Appendix 1. Prawns

Optimising business structures and fisheries management systems for key fisheries

T.M. Ward

Project No. 2009/715

AUSTRALIAN SEAFOOD COOPERATIVE RESEARCH CENTRE

February 2015

PREMIUM FOOD AND WINE FROM OUR CLEAN ENVIRONMENT

SOUTH AUSTRALIA

Government of South Australia
Primary Industries and Regions SA

SARDI
SOUTH AUSTRALIAN RESEARCH AND DEVELOPMENT INSTITUTE

This project was conducted by the South Australian Research and Development Institute

This report may be cited as:
Ward, T. M. (2015). Appendix 1. Prawns. Optimising business structures and fisheries management systems for key fisheries. Prepared by the South Australian Research and Development Institute (Aquatic Sciences), Adelaide. CRC Project No. 2009/715. 88pp.

The Australian Seafood CRC is established and supported under the Australian Government's Cooperative Research Centres Program. Other investors in the CRC are the Fisheries Research and Development Corporation, Seafood CRC company members, and supporting participants.

Office Mark Oliphant Building, Laffer Drive, Bedford Park SA 5042
Postal Box 26, Mark Oliphant Building, Laffer Drive, Bedford Park SA 5042
Tollfree 1300 732 213 Phone 08 8201 7650 Facsimile 08 8201 7659
Website www.seafoodcrc.com ABN 51 126 074 048

Table of Contents

Appendix 1.1. SGPF Workshops 1 and 2: Agenda

DRAFT

Economic Performance and Management Opportunities

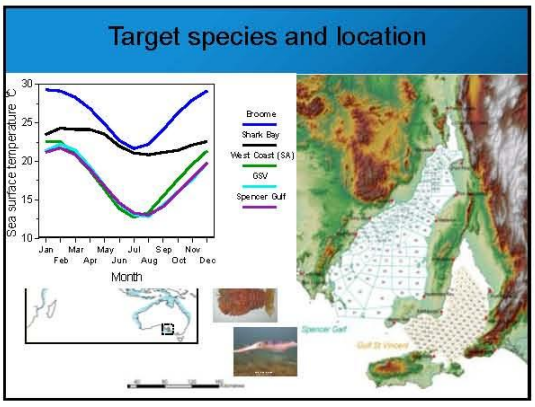
Port Lincoln

Monday 27 February	**8:30 – 17:30**	**Port Lincoln Hotel**	
OR			
Adelaide			
Tuesday 28 February	**8:30 – 17:30**	**SARDI Conference Room**	**2 Hamra Ave, West Beach**

AGENDA

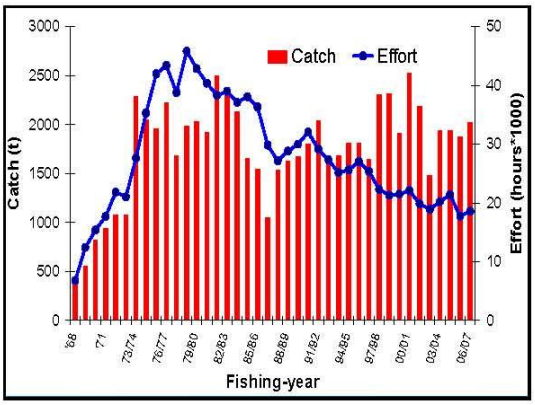
1.	Welcome, introductions & background	Exec/O	8:45
2.	Summary of Spencer Gulf Fishery	C. Dixon	9:00
3.	"Anderson's Assessment" of fisheries	T. Ward	9:20
4.	Economic analysis – summary of Spencer Gulf prawn fishery	E. Hoshino	9:45
	Morning Tea		10:30
5.	Property Rights opportunities: national perspective	A. Jarrett	10:50
	Shark Bay and Exmouth experiences	G. Stewart	11:50
	Lunch		12:30
6.	Property Rights: Case study of Challenger Scallop Enhancement Company	M. Harte	13:00
7.	Clarence River: Marketing and promotions experience	D. Adams	13:40
9.	Discussion and summary	Chairperson	14:10
	Close		16:30

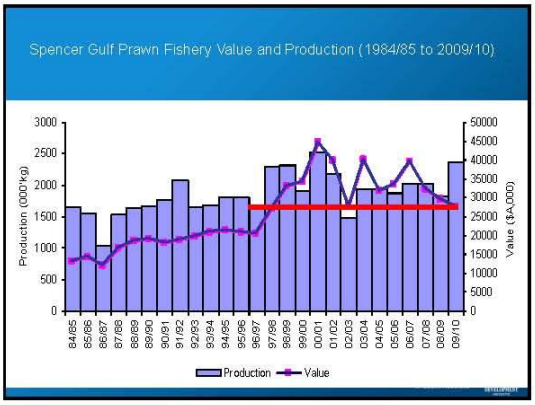
Appendix 1.2. Spencer Gulf Prawn Fishery



Management controls in the Spencer Gulf Prawn Fishery

Management tool	Current restriction
Permitted species	Western king prawn (*Melicertus latisulcatus*), slipper lobster (*Ibacus* spp.), Calamari *Sepioteuthis australis*
Limited entry	39 licences
Licence transferability	Permitted
Corporate ownership	Permitted
Spatial and temporal closures	Adjusted based on survey results
Closed areas	No trawling in waters shallower than 10m
Method of capture	Demersal otter trawl
Trawl rig	Single or double rig
Trawling times	Not during daylight hours
Maximum headline length	29.26 m
Minimum mesh size	4.5 cm
Maximum vessel length	22 m
Maximum vessel power	272 kW
Catch and effort data	Daily and monthly logbook submitted monthly
Landing locations	Landings permitted anywhere in the State
Landing times	Landings permitted at any time during the season





Appendix 1.3. Fishery Performance Indicators

SARDI Aquatic Sciences

AUSTRALIAN SEAFOOD COOPERATIVE RESEARCH CENTRE

SPENCER GULF PRAWN FISHERY:

FISHERY PERFORMANCE INDICATORS

Associate Professor Tim Ward

Science Leader, Fisheries
SARDI Aquatic Sciences

Flinders University of SA, University of Adelaide

Fishery Performance Indicators

James L. Anderson & Chris Anderson
University of Rhode Island

Prepared for: The International Coalition of Fisheries Associations (ICFA), McLean, VA

Funded by: ALLFISH (Alliance for Responsible Fisheries), a public-private partnership created by the seafood industry, the World Bank, FAO

Anderson and Anderson (2010)

Guiding Principles

- COMMERCIAL FISHING is a BUSINESS and should create wealth
- Ecological sustainability is NECESSARY, but NOT SUFFICIENT, for commercial fisheries to generate sustainable income and create wealth
- Community sustainability is necessary for sustainable wealth creation.

Anderson and Anderson (2010)

- *A wealth-based fishery management system is one that is ecologically sustainable, socially acceptable and generates sustainable resource rents or profits.*
- Purpose: The Fishery Performance Indicators (FPIs) are designed to evaluate and compare the world's fisheries management systems based on their ability to generate sustainable wealth

Anderson and Anderson (2010)

- Greater attention must be focused on governance systems and economic factors
- It is not good enough to be just biologically sustainable; fisheries and the communities that dependent on them must generate sustainable wealth.

Anderson and Anderson (2010)

The creation of a Wealth-Based Fisheries Performance Indicators give

stakeholders who rely on fisheries for their livelihood

critical information to make the case for better fisheries management based on a broader set of criteria incorporating governance and economic factors

Anderson and Anderson (2010)

The Performance Indicators are Designed to Incorporate the Three 'Sustainabilties' Necessary for Wealth Creation

1) Economic Sustainability

2) Ecological Sustainability

3) Community Sustainability

Anderson and Anderson (2010)

Characteristics of Indicator Components

- Readily Available
- Accurate
- Quantifiable
- Relevant
- Understandable

Anderson and Anderson (2010)

Two Parts – Outputs and Inputs

1) Performance Indicators of wealth creation and accumulation (outputs)

2) Performance Factors that enable wealth creation (inputs)

Anderson and Anderson (2010)

The Fishery Performance Indicators - Outputs

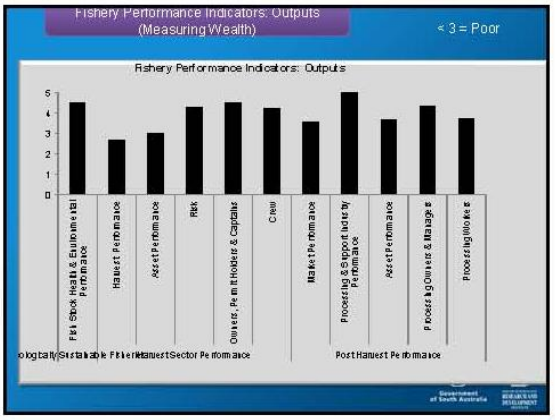
- 54 components covering 11 dimensions:
  - Fish Stock Health & Environmental Performance
  - Harvest Performance
  - Harvest Asset Performance
  - Risk
  - Owners, Permit Holders & Captains
  - Crew
  - Market Performance
  - Processing & Support Industry Performance
  - Post-harvest Asset Performance
  - Processing Owners & Managers
  - Processing Workers

Anderson and Anderson (2010)

The Fishery Performance Factors: Inputs Enabling Wealth Creation

- 39 components covering 8 dimensions:
  - Macro Factors-Environmental, Economic & Community
  - Access Rights
  - Harvest Rights
  - Collection Action
  - Management Inputs
  - Management Participation
  - Markets and Market Institutions
  - Infrastructure

Anderson and Anderson (2010)



Fishery Performance Indicators: Outputs (Measuring Wealth)

< 3 = Poor

COMPONENT	DIMENSION	AVERAGE SCORE	
Ecologically Sustainable Fisheries	Fish Stock Health & Environmental Performance	4.5	agency, by-catch
Harvest Sector Performance	Harvest Performance	2.7	unfished days, # vessels
	Asset Performance	2.8	price down, costs up
	Risk	3.7	low-moderate variability, increasing risk
	Owners, Permit Holders & Captains	4.5	good
	Crew	4.3	good
Post Harvest Performance	Market Performance	3.6	declining prices
	Processing & Support Industry Performance	5.0	most processing on vessel
	Asset Performance	3.7	declining returns, reducing export
	Processing Owners & Managers	4.3	ok
	Processing Workers	3.7	factory workers

Fishery Performance Indicators: Outputs (Measuring Wealth)

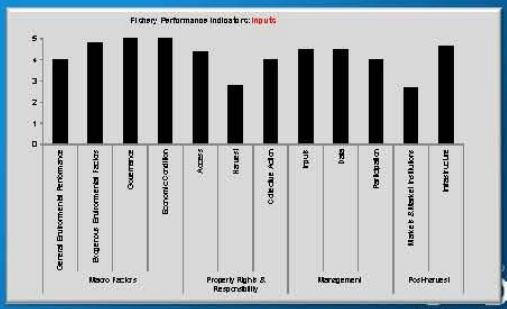
Harvest Performance	Economics	Landings Level	• 5: Harvest is less than MSY (stock is above MSY level) to increase profit; • 4: Harvest is approximately at MSY; • 3: Harvest is directed to promote recovery (stock is below MEY level); • 2: Harvest is constraining stock recovery (stock is stable between MEY level); • 1: Harvest is causing overfishing (stock is below MEY and declining)	Average annual harvest over the last three years. Note: In practice, there are very few estimates of MEY, however where it has been established it is typically 5-10 percent less than maximum sustainable yield (MSY).
	Economics	Excess Capacity	• 5: Within 5% of days required; • 4: 105-120 or 90-95%; • 3: 120-150% or 75-90%; • 2: 150-200% or 50-75%; • 1: More than 200%, or less than 50%, of days required	Estimate of standardized vessels-days required to catch the maximum economic yield (MEY) compared to the number of standardized vessels days available. Days are considered not to be restricted by trip limits.
	Economics	Season Length	• 5: Virtually no regulatory closures; • 4: 91-99%; • 3: 51-90%; • 2: 11-50%; • 1: Less than 10%	Ratio of number of days in which fishing occurs to the number of days the species is available in economically feasible quantities.

Fishery Performance Indicators: Outputs (Measuring Wealth)

Asset Performance	Economics	Ratio of Asset Value to Gross Earnings	• 6: 10 or higher; • 4: 7.5-10; • 3: 5-7.5; • 2: 2.5-5; • 1: Below 2.5	Ratio of average price of access to the fishery over the last five years to the average annual earnings value for similarly scaled access rights in the same period. Same business or same family sales are excluded, where they cannot be identified.
	Economics	Total Revenue versus Historic High	• 6: About 95%; • 4: 85-95%; • 2: 71-85%; • 2: 50-70%; • 1: Below 50%	The indicator is the ratio of total revenue to the average of the three highest total revenues in the past 10 years.
	Economics	Asset (Permit/Quota) Value versus Historic High	• 6: About 95%; • 4: 85-95%; • 2: 71-85%; • 2: 50-70%; • 1: Below 50%	The indicator is the ratio of asset to the average of the three highest asset values in the past 10 years.
	Economics	Borrowing Rate Relative to Risk-free Rate	• 6: Less than 1.75; or, 30-year conforming mortgage; • 4: Less than 2.5; or, personal bank loan; • 3: Less than 4; or, good credit card rates; • 2: Less than 7; or, bad credit card rates; • 1: Greater than 7; usury	Average ratio between the interest rate on loans made in the industry to risk-free rates over the last three years.
	Economics	Source of Capital	• 6: Unsecured business loans from banks/Venture capital; • 4: Secured business loans from banks/Public stock offering; • 3: Loans from banks secured by personal (not business) assets/Government-subsidized private lending/Government-run loan programs/International agencies; • 2: Microlending/family/community-based lending; • 1: Marginal capital available	Points to be assigned based on the category of lenders or ranks as the most typically used in the fishery.
	Economics	Functionality of Harvest Capital	• 6: Capital is new; • 4: Capital is older but well maintained, e.g., freshly painted; • 3: Capital is moderately well maintained; • 2: Maintenance is poor; • 1: Serious concerns about seaworthiness or safety throughout fishery	Average age of the key durable harvesting capital unit (vessels, vehicles).

Fishery Performance Indicators: Inputs (Enabling Wealth Creation)

<3 = poor
Property rights and responsibility
Harvest
Post-harvest
Markets and institutions



Fishery Performance Indicators: Inputs (Enabling Wealth Creation)

COMPONENT	DIMENSION	AVERAGE SCORE	
Macro Factors	General Environmental Performance	4.0	ok
	Exogenous Environmental Factors	4.3	ok
	Governance	5.0	?
	Economic Condition	5.0	?
Property Rights & Responsibility	Access	4.4	access confidence & transferability, season restrictions
	Harvest	2.8	no quota, can't transfer harvest, input controls
	Collective Action	4.0	associations, co-management, poorly coordinated marketing
Management	Inputs	4.5	good research and management
	Data	4.5	good data but lack decorum
	Participation	4.0	co-management, reduced days by effort law
Post-Harvest	Markets & Market Institutions	2.7	buy transparency, lack vertical integration
	Infrastructure	4.7	good infrastructure

Fishery Performance Indicators: Inputs (Enabling Wealth Creation) — Access

Proportion of Harvest Managed with Rights-based Management	• 6: Virtually all; • 4: 71-99%; • 3: 36-70%; • 2: 6-35%; • 1: Virtually none	The proportion of total harvest that is under rights-based fisheries management (e.g., Individual/Community Quotas, Catch Shares or Territorial Use Rights (TURFs)).
Transferability Index	• 6: Very Strong: Fully transferable through well-established, efficient market institutions; • 4: Strong: Fully transferable, but institutions are poor or illiquid; • 3: Moderate: Transferable, but with severe restrictions on who can sell, or how much; • 2: Weak: Transferable only under highly restricted and limited conditions; • 1: Access rights not transferable	
Security Index	• 6: Very Strong: Harvest rights are completely respected and are not diluted (e.g., by issuing more access rights) by the government; • 4: Strong: Rights are mostly respected by the government, generally pursue changes in government administration; • 3: Moderate: Rights are at risk of reduction or dilution with changes in administration; • 2: Weak: Rights are highly diluted or there is high political uncertainty; • 1: None: Harvest rights are not protected	Extent to which the government reduces or dilutes the access rights.
Durability Index	• 6: Very Strong: > 10 years to perpetuity; • 4: Strong: 6 to 10 years; • 3: Moderate: 1 to 5 years; • 2: Weak: Seasonal; • 1: None: Nominally	Duration of the property right.
Flexibility Index	• 6: Very Strong: All decisions on time of harvest, gear used and handling practices are in the owner's control; • 4: Strong: Minimal restrictions on time of harvest and technology; • 3: Moderate: Modest restrictions on time of harvest and technology; • 2: Weak: Significant restrictions on time of harvest and technology; • 1: Time of harvest, gear used and handling practices are not in the owner's control	Ability of right holders to be flexible in the timing and production technology employed.
Exclusivity Index	• 6: Very Strong: All decisions and access to the property are controlled by the rights owner (rather than those without rights), competing resource users (like recreational or bycatch fisheries); • 4: Strong: Little intrusion on resource by those without rights; • 3: Moderate: Modest intrusion on resource by those without rights; • 2: Weak: Significant intrusion on resource by those without rights; • 1: None: Completely unrestricted open access, despite putative right	Ability of right holders to exclude those who do not have the right from affecting the resource or market.

