

Value Adding: The King Prawn

A report for:



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Executive Summary

The focus of this research was about using the positive aspects of other industries, particularly other prawn fishing industries, throughout the supply chain. The objectives of this research were to:

1. Investigate new technologies and how they could be applied in South Australia.
2. Learn about management practices in other fisheries and identify those that could improve the performance of the Spencer Gulf Prawn Fishery and prawn fisheries in Australia more generally.
3. Identify how product differentiation will improve prawn prices (including the value of an internationally recognised environmental accreditation system, ie Marine Stewardship Council certification).

Through the research conducted, there are several opportunities that have been identified to improve the performance of the Spencer Gulf Prawn Fishery in the international market as well as within the fishery itself. In particular, there is a need to highlight Australia's stringent food safety standards overseas and a need for better labelling of product (ie so other inferior product is not sold as Australian). There are also opportunities for live prawn exports that obtain higher prices, which need further investigation and research. Additionally, consideration needs to be given to the current operations of the Spencer Gulf Prawn Fishery, in relation to vessel numbers; there would be a greater advantage to those in the fishery to have fewer operators. Furthermore, should the Spencer Gulf Prawn Fishery introduce a mechanism, which reduces the fleet size, there are new technologies that can assist with processing product on board vessels.

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Secondly, to the management team at the Fisheries Research and Development Corporation (FRDC). Thank you for your continual financial support. The seafood sector is only a relatively new addition to the scholarship family, but I believe it is a significant addition that only adds weight to the esteemed Nuffield brand. With your continued support the marine based industries will benefit greatly from the wealth of knowledge that is acquired globally each year through the conduit that is Nuffield.

Thirdly, to the management team at the Spencer Gulf Prawn Fisherman Association. I would like to thank you for not only nominating me as a candidate, but also putting your financial faith in me as well. Thank you to our chairman, Mr Glenn Davis for your guidance and encouraging words of wisdom. And a special thank you to our former EO, Karen Hollamby, who was with me from the application process to the final proofing of this report. Your input has been invaluable.

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Thank you all.

Abbreviations

ABARES – *Australian Bureau of Agricultural and Resource Economics and Sciences*
ACPF – *Australian Council of Prawn Fisheries*
AFMA – *Australian Fisheries Management Authority*
C&P – *Cooked and Peeled*
CPI – *Consumer Price Index*
FRDC – *Fisheries Research and Development Corporation*
FNS – *Fish Names Standards*
GDP – *Gross Domestic Production*
GFC – *Global Financial Crisis*
HRH – *His Royal Highness*
MEY – *Maximum Economic Yield*
MSC – *Marine Stewardship Council*
MSY – *Maximum Sustainable Yield*
NGO – *Non-government organisation*
PIRSA – *Primary Industries and Regions South Australia*
RG – *Royal Greenland*
SARDI – *South Australian Research and Development Institute*
Scampi – *‘Prawns’, ‘Shrimp’ and ‘Scampi’ are used interchangeably in the document*
SGPF – *Spencer Gulf Prawn Fishery*
SGWCPFA – *Spencer Gulf and West Coast Prawn Fisherman’s Association*
Shrimp – *‘Prawns’, ‘Shrimp’ and ‘Scampi’ are used interchangeably in the document*
Spencer Kings – *King prawns caught in the clean and green waters of Spencer Gulf, South Australia*
TAC – *Total Allowable Catch*
TAQ – *Total Allowable Quota*
TC – *Temperature Controlled*
VAT – *Value Added Tax*
WoRMS – *World Registry of Marine Species*
WWF – *World Wildlife Fund*

Foreword

This project has been conducted through the Nuffield Australia Farming Scholarship program, I have had the opportunity to gain an awareness of other fisheries and other primary production industries across the globe, their management practices, their processing technologies and how the assets of the Spencer Gulf Prawn Fishery will set the prawns apart in future activities. Becoming a Nuffield scholar has also provided me with recognition and standing amongst my fellow peers at the Spencer Gulf and West Coast Prawn Fishermen's Association. I hope to build on this further in my local fishing community as well as the prawn industry on a national basis. Conducting this research would not have been possible without the financial support and my activities as a Nuffield scholar.

I have come to realise that the Spencer Gulf prawn fishery is highly efficient and extremely well managed, although we lack expertise and leadership in post harvest production at the boat level. We also have relatively inflexible management arrangements, which could impede future growth and profitability within each business.

I am grateful for this experience, as it provides an opportunity to guide future research and development not only in my business, but also with the Spencer Gulf and West Coast Prawn Fishermen's Association and even wider across Australia through the Australian Council of Prawn Fisheries. I look forward to sharing my report with fishers and co-workers to provide an alternative view and begin discussions on other activities we could get involved with or changes we could make.

As you are reading this, I hope you find the information interesting and of use to you as much as the study program has been for me. Please enjoy the report, and hopefully while eating a few Australian prawns!

Introduction

Australian prawn fishermen have been enduring extremely tough times of late. The impact of the global financial crisis has hit hard. European countries that were previously solid importers of our King Prawn are now opting for cheaper alternatives such as wild Kings from Mozambique and Argentina. The largest importer of the 'Spencer King' was Spain followed by Greece. These two countries ironically have been the hardest hit within Europe's financial circle. Combine the effects of the Global Financial Crisis (GFC) with a strong Australian dollar and add a European Union (EU) government-imposed 12% duty on imported seafood and you place serious pressure on the Australian prawn market.

The domestic market last year consumed 90% of the Australian wild caught stock, around 18,000 tonnes. On top of this there is also the imported and local farmed varieties competing for their market share. This is why it is so crucial we find new and lucrative overseas markets to ease the pressure at a local level. The average business pre-2008 was at least growing in line with the CPI at 2-3% or better. Now businesses are at risk, with no apparent positive outlook. The average price per kilogram that South Australian fisherman received last year was almost 10% less than it was 15 years ago. This is much higher when comparing to CPI increases for other costs. The average production cost per kilogram has increased by 39% since 1997/98, due to skyrocketing fuel prices, increased insurance and escalating license fees. It is now time for change.

The acquisition of Marine Stewardship Council certification was a wise decision by the Spencer Gulf management committee and has certainly opened many doors that were previously closed to the fishery. This report looks at how this particular certification has affected other prawn/shrimp fisheries globally. The other form of value adding investigated is the proposition of a self-funded license buy-back. This is a plan put together over a 10-year period with the goal of increasing profitability to the remaining license holders in the form of higher yields. I have also included the option of processing live prawn to be sold as a high value, exclusive product for Chinese and Japanese markets.

Objectives

The objectives of this research were to:

1. Investigate new technologies and how they could be applied in South Australia.
2. Learn about management practices in other fisheries and identify those that could improve the performance of the Spencer Gulf Prawn Fishery and prawn fisheries in Australia more generally.
3. Identify how product differentiation will improve prawn prices (including the value of an internationally recognised environmental accreditation system, such as the Marine Stewardship Council certification).

Chapter 1: Australian Wild-catch Prawn Industry

The purpose of this chapter is to give the reader a an overview of the location of harvested wild-caught Australian prawn fisheries. It concentrates on the location and size of the Australian King prawn fisheries on the Australian coast.

1.1 Northern Prawn Fishery (Commonwealth)

The Northern Prawn Fishery is a Commonwealth Government fishery managed by the Australian Fishery Management Authority (AFMA). Fishing occurs in the waters north of Australia, stretching from the top of Western Australia at Cape Londonderry across to the top of Cape York in north Queensland (Figure 1). The fishery targets nine commercial species of prawns including white banana (*Fenneropenaeus merguensis*), red-legged banana (*Fenneropenaeus indicus*), brown tiger (*Penaeus esculentus*), grooved tiger (*Penaeus semisulcatus*), blue endeavour (*Metapenaeus endeavouri*), and red endeavour (*Metapenaeus ensis*) (AFMA, 2012a). Around 4,100 tonnes of banana prawns, 1,500 tonnes of tiger prawns, and 476 tonnes of endeavour prawns are caught annually. Minimal catches of king prawns are documented for this fishery (12 tonnes in 2010).

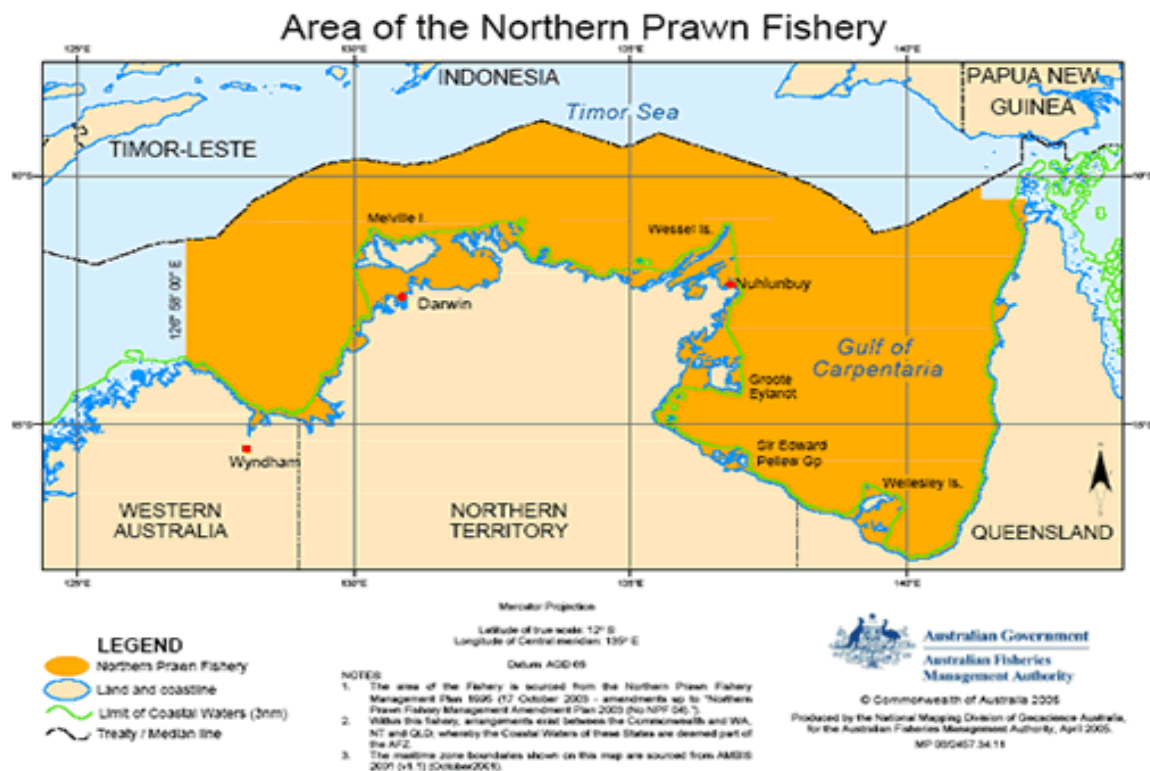


Figure 1: Northern Prawn Fishery fishing grounds (shown in yellow)

