAC?

"Determine that the thing can and shall be done, and then we shall find the way."
- Abraham Lincoln

In many fisheries the TAC is based on scientific research that estimates the absolute or relative abundance of a stock and then, based on biological and life history characteristics of the species, calculates a quantity that can be safely and sustainably removed from the population over a specified period of time. However, there are examples where TACs are established based on historical catch levels that have been sustainable over time. These TACs are adjusted upward or downward based on information collected from the fishery.



Spawner-index testing in the prawn fishery has been an effective tool for ensuring that stocks in specific areas are not over fished, and such testing would continue to be used in an IVQ fishery. Spawner-index testing, does not preclude and is not inconsistent with having a TAC in the prawn fishery. Historical catch records for the commercial prawn fishery indicate that the total annual catch of prawns between 1996 and 2003 has been relatively consistent. Indeed, during this eight year period the annual catch has generally been within 20% of the average catch. A risk averse approach for the prawn fishery could be to set the TAC at 80% of the most recent three year average catch. Using 2001 – 2003 data, this would equate to a TAC of 1678 tonnes ((2105 + 1866 + 2321) / 3 x.80 = 1678). Spawner index testing would continue to be used to ensure specific areas were not overharvested resulting in vessels with

remaining IVQ relocating to open areas. If at some point during the season, DFO management and science determined that the prawn resource could sustain a larger harvest (larger TAC), commercial prawn vessel licenses could be amended with the additional IVQ associated with the increased TAC. For example, if DFO believed that 300 more tonnes of prawns could be safely harvested coastwide (with ongoing spawner-index testing to protect areas), each prawn license would be issued a license amendment allocating them additional IVQ. If a license is entitled to .4% of the TAC the license amendment would issue an additional 2,645 lbs to the vessel (over and above the IVQ issued to the vessel at the start of the season).

What's the allocation formula?

"Never doubt that a small group of thoughtful committed people can change the world: indeed it's the only thing that ever has!" - Margaret Meade

Allocation is always the most difficult design component of an IVQ program. The Department of Fisheries and Oceans has been consistent, however, in establishing the license holders for a fishery as the recipients of IVQ allocations. This is consistent with the current licensing policy and regulatory framework that limits the number of licenses in a fishery and provides the Minister discretionary authority to issue licenses (and to allocate quantities to a license). There are several allocation criteria that can be used in an almost infinite number of combinations. Equal shares, vessel length, and historical catch are elements that have been used (separately or in combination) to determine allocations in other IVQ fisheries.

Each allocation criteria has its purpose. Equal shares ensure that all licenses receive some level of allocation consistent with the notion that all prawn licenses represent a minimum level of investment in the prawn fishery. Vessel length also ensures that all licenses receive some allocation but in a way that is related to their actual investment in the license and vessel (currently licenses trade by the foot and larger vessels are generally more expensive to purchase and operate). Historical catch reflects the operator's investment in effort, gear and technology combined with experience and ingenuity.

Of course all prawn operations are not identical and, as a result, they will have differing views on what criteria (equal shares, length, or historical catch) are most appropriate for allocating prawn IVQs. Vessels with large catches will want to use only catch history. Larger vessels may prefer an allocation formula based solely on vessel length. Small vessels with little catch history will favour allocation based on equal shares. Indeed if you were to give license holders the option of choosing from different allocation formulas (one based on equal shares, one based on length, and one based on historical catch), all would receive considerable support consistent with the diversity of operations within the prawn fishery.

The allocation formula presented in this discussion paper tries to capture this diversity of interests by incorporating all three allocation criteria. The recommended allocation

formula is based 20% on equal shares, 30% on vessel length, and 50% on average historical catch over a three year period (For the purposes of this discussion paper, the years 2001 – 2003 were used. The 2004 catch data was not available but could be incorporated at a later date).

In Appendix A you will find a list (in alphabetical order by vessel name) of the currently active 250 prawn licensed vessels. Most of the information for this table comes from the DFO Pacific Region website. The first six columns show the prawn license number, vessel name, Vessel Registration Number, overall length in feet and meters, and contact owner name. Column 7 shows each vessel's equal share allocation in pounds. Column 8 shows each vessel's length allocation in pounds based on the identified length in Column 4. Column 9 shows the historical catch allocation in pounds. Currently there are only 0's in this column but the reader can calculate this number from an electron version of the spreadsheet or separately based on the formula outlined below. Column 10 is the summation of columns 7, 8, and 9 (Currently Column 10 only shows the total of Columns 7 and 8 because Column 10 has not been calculated).