Fishery Performance Indicators: Inputs (Enabling Wealth Creation) — Markets

Landings Pricing System	• 5 : Virtually all; • 4 : 71-99%; • 3 : 36-70%; • 2 : 5-35%; • 1 : Virtually none	Proportion of the harvest sold in a transparent daily competitive pricing mechanism, such as an auction or centralised wholesale/ wholesale market.
Availability of Ex-vessel Price & Quantity Information	• 5 : Complete, accurate price and quantity information available to market participants immediately; • 4 : Reliable price and quantity information is available prior to the next market closing; • 3 : Price information is available but no timely quantity information; • 2 : Price and quantity information are inaccurate, lagged or available to only some; • 1 : No information available	
Number of Buyers	• 5 : Highly competitive; • 4 : 4-5 buyers; • 3 : 2-3 competing buyers; • 2 : A small number of coordinating buyers; • 1 : There is one buyer	Typical number of buyers of ex-vessel product in a given market.
Degree of Vertical Integration	• 5 : Virtually all; • 4 : 71-99%; • 3 : 36-70%; • 2 : 5-35%; • 1 : Virtually none	Proportion of harvest where the primary harvester and primary processor of the fishery are same firm.
Level of Tariffs	• 5 : Virtually none; • 4 : 0.5%-2.5%; • 3 : 2.6%-5%; • 2 : 6%-10%; • 1 : Over 10%	Based on quintile once data on an appropriate number of systems are collected. However, initially tariff rate on key seafood exports relative to international average for food commodities.
Level of Non-tariff Barriers	• 5 : Are not used to limit international trade; • 4 : Have very limited impact on international trade; • 3 : Act to impede some international trade; • 2 : Act to impede a majority of potential international trade; • 1 : Act to effectively impede a significant amount of international trade	Non-tariff barriers include: quantity restrictions (import quotas), regulatory restrictions, investment restrictions, customs restrictions and direct government intervention.

SPENCER GULF PRAWN FISHERY: FISHERY PERFORMANCE INDICATORS

- FPIs capture issues in SGPF quite well
  - poor harvest and asset performance
  - poor systems for managing harvest and marketing catch
- Issues in fishery are
  - input controls cause inefficiency
    - too many licences/vessels
    - very short season
    - can't consolidate effort/catches to reduce costs
  - falling prices
    - competition from aquaculture prawns
    - low product differentiation
    - poor marketing
    - low cohesion

Need to redesign fisheries management arrangements, operational procedures and business structures

Fishery Performance Indicators—Outputs (Measuring Wealth)

6 indicates overall wealth creation. The last column describes the dominant sustainability category. Ecological sustainability, economic sustainability, or community sustainability, all of which are necessary for sustainable wealth generation.

COMPONENT	DIMENSION	MEASURE	DOMINANT SUSTAINABILITY CATEGORY
Ecologically Sustainable Fisheries	Fish Stock Health & Environmental Performance	Proportion of Harvest with 3rd Party Certification	Ecology
		Fish Stock Sustainability Index (FISS)	Ecology
		Percentage of Stocks Overfished	Ecology
		Non-fishery Mortality	Ecology
Harvest Sector Performance	Harvest Performance	Landings Level	Economics
		Excess Capacity	Economics
		Season Length	Economics
	Asset Performance	Retained Asset Value to Gross Earnings	Economics
		Total Revenue versus Historic High	Economics
		Asset (Permit, Quota) Value versus Historic High	Economics
		Borrowing Rate Relative to Risk-free Rate	Economics
		Source of Capital	Economics
		Sustainability of Harvest Capital	Economics
	Risk	Annual Total Revenue Volatility	Economics
		Annual Landings Volatility	Economics
		Inter-annual Landings Volatility	Economics
		Annual Price Volatility	Economics
		Inter-annual Price Volatility	Economics
		Spatial Price Volatility	Economics
		Geopolitical & Legal Challenges	Community
	Owners, Permit Holders & Captains	Earnings Compared to National Average Earnings	Community
		Fishery Wages Compared to Non-fishery Wages	Community
		Social Standing of Boat Owners and Permit Holders	Community
		Proportion of Non-resident Employment	Community
	Crew	Earnings Compared to National Average Earnings	Community
		Fishery Wages Compared to Non-fishery Wages	Community
		Social Standing of Crew	Community
		Proportion of Non-resident Employment	Community
		Crew Experience	Community
		Age Structure of Harvesters	Community

Fishery Performance Indicators—Outputs (Measuring Wealth) - Continued

6 indicates overall wealth creation. The last column describes the dominant sustainability category. Ecological sustainability, economic sustainability, or community sustainability, all of which are necessary for sustainable wealth generation.

Post Harvest Performance	Market Performance	Ex-vessel Price versus Historic High	Economics
		Final Market Use	Economics
		International Trade	Economics
		Final Market Wealth	Economics
		Wholesale Price Relative to Similar Products	Economics
		Capacity of Firms to Export to the USA & EU	Economics
		Ex-vessel to Wholesale Marketing Margins	Economics
	Processing & Support Industry Performance	Value of Processed Product	Economics
		Capacity Utilisation Rate	Economics
		Product Improvement	Economics
		Regional Support Businesses	Economics
		Time to Repair	Economics
	Asset Performance	Borrowing Rate Relative to Risk-free Rate	Economics
		Source of Capital	Economics
		Age of Facilities	Economics
	Processing Owners & Managers	Earnings Compared to National Average Earnings	Community
		Manager Wages Compared to Non-fishery Wages	Community
		Social Standing of Processing Managers	Community
		Non-resident Ownership of Processing Capacity	Community
	Processing Workers	Earnings Compared to National Average Earnings	Community
		Worker Wages Compared to Non-fishery Wages	Community
		Social Standing of Processing Workers	Community
		Proportion of Non-resident Employment	Community
		Worker Experience	Community

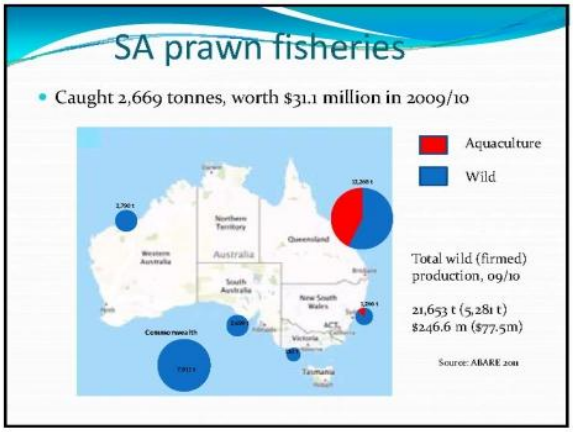
Fishery Performance Factors – (Enabling Wealth Creation)

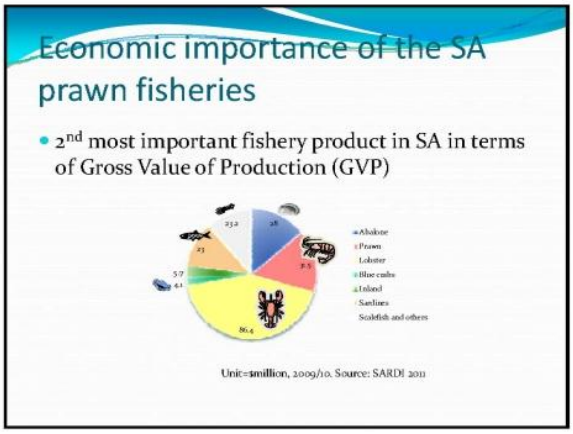
Macro Factors		Environmental Performance Index (EPI)
		Governance Indicator–Effectiveness
		Governance Indicator–Voice & Accountability
		Index of Economic Freedom
		Gross Domestic Product (GDP) Per Capita
Property Rights & Responsibility	Access	Proportion of Harvest Managed Under Limited Access
		Transferability Index
		Security Index
		Durability Index
		Flexibility Index
		Exclusivity Index
	Harvest	Proportion of Harvest Managed with Rights-based Management
		Transferability Index
		Security Index
		Durability Index
		Flexibility Index
		Exclusivity Index
	Collective Action	Participation in Harvest Organisations
		Harvester Organisation Influence on Fishery Management & Access
		Harvester Organisation Influence on Business & Marketing
Management	Inputs	Management Expenditure as Value of Harvest
		Management Employees as Value of Harvest
		Management Employees per Permit Holder
		Research as a Proportion of Fisheries Management Budget
		Level of Subsidies
	Participation	Days in Stakeholder Meetings
		Industry Financial Support to Management
Post-Harvest	Market & Market Institutions	Landings Pricing System
		Availability of Ex-vessel Price & Quantity Information
		Number of Buyers
		Degree of Vertical Integration
		Level of Tariffs
		Level of Non-tariff Barriers
	Infrastructure	International Shipping Service
		Road Quality Index
		Technology Adoption
		Extension Service
		Reliability of Utilities/Electricity
		Access to Ice & Refrigeration

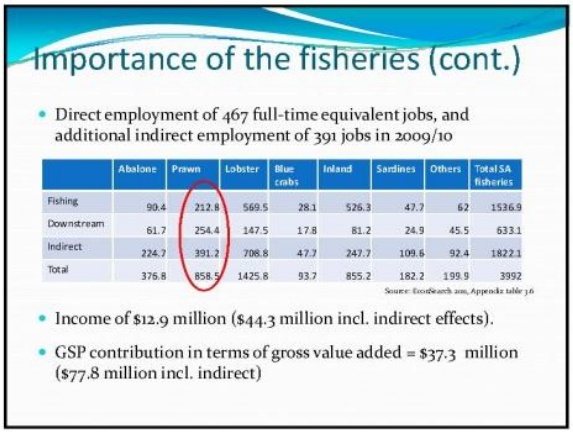
Note on Sources for the Macro Factors: Environmental, Economic and Community

Macro Indicators	Environmental Performance Index (EPI) Yale University/Columbia University	• Environmental Health • Ecosystem Vitality
	Governance Indicator–Effectiveness World Bank	• Effectiveness • Regulatory Quality • Rule of Law • Control of Corruption
	Governance Indicator–Voice & Accountability World Bank	• Voice & Accountability • Political Stability
	Index of Economic Freedom Heritage Foundation/Wall Street Journal	• Business Freedom • Trade Freedom • Fiscal Freedom • Government Size • Monetary Freedom • Investment Freedom • Financial Freedom • Property Rights • Freedom from Corruption • Labor Freedom
	Gross Domestic Product (GDP) Per Capita	

Appendix 1.4. Economic status







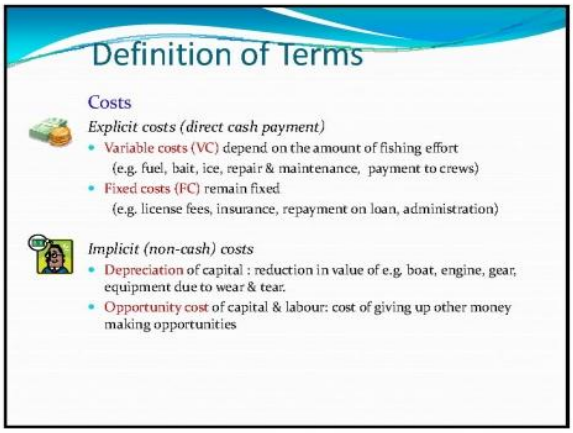
Importance of the fisheries (cont.)

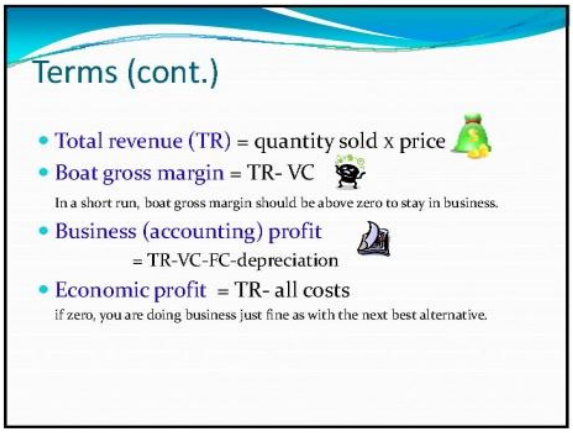
- Direct employment of 467 full-time equivalent jobs, and additional indirect employment of 391 jobs in 2009/10

	Abalone	Prawn	Lobster	Blue crabs	Inland	Sardines	Others	Total SA fisheries
Fishing	90.4	212.8	569.5	28.1	526.3	47.7	62	1536.9
Downstream	61.7	254.4	147.5	17.8	81.2	24.9	45.5	633.1
Indirect	224.7	391.2	708.8	47.7	247.7	109.6	92.4	1822.1
Total	376.8	858.5	1425.8	93.7	855.2	182.2	199.9	3992

Source: EconSearch 2011, Appendix table 3.6

- Income of $12.9 million ($44.3 million incl. indirect effects).
- GSP contribution in terms of gross value added = $37.3 million ($77.8 million incl. indirect)





Economic indicators: measure of wealth from a fishery

1. Price of the privilege or right to access (e.g. license, lease or quota).
2. (1) relative to gross earning (5 year average value of annual landings) - asset performance
3. Total revenue (TR) relative to historical high (average of 3 highest TRs over the past 10 years)

2009/10 season	GSV	SGWC
1. Aggregated market values of license	$21m	$134m
2. (1)/ annual landing value	7	4
3. TR relative to historic high	42.7%	67.8%

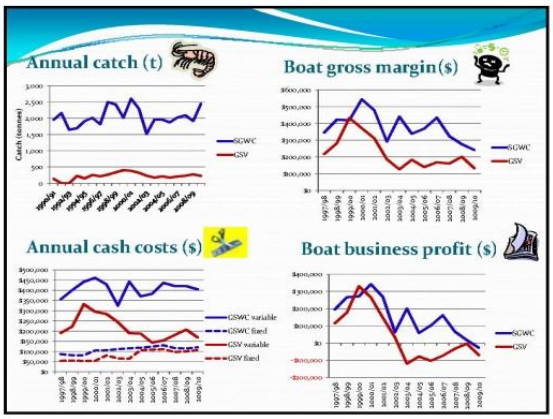
Economic indicators (cont.)

4. Beach price relative to historical high
5. Average boat gross margin
6. Average boat business profit
7. Economic profit (industry as a whole)

Volatility (eg. price, landing, TR) and more....

2009/10 season	GSV	SGWC
4. Beach price relative to historic high	62.0%	59.6%
5. Average boat gross margin ($000)	$132.6	$241.6
6. Average boat business profit ($)	-$70,251	-$26,804
7. Economic profit ($million)*	- $1.59m	-$7.33m

* Opportunity cost of 10% is used (EconSearch 2010)



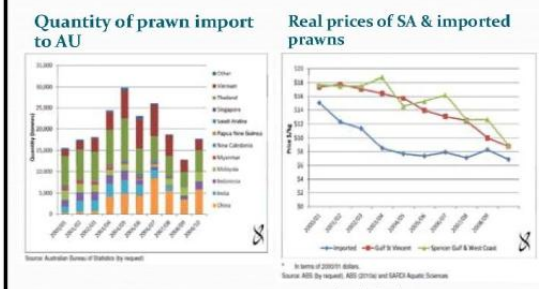
Beach price has declined...