Australian Fisheries Management Authority website (AFMA, 2012b)

1.2 Torres Strait Prawn Fishery (Commonwealth)

The Torres Strait Prawn Fishery is a Commonwealth Government fishery managed by AFMA in conjunction with the Torres Strait Regional Authority and the Queensland Government, jointly termed the Torres Strait Protected Zone Joint Authority. Its fishing grounds lie between Australia and Papua New Guinea in the Torres Strait (as the name suggests) over the Queensland landscape. Brown Tiger prawn (*Penaeus esculentus*) and the Blue Endeavour prawn (*Metapenaeus endeavouri*) are the key target species. The Red Spot King prawn (*Melicertus longistylus*) is essentially a by-product species. Approximately 335 tonnes of tiger prawns, 173 tonnes of endeavour prawns, and 16 tonnes of king prawns were caught in 2009, which were below the long term average (Kertesz et al, 2010). The average catches from 1991 through to 2003 (high fishing effort) was approximately 668 tonnes of tiger prawns, 1044 tonnes of endeavour prawns and 70 tonnes of king prawns (Kertesz et al, 2010)

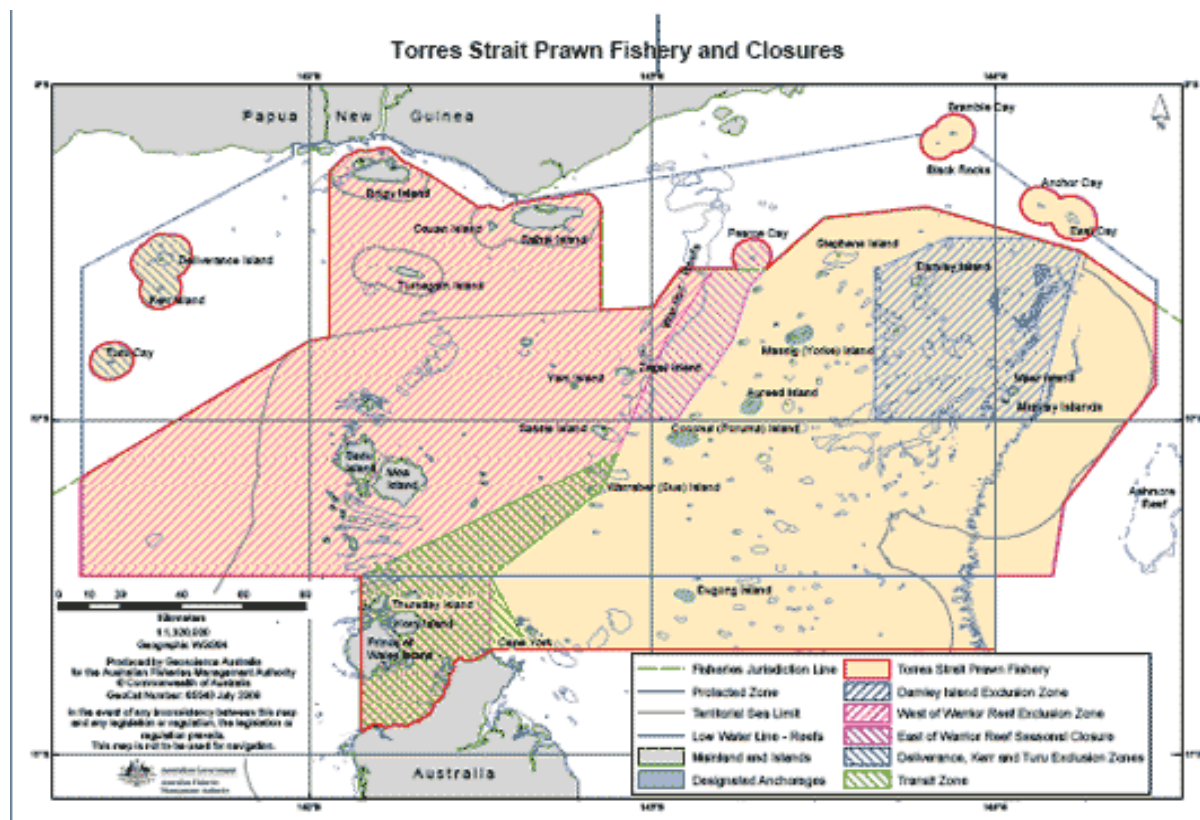


Figure 2: Torres Strait Prawn Fishery fishing grounds

Australian Fisheries Management Authority website (AFMA, 2012c)

1.3 Western Australia

Fisheries within Western Australia are managed by the State Government. The commercial prawning industry occurs along the length of the coast with catches consisting of a variety of species, primarily the western king prawn (*Penaeus latisulcatus*), brown tiger prawn (*P. esculentus*), banana prawn (*P. merguensis*) and blue endeavour prawn (*M. endeavouri*). There are two main prawn fishing areas located in Exmouth Gulf and Shark Bay, with a number of other smaller fisheries operating in the Kimberley, Broome, Nickol Bay, and Onslow areas. Another two fisheries, Abrolhos Trawl and South West Trawl are permitted to catch prawns but the total take of prawns in these fisheries is negligible and so are not reported on in this report.



Figure 3: Western Australia prawn fishing grounds
Department of Fisheries, Western Australia State Government

1.3.1 Exmouth Gulf Prawn Managed Fishery

The fishery (Figure 4) targets western king prawns (*Penaeus latisulcatus*), brown tiger prawns (*Penaeus esculentus*), endeavour prawns (*Metapenaeus* spp.) and to a lesser extent banana prawns (*Penaeus merguensis*). For the 2010 fishing season catches included approximately 388 tonnes of tiger prawns, 254 tonnes of king prawns and 138 tonnes of endeavour prawns and by-product catch of 18 tonnes of coral prawns (Fletcher and Santoro, 2011), which are low when compared to the relatively high fishing catches in 2004. Catches in 2004 were

approximately 629 tonnes of tiger prawns, 436 tonnes of king prawns, 282 tonnes of endeavour prawns and 47 tonnes of coral prawns (Penn et al, 2005). No recorded catches of banana prawns were documented for 2004 (Penn et al, 2005) and only around one tonne in 2010 (Fletcher and Santoro, 2011).

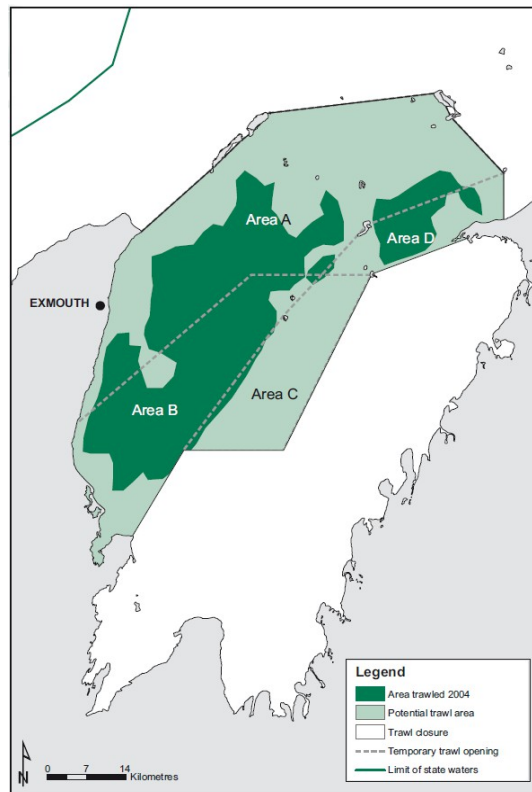


Figure 4: Exmouth Gulf Prawn Fishery fishing grounds
State of the Fisheries Report 2004/05 (Penn et al, 2005)

1.3.2 Shark Bay Prawn Fishery

The fishery (Figure 5) targets western king prawns (*Penaeus latisulcatus*) and brown tiger prawns (*Penaeus esculentus*), plus also catches small amounts of endeavour prawns (*Metapenaeus spp.*) and coral prawns (various species). For 2010 catches were included approximately 1122 tonnes of king prawns, 423 tonnes of tiger prawns and less than one tonne of endeavour prawns (Fletcher and Santoro, 2011). In addition, 106 tonnes of coral prawns were landed (Fletcher and Santoro, 2011). Shark Bay prawn fishery (Figure 5) is quite unique in that it is the second highest producer of the western king prawn (*Penaeus latisulcatus*) at 1200 tonnes, behind the Spencer Gulf Prawn Fishery (SGPF) at around 2000 tonnes annually.

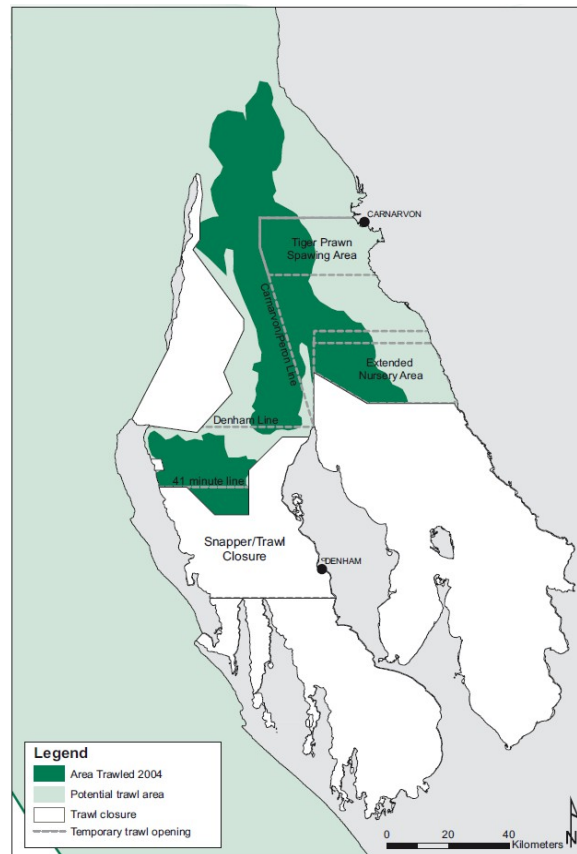


Figure 5: Shark Bay Prawn Fishery fishing grounds
State of the Fisheries Report 2004/05 (Penn et al, 2005)

1.3.3 Broome Prawn Managed Fishery

The Broome prawn fishery (Figure 3) targets western king prawns (*Penaeus latisulcatus*) and coral prawns (various species). Catches in 2010 were very low, with only 3 tonne of king prawns recorded as landed (Fletcher and Santoro, 2011).

1.3.4 Kimberley Prawn Managed Fishery

The Kimberley prawn fishery (Figure 3) targets banana prawns (*Penaeus merguensis*) but also catches tiger prawns (*Penaeus esculentus*), endeavour prawns (*Metapenaeus endeavouri*) and western king prawns (*Penaeus latisulcatus*). Catches in 2010 included approximately 241 tonnes of banana prawns, 11 tonnes of tiger prawns and 4 tonnes of endeavour prawns (Fletcher and Santoro, 2011).