Please remember that the allocation is based on a TAC of 1678 tonnes (3,699,319 lbs) which equates to 80% of the 2001-2003 total average catch of 2,097 tonnes (4,623,046 lbs). For simplicity, all numbers have been rounded to the nearest pound. Each component of the allocation formula is calculated as follows:

20% Equal Share: Take 20% of the TAC (0.2 x 3,699,319 lbs = 739,864 lbs) and divide by the total number of prawn licenses – which we assume to be 252 (739,864 / 252 = 2,936 lbs). Each license will receive 2,936 lbs based on 20% of the TAC being allocated as equal shares.

30% Vessel Length: DFO's licensing data only provides the length for 250 prawn licenses. Therefore, for the purposes of this paper, we have added the average length (37.25 feet) twice to the known total of the 250 prawn licenses (9,312.89 feet) to give us a total length for 252 prawn licenses of 9,387.39 feet. To calculate the pounds allocated per foot of vessel length, take 30% of the TAC (0.3 x 3,699,319 lbs = 1,109,796 lbs) and divide by the total length of all 252 prawn licenses (1,109,796 lbs / 9,387.39 ft = 118.22 lbs/foot). Then multiply the vessel length by 118.22 lbs per foot to determine the vessel length allocation per vessel. For example, a vessel with an average length of 37.25 feet would receive a vessel length allocation of 4,404 lbs (37.25 x 118.22 = 4,404).

50% Historical Catch: DFO did make available the catch history data for 2001 to 2003. Unfortunately, the data only shows the number of traps and the total catch by year and does not identify which vessel the catch is associated with. Therefore we are unable to calculate for the reader their historical catch component of the formula. However, each licence holder can calculate their catch history share by inserting their average catch for the three year period 2001-2003 (*stacked licenses should look at the special provisions identified below*). Simply add together your catches for each of the years 2001, 2002, and 2003 and then divide the total by three (this is your license's 3-year average catch). To calculate your catch history component of the formula you simply multiply your license's

3-year average catch by 0.400031792 (this fraction is 50% of the TAC divided by the 3 year total catch history average for the entire fleet for 2001-2003 which numerically is .5 x 3,699,318.8 / 4,623,781 = .400031792). For example, assume a prawn license holder caught 17,000 lbs in 2001, 18,000 lbs in 2002, and 19,000 lbs in 2003. His 3-year catch average would be 18,000 lbs (17,000+18,000+19,000=54,000/3=18,000). Multiplying 18,000 lbs by .400031792 results in the vessel receiving 7,201 lbs of allocation under the 50% Historical Catch component of the formula.

Special Provisions for Stacked Licenses: Since 1995 vessels have been permitted to stack licenses to increase the number of traps they can fish during the season. Based on DFO data, the number of vessels fishing 500 traps was 36 in 2001, 35 in 2002 and 36 in 2003. Of course the same licenses are not stacked every year. Between 2001 and 2003 there were 54 different vessels that fished 500 traps. Of these 54 vessels, 19 stacked only one year, 17 stacked two years, and 18 stacked all three years. The catch history by the vessel fishing the 500 traps is clearly higher due to the extra traps that have been leased and therefore some of the catch history should be credited to the license that was stacked onto the vessel that fished. There are numerous arguments on both sides about the amount of history that should be assigned to the stacked license. Regardless of the varied positions that can be taken, this discussion paper proposes that 20% of the catch history from the year it was stacked be assigned to the stacked license. This means that if in 2003 vessel X stacked its license on to vessel Y and vessel Y caught 40,000 lbs, then 8,000 lbs of the catch history would be credited to vessel X in 2003 for the purposes of calculating their allocation under the proposed IVQ formula and vessel Y would only use 32,000 lbs of catch history in 2003 for calculating their allocation. Vessels that fished with stacked licenses are likely able to calculate their historical catch and subtract 20% for the stacked license. Unfortunately, license holders who leased out their licenses do not usually know the annual catch of the vessel that fished it and, therefore, cannot determine how much catch history to use in the formula. This information would be provided by DFO to individual license holders if the formula and IVQ program are adopted for implementation on a 2-year trial basis. For the purposes of this discussion paper, however, the average annual catch across all 54 vessels that fished 500 traps between 2001 and 2003 is 35,557 lbs and 20% of this amount is 7,111 lbs. For convenience, license holders that stacked their licenses onto other vessels and are unaware of the catch of that vessel, can use the catch average of 7,111 lbs for each of the years that they leased out their license to calculate their 50% Historical Catch component of the allocation formula. For example, assume vessel X fished in 2001 and 2002 and caught 15,000 lbs and 14,000 lbs of prawns respectively. In 2003 vessel X leased his license to vessel Y and does not know the catch of vessel Y in that year. Vessel X could still carry out an estimation of the 50% Historical Catch component of the allocation formula as follows: Add vessel X's catches in 2001 (15,000 lbs) and 2002 (14,000 lbs) and the average stacker catch (7111 lbs) as an estimate of Vessel X's catch history share for 2003 from the vessel that stacked his license. Divide this total by 3 (15,000 + 14,000 + 7111 = 36111 / 3 = 12,037) to determine the 3-year average catch for vessel X of 12,037 lbs. Multiply this by .400031792 to calculate the 50% Historical Catch component of 4,815 lbs for vessel X.