Source: EconSearch 2011

Factor affecting the profitability

1. Decline in beach prices
2. Fuel cost as % of variable costs more than doubled in 10 years (7-12% to 22-23%).
3. Strong Australian dollar (significant proportion of SA prawn are exported overseas until 2005/06).
4. Increase in prawn import to Australia.
5. Increase in global production of farmed prawn.
   - -Farmed prawn production in AU almost doubled to 5,381 tonnes in 09/10 just in 2 years!
   - -Most are sold domestically (Australian Prawn Farmer's Association website)

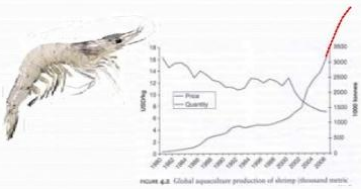
Prawn import to Australia



Source: EconSearch 2011

Decline in real price of seafood greatest where aquaculture is highly substitutable for capture fishery products ..

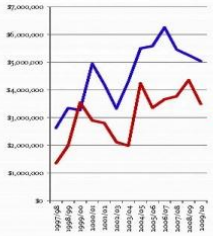
4,960,000 t (2009)



Source: Grafton, Hilborn and Squire 2009

Capital investment..

Boat capital



Return on capital

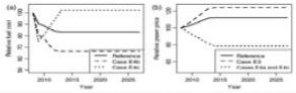
Data source: EconSearch 2011

Discussions

- Low beach price & higher fuel cost (lesser extent) have lower the profitability of the SA prawn fisheries.
- Beach price highest in Nov & Dec ($18.5/kg), lowest in April & May ($11.00/kg) in 2009/10
- Strong exchange rate
- Increased in prawn import and expansion of global aquaculture production appear to have had negative impacts on price.
- Boat capital investment has increased, although declining trends in recent years.
- Future uncertainty (e.g. fuel prices, exchange rate)

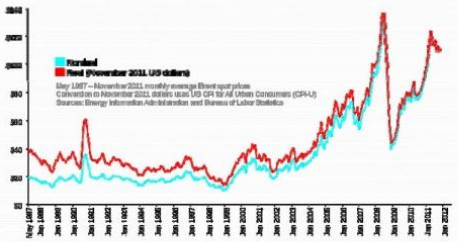
How about future?

- Fuel price expected to fall by 16% from its 2008 level over the next 7 years and to remain constant in real terms after 2013 (ABARE 2007).
- The price of tiger prawns increases over the next 7 years in real terms by 12%, owing to a projected softening of the AU$ (Punt et al. 2010).



- Short-term effects: Floods in Thailand, disease outbreaks in Vietnam have reduced supply, pushing up prices in 2011(FAO Globefish)
- Global aquaculture production continues to grow?

Crude oil prices



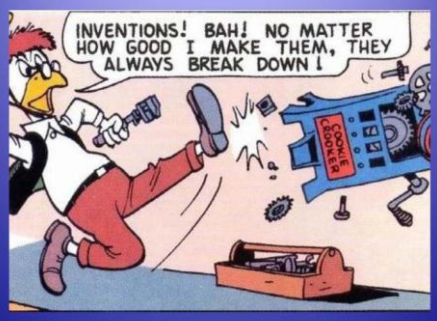
Recommendations

- Continue monitoring of the economic indicators
- Investigate the possible impacts of increased supply of farmed prawn on domestic prices and demand
- Identify harvest strategies that increase the future profits (size, seasons etc.)
- Explore management options (e.g. ITQ, buyback) to improve the profitability of individual operators.

Appendix 1.5. Transferable Fishing Rights

INDIVIDUAL TRANSFERABLE FISHING RIGHTS – A PATHWAY TO $$$$ PROFITABILITY $$$$

Annie Jarrett
Pro-Fish Pty Ltd
February 2012



Fisheries Management: A Delicate Balancing Act

- *Eco-system Based Fisheries Management*
- *Bycatch Reduction*
- *Marine Protected Areas*
- *Environmental Certification*
- *Resource Stewardship – Community Pressure*
- *Harvest Strategies*
- *Fishery reference points – MSY v MEY*
- *Economic Efficiency*

Adjustment

- Globally most fisheries have suffered from over-capacity, effort creep & recruitment overfishing
- Most fisheries have required cuts in fishing effort and adjustments in fishing capacity
- Mechanisms for capacity adjustment :
  - buy backs (govt and/or industry funded eg Qld, NPF, TS)
  - compulsory reductions in TAEs/ TACs
- Capacity adjustment (excluding buy backs) needs basis eg form of individual transferable fishing rights system

But:

ITS HARD TO BE GREEN WHEN YOU'RE IN THE RED

- Unfavourable FX – AUD high & climbing
- Challenging market conditions
- Too much competition (aquaculture & domestic)
- Increasing costs (production, management, research)
- Reducing or static catches
- Too Many Boats??

Australian Prawn Fisheries

Individual Transferable Fishing Rights

The Benefits

•SECURE ON-GOING ACCESS (PROPERTY RIGHTS) FOR INDUSTRY; SOUND INVESTMENT BASE FOR FINANCIERS

•FLEXIBILITY FOR OPERATORS – INDIVIDUAL DECISIONS TO BUY, SELL OR LEASE ARE MARKET BASED, NOT GOVERNMENT DRIVEN

• EFFECTIVE TOOL TO BALANCE FISHING EFFORT AND BIOLOGICAL & ECONOMICAL SUSTAINABILITY

•AN EQUITABLE TOOL FOR ADJUSTMENT IN THE FISHERY WHEN REQUIRED - (ADJUSTMENT PROPORTIONAL ACROSS THE FLEET)

•GENERALLY COST EFFECTIVE TO MANAGE AND ENFORCE

• HAVE PROVEN EFFECTIVE IN QLD, TORRES STRAITS & NPF PRAWN FISHERIES

Types of Individual Transferable Fishing Rights

- **Input controls: gear units; boat units; boat days/ time units; effort units; pot units** (Individual Transferable Effort Units or ITEs)
- **Output controls:** Individual Transferable Quotas (ITQs) – issued as kilos of fish/prawns

ASSUMPTIONS FOR SUCCESS

- ALL INDIVIDUAL RIGHTS FULLY TRADABLE (SALE OR LEASE)
- RETENTION OF LIMITED ENTRY
- CLOSURES FOR BIOLOGICAL/ ECOLOGICAL PURPOSES
- CONTINUED USE OF ECBM/ BYCATCH MITIGATION
- ONGOING RESEARCH, DATA COLLECTION & COMPLIANCE PROGRAMS – MAY VARY WITH EACH SYSTEM
- NEED TO CONSIDER ECONOMICS AS WELL AS BIOLOGY

WHO HAS WHAT RIGHTS BASED MANAGEMENT SYSTEMS?

- Northern Prawn Fishery: limited entry/ gear units (ITEs – investigation ITQs)
- QLD Trawl: Limited entry/ effort units (ITEs)
- Torres Straits: Limited entry/ boat days (ITEs)
- South Australia: Limited entry/ boat license
- New South Wales: Limited entry/boat license
- Western Australia: (Exmouth Gulf/ Sharks Bay): Limited entry/boat license

CRITERIA

- Equitable: need to identify existing shares & determine translation formula; the 'share' of rights held under one system must not be diminished in moving to a new system
- Flexible & Adjustable: operators need flexibility to adapt to changing circumstances & to maximise returns; fishery needs to be adjusted to respond to biological or economic changes
- Responsive – capable of adjusting the fishery on either biological or economic grounds in a timely manner
- Transferable: allows operators maximum flexibility to trade up or down to suit their own operational/market demands
- Economically efficient: retaining as few inputs as possible to maximise opportunity for economically efficient exploitation
- Simple & Cost Effective to manage: easily understood by industry; simple administration & enforcement; legally defensible

Input Controls

- **Boat Days/ Time Units; Effort Units; Gear Units; Capacity/ HP Controls**
  - Generally acceptable to industry – often based on catch history
  - Generally more cost effective
  - Not always effective at controlling effort
  - impose economic inefficiencies;
  - Flexible and responsive for adjustment *but*
  - benefits of individual decisions to increase efficiency dissipated across the fleet
  - Rent dissipation can occur if capacity adjustment doesn't occur (fishing inefficiently)

Individual Transferable Quotas -ITQs

- A Total allowable Catch (TAC) determined by bio (+ economic) model - Individual Transferable Quotas allocated (kgs of prawns) allocated
- Requires robust scientific data / stock assessment (+ economics if managing to MEY) & TAC predicting methodology – survey information can assist
- Best results generally in single, long lived species
- Few short life cycle (less than 6 years) multi species fisheries managed under ITQs tho some high volume, high value fisheries eg African anchovy/sardine , NZ arrow squid & Icelandic capelin fisheries
- No prawn fishery managed under ITQs (Mozambique Shrimp fishery closer to Total Allowable Catch system) – NPF investigating ITQs

The NORTHERN PRAWN FISHERY (NPF) Experience

1960's: Exploration followed by commercial trawling - open access fishery (no limited entry)

1974: Biggest banana prawn season on record; expansion of commercial fishery

1980: First 'Management Plan' for the NPF, 302 licenses

1985: The 'A unit' system introduced - individual transferable rights based - combination of hull and horsepower specs/formula

Provided secure legally defensible fishing rights & basis for management costs/ buy back/ adjustment

1985: Industry-initiated buy back scheme; 2 for 1 boat replacement policy

- ITQS CAN PROVIDE MORE EFFICIENCY GAINS THAN INPUT CONTROLS
- FLEXIBILITY TO MAXIMISE CATCH FOR LEAST COST; ECONOMIC EFFICIENCY; FACILITATES TRADE/ AUTONOMOUS ADJUSTMENT; LIMITS CATCH
- ECONOMIC THEORY – MOST BENEFITS ARE FROM QUOTA TRADING
- SINGLE SPECIES NATURE OF SGPF MAY BE SUITABLE TO QUOTA MANAGEMENT, SUBJECT TO STOCK ASSESSMENT
- POTENTIAL LOSS OF REVENUE FROM HIGH GRADING/DISCARDING
- COMPLIANCE, RESEARCH AND ADMINSTRATION COSTS HIGHER – CAN CO-MANAGEMENT OFFSET?
- ISSUES OF 'CORPORATISATION' AND CONCENTRATION OF OWNERSHIP
- REAL TIME MANAGEMENT MAY ALLOW TAC IN-SEASON UPDATES

The NPF Experience Cont.

- A Units ineffective effort control; Operators 'rorted' horsepower and vessel configuration regs; Effort creep and stock depletion
- Inflexible adjustment tool; can only buy or sell under adjustment
- Buy back based on A unit system slow and expensive: $45 million to remove 89 licenses over ten years
- Input restrictions to address stock depletion (twin gear/ closures/ daylight trawl ban) force inefficiencies/ reduce fleet profitability
- Additional 35% compulsory surrender of 'A' UNITS in 1993 – fleet reduced to 130 trawlers

ALLOCATION

- ALLOCATION IS THE MOST CONTROVERSIAL ISSUE IN MOVING TO ANY NEW SYSTEM OR IN IMPLEMENTING ADJUSTMENT PROGRAMS
- FISHERS ARE GENERALLY MORE INTERESTED IN WHAT THEY ARE 'GOING TO GET' THAN HOW A NEW SYSTEM WOULD WORK
- FISHING HISTORY (EG CATCH, VESSEL SIZE; HP) FINANCIAL INVESTMENT; ADMINISTRATIVE DECISION; AUCTION/ TENDER ALL MECHANISMS USED IN ALLOCATIONS

2000: GEAR UNITS INTRODUCED . ALLOCATION PROPORTIONAL TO 'A' UNIT HOLDINGS. TRANSITION INCORPORATES 20% REDUCTION IN TOTAL HEADROPE - 10 BOATS LEAVE

• 2001: BOTH SPECIES OF TIGER PRAWNS CLASSIFIED AS 'OVERFISHED'

• 2002: TOTAL HEADROPE REDUCED 15%. INDIVIDUAL REDUCTION PROPORTIONAL TO GEAR UNIT HOLDINGS. 17 BOATS LEFT THE FISHERY

• 2002: DECREASED SEASON LENGTH TO IMPROVE SUSTAINABILITY OF BROWN & GROOVED TIGER PRAWNS

• 2005: TOTAL HEADROPE REDUCED BY 25% TO IMPROVE ECONOMICS OF THE FISHERY. 11 BOATS LEFT THE FISHERY

• *38 TRAWLERS REMOVED IN 5 YEARS (INTERNAL ADJUSTMENT).*

•*60% EFFORT REDUCTION IMPOSED MASSIVE ECONOMIC INEFFICIENCY - SMALL GEAR, SHORT SEASONS, LOW PRICES = ECONOMIC DISASTER. 2007 GOVT-FUNDED SAP REMOVES 43 BOATS*

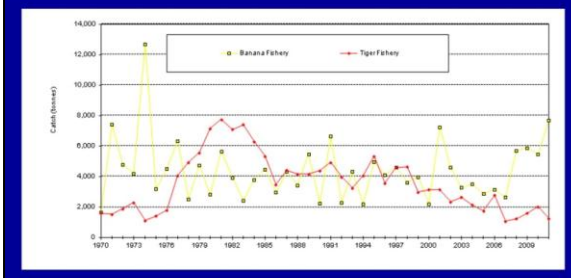
GEAR UNITS IN THE NPF

- Total amount of gear and Fishing Season Length / Timing
- determined by bio (+ economic) model
- Allocation of gear units based on agreed formula 9eg catch history)
- Each gear unit entitles operator to % of towable gear eg 1 gear unit = 10 cm
- A gear unit can comprise headrope only or combined headrope & footrope (NPF has a headrope constraint relative to footrope)
- Under adjustment, total number of gear units remains the same - the value of each gear unit changes

  As an example in the NPF where each gear unit equals 10 cm of headrope & 11.5 cm of footrope, , after a 10% reduction each gear unit would equal 9cm of headrope & 10.35 cm of footrope

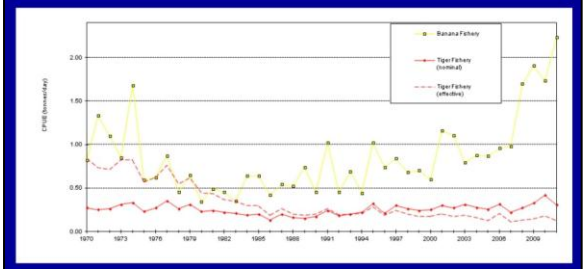
- System requires net size identification / gear unit register/ regular net checks
- Transfer of gear units only during closures to reduce compliance costs

Catch in banana and tiger fishery (tonnes) 1970 - 2011



- Headrope (controls swept area) good measure of fishing effort
- Easily measured & enforced - particularly compared to hp
- Enforcement – on shore measuring and net tagging; at sea checks
- System does not impede technical innovation – allows for removal of other inputs eg boat size/ hp restrictions/ gear types
- Operators can trade gear units to suit own operational/market demands
- Flexible tool for adjustment - gives operators option of buying, selling, leasing gear units, amalgamating licenses or fishing with smaller gear
- Potential for effort creep with removal of boat size/ hp restrictions but can be adjusted
- Can result in economic inefficiencies (rent dissipation) if operators tow inefficient gear when adjustment occurs

NPF CPUE 1970 - 2011



The NPF Today

- From 302 to 52 trawlers; flexible gear unit system - no limits on gear: twin, quad, tongue nets ; flexibility/economic efficient
- Bio-economic model for tiger prawns; escapement policy for banana prawns; Catch trigger limits to determine season lengths (economic triggers)
- Harvest strategy includes Maximum Economic Yield (MEY) target reference point; MSY limit reference point
- Both species of tiger prawns now sustainable; 3 high yield banana prawns seasons (5000 – 7000 t)
- Industry Company; Co-management with AFMA – NPFI managing data, out-sourcing of surveys, crew member observer program; in MSC program
- GVP : $63m (130 Boats - 2004/5); $89 m (52 boats 2010/11)

ITQs in NPF

- World class tiger prawn bio-economic model converted to TAC predicting method but failed in 2011 (overestimation by 60%)
- Model heavily reliant on data from annual recruitment and spawning surveys (annual survey cost $750K)
- No stock assessment and TAC setting method for banana prawns due to high recruitment variability . 2010 under-prediction of 2000t ($20 million) but investigating environmental (rainfall) model
- High grading/discarding – trials of e-monitoring (cameras) to reduce observer coverage/cost
- Increased compliance & management costs > $500,000 pa
- Will require retention of some inputs ie seasonal closures to protect juvenile and spawning stock (Dec – March; June – July)
- Kompas et al CBA shows main gains ($50 million over 50 years NPV) from quota trading . Predicated on getting TACs right

Option 1 – ITQs for tigers & Bananas

Cost Type	Area	Option 1			
		Current* (2008-09)	CBA	TACs across the whole fishery (a &b)	Spatial Split for bananas
Ongoing	Management	$588,586	$600,000	$600,000	$600,000
	Compliance	$613,976	$636,000	$882,350	$1,000,950
	Data Collection	$82,021	$90,000	$90,000	$90,000
	Licensing/quota monitoring	$37,635	$50,000	$50,000	$70,000
	Observers (15% coverage)	$146,936	$1,180,000	$1,180,000	$1,180,000
Transitional	Staff resources	-	-	$50,000	$50,000
	IT systems	-	-	$75,000	$75,000
	Plan Amendments	-	$60,000	$100,000	$100,000
	IAAP	-	$100,000	$100,000	$100,000
	Compliance		$10,000	$10,000	$10,000
	Sub-total		$170,000	$335,000	$335,000
	Total	$1,469,133	$2,726,000	$3,137,350	$3,275,950

THE LESSONS

- There is no 'perfect' management system

  OUTPUT CONTROLS – INDIVIDUAL TRANSFERABLE QUOTAS (ITQ's): responsive & flexible for adjustment BUT generally inappropriate in short life cycle, multi-species fisheries due to annual variation in recruitment & potential for high grading & discarding; expensive to administer and enforce

  INPUT CONTROLS – BOAT SIZE /HORSEPOWER CONTROLS: Not effective at controlling effort; not totally flexible or responsive for adjustment; impose economic inefficiencies; benefits of individual decisions to increase efficiency dissipated across the fleet

THE LESSONS cont.