1.3.5 Nickol Bay Prawn Fishery

Nickol Bay prawn fishery, between Broome and Exmouth (Figure 3) targets banana prawns (*Penaeus merguensis*) but also has catches of western king prawns (*Penaeus latisulcatus*), brown tiger prawns (*Penaeus esculentus*) and endeavour prawns (*Metapenaeus* spp.). In 2010 catches were low, with total landings of 40 tonnes of banana prawns only; there were no recorded catches of king, tiger or endeavour prawns (Fletcher and Santoro, 2011).

1.3.6 Onslow Prawn Fishery

Onslow prawn fishery, north of Exmouth (Figure 3) targets western king prawns (*P. latisulcatus*), brown tiger prawns (*P. esculentus*), and endeavour prawns (*Metapenaeus* spp). 2010 catches of prawns included approximately 1 tonne of king prawns, 27 tonnes of tiger prawns, and less than 1 tonne of endeavour and banana prawns (Fletcher and Santoro, 2011).

Table 1: Summary of WA Prawn Catches in 2010 compared to 2004

Species (Common Name)	Fishing Year 2010 (Tonnes)	Fishing Year 2004 (Tonnes)
Western King Prawns	1,380	1,725
Brown Tiger Prawns	849	1,426
Banana Prawns	283	466
Endeavour Prawns	144	343
Coral Prawns	124	188

Information obtained from Fletcher and Santoro (2011) and Penn et al, 2005 respectively

1.4 Queensland

Fisheries within Queensland are managed by the State Government of Queensland's Department of Agriculture, Fisheries and Forestry. Commercial fishing occurs along the length of coast, east of Queensland and within rivers. Queensland has three main prawn trawl fisheries: East Coast Otter Trawl Fishery; Moreton Bay Otter Trawl Fishery; and River and Inshore Beam Trawl Fishery. Data obtained is for all three fisheries combined and therefore a report has not been prepared separately for each fishery.

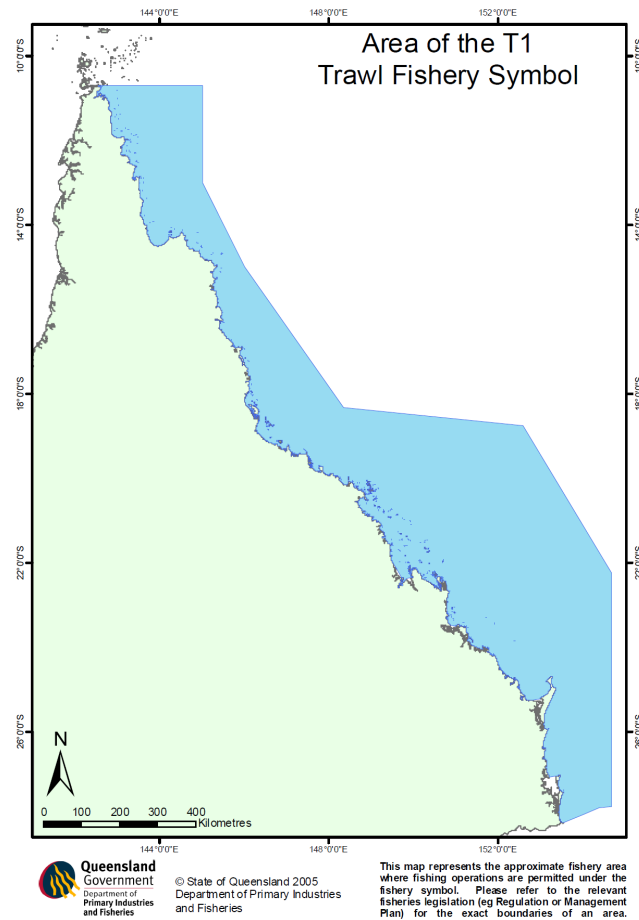


Figure 6: East Coast Trawl fishing grounds
State of Queensland, 2012

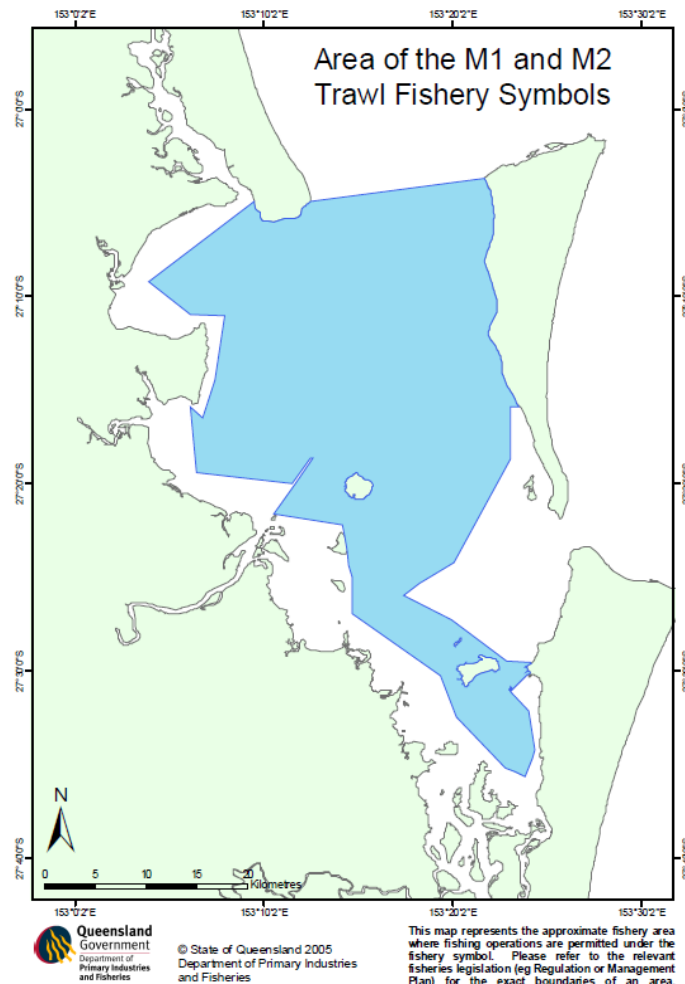


Figure 7: Moreton Bay Trawl fishing grounds
State of Queensland, 2012

Catches in Queensland consist of around 21 different types of prawn species. The most abundant species caught are the eastern king prawn (*P. plebejus*), tiger prawns (*P. esculentus*, *P. semisulcatus* or *P. monodon*), banana prawns (*P. merguensis*), endeavour prawns (*M. endeavouri* and *M. ensis*), red spot king prawns (*P. longistylus*), ‘blue leg’ or western king prawns (*P. latisulcatus*) and bay prawns (*M. bennettiae* and *M. macleayi*). Species catches are summarised in Table 2, with the king and tiger prawn catches being significantly higher.

Table 2: Summary of QLD Main Prawn Species Catches in 2010

Species (Common Name)	Fishing Year 2010 (Tonnes)
Eastern King Prawns	2,612
Tiger Prawns	1,272
Banana Prawns	669
Endeavour Prawns	579
Red Spot King Prawns	342
Blue Leg King Prawns	152
Bay Prawns	128

Information courtesy of Department of Agriculture Fisheries and Forestry, Queensland Government
Catches are approximates only; only catches greater than 100 tonnes are included

King prawns and tiger prawns are caught in the East Coast Trawl Fishery. Endeavour, banana and bay prawns are caught both in the East Coast Trawl Fishery and the River and Inshore Beam Fishery. Fishing generally occurs year round, but there is some seasonality between species and locations along the coast as well as environmental factors.

1.5 New South Wales

Fisheries are managed by the State Government within New South Wales. Commercial fishing occurs in estuaries as well as in the ocean. There are three types of fisheries that catch prawns including the Estuary Prawn Trawl Fishery, Estuary General Fishery and the Offshore Trawl Fishery. Catches of prawns in New South Wales include the eastern king prawn (*M. plebejus*), school prawn (*M. macleayi*), greentail prawn (*Metapenaeus bennettiae*), royal red prawn (*Haliporoides sibogae*) and the brown tiger prawn (*P. esculentus*). There are some reported catches of prawns by the recreational sector in addition to the commercial sector in NSW, unlike many other prawn fisheries in Australia.

1.5.1 Estuary Prawn Trawl Fishery

There are three prawn estuary fisheries located in the Clarence, Hunter and Hawkesbury Rivers (Figure 8). It should be noted that Port Jackson is included in the map, however this fishery was closed to commercial fishing in 2006. Catches in the Estuary Prawn Trawl Fishery include school prawns, greentail prawns, and eastern king prawns. The predominant catch in this fishery is school prawns totalling 469 tonnes in 2006/07 fishing season (Primary Industries Fishing and Aquaculture, 2012). Catches of other species are relatively minimal.

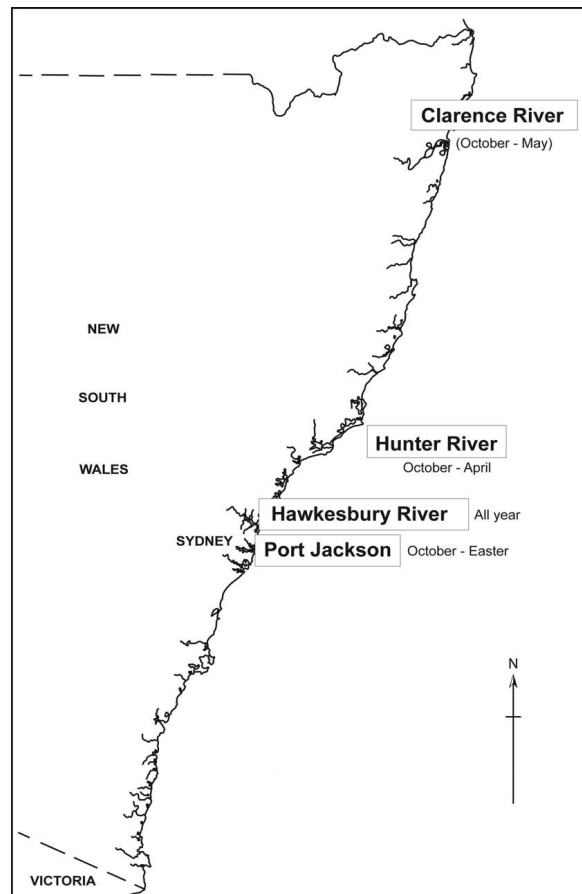


Figure 8: Estuary Prawn Trawl Fishery locations
NSW Fisheries, 2003a

1.5.2 Estuary General Fishery

The Estuary General Fishery is made up of many different estuaries using multiple catch types and targeting a variety of species. Included in the Estuary General Fishery catch are tiger prawns, greentail prawns, school prawns and eastern king prawns. In 2006/07 there were 179 tonnes of school prawns and 39 tonnes of eastern king prawns in these areas (Primary Industries Fishing and Aquaculture, 2012). Of the 20 tonnes of greentail prawns caught in 2008/09 most came from the Estuary General Fishery (Rowling et al, 2010).