Total Annual Allocation: The total annual allocation is the addition of each of the three components (20% equal shares, 30% vessel length, and 50% Historical Catch – Columns 7+8+9 in Appendix A). The calculations for the 20% equal shares and 30% vessel length are already provided in Appendix A. Calculate the Historical Catch component for your vessel as shown above and add this to the other components to determine your total allocation under the proposed formula.

What's fair?

"He who knows he has enough is rich." - Lao Tzu

It must be understood, that there is no perfect allocation formula that can satisfy every license holder. Because people have different definitions for fairness and equitable, reaching a consensus on how to allocate access to the commercial prawn TAC is virtually impossible. What should be achievable, however, is an allocation formula that leaves no license holder worse off financially than prior to IVQs (as measured by considering the combined affects of an IVQ program on the value of their license and annual landed value).

Comparison of annual landed values: Once you have calculated your allocation under the proposed formula, compare it with your current average annual income from the prawn fishery (from fishing or from leasing). We suggest that under an IVQ program the average landed price for prawns should be at least $8 per pound and the lease rate for stacked licenses should be at least $4 per pound. Multiply your allocation by $8 to determine your gross stock and compare it to other years. Remember that this is based on 80% of the TAC and increased allocations may be possible inseason. If you have leased out your license in the past as a stacker, multiply your allocation by $4 to determine your annual lease income and compare this to previous years.

Comparison of asset values: Similarly, compare the current value of your license to the potential value of the IVQ you are allocated. In mature IVQ fisheries, the quota sells for 7 to 10 times the landed value of the quota. For example, halibut currently receives a landed price of approximately $4 per pound and the IVQ sells for about $40 per pound. It is entirely possible over time that the landed price for prawns under an IVQ program could be higher than $8 per pound. However, for the purposes of this discussion paper we will assume that the landed price of prawns remains at $8 per pound and that the selling price of prawn IVQ will be 8 times the landed price, or $64 per pound. Multiply your allocation by $64 and compare this to the current value of your prawn license (which sells currently for $16,000 a foot).

Should we try it?

"Take the first step in faith. You don't have to see the whole staircase, just take the first step." - Dr. Martin Luther King Jr.

Although IVQs appear to offer solutions to many of the current fishery issues of concern and have generally proven beneficial in other fisheries, they are untested in the commercial prawn fishery and by most prawn fishermen. Therefore, it would be helpful if DFO and commercial prawn fishermen could test IVQs during a two year Pilot Program. During this trial period, prawn fishermen would have time to determine whether there are operational, economic and safety benefits and DFO would be able to assess its ability to properly manage the prawn fishery and resource. Following the second pilot season, a comprehensive program review and evaluation would be conducted and continuation of the program would be at the discretion of the Minister of Fisheries and Oceans after thorough consultations with the commercial prawn industry.

A Pilot Program means that if industry and DFO are not satisfied with the results of the trial period, they can discontinue the IVQ experiment and implement a completely different management regime.

How long is the season?

"Change your thoughts and you change your world." - Norman Vincent Peale

Because all prawns become reproductively mature females, they can be harvested year round provided sufficient females are allowed to escape. However, prawn biology indicates that from February to April prawn larval will hatch and release and managers have recommended against commercial fishing during this period. The race to catch prawns under the current management system has resulted in increased activity levels and CPUE that have reduced the length of the fishing season to 62 days in 2004 (early May to early July). Under an IVQ system, the vessel's quantity of catch is already known and the incentive to catch as much prawns as quickly as possible is greatly reduced (there still may be some competition for areas). Therefore an 8 month prawn season commencing May 1 and concluding December 31 is recommended during the two year Pilot Program. The four month closure (January through April) will be consistent with the biological characteristics of prawns and will allow time for industry to review the completed fishing season and plan for the following season.