- Trade-offs between costs and benefits in all systems
- The balance (competing objectives) changes – subject to complexity of management arrangements and degree of risk
- Closures effective for biological protection (eg seagrass/habitats/ small prawns) but impose economic impediments on operators
- Reductions in fishing effort MUST be implemented through the primary management tool to avoid increasing economic impediments
- Targets are rarely – <u>if ever</u> – met in time, on time, to achieve objectives: harvest strategy should include clear targets, objectives & decision rules, including economics
- Profit is not a dirty word!

Appendix 1.6. Exmouth Gulf and Shark Bay

Exmouth Gulf and Shark Bay Fisheries

Presentation by Graeme Stewart
Past President: ACPF
Executive Officer: Shark Bay Boat Owners Association

Summary by Tim Ward and Cameron Dixon

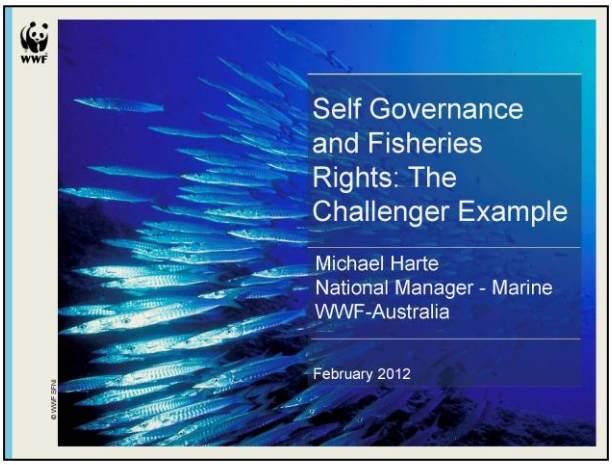
Shark Bay

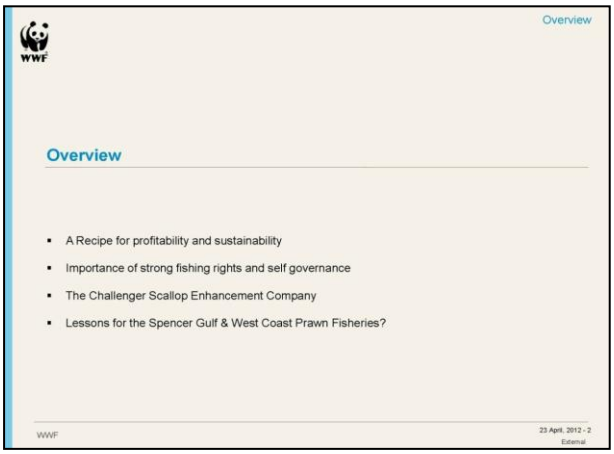
- Shark Bay
- Target MEY
- Input controls legislated
- Don't adhere to Management Plan
- Try to minimise overheads – resource rent (5.9% GVP c.f. cost recovery 7.9% GVP)
- 18 boats, 7 owners (3-4 active)
- 10 boats NW Seafood
- Try to operate in corporate manner – bulk buy nets, etc (but compete at sea)
- 1962-75 legislation did not support fishery
- Multi-species fishery with permit for prawns
- 170 days per year
- 4 x 5.5 fathom nets (optimal fuel consumption)
- Two buybacks: 1991 Fisheries Adjustment Schemes Act 1987 and 2011
- 1991 reduced fleet from 35 to 27 vessels ($1.25M per vessel) – government loan
- 2011 reduced fleet from 27 to 18 vessels ($2.5M per vessel) – government loan

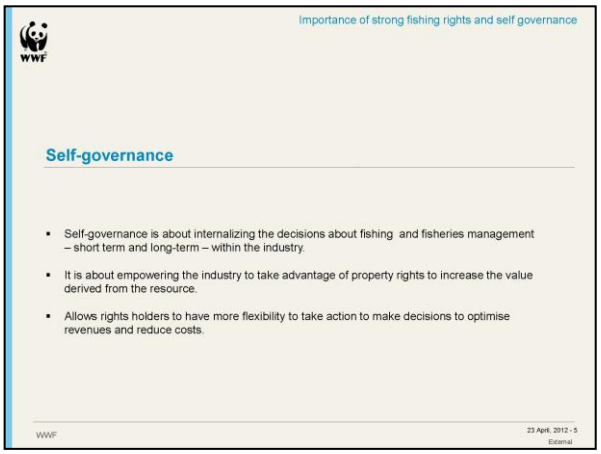
Exmouth Gulf

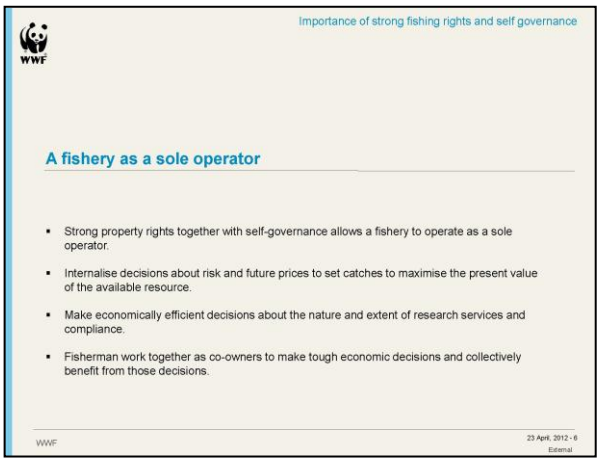
- Began 1962, effort grew until 1981
- Overfishing lead to collapse – no fishing in 1982-3
- Onshore processing (MG Kailis) sashimi grade prawn for Japan
- 16 licences (15 Kailis)
- Buy-back bought out last single (non-Kailis) licence
- Now one company maximum catch 1200 kg per night (factory capacity)
- Reduced number of vessels
- Electricity costs increased by 28% led to factory closure
- Bought 3 freezer boats
- 16 licences, only 8 boats fishing
- Management Plan not suitable

Appendix 1.7. Self Governance: Challenger Scallops









The Southern Scallops fishery

- The southern scallop fishery is located at the top of NZ's South Island.
- Between 30-60 scallop vessels operate in the fishery.
- Relatively small fishery with an annual harvest worth NZ$10-20m.
- Industry self governance is highly developed.
- It is one of NZ's first fisheries to have industry investment in and commitment to self-management.

Challenger Scallop Enhancement Company

- Challenger was created in 1992 to establish an ownership structure for collective capital investments.
- Challenger gives rights holders the ability to "privately" manage the fishery so as:
  - To capture upside benefits of sole ownership management.
  - To minimise free-riding.
  - To collectively control the costs of managing the fishery.

Challenger Company

- Challenger has gone through several major restructurings both internally and externally driven (government and environmental).
- Challenger is not a "sole owner" of the southern scallop fishery.
- Challenger has attempted to capture the benefits of a "sole ownership" management regime by use of civil contracts and regulation to overcome free-riders who might not otherwise pay levies for the costs of management.

Management and decision sharing arrangements

- Challenger has a MOU with NZ Ministry of Fisheries:
  - Specifies the information required by the Minister of fisheries to assess performance.
  - Provides for the Ministry to approve specifications and standards for research.
  - Provides for Challenger to make annual harvest level recommendations.
  - Establishes a process of consultation with recreational fishers, Maori fishers and environmental interests.
  - Makes provision for overcoming harvesting conflicts with recreational fishers (have a directorship on Challenger Board).

Management and decision sharing arrangements

- Challenger carries out its own research and selects its own science provider.
- Produces harvest strategy addressing proposals for:
  - Areas to be closed to commercial fishing under its rotational harvesting strategy
  - Areas to be closed to commercial fishing to allow for recreational fishing
  - % of fishing rights to be shelved each year (TAC is cap and not binding since harvest is less)
  - Daily and weekly catch limits.
- Business plan and harvest strategies approved at AGM by majority vote.

Management and decision sharing arrangements

- Activities funded under compulsory levy ranging from 15-20% of landed value.
- The management plan is implemented under civil contract among rights owners, vessel skippers and Challenger.
- All sign a contract outlining the harvest rules and agreed damages that must be paid in the event of non-compliance.
- Contract provisions are agreed by consensus at the general meeting of the Company.

Compliance and enforcement

- Two types of sanctions:
  - Sanctions that are applied to individual industry participants (e.g. vessel operators) for non-compliance with rules, whether they be regulations or contract rules.
  - Sanctions that apply to the Challenger for none performance under its management agreement with the Ministry of Fisheries.

Compliance and enforcement

- Individual sanctions are specified in law or in the Challenger contract with scallop fishery participants
- Challenger performance is an organisational issue related to the competency of company and is audited by the shareholders (aligned with the government requirements).
- Challenger operates in many respects like a traditional government regulatory agency yet is managed by fishers for fishers.

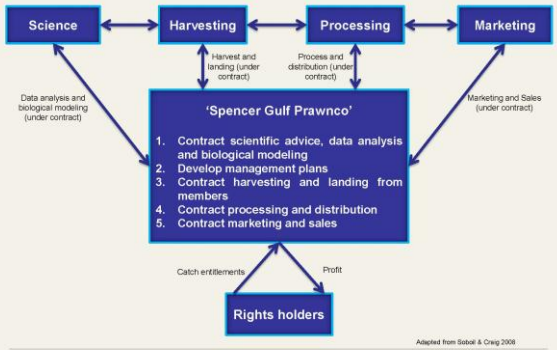
The wider influence of the Southern Scallop fishery

- Management arrangements in the southern scallop fishery were a catalyst for recent ground breaking fisheries reforms that promote devolution and decentralisation of fisheries management,
- Challenger offers a genuine alternative to centralised government management.
- The fishery is a blueprint for the wider devolution of fisheries management responsibility and for effective sole management by fishery rights holders.

Lessons for Spencer Gulf Prawn?

- Spencer Gulf Prawn fishery has many of the key ingredients for a profitable and sustainable fishery already in place.
- Can you transition from statutory fishing rights to stronger property rights? This could be voluntary or State sanctioned.
- Can you build on existing co-management structures and look for opportunities for greater-self governance by internalising more management responsibilities especially those with major cost saving potential?
- Can you explore potential, benefits and costs for fishery to function like a sole operator through collective management of harvesting operations and value chain activities as well as routine fisheries management and research activities?

Possible model for an integrated Spencer Gulf Prawn industry



Adapted from Sobol & Craig 2008

Thank you

wwf.org.au

Appendix 1.8. Clarence River Prawn Fishery

Economic Performance & Management Opportunities
Spencer Gulf Fisheries Conference
Port Lincoln/Adelaide
27th & 28th February 2012

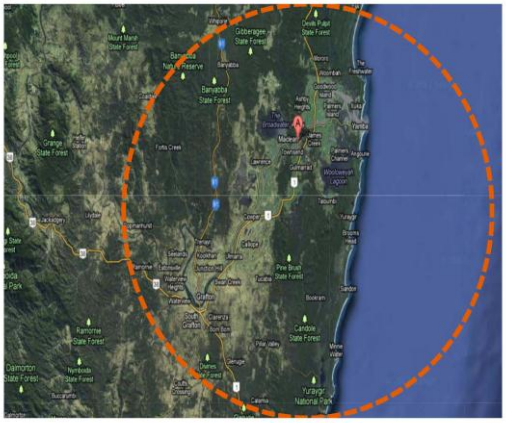
Danielle Adams
General Manager

CLARENCE RIVER FISHERMEN'S CO-OPERATIVE LTD

PRAWN YAMBA
CLARENCE RIVER FISHERMEN'S CO-OPERATIVE

WHERE HAVE I COME FROM??

- Hired – Sales Manager May 2011, promoted Sept 2011 to GM
- "KISS" business principles
- Graduate from school of hard knocks
- Sales experience from 15 years old
- Automotive & Software background
- International business experience – start-up businesses in China, Thailand, Philippines
- Focus on business feasibility, foundation laying, change management, profitability and bottom line impacts
- People growing rather than people management
- Proactive sales versus reactive headaches

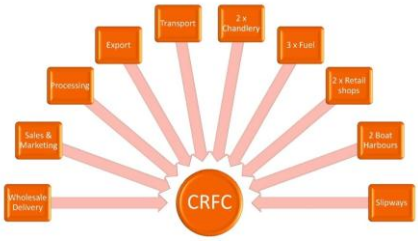


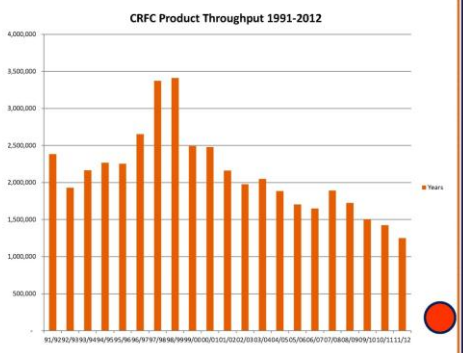
IF YOU CONTINUE TO DO WHAT YOU HAVE ALWAYS DONE, YOU WILL CONTINUE TO GET WHAT YOU HAVE ALWAYS GOTTEN!!

THE CLARENCE RIVER FISHERMEN'S CO-OP (CRFC)

- Incorporated in 1945
- 134 Members (all shareholders) – approx 40 Ocean and 94 Estuary
- Board of 6 – 4 fishers, 2 independants
- Core products – Mullet, School prawns, King prawns, Octopus, Trawl Whiting
- 50 Staff
- 7 hours north Sydney, 3 hours south Brisbane

CRFC Infrastructure (or the beast as I call it)



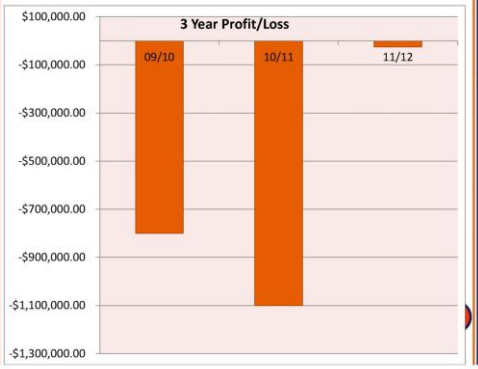


The challenges faced at the CRFC!