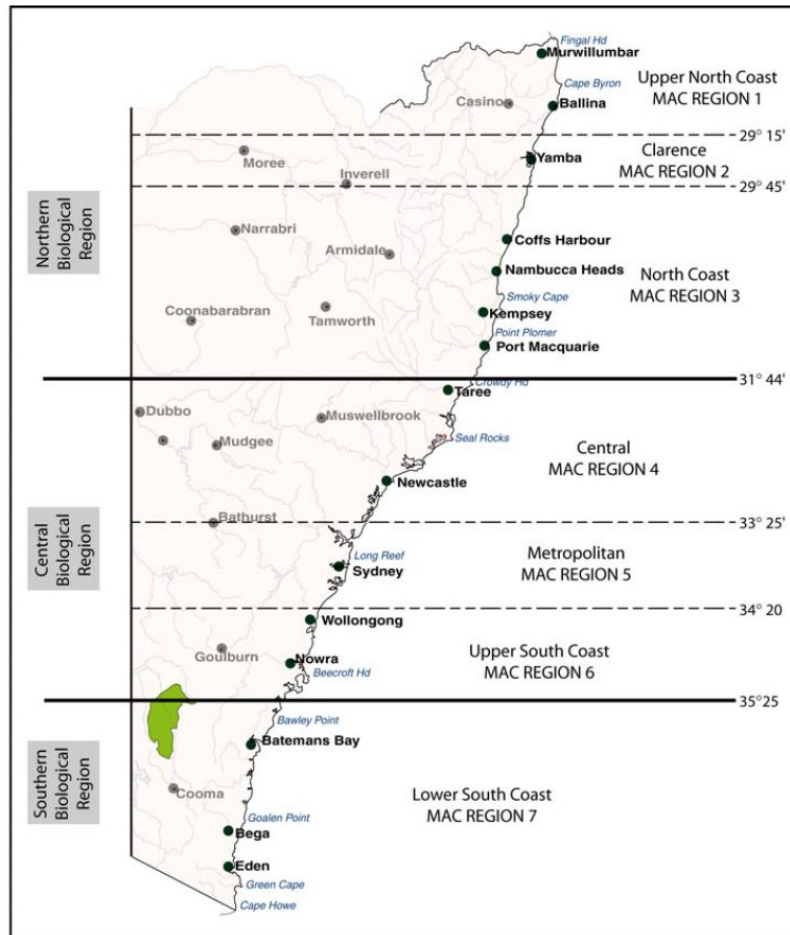


Figure 9: Estuary General Fishery locations

Picture from NSW Fisheries, 2003b

1.5.3 Offshore Trawl Fishery

The Offshore Trawl Fishery (Figure 10) is made up of two distinct areas: where prawn fishing alone can occur; and where prawn fishing and other species are able to be caught. The predominant catch in the Offshore Trawl Fishery is eastern king prawns with 468 tonnes caught in 2006/07 (Primary Industries Fishing and Aquaculture, 2012). Other prawn species caught in this fishery include school prawns, brown tiger prawns, royal red prawns and school prawns but all are minimal in comparison to the catch of eastern king prawns. It should be noted that royal red prawn catches have reached 250 tonnes in one fishing season and that the total allowable catch (TAC) has been set at 374 tonnes per year but catches have reduced to negligible (around 5-10 tonnes in 2008/09) as their demand has lessened (Rowling et al, 2010).

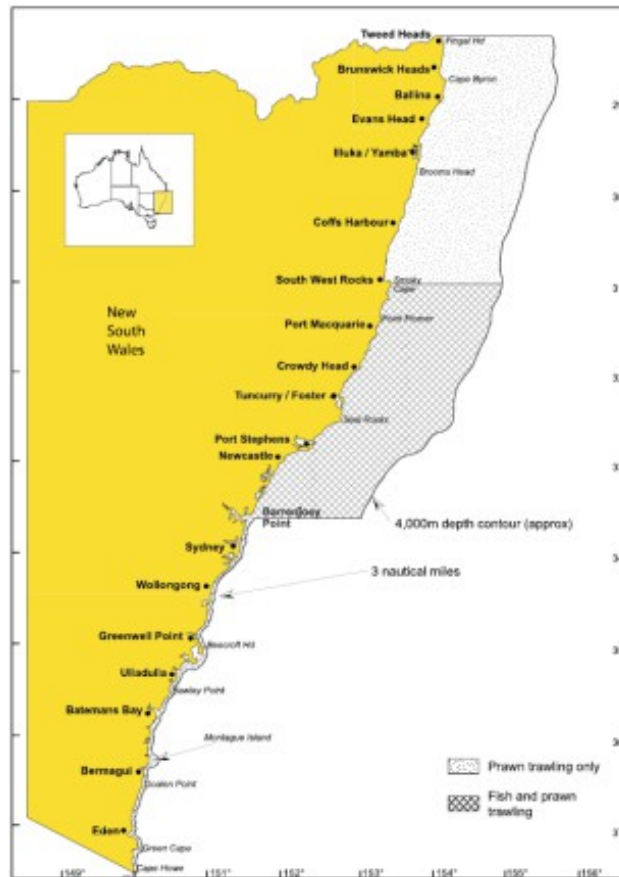


Figure 10: Ocean Trawl Fishery
NSW Department of Primary Industries, 2007

Table 3: Summary of NSW Prawn Catches for 2008/09

Species (Common Name)	Total Catch (Tonnes)
School Prawns	1,000
Eastern King Prawns	600
Greentail Prawns	20
Royal Red Prawns	10
Brown Tiger Prawns	6

Information obtained from Rowling et al, 2010

1.6 South Australia

There are three prawn fisheries in operation in South Australia. All three prawn fisheries are managed by Primary Industries and Regions South Australia (PIRSA). They are based on catches of a single species, the western king prawn (*P. latisulcatus*). The three prawn fisheries are the West Coast prawn fishery, Spencer Gulf Prawn Fishery (SGPF) and the Gulf Saint Vincent prawn fishery. The area available for fishing is provided in Figure 11. The blue region indicates the area available for fishing in the West Coast prawn fishery. The fishery comprises three vessels catching up to 150 tonnes per year. This fishery is subject to environmental conditions, being cold water and exposed to open ocean. The yellow region north of Kangaroo Island, indicates the Gulf Saint Vincent prawn fishery. This fishery comprises 10 vessels catching between 180 – 400 tonnes annually. The other fishery is the SGPF, with the total available fishing area shown in green. More details about the SGPF is provided in Chapter 2.

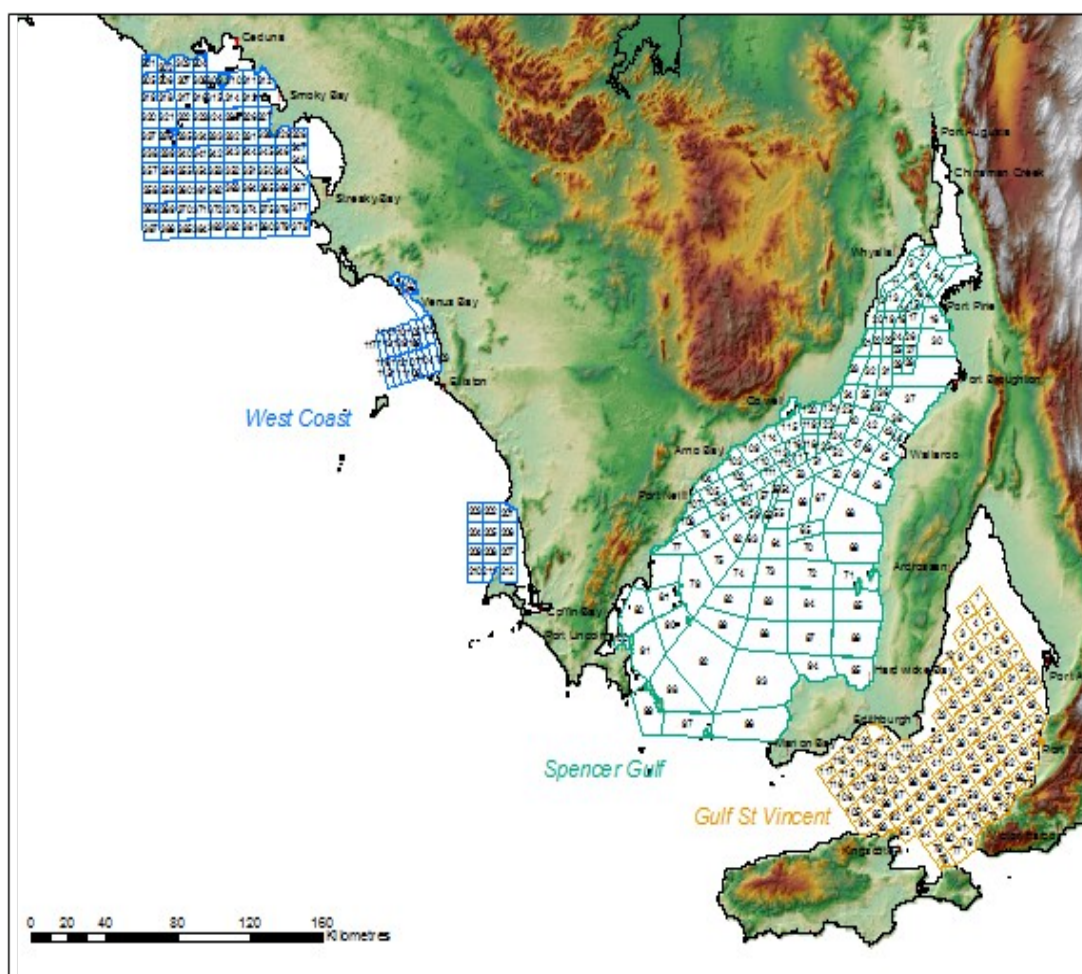


Figure 11: South Australian Prawn Fishery fishing areas
Courtesy of the Fisheries Statistics Unit – SARDI Aquatic Sciences

Chapter 2: Spencer Gulf Prawn Fishery, SA

The Spencer Gulf, South Australia is a single species prawn fishery producing approximately 2000 tonnes annually of Western King Prawns (*P. latisulcatus*), spread amongst 39 license holders. There is no strict Total Allowable Quota (TAQ), alternatively the SGPF is regulated by a unique real time management system where the fisherman in collaboration with government agencies manage the biomass depending on what is available from season to season. PIRSA Fishery and Aquaculture Division manage the prawn resource with input and scientific review from the South Australian Research and Development Institute (SARDI).