Can IVQs be transferred?

"Learn to be silent. Let your quiet mind listen and absorb."
- Pythagoras

Industry participants have concerns about the impacts of IVQ transferability on communities, crews, small vessel operators, and others. Therefore, it is recommended that during the two year Pilot Program the IVQs be non-transferable and non-divisible and fished by the license for which they have been issued. Transfers would only be permitted in accordance with existing licensing policy rules for license transfers and

stacking (i.e. transferring of a license to another vessel of same or shorter length and the temporary stacking of two licenses on one vessel for a season). During the two year Pilot Program, DFO, the Commercial Prawn Industry Caucus and prawn license holders will assess the impacts and usefulness of IVQ transferability in the commercial prawn fishery.

How do we monitor IVQs?

"I destroy my enemies when I make them my friends." - Abraham Lincoln

Accurate and timely monitoring of IVQ landings is essential for program credibility and operations. As such a dockside monitoring program along the lines used in other IVQ programs will be necessary. The main elements of the program include:

- Hail in requirements prior to landing (requiring adequate lead time)
- Designated landing locations throughout the coast (in line with the traditional landing locations already established)
- Monitoring of all offloads (this will entail a complete counting of boxes or cages and subsampling to determine average weight per container)
- Data management program to ensure that all hail and offload data are entered in a timely manner to update managers on total removals and vessel operators on IVQ status

There are approximately 25 different processors and as many or more landing locations. The 2002 commercial prawn fishery produced 1754 sales slips (approximately 1/3 from vessels delivering frozen product and 2/3 from vessels delivering fresh or live product) and landed 1866 tonnes of prawns (approximately 2/3 frozen product and 1/3 fresh or live product). Vessels can land both frozen, fresh or live product in boxes or baskets. Factoring in the above monitoring program requirements and the associated administrative, coordination, training, and certification costs, the total monitoring program costs should be about 4-6 cents per pound of product landed (This is inline with other IVQ programs).

Some may suggest that at-sea monitoring (at-sea observers or electronic monitoring) should be implemented with IVQs in the commercial prawn fishery. There is no evidence to support this claim at this time. At-sea monitoring was not part of the initial halibut, sablefish or geoduck IVQ programs and program reviews indicate that there have not been significant problems with illegal fishing or high grading. At-sea monitoring was introduced with the groundfish trawl IVQ program (and is now being phased into the halibut and sablefish programs) to deal with accurate reporting of bycatch and the catch of different species managed on an area specific basis. If, however, the evaluation of the Pilot Program indicates that illegal fishing is a problem within the commercial prawn fleet, then at-sea monitoring should be implemented if the program is to continue.

Summary

"It is not the strongest of the species that survive, nor the most intelligent, but the one most responsive to change." - Charles Darwin

The commercial prawn fishery has changed significantly over the last 15 years. While DFO has done a good job of sustaining the resource, management measures have failed to adequately address the race to fish and the negative impacts this race has on economic viability and safety. Eventually, the race to fish will also undermine resource sustainability.

Fisheries management is complex and growing ever more difficult. Today's public is concerned about the health of natural resources and has little appetite for overfishing and mismanagement. New legislation such as the Oceans Act and Species at Risk Act will add to the complexities and increase management costs. Increasingly, industry will be required to fund research and management activities and growing precautionary environment. The globalization of seafood markets and the growth of aquaculture will place a greater focus on certainty of supply and consistency of quality. The demands on the prawn resource by recreational and First Nations users will grow, putting further pressure on managers for clear allocation among sectors. First Nations Harvest Agreements are being negotiated with various bands throughout the coast and in many cases will include allocations of prawns either as a percentage of the total catch or in pounds of catch annually. First Nations allocations over and above historical use will be purchased from the commercial industry either through the purchase of prawn licenses (for which an average catch allocation will be assigned) or prawn IVQ (if it exists).

IVQs have the potential to improve the economic viability and sustainability of the commercial prawn fishery and enables the industry to address proactively many of the daunting issues license holders will face in the coming years.

"In any moment of decision, the best thing you can do is the right thing. The worst thing you can do is nothing." - Theodore Roosevelt