- Catch declining
- Detrimental financial losses
- Location
- Aging fleet
- Black market selling
- Industry deregulation (buybacks, fish receivers licenses)
- Imports
- Fewer clients
- 2 Aging facilities, old equipment
- Government controls and restrictions
- Costs increasing, seafood prices maintain same levels
- Operating like the old days not taking into account market/industry/trading downturn
- Angry share holders, negative fishers
- Very unhappy customers
- Natural disasters – 3 floods, 3 years

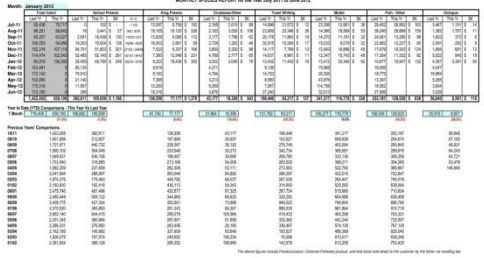
In the first 6 months

- Rebuild internal sales procedures
- Basic sales skills training
- Build relationships with surrounding towns small seafood sellers
- Focus on value adding
- Use shops to push product
- Focus on large buyer relationship from Corporate perspective – work on allocation orders
- Encourage one-on-one relationships with large buyers location managers



In the first 6 months

- Rebrand "Yamba Prawn"
- Review and research alternate markets
- Better use of bi products
- Export evaluations
- Encourage new memberships
- Alliances with other Co-Ops
- Sales runs – personalise the sales process
- Reassess processing values & costs (wet weight)
- Revise debtors accounts
- Greater visibility of information



CLARENCE RIVER FISHERMEN'S CO-OPERATIVE LTD
MONTHLY SPECIES REPORT for the Year July 2011 to June 2012

Month: January 2012

	Kilo Sales		School Prawns			King Prawns			Western Other			Food Whole			Mullet			Fish - Other			Octopus		
	Last Yr	This Yr	Last Yr	$	%	Last Yr	This Yr	$	Last Yr	This Yr	$	Last Yr	This Yr	$	Last Yr	This Yr	$	Last Yr	This Yr	$	Last Yr	This Yr	$
Jul-11	60,246	78,701	10	160	1	12,047	9,749	$ 162	2,168	2,012	$ 56	14,082	21,012	$ 12	23,245	12,341	$ 38	26,402	38,560	$ 163	3,447	1,721	$ 14
Aug-11	96,281	98,942	16	3,441	$ 27	19,105	19,120	$ 328	2,155	3,030	$ 918	23,856	23,346	$ 38	14,366	18,666	$ 152	34,245	28,866	$ 179	1,350	1,757	$ 11
Sep-11	90,287	63,023	2,891	18,436	$ 150	13,005	8,085	$ 112	3,177	1,798	$ 52	20,176	11,860	$ 18	14,215	11,101	$ 32	24,961	13,285	$ 58	1,803	372	$ 8
Oct-11	108,033	54,058	16,303	19,924	$ 108	16,503	2,891	$ 39	2,736	1,283	$ 46	32,015	15,264	$ 17	15,022	8,079	$ 22	22,663	12,277	$ 60	2,091	280	$ 3
Nov-11	152,216	107,118	34,751	31,202	$ 301	7,520	6,337	$ 108	3,850	3,320	$ 48	14,117	7,785	$ 12	12,402	16,996	$ 45	17,016	16,333	$ 124	1,054	921	$ 12
Dec-11	114,474	102,943	32,465	32,140	$ 281	7,360	12,946	$ 211	4,768	2,777	$ 55	14,637	8,981	$ 11	12,947	15,742	$ 44	17,264	11,332	$ 52	3,522	840	$ 14
Jan-12	73,140	136,126	46,795	46,795	$ 240	10,420	19,436	$ 300	3,045	5	$ 18	10,420	11,440	$ 18	10,420	35,346	$ 52	10,420	16,947	$ 102	3,045	5	$ 58
Feb-12	163,481		80,134			9,918			4,371			9,138			15,890			10,000			4,047		
Mar-12	172,142	0	78,910			9,100			4,784			14,753			29,326			16,775			10,884		
Apr-12	102,282	0	21,140			7,285			3,212			8,093			43,879			13,391			5,305		
May-12	172,016	0	11,897			10,200			5,056			7,957			114,756			18,092			3,654		
Jun-12	173,140		295			10,710			3,070			17,242			72,213			17,000			3,025		
	1,622,242	639,748	302,811	152,600	1,108	106,938	77,111	1,219	42,177	16,208	243	166,446	92,217	127	347,217	118,775	233	202,187	139,326	858	38,845	6,391	113

Year to Date YTD Comparisons - This Year Vs Last Year

1 Month	152,242	639,748	106,938	77,111	42,177	16,208	92,217	118,775	202,187	139,326	38,845	6,391
	FYPC	FYPC	FYPC	FYPC	FYPC	FYPC	FYPC	FYPC	FYPC	FYPC	FYPC	FYPC

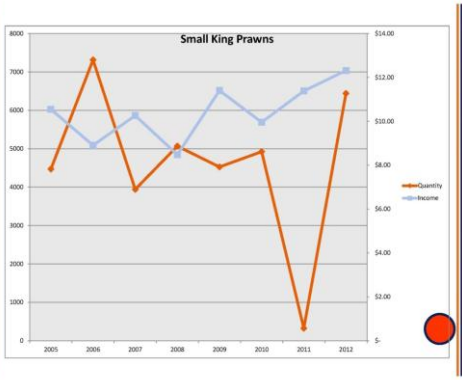
Previous Years' Comparisons

1011	1,622,225	302,811	138,939	42,177	166,449	241,217	203,197	38,845
0910	1,511,971	210,207	197,988	39,937	153,627	459,938	294,816	87,100
0809	1,751,871	243,732	225,397	35,100	275,749	402,684	290,845	40,921
0708	1,890,122	508,089	233,948	35,272	242,734	389,901	290,615	64,200
0607	1,640,621	436,108	166,487	39,664	269,780	333,139	309,209	64,721
0506	1,753,942	316,865	213,166	54,639	203,525	388,211	294,200	63,479
0405	1,992,259	237,859	262,309	53,111	273,993	522,769	380,867	145,845
0304	2,246,000	237,000	305,000	60,000	300,000	600,000	400,000	
0203	1,874,279	175,460	449,765	66,637	287,938	266,447	746,615	
0102	2,160,600	162,418	430,112	54,540	314,869	525,092	638,664	
0001	2,475,746	421,486	432,877	67,325	267,724	515,830	714,834	
9900	2,460,440	505,122	344,969	84,629	326,282	604,989	639,499	
9899	2,660,143	386,000	291,000	84,000	386,000	600,000	912,000	
9798	3,070,620	365,865	251,243	84,267	888,855	801,864	910,716	
9697	2,952,140	644,415	256,079	105,684	416,433	462,398	753,337	
9596	2,291,349	380,994	297,601	91,859	333,360	442,244	729,837	
9495	2,346,331	279,460	203,436	28,160	336,487	574,139	797,139	
9394	2,742,168	149,882	337,809	60,646	163,537	466,369	825,946	
9293	1,926,279	197,976	240,652	169,224	76,696	410,011	638,246	
9192	2,081,854	386,129	389,352	189,666	142,975	413,208	793,420	

The above figures include Flaxton product, Clarence Fisheries product, and that stock sold direct to the customer by the fisher via handling fee

The Next 12 Months

- Yamba Prawn awareness campaign
- Add attention to undervalued species (Mullet) – point of sale material, value add options, how to cook etc
- Focus on "volume for value" projects
- Extend reach of client base and opportunities
- Industry networking
- New project involvement – more value add opportunities
- Export exposure, research markets
- Funding and capital expenditure investments
- Downsize without impacting operations



The Next 12 Months

- Recognise the competition but build your competitive advantage
- Win/win relationships are far more valuable
- Manage cash-flow without just targeting profitability
- Tweak the focus – don't focus exclusively on increasing sales and revenue - improve sales margins
- Balanced mix of sales opportunities and growth targets – more local sales, new export markets, value adding
- SMS communications with buyers
- SMS to members with targeted products, fixed prices, better returns

Evaluate product direction

Old direction	New direction
SFM	CRFC Shops
Local Sales	Local Sales
Larger sales/Woolworths (transport)	Larger sales/Woolworths (transport)
CRFC Shops	SFM/MFM

"Coming together is a beginning, keeping together is progress, working together is success"
Henry Ford

Marketing Focus

- In shop displays for new clients
- Involvement in Food Festivals/Functions
- Media opportunities
- Buy smarter
- Process faster – new machinery
- Evaluate quick cook/easy serve meals
- Bait market
- Processing for buyers
- Retail shops – no imports, all fresh, mostly local, "home-made, home-grown"

Thank You For The Opportunity To Share Our Company's Challenges, Vision and Plans

CLARENCE RIVER
FISHERMEN'S CO-OPERATIVE LTD

PRAWN YAMBA
CLARENCE RIVER FISHERMEN'S CO-OPERATIVE

Appendix 1.9. Key findings of initial SGPF Workshops

Options for improving the economic performance of SGPF

Simon Clark and Cameron Dixon

Issues identified

Prices too low, cost too high
Too many restrictions
Too inefficient
Too many boats to be profitable
How to get boats of the waters
- government buy back unlikely
- need to assess economics of industry buyout
- need transferability

Also need to address prices through marketing

Options for improving the economic performance (Cont)

Options identified

- Consider options for an industry buyout
- Challenger (corporate) model may be too big a step right now
- Investigate buyback options/amalgamations
- Incorporate economics into stock assessment strategies
- Decision rules to achieve/retain economic efficiency
- Need to work out optimal catch per boat and most efficient way to fish gulf
- Reductions need to large and fast (AJ)
- Industry buy back warrants consideration

- Need to also consider marketing (two pronged attack)
- Levy system for marketing an option
- Marketing always important, this discussion is about increasing efficiency - options are buybacks and/or transferability (AJ)

- Broad recognition of need to introduce transferable systems: e.g. quota, gear/effort units, tradeable nights – need to consider all options
- Need options paper

Appendix 1.10. SGPF Agenda Workshop 3

Economic Optimisation Workshop II

LOCATION: SARDI Adelaide

09:00 – 17:00 29 & 30 August 2012

FASCILITATOR: - Annie Jarrett

PARTICPANTS: Spencer Gulf Economic Optimisation Sub-committee, with supporting Officers, Simon Clark, Tim Ward and Eriko Hoshino

AGENDA

1.	Welcome, introductions & background	Exec/O
2.	Outline of the process and rules of engagement	
3.	Summary of Economic figures and assumptions	
4.	Establish and agree on primary driver for change	
5.	Establish targets that the fishery is setting.	
6.	Review property rights and establish options up for review.	
7.	Buy backs and buy ups.	
8.	Tradable rights – gear unit	
9.	Tradeable rights – gear by time effort units	
10.	Tradable rights - nights	
11.	Tradable right - quota	
12.	Self-governance	
13.	Small improvements – reduce net drag, prop technology etc	
14.	Economic decision rules	
15.	Discussion and summary	Chairperson
	Close	

Appendix 1.11. SGPF Briefing Paper for Workshop 3

Economic Optimisation Sub-Committee
Briefing Paper

Contents

1. Executive Summary

The profitability of businesses in the Spencer Gulf prawn fishery has been declining. Fisheries in similar situations typically undertake a structural adjustment program. The outcome of a structural adjustment is generally to improve profitability by removing inefficient activities or practices. Structural adjustments are often expensive and implemented when a fishery can least afford the change.

The Economic Optimisation Sub-committee (EOSC) will investigate structural adjustment options to improve the future profitability of the business involved in the fishery.

2. Purpose

The purpose of this paper is to provide preliminary background information for the Association's EOSC.

Information and recommendations developed by the EOSC will be submitted to the Management Committee. The Management Committee will then approach the Association's membership for further advice and feedback.

3. Introduction

On reviewing Econsearch's economic evaluations of the Spencer Gulf prawn fishery, in conjunction with regular feedback from membership within the fleet, it has been highlighted to the Association that there are concerns with the future economic viability of the businesses that operate in this fishery. This was reinforced during February's workshop where members provided broad agreement to evaluate future management options for this fishery to improve economic returns.

The Spencer Gulf prawn fishery has, to date, successfully been managed by input controls and real time management. The ecological sustainability of the fishery is of a high standard, as reflected by the Marine Stewardship Council (MSC) certification. Concern with the fishery has been raised through its future economic viability.

The economic performance of the fishery can be referenced back to the Management Plan for the Spencer Gulf prawn fishery (pg 36) which has several performance indicators. Two of these economic indicators have not been realised:

1. Gross Value of Production <0% change
2. Return on Investment <0% change

This is evidenced in the following extracts from the 2009/10 Economic Indicators for the Spencer Gulf and West Coast Prawn Fisheries report by Econsearch.
Average gross boat income fluctuated between years but, overall, between 1997/98 and 2009/10 average income decreased by 8 per cent.
Between 1997/98 and 2009/10 the average cost per kilogram increased by approximately 39 per cent, significantly more than the change in price.
The estimated rate of return to capital peaked at almost 9 per cent in 1999/00 but has followed a declining trend in subsequent years. In 2009/10 the estimated rate of return to capital was just 0.4 per cent. The decrease in rate of return is due to both a decline in profitability in the fishery and an increase in the value of fishing licences.
The Association has also established a set of targets through its annual reports, of which two economic indicators are:

1. Our fishing licence (with boat) is worth more than $4 million.
2. We have made an extra $10 million for the industry through value-adding methods.

The first is difficult to assess as there has not been a licence transfer for over 12 months. However, there have been licences on the market which have resulted in no transaction, indicating that this target is not being realised. The Association has not invested in developing value adding options, except through supporting investigations through the Nuffield Scholarship Candidate, Clinton Scharfe.
Fishermen (investors) have worked towards maximising their fishing operations within the boundaries of input controls, creating a race to the prawns. However, as it has been documented, the limitation of input control has driven inefficiencies into this fishery via the introduction of large expensive vessels which are used for short periods. The fishery has suffered from effort creep, i.e. large boats, greater horsepower leading to increased fixed costs etc. It should be noted that there is still potential for future effort creep, which is currently limited due to low returns leading to subsequent reduced investment capital.

4. Objectives of the Economic Optimisation Working Group

The objective of the EOSC is to evaluate alternative management options outlined in the February workshop by determining:

1. how a management option may be implemented,
2. associated benefits, negatives, implementation barriers,
3. operational costs (science, management, business, restructure)
4. economic return to the fishery of each option,
5. a priority list for the application of an option.

Following is a summary of points discussed at the February workshop.

- Property rights:
  - Quota/TAC
  - Effort units
    - Tradable nights
    - Time units
    - Area trawled
  - Gear units
    - Nets
- Fleet coordination/company structure
- Buy out or buy up licences
- Amalgamations

In order to evaluate options and alternatives, consideration needs to be given to the key driver for change and the new targets set for the fishery. Subsequently, the committee will develop some simple targets.
The topics for determination are:

1. Agree on the key driver(s) for change
2. Set targets
3. Analysis of available options
4. A review of a best fit option.

5. Key Driver for Change

The Committee should agree on a primary (and if necessary secondary) driver for the fishery to change. The primary driver for change that has been discussed in this fishery is declining profitability. There are various factors which have driven changes in the fishery, which include:

- variable costs of running the vessels are rising;
- prices are stagnant and reducing in real terms;
- Australian dollar is high decreasing international competitive edge for exports;
- competing with imported and local wild caught and aquaculture prawns;
- competition with employment packages with mining industry combined with a reduction in (real) wages is driving increasing staff turnover, which are;
    - reducing corporate knowledge in this prawn fishery,
    - leads to a risk of poorer quality prawns.
    - less experience crew intrinsically increases OHSW risks.

The majority of these factors are beyond the influence of the Association. However, changes in these factors can be estimated and subsequent plans established to how the fishery will respond, as such should be considered through the economic analysis of any selected structural adjustment.
To gain a global perspective and develop an understanding of the factors that the Association can directly influence with respect to economic improvement of the Spencer Gulf prawns fishery, and to develop a back ground to other experiences, consider extracts from an FAO report included in Appendix 1.