The SGPF is one of the only fisheries in the world that operate in this manner, using an Olympic quota system. It is the reason the Food and Agriculture Organisation of the United Nations (FAO) accredited the SGPF as one of the world's best-managed fisheries. The SGPF fishery has also recently been awarded the Marine Stewardship Council (MSC) certification, in October 2011. It is the first wild catch trawl fishery to do so in the South East Asia region. This is true recognition for sound management practices over the decades of its operation.



Figure 12: Western King Prawn
(*P. latisulcatus*)



Figure 13: King Prawn bury themselves in
daylight or under threat.

The SGPF has, by evolution, minimised its carbon footprint. This has been achieved by reducing the fishery down from 300 nights of fishing to a mere 50 nights per year in recent years. As you can see from the Figure 13 below, the annual catch has remained relatively constant at around 2000 tonnes (excluding the catch in 1986), yet the trawl hours have been cut by 60% over 23 years. The number of vessels has remained at 39 since the government introduced limited entry and the number of issued licenses increased from 34 to 39 in 1975.

The fishery has also minimised its environmental footprint by decreasing the area in which the prawns are harvested. It now takes 85-90% of its annual tonnage from less than 15% of the entire Spencer Gulf. The Management committee have introduced self-imposed closure zones due to specific areas of high by-catch, in particular scale fish and where other areas have been defined as having high benthic or tropic species of importance. This has added considerable weight to the clean, green image of the SGPF.

It should be noted that king prawns were previously separated into two distinct species group: western king prawn (*Melicertus latisulcatus*) and eastern king prawn (*Melicertus plebejus*). Under Fish Names Standards (FNS), these two groups have been merged to create a generic 'king prawn' species, although it is still arguable that they are dissimilar to be separated. The 'western king prawn' is taken from South Australia and Western Australia. Catches along the east coast of Australia are of the 'eastern king prawn'. SGPF licence holders have strong beliefs that the 'western king prawn' is far superior in taste, texture and shelf life than its neighbour. For the purposes of this report, catches will be referred to as per the FNS, without differentiating between 'western king prawns' and 'eastern king prawns'.

Chapter 3: King prawns; the domestic overview

As shown in the previous chapters, there are major commercial prawn fisheries in Western Australia, New South Wales, Queensland, and the Commonwealth as well as South Australia. Prawn fisheries are now competing against one another for a larger slice of the domestic seafood pie. Total prawn catches from Australia combined in 2009/10 was 27,034 tonnes equalling around \$324M (ABARES, 2011). On a per State / Commonwealth fishery basis, the share of catch and value mainly lies with Queensland and the Commonwealth fisheries (including both Northern Prawn Fishery and the Torres Strait Fishery), although South Australia and Western Australia also have a significant share. New South Wales has a smaller contribution, followed by Victoria with a very small contribution of catch and value of prawns. Tasmania and the Northern Territory do not have commercial prawn fisheries. Details are provided in Table 4. Figure 15 shows graphically the split of prawn catches between the States and Commonwealth.

Table 4: Prawn Catches, Volume and Share by State in 2009/10

State	Value (\$,000)	Catch (tonnes)	Share (%)
New South Wales	16,004	1,266	4.68
Victoria	904	130	0.48
Queensland	155,860	12,268	45.38
Western Australia	27,940	2,790	10.32
South Australia	31,142	2,669	9.87
Commonwealth	92,242	7,911	29.26
TOTAL	324,092	27,034	100.00

Information sourced from ABARES, 2011

The share of prawn catches for king prawns (*P. latisulcatus*) is much closer between Queensland, Western Australia and South Australia than overall catches, being around 30%

each. New South Wales, Victoria and the Commonwealth prawn fisheries have a very small percentage share of king prawns, with catches being extremely small in comparison to the overall catch of prawns seen in Table 4 and Figure 15. King prawn catches by each State and the Commonwealth are presented in Table 5. Figure 16 shows graphically the split of king prawn catches between the States and Commonwealth.

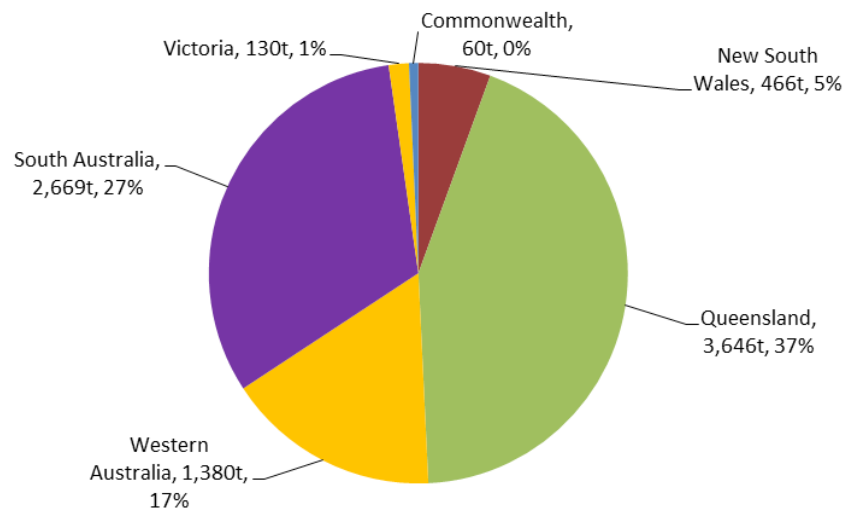


Figure 16: Proportion of King Prawn Catch from each State in 2009/10

Information sourced from ABARES, 2011, used with Fletcher and Santoro (2011) data

The king prawn is valued at over 30% (\$113M) of the total prawn catch value (\$324M) in 2009/10, being approximately equivalent in catch volume as a percentage (ABARES, 2011). Seemingly, Australia is the only country commercially producing / catching king prawns. This demonstrates the value and contribution that king prawns make to the Australian prawn industry, and wider economy. Additionally, South Australia provides about one third of the total king prawn catch. This demonstrates the significant contribution made by South Australia and its ability to play on the market stage with this unique product.

Chapter 4: Global shrimp overview

4.1 Global Trends and Australia's Position

Canada ranks as the leading producer of coldwater shrimp (*Pandalus borealis*), followed closely by Greenland. Other producing countries include Norway and Iceland. Though Canada holds a dominant position, its producers have limited power in the market. This is due to structural issues in the industry and the resulting competitive environment.

Just as the price for the Australian-caught prawns has been steadily declining, the same challenges are being faced by the global shrimp industry. Prices for coldwater shrimp have dropped by 40-50% over a decade (1999-2008) as growth in supply has outstripped the increase in consumption. These trends were expected to continue as the coldwater product faced intense competition from the warm water varieties. However, over the past three years there has been a distinct turn around in demand from the Asian region, in particular the emerging superpower - China. This has reflected an increase in price not only for the coldwater shrimp but also the Asian white prawn (*Penaeus Vannamei*) or 'vannamei prawn'. In 2011 a massive 30% jump was seen in price for vannamei prawns, grade - 90/120 prawns/kilogram.

The global supply of shrimp has doubled in just over a decade, rising from three to six million tonnes. Just over three million tonnes originates from wild fisheries, with the balance from farmed production. Farmed shrimp is the most rapidly growing source of supply, in particular for vannamei prawns. Thailand produces around 500,000 metric tonnes of which only 15% (75,000 tonnes) is consumed locally. The other 425,000 tonnes of Thai farmed vannamei prawns are exported worldwide.

During 2011 China increased farm production of vannamei prawns from one million to a massive 1.5 million tonnes. The domestic consumption in China is estimated at around 900,000 tonnes, with the remainder of the vannamei prawns being exported globally.

Coldwater shrimp supply at 450,000 tonnes accounts for 7% of total supply. Australian caught prawn supply, at 20,000 tonnes, accounts for only 0.3% of this. The king prawn is then only a mere 0.06% of the total global supply of coldwater shrimp.

The Greenland cooked and peeled (C&P) sector consists of seven to eight plants supplied by

about 40 inshore or coastal wetfish trawlers. This fleet sector, which is allocated about 45% of the TAC, has declined from over 100 vessels since 1995. The fleet also consists of about 12 factory freezer trawlers (down from 25 or so in 1995). So, despite rising quotas, the fleets have rationalized considerably. Greenland's C&P production was about 16,500 tonnes in 2004, of which 7,000 tonnes was exported to the United Kingdom (UK) and 5,500 tonnes to Denmark, with the balance going elsewhere in the European Union (EU). Today Greenland is catching around 100,000 tonnes.

The Norwegian prawn fishery takes place all year around along the Norwegian coastline, up near Svalbard and in the Barents Sea where both small inshore vessels and larger ocean-going vessels catch around 20,000 tonnes annually. The stock is shared with other nations but the Norwegian fleet, which comprises 89 vessels, catches around 30% of the total catch. Europe is the main market for Norwegian cold water prawns where both never-frozen and frozen prawns are sold in Sweden, the UK, Denmark, Finland, Italy and France.

Within these markets issues of sustainability, food safety and quality and eco-labelling are given a high priority. Whilst these markets remain underdeveloped as export sources for Australian prawns, it is considered that they deserve much greater attention in the future. The prawn industries have already proved that better market access into the EU is achievable. With the attention that these industries already give to environmental sustainability and food quality and safety it is considered that we should seek out further market opportunities in Europe. A funding source on a national basis, ie contributed through the Australian Council of Prawn Fisheries (ACPF), would be a significant factor in establishing generic promotion and as an essential source of funds for trade and market access of this kind.

The entire planet has been enduring a Global Financial Crisis (GFC), while China manages to increase her Gross Domestic Production (GDP) by around 10% annually, although the 2011/12 financial year saw it drop to 7.5%. The China factor is the very reason Australians are faced with such a powerful currency at present. The term 'two speed economy' is used frequently by our economists: it is the mineral rich Australian mining industry feeding the gargantuan appetite of our Asian cousins that has certainly played a role in decreasing seafood exports by inadvertently inflating the \$AUD.

As shown below (Figure 17), the whole prawn export value out of Australia has declined rapidly since 2000. However, the imported cultured prawn such as vannamei or the tiger prawn (*P. Monodon*) have more than doubled. The prawn grown in the Asia region has

improved to a point where it is now able to compete for a slice of the large prawn market. Several years ago the grades imported were no larger than a 35/44 prawns per kilo (16/20 prawns per pound). Now we are seeing 22/33 prawns per kilogram regularly, and processed to a very high quality. As the cost of living rises, people are opting for a cheaper alternative rather than a fresh, wild caught local product. This has certainly played a role in why local fishermen are experiencing lower than expected prices for their once very lucrative yields.