6. Target

The EOSC needs to set clear targets for this fishery to achieve through any structural adjustment. There are various economic measures which can be identified. The following are examples (taken from Econsearch report):

Boat Business Profit is defined as gross operating surplus (GOS) less depreciation less owner-operator and unpaid family labour. Boat Business Profit represents a more complete picture of the actual financial status of an individual firm, compared with GOS, which represents the cash in-cash out situation only.

Rate of Return to Capital is calculated as Profit at Full Equity divided by Boat Capital multiplied by 100. This measure is expressed in percentage terms and is calculated for an individual licence holder. It refers to the economic return to the total investment in capital items, and is a useful relative measure of the performance of individual firms. Rate of return to capital is useful to compare the performance of various licence holders, and to compare the performance of other types of operators, and with other industries.

Profit at Full Equity is calculated as Boat Business Profit plus rent, interest and lease payments. Profit at Full Equity represents the profitability of an individual licence holder, assuming the licence holder has full equity in the operation, i.e. there is no outstanding debt associated with the investment in boat capital. Profit at Full Equity is a useful absolute measure of the economic performance of fishing firms.

Economic Rent is defined as the difference between the price of a good produced using a natural resource and the unit costs of turning that natural resource in to the good. In this case the natural resource is the Spencer Gulf and West Coast Prawn fishery and the good produced are the landed Prawns.

7. Harvest target

Consideration should be given to the target harvest level and the ability of the management regime to assist in the targets being met. This fishery is currently harvesting at its maximum sustainable yield (Msy).

The alternative is to harvest at maximum economic yield (Mey). Mey sets a harvest strategy which is generally lower than Msy. Importantly, Mey takes into consideration the cost of fishing and price of the product. Bio-economic models provide a tool to assist fisheries in obtaining Mey. The advantages of Mey are that the fished biomass and fishery should be maximising its economic performance and creates a buffer against negative shocks (environmentally and economically).

8. Previous Concepts

There have been several submissions to the Management Committee in the past dating back to the mid-1980s. These options have been described in previous documents, which consider implementing:

- Individual Transferable Quotas (based on real time management)
- Voluntarily combine licenses (involves gear modification)
- Setting quota on one of the following attributes - time/nights/area trawled
- Buy-out effort
- Net transfers i.e. nets become a quota
- Purchase the Gulf of St Vincent fishery.

Other concepts are related to individual vessel cost management:

Reducing individual costs on the vessel:

- consider smaller engines with larger gear ratios and latest propeller and shaft technology to reduce fuel cost.
- modify fishing gear to reduce drag and effort, as demonstrated in the T90 trials or quad rigs.
- investigate options of an alternative to otter boards, such as the ‘batty’ wing.

9. Management Controls

Broadly there are two management controls: input and output controls.

Input controls – Generally simple to design and administer and allows the effort to adjusts to available stock. However there are disadvantages, they don’t necessarily lead to equitable access to resources. The strength of competition between fishers leads to investment into areas of operations that are not controlled by inputs. Structural adjustment is not driven by input controls.

Output controls – Generally output controls still maintain some input measures. These controls reduce competition between fishers, which can reduce capital stuffing. They can maximise operational flexibility and create a more secure access right. They require an economic model which can be expensive to maintain, are vulnerable to data corruption particularly through high grading, increased management costs and can lead to socio-economic changes in the fishery.

10. Individual Transferable Fishing (ITF) Rights

ITF rights refer to fishery being divided into units which are distributed to license holders. The effect of dividing up the fishery into units will generally lead to inefficient operations to be absorbed by efficient operations. ITFs traditionally have strengthened access rights to resources. ITFs can either be based on input or output controls.

Assumptions for success of ITFs

1. All individual rights are fully tradable (sale or lease) (transferable)
2. The rights exist for the long term (duration)
3. Retention of limited entry (exclusive)
4. Closures for biological/ecological purposes
5. Continued use of ECBM/By-catch mitigation gear
6. Ongoing research, data collection & compliance programs – may vary with each system
7. Need to consider economics

Criteria

1. **Equitable:** need to identify existing shares & determine translation formula; the 'share' of rights held under one system must not be diminished in moving to a new system.
2. **Flexible & Adjustable**: operators need flexibility to adapt to changing circumstances & to maximise returns; fishery needs to be adjusted to respond to biological or economic changes.
3. **Responsive:** capable of adjusting the fishery on either biological or economic grounds in a timely manner.
4. **Transferable**: allows operators maximum flexibility to trade up or down to suit their own operational/market demands.
5. **Economically efficient:** retaining as few inputs as possible to maximise opportunity for economically efficient exploitation.
6. **Simple & Cost Effective to manage:** easily understood by industry; simple administration & enforcement; legally defensible.

The benefits

1. Secure on-going access (property rights) for industry, sound investment base for financiers.
2. Flexibility for operators – individual decisions to buy, sell or lease are market based, not Government driven.
3. Effective tool to balance fishing effort and biological & economical sustainability.
4. An equitable tool for adjustment in the fishery when required (adjustment proportional across the fleet).

Types of Individual Transferable Fishing Rights

1. **Input controls**: gear units; boat units; boat days/ time units; effort units; pot units (Individual Transferable Effort Units or ITEs).
2. **Output controls**: Individual Transferable Quotas (ITQs) – issued as kilos of prawns.

Input Controls

The following represent possible input units, through an ITF system:

Boat Days/Time Units – licences are allocated a set number of nights or a time unit which allow access to the fishery. A time unit would be a percentage of total allowable nights allowed for a season which would be adjusted according to the stock levels. The nights or time units could be traded through either leasing or sale.

Effort Units – can represent gear type by time or swept area or vessel size by time. Similarly to time units, a gear unit would be issued to licences on a unit basis. The number of units would be influenced by the available stock.

Gear Units – represent an allocation of equipment which can be transferred between vessels, such as head line length.

Benefit

- Generally acceptable to industry – often based on catch history,

- Generally more cost effective,
- Flexible and responsive for adjustment ,
- Benefits of individual decisions to increase efficiency dissipated across the fleet.

Risk

- Not always effective at controlling effort,
- Can impose economic inefficiencies,
- Rent dissipation can occur if capacity adjustment doesn't occur (fishing inefficiently).

Output Controls

Output controls can be represented by Individual Transferable Quotas (ITQs). The ITQs would be established through a Total allowable Catch (TAC) which relies on research and a proven bio-economic model. ITQs result in an allocation of kg to each licence holder.

Assumptions for ITQ

- Requires robust scientific data / stock assessment (+ economics if managing to MEY) & TAC predicting methodology – survey information can assist. The accuracy of predictive models are important as an under prediction results in underutilisation & an over prediction can result in a stock collapse.
- Models are heavily reliant on data, including annual data collection.
- Best results generally in single long lived species.
- Few short life cycle (less than 6 years) multi species fisheries managed under ITQs though some high volume, high value fisheries eg African anchovy/sardine , NZ arrow squid & Icelandic capelin fisheries.
- No prawn fishery currently managed under ITQs (Mozambique Shrimp fishery closer to Total Allowable Catch system).
- NPF investigating ITQs.
- Flexibility to maximise catch for least cost, economic efficiencies, facilitates flexible trade/autonomous adjustments, limits catch.
- Single species fisheries are more suitable to quota management, subject to stock status.
- Potential loss of revenue from high grading and discards.
- Compliance, research and administrative cost are higher. Need to consider how co-management may offset these costs.
- Issues of 'corporatisation' and concentration of ownership.

Allocation

- Allocation is the controversial issue in moving to any new system or implementing adjustment programs.
- Fisheries are generally more interested in what they are going to get rather than how a new system works.
- Fishing history (catch, vessel size, and horsepower), financial investment; administrative decision; auction/tender are all mechanisms used in allocations.

11. Company model/self-governance

The company model is based on the experience of the Challenger Scallop Company. In response to dwindling stock and the establishment of a seeding program, the individual licences in the scallop industry in New Zealand Challenger region combined to establish a company to manage the business of

reseeding areas. Later further steps were taken to manage the fishery, including the science and data collection resulting in the company moved the fishery towards self-management. The following are key points:

- Self-governance or a company model is focused on internalizing the decisions related to fishing and fisheries management – short term and long-term – within the industry.
- It is about empowering the industry to take advantage of property rights to increase the value derived from the resource.
- Allows licence holders to have more flexibility to take action to make decisions to optimise revenues and reduce costs.
- Strong property rights together with self-governance allows a fishery to operate as a sole operator.
- Internalise decisions about risk and future prices to set catches to maximise the present value of the available resource.
- Make economically efficient decisions about the nature and extent of research services and compliance.
- Fishermen work together as co-owners to make tough economic decisions and collectively benefit from those decisions.

12. Buy outs (or buy ups)

An alternative measure is to buy out boats from the fishery. This in effect will allow the removed effort and catch to be distributed between the remaining vessels, potentially increasing revenue for remaining businesses. A buy out at this point in time would not receive direct financial support from the Government, as such, a funding mechanism would need to be developed.

A buy out of the fishery would need to consider value of removing effort from the fishery against the costs generated by its removal combined with the additional costs incurred through harvesting greater volumes of prawns. Determining the value of licences would need to be considered, which could potentially influence whether they are compulsorily or voluntarily acquired.

A limitation of buy backs is that it is does not establish an ongoing mechanism which can adjust to future changes in economic conditions. There are also risks of increases in capital investment which could lead to erosion of improved revenue in the race to catch more prawns.

The option of buying up the Gulf of St Vincent and other fisheries is a consideration, which will allow an expansion of the fishery. Similar issues surround a buy up as with a buy back, i.e. values, debt levels and benefit.

13. Amalgamations

The concept of amalgamating licences is equivalent to implementing a gear unit, such as headline length, then halving it. Consideration in an amalgamation would require an understanding of the value of the amalgamated licences, transfer of costs associated with the remaining vessels etc. Other factors to consider are whether the amalgamations would be considered compulsory or would be constituted as a component of a buy back scheme as implemented in Shark Bay.

Amalgamations, similarly to buy backs, share similar advantages and disadvantages.

14. Parameters for consideration

The following is a list of parameters that should be considered in determining any future changes. They may assist in clarifying and weighing up options of particular strategies that may be recommended.

- **MSC Certification** – may improve value of product and ensure that changes fit within the MSC criteria.
- **Real Time Management** – current management strategy to use stock assessment and spot surveys to decide on harvest strategies, creating a sustainable flexible approach to access the biomass.

- **Ecosystem and TEPS impacts** – need to consider any changes of risk or impacts on the ecosystem and TEPS.
- **Stock management** – ensure that prawn biomass is managed.
- **Survey Cost** – the cost of undertaking stock assessment and ecological impact research.
- **Culture of SG prawn fishery** – family owned businesses will influence strategies and ability to adapt to change.
- **Crew maintenance** – maintain product quality and low OHSW risks.
- **Compliance cost** – need to consider the changes in compliance costs with any management changes.
- **Management costs** – need to consider any management cost with any changes in the fishery.
- **Co- management** – consider the involvement and tasks of PIRSA and the Association under a new management regime.
- **Internal adjustment costs** – adjustment of the fishery may result in cost associated with making adjustments.
- **Carbon Tax** – manage future impacts of the tax.

APPENDIX 1.

The following extracts have been included from a FAO report; Gillett, R. Global study of shrimp fisheries. *FAO Fisheries Technical Paper.* No. 475. Rome, FAO. 2008. 331p.

> "The recent world shrimp catch is about 3.4 million tonnes per year, with Asia as the most noteworthy area for shrimp fishing. World production of shrimp, both captured and farmed, is about 6 million tonnes, of which about 60 percent enters the world market. Shrimp is now the most important internationally traded fishery commodity in terms of value. In many tropical developing countries, it is the most valuable fishery export; the employment aspect is also significant."

Profitability

In examining shrimp fishing in ten countries, one of the main features to emerge is the current low profitability of many commercial shrimp fishing operations. The typical situation consists of rising costs (mainly fuel) and falling revenue from shrimp sales (resulting to a large degree from competition with lower-cost farmed shrimp) in an environment where there is overcapacity. A number of measures to improve the current situation of poor profitability have been implemented or recommended. The most important measures are: increased attention to fuel costs, fleet reduction, market promotion, subsidies and import barriers. The boldest move to improve the profitability of domestic shrimp fishing in recent years has been the initiative in the United States to restrict the import of farmed shrimp on the basis that it has been dumped on the market.

Resource rent

Resource rent can be defined as the difference between the revenue from a fishery resource and the costs of exploiting it, including capital costs. In a broader sense, if non-monetary costs and benefits are taken into account, rent can be considered as the net economic return from a fishery to society. Good management regimes tend to increase rent; others, especially open access, can dissipate it. Unfortunately, information on the amount of resource rent available appears to have been estimated for only a few of the world's shrimp fisheries.

Prioritizing objectives

It is difficult to prioritize the incongruous and conflicting objectives that are often set for shrimp fisheries. On a practical level, one situation is especially common – attempting to maximize economic yield in an open access regime. An important objective of open access shrimp fisheries, probably more common in the world than restricted access, is often to maximize employment. This is, however, incompatible with the economic efficiency needed to generate maximum economic yield.

Impacts of shrimp farming on shrimp fishing

The main effects of shrimp farming on shrimp fishing are:

- economic impacts in the marketplace;
- the destruction of mangrove forests for shrimp aquaculture operations;
- the capture of shrimp postlarvae and broodstock for farming;
- escapes of cultured shrimp into the wild;
- the "trash fish" issue.

Overall, shrimp farming has had a substantial impact on shrimp fishing activities, from the fishery level to the international level. Interaction in the marketplace seems to have the most effect, at least during the present period of low profitability. The total impact of shrimp farming cannot be quantified, but the net result has been lower prices.

From the mid-1990s to 2005, a major feature in the world shrimp market was generally falling prices. Ward et al. (2004) indicate that from 1997 to 2002 in the United States, ex-vessel prices declined by 27 percent in the Gulf of Mexico and 24 percent in the Southern Atlantic States Shrimp Fishery, as imports increased by 300 percent.

In Japan, there was a general downward trend in prices from the mid-1990s. In the European Union (EU), combined penaeid import prices mostly declined from 2000, but prices for some captured species increased. Cold-water shrimp prices, as judged from Pandalus borealis prices in the United Kingdom, show a downward trend from the mid-1990s. Although increased aquaculture production is the main cause of the fall in prices, Globefish (2003) also notes other causes in the early 2000s.

Demand weakened in key markets, particularly the United States of America, following the events of 11 September. Difficult economic conditions in Japan, as well as the weak yen, meant reduced demand and downward pressure on prices in that market. In the EU, the appreciation of the euro vis-à-vis *the dollar effectively reduced import prices for shrimp products normally quoted in dollar terms.*

Since late 2005, the shrimp price situation has changed. Because of higher demand and lower expected aquaculture production, especially in Thailand, shrimp prices have been increasing. At least part of the increased demand is from Thailand and China where domestic consumption is rising.

Important Issues in the Shrimp Trade

Three important issues in the shrimp trade deserve special attention: the United States trade measures relating to turtle conservation, United States anti-dumping tariffs and ecocertification of shrimp fisheries.

Relative fuel consumption still compares favourably with other animal protein production systems. With an energy used/energy produced ration of 0.095 (about 10 percent), the fuel consumption in 29 North Atlantic fisheries appears to be about five times more efficient than beef production, 4.5 times more than lamb production, three times more than chicken production, 1.5 times more than swine production and much more efficient than most aquaculture systems (Tyedmers, 2004).

Fuel Saving

According to the ten countries studied, operational measures used in shrimp fisheries to mitigate fuel cost increases include: using multiple nets (Figure 24); lightening the fishing gear; using sled-type doors for otter trawling; switching from otter trawling to pair trawling; reducing bycatch; using improved netting material; avoiding trawling against tidal currents; basing shrimp vessels closer to fishing grounds; fuelling offshore; smuggling fuel; and remaining in port until the fuel and/or catch situation improves.

Improving Profitability

A number of measures to improve the current situation of poor profitability have been implemented or suggested. The most important are increased attention to fuel costs (discussed in Chapter 7), fleet reduction, market promotion, subsidies and import barriers.