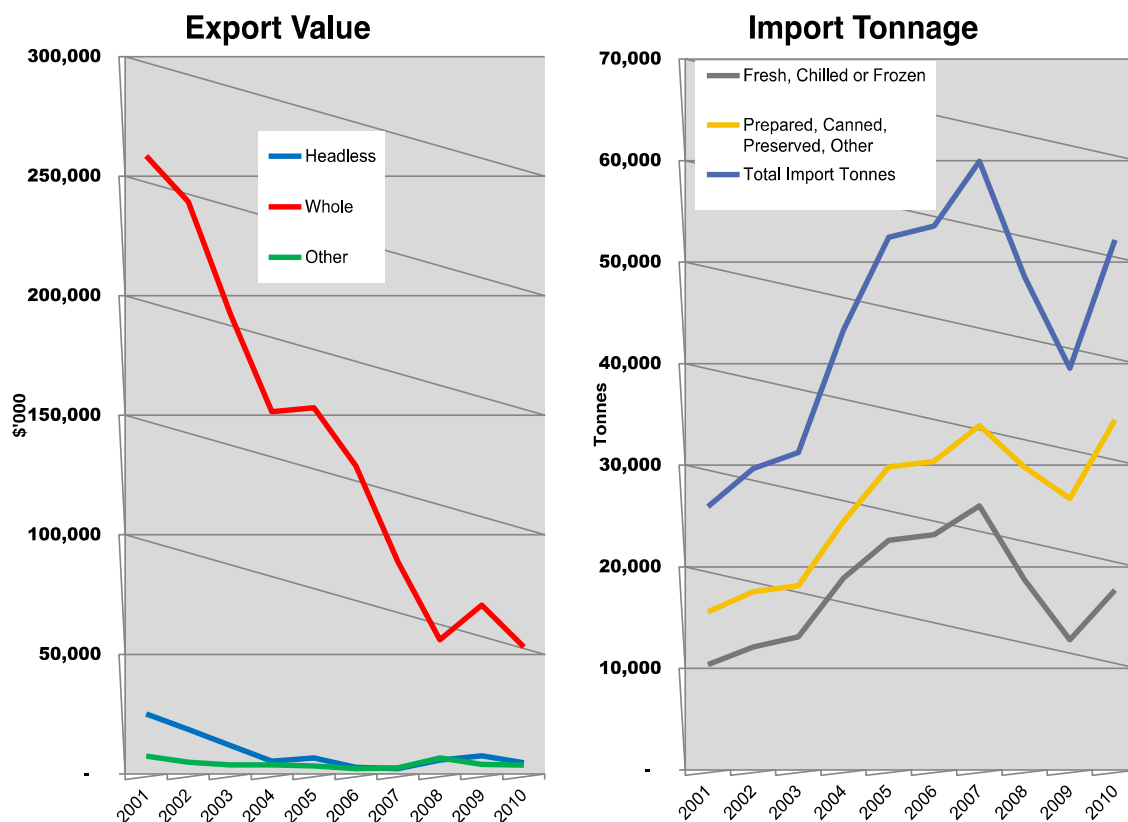


Figure 17: Value of Australia's Export Prawns and Tonnage of Imports

Information prepared and courtesy of Ridge Partners, 2012

4.2 Spencer Gulf King Prawns in Europe

European countries such as Germany and Denmark have a 20-25% Value Added Tax (VAT) on goods being imported into their country. This again adds another hurdle when trying to penetrate new markets, with higher than domestic prices and the inability to compete with those price points. However, despite the many hurdles there is still great belief and interest in the king prawns caught in Spencer Gulf, the 'Spencer King', in these countries.

During the study tour, I was fortunate enough to have a meeting with the sales director for the Asia region, Mr Finn Laursen from Royal Greenland. Mr Laursen believes that the markets for the Spencer King within Europe lie in Spain, France, and Italy. These countries represent those where people value their seafood above all else. Traditionally the northern European

countries such as Norway, Denmark and Finland (Scandinavian countries) do not want to pay high prices for their seafood. They have an ingrained belief and mind-set that fish is a 'poor man's food'. This is a way of thinking that dates back many decades and Mr. Laursen believes it will be a steep challenge to implement change.

Chapter 5: The value of Marine Stewardship Council certification.

Royal Greenland has a processing plant in Canada as well as Greenland. It was interesting to learn that Royal Greenland use the Canadian coldwater shrimp, which is MSC certified, as a secondary resource to satisfy select companies that require sustainable products. Companies such as Tesco, Lions and Marks & Spencer based in the UK are the main drivers of the MSC certified seafood products and are creating a new wave of demand for sustainable product. MSC is very much in vogue at present but according to Mr Bjoern Hansen (shrimp expert) of Royal Greenland (RG), there is no direct financial benefit when comparing the certified shrimp they sell from Canada against the shrimp coming out of Greenland. In saying that, Royal Greenland are currently undergoing the certification process as they see it as a necessity moving forward in a very demanding market that relies heavily on public perception.



Figure 19: Catch of *Pandalus borealis*



Figure 20: Royal Greenland pack of coldwater shrimp

In terms of financial benefit, I had an inspiring meeting with Mr Jeroen Lamote who is a purchase manager with the Belgian seafood company 'Setraco'. This particular company has had direct success with MSC certified scallops. The success is not only in terms of market access, but also the company has encountered an increase in product value. The German market was the target for selling ordinary scallops under the Setraco banner, but for some reason there was minimal market response despite a glossy labelled, quality product. So the marketing team decided to take on a scallop that was certified MSC sustainable. Results of this market tactic were almost instantaneous. Not only did the product begin to move at a rapid rate, it was selling for 30% more than its predecessor. For this very reason Setraco agreed to meet and discuss the possibility for a relationship to develop between Spencer Kings sourced from South Australia and the Belgian company.



Figure 21: Pack of MSC certified scallops as ‘Ocean Pride’



Figure 22: Imported shrimp packaged

Chapter 6: Product differentiation within the market place

A spontaneous visit to Moxon's Fishmongers in London, England revealed Western king prawns imported from Australia in the display window. The junior monger behind the counter was unaware of the origin of the Australian prawns, believing they were from Mozambique.



Figure 23: Moxon's Fishmongers in London

Figure 24: Australian king prawns

Figure 25: Selling king prawns at £25 per kilo

It was interesting to learn from the store manager that king prawns had only recently been introduced into Moxon's three seafood outlets replacing the wild caught prawns from Mozambique. The owner of the company discovered the king prawns when he was travelling in Australia where the unique flavour and texture captured the Englishman's heart. He was so impressed he had them imported at around £15-16 pound per kilogram (\$24 AUD) and put them in all three of his stores. The grade of these particular prawns was 10/20 per pound and they found that they are walking out of the door at £25 per kilogram (\$39 AUD). These

prawns were without MSC certification.

There is the odd customer who is a little dubious about buying a prawn from the other side of the planet. As an example, in this very store, a woman approached the counter and inquired about the origin of the unlabelled Australian prawns. Her response was fascinating, “I don’t know if I want to buy something that has travelled that far.” This had me thinking about where the system is breaking down. People do not know enough when it comes to what they are putting in their mouth, particularly when it comes to seafood. Education is very underrated. The global public needs education on processing and processing practices. The Australia Quarantine Inspection Service (AQIS) has set stringent food safety standards that Australian suppliers adhere to needs to be advertised.

The logistical standards that have been implemented for exported fresh and frozen seafood out of Australia are second to none. However, consumers may not know that these standards are in place in Australia or if these same standards are necessary for other exporting countries. Consumers need to know where their seafood is coming from to ensure that they can make informed decisions. Therefore seafood needs to be identified by species and country of origin via correct product labelling across the globe. There needs to be a generic system in place that is common across the globe. Additionally, products should be labelled sustainable where applicable.

Advertising quality standards, country of origin labelling and sustainability of product would alleviate most of the doubts consumers have when it comes to deciding what they will take home when next standing at the counter of their local fishmonger.

Chapter 7: The live prawn market

7.1 Live prawn product

Before embarking on my journey, I had heard of about a unique fishery in the northern most reaches of the UK. The *Nephrops norvegicus*, otherwise known as the Dublin bay prawn (scampi), is caught in Creels (pots) or is trawled in the conventional way in waters ranging from 100-500m in depth in the waters off of Scotland.

It was in the Isle of Skye, Scotland, I met scampi fisherman Callum McKinnon Senior and his son Callum Junior. I learned from these fishermen that this particular prawn industry was experiencing times of hardship in the 1990's when prices for the fresh market were dwindling. This forced fishermen to be inventive and innovative with their product and experiment with alternative products.

The live prawn for a niche market was identified as giving fishers the most opportunity and benefits in a very competitive market. The small fleet has now perfected the art of live capture and transport of the crustacean. The live prawn market for scampi paid dividends for license holders in the Isle of Skye fishery. Prices began to skyrocket and licence value followed suit with the introduction of live prawn product.

Each licence issued for scampi has a 20 tonne per quarter quota system, potentially allowing vessels up to 80 tonne per season (365 days). Of course, this part of the world has its own peculiar way of regulating the fishery in the forms of high winds, ice and very low temperatures. Local fisherman will on average catch around only half of their TAQ (40 tonnes).



Figure 26: *Nephrops norvegicus* (scampi)



Figure 27: Callum McKinnon Junior and Senior

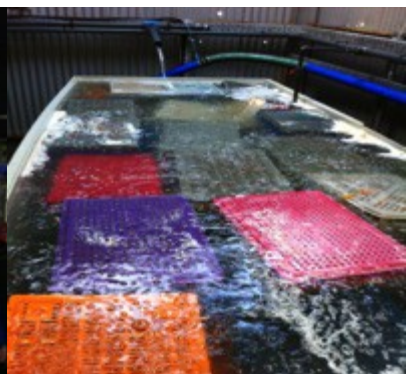


Figure 28: Scampi stored in temp. controlled holding tanks

The Dublin bay prawns are kept in ‘tubes’ (Figure 26) to keep them separated for storage and transport. The tubes are plastic divisions inserted inside the storage crates preventing damage and cannibalism. To transport the crustaceans, the ambient water temperature needs to be reduced from 8°C down to somewhere between 3-5°C for dormancy to take effect. Mortalities are reduced significantly when prawns are in their dormant state due to lowering metabolic rates and stress levels (Goodrick et al, 1993). This form of anaesthetisation is key to successful live transport of crustaceans.

7.2 Australia live prawn product

The late 80’s early 90’s saw Australia begin to export farmed prawn live into Japan. The desired species of the Japanese was the kuruma prawn (*Penaeus japonicus*), which was being produced in Australian prawn farms. The kuruma prawn has many similarities to the king prawn in terms of its size, hardiness and nocturnal behaviour (Carrick. N, pers.comm). It is the ideal species to compare to king prawns when considering live transport and in opening doors for the Japanese market.

From discussions with local Australian prawn farmers, they all described how difficult and costly it was dealing with the nocturnal crustaceans. The kuruma prawn had to be harvested at night making labour and logistics very difficult and expensive. However, the price of kuruma prawns sometimes exceeded \$300/kg, being a huge incentive to persevere.

The Australian prawn aquaculture industry faced two major problems. The first was the disease that affected the major prawn producers in 1993 onwards. The second problem was the availability of reliable spawners. The industry relies on wild caught spawners as they ensure future harvests, but they vary in availability and quality both seasonally and from year to year. Although the number of spawners increased, there was a considerable decrease in the reproductive qualities such as hatching rate and larval survival (Lobegeiger, 1997). The live export of karuma prawns was gradually phased out due to a drop in price. This resulted in reduced profit margins forcing growers to focus on the low-cost farming of the black tiger prawn (*P. monodon*).

7.2.1 Live prawn research for chilling and respiration in tiger prawns (*P. monodon*)

In 2000, there was work done in Australia with a view of determining the chilling rates for cold anaesthetisation and live storage of prawns (*P. monodon*) in chilled sawdust, for live transportation. The effects of chilling rates and shipping durations on quality were proved insignificant. One hundred per cent survival was obtained for 24, 20 and 16 hours for the slow, moderate and fast chilling rates respectively (Salin and Jayasree-Vadhyar, 2001). Percentage survival of the shrimps at different durations was significantly different among the chilling rates, but pair-wise comparison revealed that the slow and moderate chilling rates were identical. Hence, Salin and Jayasree-Vadhyar (2001) determined that the moderate chilling rate, which took only 4 hours, was considered the best.

Once harvested, kuruma prawns were immobilised by cooling and then handled for grading individually when packed for live shipment out of water. An automatic respirometer, with modifications to improve water circulation, was used to measure the respiration rate of adult kuruma at 12, 17 and 22°C (Salin and Jayasree-Vadhyar, 2001). Handling increased the respiration rate of the prawns at the two highest temperatures but had no effect at 12°C (Salin and Jayasree-Vadhyar, 2001). Thus, the contribution that handling normally made to metabolic rate was removed when the prawns were cold “anaesthetised”. The choice of different chilling rates depends on the duration of live storage.

7.2.2 Live prawn research on king prawns (*P. latisulcatus*)

The wild-caught king prawns face a larger obstacle in the quest for live export. Keeping mortalities at a minimum is a difficult task when your only harvest method is demersal otter trawl. There were trials done in 1999, demonstrating the capacity of king prawns for live export (Musgrove et al, 2000). The prawns in Phase 1 of the trial were taken from trawl shots 20 minutes long. The prawns that appeared especially vigorous were sorted into crates and placed in 18.5°C tanks connected to a running deck hose and aeration. Before the prawns were moved to temperature controlled holding tanks the dead/moribund prawns were removed leaving only the healthy animals. At this stage there were only few mortalities recorded (Musgrove et al, 2000). From the vessel, the prawn crates were transferred onto the wharf and into a Xactics bin. The bin was filled with seawater chilled to 17°C and oxygenated via an air-stone.

The ‘packing’ phase of the trial involved chilling the remaining prawns to torpor by dipping the crates in 16°C and 11°C seawater for 20 minutes per temperature. The prawns were then packed head to tail in 1kg ‘inner’ packs from the kuruma prawn boxes (Goodrick et al, 1994). Chilled, moist hoop pine shavings were used as a bed and to separate layers of prawn when

packing. The prawns were then placed in temperature controlled rooms at 12°C and 14°C degrees. Mortality rates were observed and measured at 10, 23, 28 and 34 hours. Survival declined and variability increased with time. Musgrove et al (2000) found that after 10 hours the mortality at both temperatures averaged 6%, the 23 hour mortality ranged from 12-21% at 12°C, at 14°C mortality increased to 40-47%, after 28 hours at 12°C the mortality averaged 46% and 35% mortality at 14°C and after 34 hours, mortalities were up at 52% for both temperatures.

7.2.3 Future for live export prawn trade from Australia

The Japanese market is still the main destination for the exclusive live prawn. China is now also increasingly demanding this niche product as its economy moves from strength to strength. The flight time to Tokyo and Shanghai (ex Adelaide) are both just under 10 hours. Taking into account the logistics on land locally and abroad combined with the secondary processing, the total time needed would be around 23 hours. The results from the trials back in 2000 had the survival rate at around 80% for this time period for the king prawn.

Since 2000, there have been many important changes on the deck of a modern trawler. Haldane hopper units (Figure 29) are fitted to almost 100% of the Spencer Gulf prawn fleet, all with the aim of improving quality and moving product at a faster rate. The advantage of a hopper for decreasing prawn mortality is:

1. It can be partially filled with seawater so that when the cod end is opened, it is done so into a pool of water that softens the impact to the prawn upon release, as well as taking pressure off of each animal as it waits to be sorted (improving survival).
2. It is a much faster way of sorting and separating prawns from by-catch.
3. It allows prawns to be sorted directly into a water shoot, which carries the product into a well of seawater where the prawns wait to be graded.



Figure 29: Haldane hopper filled with king prawn catch

7.2.3 Future for live export of king prawns (*P. latisulcatus*)

The relationship between the Spencer Gulf and West Coast Prawn Fishermen's Association (SGWCPFA) and government agencies PIRSA and SARDI have helped to develop a unique understanding of the Spencer Gulf and the life cycles/patterns of king prawns. Over 30 years of research and experience gives the industry a distinct advantage in recognising when the Spencer Kings are in their fecund (fertile) state. This would prove beneficial when choosing harvest times of Spencer Kings for the live market when trying to avoid catching weak animals post spawn.

The SGPF also has an intimate knowledge of where to fish for premium size prawns in areas of extremely low by-catch. The undertaking of stock and spot assessment surveys supports this knowledge with evidential data. This data proves beneficial when choosing the most suitable areas of harvest. It is the by-catch such as blue swimmer crabs, leather jackets and marine sponges that cause most prawn shell damage within the Spencer Gulf. By-catch Reduction Devices (BRD's) are also important tools for reducing the volume of soft or damaged prawns by deflecting by-catch out and away from prawns in the cod-end (the narrow end of a tapered trawl net). Minimising soft or damaged prawns is vital to increasing survival rates.

Soft prawns arise post-moulting when the hard outer shell has been shed. The live kuruma report showed that survival rates drop from 85-90% down to 50-55% depending on the moult

stage. The moulting stages of king prawns within the Spencer Gulf have been associated with lunar patterns, where they generally moult over the full moon and harden up as the dark of the moon draws nearer. Unfortunately, moulting in king prawns does not consistently occur in this way and soft prawns cannot be completely excluded from the catch.

The desired survival rate should be up to or more than 95% for prawns that have made it through to the final processing stage. However, as a result of the trials, it was concluded that the survival rate was 80% for the king prawn. In Phase 3 of the live export trial, a total of 159.5kg of prawns were caught after a five minute trawl shot. Of this, approximately 79.5kg were selected and brought back to the factory for live processing. From arrival at the factory 36.5kg of this were either soft, dead or moribund and inactive prawns were rejected. Only 43kg were packed for final export. (Musgrove et al, 2000).

I believe that with the aid of current improved processing technologies combined with a vast knowledge of the SGPF, we can not only improve on the 27% of exportable prawn demonstrated in phase 3 of the trials, but also on the 80% survival after the 24 hour period. Further testing would be needed to improve on the previous study and gain better outcomes than has previously occurred.

Chapter 8: A self-funded Spencer Gulf prawn licence buy-back proposal

The Spencer Gulf prawn industry has been enduring stagnant to declining prices for almost two decades now. When comparing the price per kilogram against the increasing CPI and skyrocketing prices for diesel fuels and other running costs, it certainly paints a fairly bleak picture of business for the industry. Today we have an unprecedented situation where we are experiencing medium to small sized prawns fetching a less than satisfactory price. This particular issue is the direct result of vessels now targeting larger fish in order to increase profitability.

Thirty years ago, there was not such an emphasis on large fish and hence there were more prawn numbers being targeted allowing for an expansion in the fleet. With the aid of improved technologies and the evolving knowledge of Spencer Gulf, the larger fish became more accessible to fisherman and as a result the fishery is experiencing record numbers of juvenile kings but declining numbers of the more profitable larger grades. It poses serious doubt as to whether 39 vessels can be sustained in the SGPF under current management practices and remain economically viable.

There are a number of factors responsible for this financially crippling scenario:

The GFC has affected our ability to export due to lack of demand from overseas importers.

High \$AUS and export tariffs placed on seafood products leaving our country makes it difficult for Australian exporters to attract overseas interest.

VATs are another deterrent for countries such as Denmark who boasts a 25% VAT and Germany has a 20% VAT all adding weight to the difficulty of export.

Cheap Asian farmed prawn, such as the popular vannamei, is being imported in growing volumes, at a price that local producers and fishermen cannot possibly compete with.

A lot of pressure is now placed on the domestic prawn market to absorb the locally caught and produced prawns. The only way that 20,000 tons of wild caught product can be moved is to lower the price. This basic supply and demand module defines the current situation and the solution(s), whatever that may be, needs to address these issues.

A vessel buy-back scheme is certainly one solution that requires serious attention. Back in

1975 it was the South Australian government who allowed the introduction of five extra licenses into Spencer Gulf, increasing the total number from 34 to the current number of 39. It is for this reason state government should be made accountable for the added pressure placed on the SGPF and assist in this transition period by means of a guaranteed interest-free loan, or at the very least a subsidised interest rate on the loan for a 10 year period. However, it is proposed that seven vessels are bought back (not five). This scheme alone would ensure the longevity and viability of an industry in financial turmoil.

This solution resolves the other crippling issue faced in the seafood industry - Crew. At present the SGPF fleet and many other seafood industries around the country are experiencing manning issues due to the mining industry poaching quality employees, who are lured away by large salaries and high levels of superannuation that vessel owners simply cannot meet. Removing seven vessels will reduce the pressure of finding and educating around 96 employees for the SGPF alone (based on three crew per remaining vessels, excluding the skipper). The increase in dollars made by the remaining license holders will ensure more money to the retained crew. The extra tonnage caught by the remaining vessels would also help to maintain the loan repayments (see figures below). As well known, the more money on offer, the better the crew and in-turn the better quality the product, which is a reflection across the industry as a whole.

The current estimated value of a SGPF licence is \$4 million (this is exclusive of the vessel). Therefore:

$$\begin{aligned} 7 \text{ (licences)} \times \$4\text{M} &= \$28\text{Mn} \\ \$28\text{m} / 32 \text{ (remaining licenses)} &= \$875\text{k} \\ \$875\text{k} / 10 \text{ (years)} &= \$87,500 \text{ per year} \end{aligned}$$

If there is 1950 tonnes of prawns to be caught annually, then removing seven licenses (seven less vessels fishing) is equivalent to an increase of approximately 11 tonnes per vessel. This equates to a 22% increase on the 50 tonnes average per vessel currently caught, taking it up to 61 tonnes per remaining licence.

At a conservative \$14 per kilogram the added benefit to each licence would be \$107,800, as follows:

$$\begin{aligned} 11 \text{ tonnes (11,000kg)} \times \$14 \text{ per kilo} &= \$154,000 \\ \text{Less 30\% for crew wages} &= \$46,200 \end{aligned}$$

$$\$154,000 - \$46,200 = \$107,800 \text{ increase per licence}$$

I would assume that the only added cost to this reduced vessel scenario would be in the form of increased licence and membership fees for the remaining members.