Considerable optimism is shown by both fishery managers and commercial operators in many parts of the world that reducing the number of vessels participating in a fishery will increase the profitability of the remaining vessels. This is often expressed in general terms but, in Nigeria and the United States, there has been some quantitative work.

- *Economic revival (of the shrimp fisheries in Nigeria) will depend upon either prices rising or catch rates improving, as there is little scope to reduce costs. If prices don't rebound, then the principal option facing the industry must be to reduce overall capacity to allow unit catch rates to increase for the remaining vessels, a situation that may be faced by much of the world's shrimp fisheries. This is already happening with the Nigerian fleet – and an indication of the eventual impact on the fleet if prices remain at current levels can be estimated as follows: to restore profitability, catch rates would need to increase by 50 percent (i.e. from 60 to 90 tonnes per boat per year). This would imply a fleet reduction of at least 35 percent, or reducing the fleet to around 100–110 boats* (Chemonics, 2002).

- Ward *et al*. (2004) examined the economics of the Gulf of Mexico and Southern Atlantic States Shrimp Fishery. Simulation analysis found that with low shrimp prices, economic profits are negative and, at the end of 2004, a reduction of 30 percent of permits/licences of the large vessels would be needed to yield positive economic profits in 2005. For small vessels, positive economic profits can be achieved only for the 50 percent fleet reduction.

Reductions in shrimp fleet sizes to improve profitability have been undertaken in several locations, including Australia and the industrial fisheries in Madagascar. On the other hand, small-scale shrimp fisheries are often unprofitable, but there are few cases, if any, where management has reduced small-scale shrimp fishing fleets to improve economic performance.

Reduction in fleet size or capacity (e.g. through vessel numbers or gear restrictions) will not necessarily increase profitability in the long term. In input-controlled fisheries, which cover most shrimp fisheries, the incentive remains to innovate and rearrange inputs to become relatively more effective. Each operator introducing an innovation (e.g. a new net or otter board design) will enjoy a short-term benefit, but this will diminish as others adopt the new technology and effort creeps forwards, eroding profitability as fishing capacity increases and CPUE falls or seasons shorten.

Market promotion exercises have been carried out in several countries to improve profitability. The Mexican Shrimp Council (*Consejo Mexicano del Camarón*) and Ocean Garden Products of San Diego, the largest Mexican shrimp importer in the United States, launched a marketing campaign in March 2004 to promote the flavour and texture of shrimp from Mexico. The campaign, touted as "The Naked Truth About Shrimp", is designed to give farmed and wild Mexican shrimp the brand recognition that products such as Colombian coffee and Mexican tequila already enjoy.

When you've got something this good, why cover it up? Our south-of-the-border beauties come from the most pure ocean waters of a sun-drenched climate. This nutrient-rich environment paired with the VIP treatment means our happy swimmers come to you perfect in taste and texture – as is. All you'll ever really need are a few culinary essentials to bring out their natural flavor. Simple is good. Naked is best (www.mexicanshrimp.org).

At least some of the premium price paid for Madagascar shrimp in Europe has been obtained through market promotion exercises. The Norwegian Seafood Export Council has also carried out some effective publicity work for cold-water shrimp (Figure 25).

Some market promotion exercises are quick to take advantage of new opportunities. In September 2007, the marketing group Wild American Shrimp (WASI, affiliated with the Southern Shrimp Alliance *[United States anti-dumping action]*) launched a marketing campaign and fund-raising activities associated with new concern in the United States over the safety of Chinese seafood products. WASI feels that this is creating a new selling opportunity for shrimp caught in the United States. To take advantage of this situation, WASI indicates that it needs additional funds to the US$10 million in federal grants received over the last four years for the marketing campaign (IntraFish, 2007).

When profits collapsed in the United States shrimp fishing industry, several measures were proposed by NMFS, including a major marketing programme. Analysis of this proposal (Ward *et al*. 2004) showed that market promotion efforts would have to result in a 15 percent increase in ex-vessel price to eliminate the negative economic profits for smaller vessels. A 5 percent increase in ex-vessel price would increase revenues by 2.25 percent and employment by 2.24 percent. Significantly, the analysis concluded that market promotion and other attempts to improve prices would not be successful unless the number of vessels participating in the shrimp fisheries is limited.

Subsidies are another mechanism that has been used to improve the profitability of shrimp fishing. Most of the obvious subsidies are related to fuel costs (Chapter 7), but others are granted on a per vessel basis, or consist of measures such as tax waivers, low interest loans or provision of infrastructure. Many, but not all, subsidies are harmful (Box 19). Several types of subsidy interventions have been used for shrimp fishing, including those to reduce costs of shipbuilding (Australia), to import vessels (India) and

to fit out vessels (Nigeria). In general, the fully or overexploited nature of many shrimp fisheries has tended to reduce government enthusiasm for subsidies, while shocks such as fuel prices and competition with farmed shrimp have resulted in more pressure on governments to grant subsidies. Subsidies to shrimp fisheries are especially sensitive. Kura *et al*. (2004) make a strong case that government fishing subsidies are a leading factor in the excess capacity of the world's fleets. It is well known that many, if not most, of the world's shrimp fisheries suffer from overcapacity. It is therefore ironic that many of these fisheries continue to receive various types of subsidies.

The boldest move to improve profitability of shrimp fishing in recent years has probably been the initiative in the United States to restrict the import of farmed shrimp on the basis that it has been dumped on the market. In December 2003, the Southern Shrimp Alliance (SSA), a lobbying organization formed by shrimp fishers and processors in eight southern states, filed an anti-dumping petition with the United States Department of Commerce against shrimp farms in Brazil, China, Ecuador, India, Thailand and Viet Nam. In July 2004, the Department imposed duties varying up to 113 percent on these countries. SSA claimed it was seeking protection from an unfair trade practice, but some commentators saw it as a form of unfair protection from foreign competition. The United States shrimp industry is likely to have profited in three ways from the tariff: from reducing the quantity of imported product on the United States market; from a United States law (the "Byrd Amendment"), which gives the duties collected to the aggrieved United States party (some US$150 million); and from a deal between SSA and foreign producers (worth several million) to avoid reappraisal of the dumping duties (The Economist, 2006).

Although SSA efforts were initially successful, subsequent analysis shows that foreign entrepreneurs reacted creatively to thwart the United States restrictions. Shrimp buyers in the United States switched to new suppliers of frozen shrimp, and foreign producers subject to the tariff switched production to shrimp products exempt from the tariff. The amount of shrimp imported into the United States actually increased – including that from many countries subject to the anti-dumping measures. Action by the United States Government also reduced the impact: in February 2007, the "Byrd Amendment", was repealed and in August 2007, Ecuador was removed from the list of countries subject to the extra duty (Mathews and Dunaeva, 2007).

Resource Rent

Resource rent can be defined as the difference between the revenue from a fishery resource and the total costs of exploiting the resource. In a broader sense, if nonmonetary costs and benefits are considered, rent can be considered as the net economic return from a fishery to society. In limited access fisheries, resource rent can be kept by fishers (as super profits) or collected by management authorities (and returned to the public) through licence fees.

Good management regimes tend to increase rent; others, especially open access, can dissipate it. Accordingly, changes in rent can be an indicator of the economic performance of a fisheries management agency. For example, the performance of the AFMA in managing several shrimp fisheries under its jurisdiction is to some extent determined by changes in resource rent levels of these fisheries.

Resource rent has not been determined for many shrimp fisheries in tropical countries. The situation in Indonesia seems typical where, according to the Director of the Centre for Marine and Fisheries Socio-Economic Research, there have been few rent studies on any of the fisheries (A. Purnomo, personal communication, December 2005). Elsewhere, many fishery managers encountered during the present study are only vaguely aware of the concepts related to resource rent. Few managers appear to use the amount of rent when managing shrimp fisheries. Chapter 4 indicates that in many countries, the gross value of the shrimp catch is often used by fisheries managers for making decisions, such as trade-offs between fisheries, simply because the numbers are available and comparable. This is unfortunate, because resource rent is in many respects a better indicator of the value of a fishery to society.

Information on resource rent is readily available for several shrimp fisheries in developed countries.

- Galeano *et al*. (2004) give the rent in the NPF ($A33 million of resource rent in the 2001/01 season), the Torres Strait Prawn Fishery ($A2.8 million in the 2001/01 season), and the Southeast Trawl Fishery ($A2 million average for several years).
- Ward (2006) determines the resource rent level for the Gulf of Mexico shrimp fishery in the United States at US$2.11 billion. By introducing optimal yield management strategies and property rights into the fishery, a rent of US$4.19 billion could be obtained.
- Christensen and Vestergaard (1993) state that in 1991 the rent in the Greenland Shrimp Fishery in the Davis Strait was between US$33.8 million and US$104.8 million.

Limiting access is often difficult but, if implemented in the early stages of a fishery, the transition can be less expensive and more effective. Two examples illustrate the difference. In 1967, commercial prawn fishing began in South Australia's Gulf of St Vincent. Limited entry was introduced in 1968 and participation in the fishery was further reduced in 1987. Indicators show that the management objectives of "optimizing economic returns to stakeholders" are being achieved (Zacharin, 1997).

In Texas, United States, shrimp fishing developed rapidly after 1920 and in the 1930s a closed season and gear restrictions were implemented, but increased participation in the fishery created economic problems for the shrimp fleets. To improve the economic performance of the shrimp fishing, in 1995 the Texas Legislature enacted the first bay and bait shrimp vessel licence limited entry programme. Since the implementation of the licence buy-back programme, the Texas State Government has purchased and retired 815 commercial shrimp boat licences (422 bay and 393 bait) at a cost of approximately US$4.3 million. This represents 25 percent of the 3 231 licences of 1995.

Since the buy-back programme was not entirely successful at restoring profitability, additional management measures were implemented in 2002 (TPWD, 2002).

Economic Impacts in the Marketplace

The best studied example of economic interaction between shrimp fishing and shrimp farming occurred a few years ago, when large amounts of cheap imported farmed shrimp came on the market in the United States. In simplistic terms, the supply of shrimp on the world market soared mainly as a result of farming operations; prices decreased; imports into the United States increased; and prices paid to domestic fishers fell, causing a demise of warm-water shrimp fishing in the country. According to Ward *et al*. (2004), major impacts are the following.

- Since 1980, much of the growth in world shrimp production has been the result of successful farming activities throughout the world, particularly in Asia and, to a lesser extent, in South and Central America. World production of farmed shrimp in 1980 was about 160 million pounds19 (live weight), which accounted for approximately 5 percent of total world production at the time. By 2001, farmed production had advanced to 2.8 billion live-weight pounds, or more than 35 percent of total world warm-water shrimp output.
- There was an 11 percent increase in world farmed shrimp production from 2000 to 2001, representing an additional 280 million pounds of shrimp (live weight) on the world market.
- From 1997 to 2001, import prices (in constant United States dollars) declined from US$5.20 to US$4.25; shrimp imports into the United States increased by about 50 percent; and prices paid to domestic fishers declined from US$2.13 to US$1.73.
- Analysis shows that the ex-vessel shrimp price should decline 84 cents per pound for every hundred million pounds of shrimp imported into the United States.
- Although farmed shrimp imports were responsible for much of the price decrease, other factors could have contributed, including the varying conditions of national economies, tariff structures and tolerance levels for banned chemical substances.

Shrimp price declines, at least partially a result of the increased availability of low cost farmed shrimp, were not confined to the United States. From the mid-1990s to 2005, a major feature in the shrimp markets was that prices were generally falling. In Japan, there has been a general downward trend in prices from the mid-1990s. In the EU, combined penaeid import prices mostly declined from 2000 to 2005.

Since late 2005, the shrimp price situation has changed, with farmed shrimp once again responsible to some degree. Lower than expected aquaculture production, especially in Thailand, together with increased Asian domestic consumption, have been causing shrimp prices to increase.

Globally, the effects of cheap farmed shrimp are felt in most shrimp fishing fleets, especially those that target the major international markets. The resultant income declines are a major component of the current worldwide shrimp fishing "profit squeeze". The typical current situation for shrimp vessels is rising costs (mainly fuel) and falling revenue from shrimp sales (competition with lower-cost farmed shrimp being a major component) in an environment where there is overcapacity.

Several measures are being discussed or implemented to mitigate the adverse economic effects of shrimp farming on shrimp fishing. At the level of the individual vessel, low shrimp prices (from whatever cause) reduce profitability and, consequently, the means to increase revenue (e.g. higher catch rates) or lower expenses (e.g. fuel efficiencies) are pursued. At the fleet level, capacity reduction is often attempted in restricted access fisheries. At the national level, subsidies, trade promotion and trade restrictions are used.

The boldest example of such a trade restriction was the initiative in the United States to restrict the import of farmed shrimp, on the basis that it had been dumped on the market (Chapter 5, section *Important issues in the shrimp trade*). In December 2003, the Southern Shrimp Alliance, a lobbying organization formed by shrimp fishers and processors in eight southern states, filed an anti-dumping petition with the United States Department of Commerce against shrimp farms in Brazil, China, Ecuador, India, Thailand and Viet Nam. In July 2004, the Department imposed duties varying up to 113 percent on farmed shrimp from these countries.

Appendix 1.12. Economic Indicators for SGPF

Economic Indicators for the Spencer Gulf & West Coast Prawn Fishery

Economic Optimisation Workshop
7-8 September 2012

Julian Morison
EconSearch Pty Ltd

econsearch

Overview

- Economic Indicators
- Spencer Gulf & West Coast Prawn Fisheries

econsearch

Economic Indicators

- Catch, gross value of production and prices
- Cost of management
- Boat level financial performance indicators
  - average income
  - operating costs
  - cost-price squeeze
  - profitability
  - return on investment

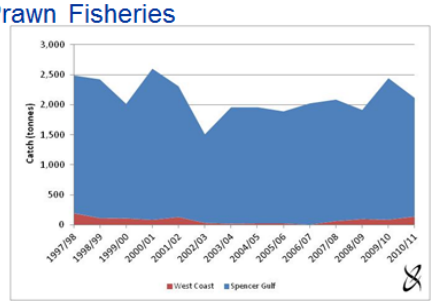
econsearch

Economic Indicators

- Economic impacts
  - Output
  - GSP
  - household income
  - employment
- Economic rent
- Other indicators

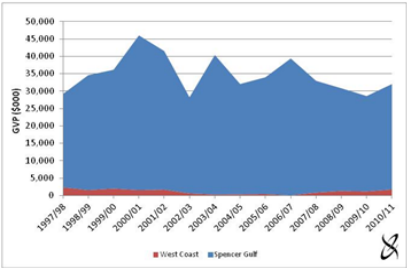
econsearch

Catch in the Spencer Gulf & West Coast Prawn Fisheries



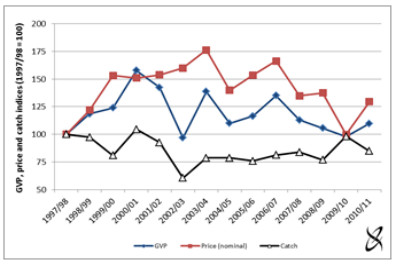
econsearch

Catch and GVP in the Spencer Gulf & West Coast Prawn Fisheries



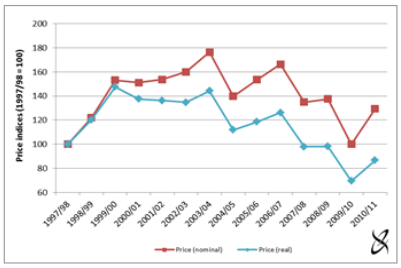
econsearch

GVP, Price and Catch Indices SGWC Prawn Fisheries (1997/98=100)



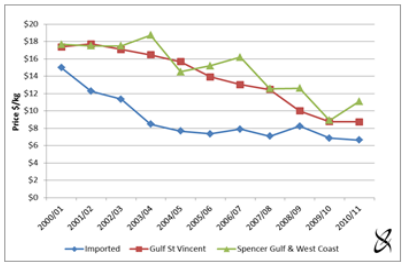
econsearch

Price Indices SGWC Prawn Fisheries (1997/98 = 100)