*Note – I have not included added fees in my calculations.

If the guaranteed interest loan rate were at 5%:

$$\$875k \times 5\% \text{ interest} = \$43,750 \text{ in the first year}$$

$$\$107,800 - \$43,750 = \$64,050$$

This calculation does not account for the actual repayment amount per year of \$87,500, only the interest

$$30\% \text{ company tax} = \$19,215$$

$$\$64,050 - \$19,215 = \underline{\$44,835 \text{ added profit for the first year.}}$$

$$*\$87,500 - \$44,835 = \$42,665$$

The final difference (deficit) for the first year would be \$42,665. Each year the principal payment would be less, reducing the interest payment as follows:

$$2^{\text{nd}} \text{ yr} - \$39,375$$

$$3^{\text{rd}} \text{ yr} - \$35,000$$

$$4^{\text{th}} \text{ yr} - \$30,625$$

$$5^{\text{th}} \text{ yr} - \$26,250 \text{ and so on... (10 year loan)}$$

If the loan was interest free, then:

$$\$107,800 \times 30\%(\text{company tax}) = \$32,340$$

$$\$107,800 - \$32,340 = \underline{\$75,460 \text{ added profit per year.}}$$

*Which is only \$12,040 under the annual repayment of \$87,500 if there was no interest on the loan.

This particular scenario would be the simplest method of adding value back to the industry. There would be no need for current real-time management to be altered to accommodate the new look industry. A much simpler alternative to that of transferable rights, such as quota (kg), gear units or nights. It is not the way in which the fishery is run that is the issue, it is simply the fact that as fishing technologies have rapidly evolved, the SGPF is now having to keep pace.

Chapter 9: The Spencer Gulf Prawn Fishery licence amalgamation proposal

As stated in the previous chapter, there are numerous reasons why the SGPF fleet size needs to be reduced. A buy-back of licenses is a clear and obvious way that this can be achieved, but it can also be quite costly for the remaining licence holders. Cost is a serious issue under the current economic climate and is what has been the main driver behind a more affordable yet very practical proposal.

This chapter discusses an amalgamation proposal, designed to reduce the fleet size down from 39 to 26 vessels without any shared cost to the industry. This is achieved by having one out of every three license coalescing so that 13 different companies are formed, each company consisting of three licences but only two vessels. It is integral that each of the 13 newly formed companies sell one of their three vessels, hence reducing fleet size by a third. The funds from the sale of each vessel go back into the company respectively and shared evenly amongst its members.

The 39 licences in each of the 13 companies would need to become unitised. As a scenario, say each licence is worth 50 units (1 unit/tonne), giving each company a value of 150 units, then each member has the ability to trade their share either wholly or partially, giving much more flexibility to stakeholders. Whatever the two vessels per company yields goes back into each company respectively, and is shared depending on the amount of units held per member.

The merging stage of the process for individual license holders would need to be an open forum. This allows two stakeholders, with the intention of permanency, the ability to amalgamate with a license holder who has every intention of selling either wholly or partially. It also allows two stakeholders with larger/newer trawlers to merge with a third party who is in possession of a smaller sized or aging vessel.

Under this arrangement there would be no need to change current management practices, as there is no increase or decrease in annual yield. However, the number of nights fished may need to be altered slightly to allow the fish to be caught with the newly reduced amount of vessels. Crewing issues will be alleviated as well, as the number of personnel required will be reduced. More importantly, the increase in tonnage per remaining vessel will attract the quality personnel back into the industry whilst maintaining the experienced crew.

The fuel costs would be reduced as companies only have the two vessels as opposed to three. Also, fishing areas will be sustained for longer periods as the catch effort is lessened. The maintenance costs will be reduced significantly as the older vessels are removed from the fleet. There will be fewer nets to construct, maintain and repair. There are now only two vessels to slip and survey instead of three. Insurance costs also drop by a third.

The major disadvantage with this proposal is the fact that business decisions are now shared. No longer will licence owners have sole control over their vessel and business. There may also be significant 'sharing' issues with groups not wanting to work together or to join with others in the group structure (how this is worked out will need to be considered). As a result, there may be considerable push back from industry to adopt this model.

Chapter 10: New Processing Technologies

One of the key interests for me on my travels was sourcing new technologies to implement into the SGPF to help with processing prawns. Whilst in Denmark I met Mr Leif Anderson, owner of Intech International. This company primarily caters for the coldwater shrimp industry, but has designed and engineered equipment suitable for king prawn fisheries. The latest piece of equipment, only recently released by Intech is the ‘Connie 500’ continuous cooker (Figure 30).

I believe that if demand for on-board cooked product were to increase further, or vessels were simply catching more due to a buy-back or an amalgamation, it would be essential for the industry to look at equipment such as a continuous cooker. The ‘Connie 500’ has a 500 litre capacity and is capable of cooking up to 800 kg/h with a 3 minute cooking time. There is also a ‘Connie 800’ that is much larger and has a capacity of 1,120 litres, but it has the potential to cook up to 1,500 kg/h (at a three minute cooking time). Both machines would require a continuous flow of prawns from a hopper via a conveyor belt. The ‘Connie 500’ would be much better suited to the needs and limited deck space of the vessel size restricted fishery of SGPF.



Figure 30: Continuous cooker



Figure 31: By-catch separator

The second piece of equipment that may be useful in certain prawn fisheries around Australia is the by-catch separator as shown in Figure 31. This machine separates small fish and shrimp based on the principle that the fish coming up with the trawl shrimp possess different abilities to attach themselves to the conveyor belt. The catch is dropped mid way up the first belt via a travel conveyor, where the fish are taken up the slope due to surface friction and the shrimp simply slide down the belt. The speed and incline of the belts are adjustable depending on the type of by-catch being caught and the wear levels of the belts themselves.

Conclusion

Research was undertaken using different methods including visiting shop fronts and reviewing product presentation and prices. Seafood outlets across the globe needed to advertise quality standards in conjunction with country of origin labelling and sustainability of product. Consumers had little knowledge of the prawn industry.

Further interviews with mid and large scale suppliers and wholesalers, and interviews with fishers around the world secured the opinion that obtaining an MSC certification was undoubtedly the right decision for the Spencer gulf prawn industry. Having a highly accredited sustainability certification will be crucial moving forward when exporting seafood. Penetrating new markets will be very difficult for fisheries that cannot prove they are doing everything in their power to ensure long-term sustainability, particularly in Europe.

High-end potential markets were the major focus of this study. China and Japan proved to have increasing demand for live prawn, paying prices seven times more than that of the frozen equivalent. With the aid of improved processing technologies and the advanced knowledge of the Spencer Gulf, survival rates could be significantly increased above 80%. This would considerably improve the viability of the live prawn export industry.

Interviews and visits were analysed based on the best outcomes included in this report. Good examples of quality product, settings and options are provided in the report throughout, including potential ways forward for managing the Spencer Gulf prawn fishery. In particular, a seven-vessel buy-back and an amalgamation are two key proposals for adding value back to licence holders.

New technologies were investigated to aid with on-board processing of prawns. Two key discoveries in Denmark were the 'Connie-500' continuous cooker and the by-catch separator.

Recommendations

As a result of my study tour and based on my observations I believe that there are many activities that the Australian prawn industry and other supporting partners (suppliers, government etc) can do to improve our markets. In particular, for the SGPF, I believe that we should:

1. Investigate options for advertising stringent food safety standards in overseas markets. This could be managed through the ACPF, liaising with government bodies and its membership to ensure that needs of all prawn fisheries are met and that the advertising is targeted to the most prominent markets / where opportunities are greatest in terms of potential product sales.
2. Request the ACPF to pursue appropriate product labelling of species, country of origin and sustainability. This needs to be addressed in Australia first and then flow through to working with other countries, particularly where our product is exported: work with government bodies to introduce this in other countries.
3. Conduct further research on methods and technologies to export live product; use existing work as basis and review recommendations from that research.
4. Investigate options for export of live product such as:
 - the country where live product would be purchased
 - transportation methods and times (to input into recommendation 3 above)
 - demonstrate any cost benefits of processing live product.
5. Investigate options for buy-back of seven licenses in the SGPF, and work with government and licence holders to determine appropriate mechanisms (ie interest rates, loans and the method of licence purchase).
6. Investigate options for licence amalgamation: terms for each 'group'; fishery management changes (ie additional nights, catch rates etc); how groups will be formed; governance of groups.
7. Investigate new technologies to support processing on board vessels

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Plain English Compendium Summary

Project Title: Value Adding: The King Prawn	
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Scholar:	Clinton Scharfe
Organisation:	Blaslov Fishing Pty Ltd
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Objectives	<ol style="list-style-type: none"> 1. Investigate new technologies for the South Australia. 2. Study management practices in other fisheries and identify those that could improve the performance of the Spencer Gulf Prawn Fishery and prawn fisheries in Australia more generally. 3. Identify how product differentiation will improve prawn prices (including the value of an internationally recognised environmental accreditation system, ie Marine Stewardship Council certification).
Background	Australian prawn fishermen have been enduring extremely difficult times of late due to the financial crisis, reduction of exported product, domestic competition, increasing cost of operating expenses and static prices. The goal of this research project is to increase the value of the South Australian prawn industry both in terms of licence value and product value by researching global prawn industry technology.
Research	Over ten countries were visited, including India, Bahrain, France, England, Scotland, Denmark, Norway, Ukraine, Turkey, United States of America, Holland, Netherlands, Thailand, and Belgium as well as visits made across Australia. Desktop research on the current Australian market and prawn production was also undertaken.. Scientific papers were reviewed in relation to the possibility of exporting live product from Australia.
Outcomes	<ol style="list-style-type: none"> 1. Detailing future research management and product labelling to be conducted through the ACPF. 2. Investigation of potential management changes in relation to the license amalgamation proposal and license buy-back, through the SGWCPFA's Economic Optimisation Sub-Committee. Progressing discussions to export product to Belgium, where high value prawns are appreciated and desired. 3. Investigating the feasibility of new equipment at the wholesale level to support on-board processing activities.
Implications	The implications for this research project are that other options and avenues are being investigated for product presentation, and processing both at the business and wholesale level. There could be management changes under legislation and associated policies and plans to the Spencer Gulf prawn fishery which could mean an improvement to individual business profitability. While many of the activities will take considerable time to progress, and assistance with some activities is needed from a wider fishing industry perspective, changes are starting to be made. Coinciding with this research are number of other research projects, which are all aimed at improving the performance of the fishery. It is likely that the Spencer Gulf prawn fishery will be prepared to enter new markets, with product that meets international requirements, when high volume export begins again with the strengthening of overseas economies.
Publications	<p>Fisheries Research and Development Corporation, Volume 21 Number 1 March 2013 '<i>Scholarships reveal new shellfish opportunities</i>'.</p> <p>A presentation was made at the SGWCPFA Annual General Meeting in October 2012.</p>