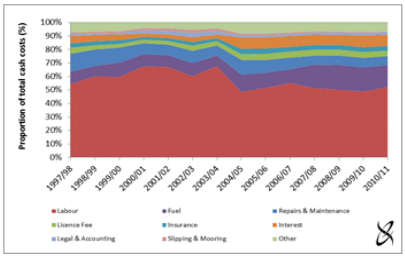
econsearch

SGWC, GSV and Imported Prawn Prices



econsearch

Cost Shares, SGWC Prawn Fisheries



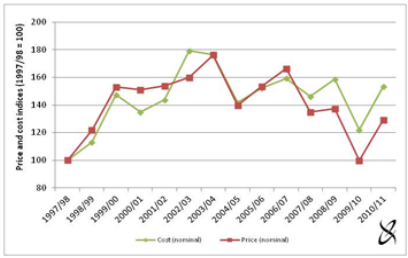
econsearch

Costs of Management, SG Prawn Fishery

	Licence Fees ($'000)	Gross Value of Production ($'000)	Fees/GVP (%)	Catch (tonnes)	Fee/Catch ($/kg)	Licence Holders (no)	Fee/Licence Holder ($/licence)
Spencer Gulf							
1996/97	648	20,389	3.2%	1,647	$0.39	39	$16,603
1997/98	916	26,859	3.4%	2,300	$0.40	39	$23,490
1998/99	732	33,074	2.2%	2,315	$0.32	39	$18,775
1999/00	653	34,198	1.9%	1,910	$0.34	39	$16,739
2000/01	605	44,518	1.4%	2,522	$0.24	39	$15,508
2001/02	568	39,873	1.4%	2,182	$0.26	39	$14,557
2002/03	671	27,681	2.4%	1,479	$0.45	39	$17,193
2003/04	753	40,171	1.9%	1,943	$0.39	39	$19,316
2004/05	734	31,759	2.3%	1,939	$0.38	39	$18,826
2005/06	803	33,610	2.4%	1,870	$0.43	39	$20,587
2006/07	899	39,386	2.3%	2,024	$0.44	39	$23,053
2007/08	1,012	32,163	3.1%	2,028	$0.50	39	$25,959
2008/09	963	29,549	3.3%	1,821	$0.53	39	$24,700
2009/10	917	27,447	3.3%	2,361	$0.39	39	$23,508
2010/11	921	30,335	3.0%	1,979	$0.47	39	$23,617
2011/12	921	n.a.	-	n.a.	-	39	$23,619

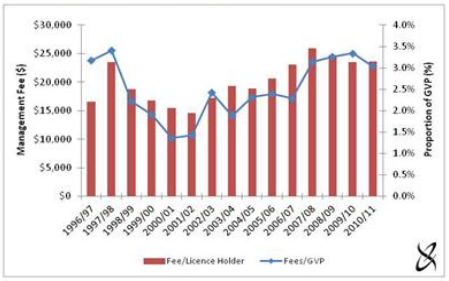
econsearch

Cost-Price Squeeze, SGWC Prawn Fisheries



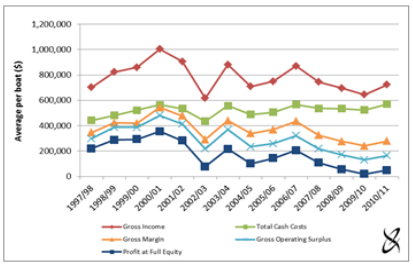
econsearch

Fee per Licence Holder & Fee as a % of GVP, SG Prawn Fishery



econsearch

Income and Profit, SGWC Prawn Fisheries



econsearch

Survey Results

- Financial performance indicators
  - Income, costs and profitability as an average per boat
- Economic impact of the fishery
  - Direct and flow-on economic benefit created as a result of the operations of the fishing industry
- Economic rent

econsearch

Return on Investment, SGWC Prawn Fisheries

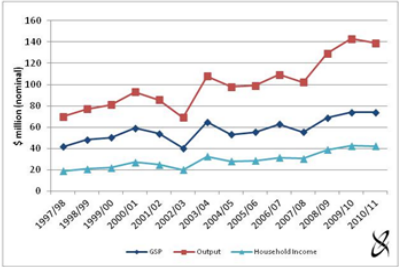
econsearch

Economic Impact of the SGWC Prawns Fisheries in SA, 2010/11

Sector	Output	Employment	Household Income	Contribution to GSP
	$m	fte jobs	$m	$m
Direct effects				
fishing	32.0	185	12.5	22.1
downstream	30.2	230	8.9	13.6
Flow-on effects	76.9	346	20.9	38.2
Total	**139.1**	**760**	**42.2**	**73.9**
Total/Direct	2.2	1.8	2.0	2.1
Total/Tonne	$65,700	0.36	$19,900	$34,900

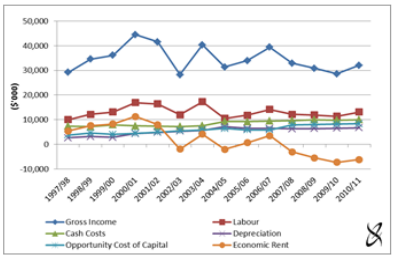
econsearch

Economic Impact of the SGWC Prawns Fisheries in SA, 2010/11



econsearch

Economic Rent in the SGWC Prawn Fisheries, 1997/98 to 2010/11 ($'000)



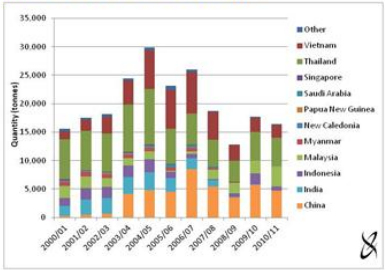
econsearch

Other Indicators

- Prawn imports to South Australia
- Prawn exports from South Australia
- Exchange rates

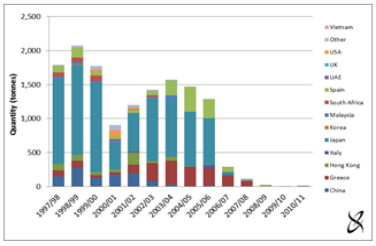
econsearch

Prawn Imports to SA by Country of Origin, 2000/01 to 2010/11



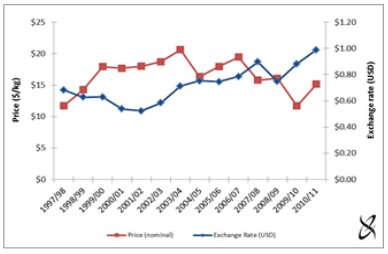
econsearch

Prawn Exports from SA by Destination Country, 1997/98 to 2010/11



econsearch

Exchange rates and SGWC Prawn prices, 1997/98 to 2010/11



econsearch

Appendix 1.13. Spencer Gulf Prawn Fishery Economic Model

The model is in a relatively basic form (early stage of development) but suitable for looking at scenarios that involve variations to one or more of the following:

- Annual catch
- Prices
- Effort creep
- No. of boats leaving the fishery annually (assumed to be leaving via a buy-back funded by the remaining boats)

Values for each of these variables can be entered in the first sheet of the model 'Base Assumptions'. Cells that can be changed are coloured green and all others are locked.

The model allows for three scenarios to be calculated at one time (S1, S2, S3).

The model generates outputs over a 10-year period so input assumptions are required over that period as well.

- For the annual catch variable, the last 7 years is taken to be an average of catch in the base year and first 3 years.
- For the price variable, the user inputs a value that will be used for each of the last 7 years.
- Similarly for the effort creep variable, the user inputs a value that will be used for each of the last 7 years.
- For the number of boats leaving the fishery, the user can input the number of boats leaving in each of the 10 years.

Also on the 'Base Assumptions' sheet the user can input:

- The start year for the analysis – currently set at 2012 which means the first year is the 2012/13 season.
- The number of boats in the fishery in the start year – currently set at 39
- The opportunity cost of capital – currently set at 5%. This value is used only in the calculation of economic rent for the industry/fishery level analysis.
- The Licence value/GVP response – this determines how average licence values change when the GVP per boat (gross income) changes. Currently set at 0.4 (or 40%) which means if the GVP per boat increase by 10%, the estimated licence value will increase by 4%.
- Average cost of buyback debt – currently set at 8%. This is used to calculate interest payments for the boats remaining in the fishery.

The only other places for user input are in the:

- 'Boat Costs' sheet, row 43 - Adjustment to Baseline Licence Value, currently set at 20%. This variable allows the user to modify the baseline licence value (=$3.2m), which is likely to be above the current market value. In the model the licence value will determine the cost of the buy back and hence the level of interest payments.
- 'Base Year Data' sheet, cell AM3 – Skipper & Crew share, currently set at 35%. Adjustments to this variable will directly affect the labour cost. This assumption applies to all scenarios, i.e. can't be varied between scenarios.

The boat level data are linked to the baseline data and can't be edited at this stage. The data are identical for scenarios 1, 2 and 3. The objective is to have the option of editing the boat level data or having one of the boats as the fishery average and the others as high catch and low catch or even the user specifying the costs, catch, CPUE, etc. for their own boat, so they could see the implications for them and compare to the fishery average. However, it will take some further development to build that functionality into the model.

The other sheets in the model are either outputs (results), data or calculation sheets, as follows:

- ‘S1 Boat’, ‘S2 Boat’ and ‘S3 Boat’ – detailed results over 10 years for the average boat in the fishery for each of the three scenarios
- ‘S1 Summary’, ‘S2 Summary’ and ‘S3 Summary’ – summary results over 10 years for the average boat in the fishery and for the fishery as a whole for each of the three scenarios
- ‘S1 Licence & Debt’, ‘S2 Licence & Debt’ and ‘S3 Licence & Debt’ – summarise over 10 years the number of boats, GVP, level of debt, repayments, licence fees per boat, etc.
- ‘Mthly catch by grade’, ‘Mthly price by grade’ and ’Mthly GVP by grade’ – sheets calculating catch, price & GVP according to base data and inputs in ‘Base Assumptions’ sheet.
- ‘3yr catch by grade by month’ and ‘20 yr catch & CPUE’ – baseline catch and CPUE data from SARDI.

Please keep in mind that the model was developed to this point just to consider some scenarios at the economic optimisation workshop (West Beach, 6-7 September 2012), so it is quite basic. However, it could be extended to look at other structural change scenarios.

Notes prepared by:
Julian Morison
EconSearch Pty Ltd

Appendix 1.14. SGPF Draft Outcomes for Workshop 3

Economic Optimisation Workshop preliminary draft outcomes
Provided a summary of the fisheries economic statistics.
Agreed the costs of running the prawn boats business are increasing.
There is a large difference between business value of license and owners expected value.
Agreed that the bottom line is getting smaller; payment of crew is a large issue, costs of operating continually creep up.
Need to include forward projections of fuel, Australian dollar, labour and other data that effect operational costs or prices.
Agreed that the major external factors are:

	Rate influence	**Note**
Prices	Low influence.	High investment of marketing costs with no guarantee for a return.
Australian Dollar	No influence	Market forces, predicted that parity in the norm for the medium term.
Imports	Very low likelihood of impacting on any direct changes o imports,	Difficult to influence Cwth trade policy to introduce "tariffs". Not influence production levels.
Employment competition	No influence.	Mining will continue to offer high wages.
Operational costs: Labour/Fuel/insurance	No influence individual business.	Ability to reduce costs on a fleet wide basis through a reduction in the number of operational vessels.

Note that land base businesses are driven to rationalise through high unserviceable debt. – Noted that this is not the current situation for the prawn fishery.

Harvest Strategy

There was discussion around the fact that there is possibly some 'fat' in the harvest strategy and there is potential to push the effort up slightly. It was noted that the fishery had become relatively stable, however to increase effort will increase risks of reduced stock stability, hence business certainty.
ACTION: Investigate the option of pushing up effort in the Nov/Dec harvest strategy to test the current strategies.
Management plan is under review.
ACTION: Management Committee to follow up a review data to push boundary of current fishing volumes. Evaluate the harvest strategy to determine if the current strategies are not being too conservative.
Short discussion with regard to improved efficiency of gear. Quad rigs are considered to improve fuel use and maintain catches, generating a small saving to the fishery.
ACTION: Literature review of net configuration efficiencies. It is recommended that the Management Committee to investigate gear trials.
ACTION: It was recommended that marketing and promotion is should be treated as a work in progress.

Target for establishing sustainable catches

Management Plan should potentially change focus to economic + biological to move towards sustainable profitability, maintaining underlying stock sustainability.
ACTION: It was recommended that the Association improve the understanding and application of Mey.

Indicators

Life style was considered an important aspect in remaining and operating in the fishery. Are there Life style indicators?
Action: Remove GVP as an economic indicator. Use "Whole of fishery profit" (aka economic rent) as an indicator *(what value or change to provide trigger??)*

Restructure through buy backs

Lengthy discussion on Buy-backs – presentation of model. A large challenge is to manage licence value through buy back.

Discussion resulted in more questions. What is license's value? What is economic affordability? What are the new efficiencies?

Two groups reviewed options discussed.

Group 1 review of tradable management options:

Characteristics	**Nights**	**Gear Units**	**Gear x Time**	**ITQs**
Equitable	2.5	3	3	3
Flexible / Adjustable	3	2	3	3
Responsiveness	3	2	2.5	2
Transferable	3	3	3	3
Economically efficient	2	2	2	3
Simplicity / Cost effective	3	2	1.5	1
Legally defensible	3	3	3	3
Allocation complexity	3	3	3	2
	22.5	**20**	**21**	**20**

Additional comments

	Night Units	Gear Units	Gear by Time units	Individual Transferable Quotas
Management Implication	Can vary value of a night on temporal / seasonal considerations. Low cost administratively simple.	Low cost administratively simple once you define the nature of the unit (head rope length).	Can be complex compared to other systems. Need to define the nature of the units. How to monitor against target limits for nightly catches twin v triple?	What process / values would be used to allocate- catch, entitlement, effort? Management systems – TACC setting, reporting, quota, integrity.
Benefits / Negatives	Can create need to fish sub optimally to meet available nights. Fleet has a level playing field on fishing nights now – is a night equal across the season? Can be adjusted.	Can be adjusted up or down to suit sustainability. Can be costly for monitoring, Can lead to greater efficiency and limited effort creep in NPF. Higher level of compliance monitoring required.	Can add costs for implementation, management and monitoring.	Could create allocation based on temporal values x Real Time Management information. Is high grading an issue – manage size by other gear or technologies?
Operational costs	Initial set up of system for monitoring (a register). Low cost options compared to ITQ. Need to maintain current systems and costs	Initial set up of system for monitoring (a register). Low cost options compared to ITQ.	Initial set up of system for monitoring (a register). Low cost options compared to ITQ, but more costly to evaluate all input values.	Initial set up and ongoing costs are high compared to other systems – research, modelling, reporting, monitoring, compliance. How to ensure integrity of systems?
Economic return	To be developed	To be developed.	To be developed.	To be developed.

The group reflected that the scoring did not reflect the “gut feeling” of the groups as to the preferred option.

Group 2 Feedback on evaluation of options:

	Equitable/ secure investment	Flexible/ Adjustable	Responsive	Transferable	Economic Efficiencies	Simple & cost effective	Legally defensible	Allocation complexity
Quota	• ✓ • More permanent • Banks favour • Good access right • Poor harvest right	✓ • Flexible if market available. • Set Annually	✓ • Pre and post Christmas quotas	✓ • Market trading, driven by relationship between partners • Knowledge of availability.	✓ • Remove inputs • Depends on level of trading.	- • Simple to set up • Science? • Compliance is the biggest issue, high grading. • Grades/size structure. • Variability of change – gear selectivity.	✓	High degree of difficulty.
Tradable rights – Gear unit/ Nights/ Unit x time	× Gear: Catch variation according to headline length is not linear. Nights: Potentially not even value.	✓ Gear: Market availability ok. Nights: High risk give there is not a strong market seen.	✓ Pre and post Christmas	✓ Gear: ✓ Nights: Not all equal	• Temporal variability. • Effort creep risks with inputs controls remaining. • Less so than catch quota. • Need to maintain input control.	• Nights and gear are relatively simple. • Gear by time units could be relatively complex.	✓	Less complex than quota.

Ranking for group 2:

1. Tradable gear units,
2. Quota (TAC),
3. Tradable nights/effort units.

Additional discussion points

Quota:

1. Higher research and compliance costs, high grading, psychological aspects of deck cameras, loss of flexible access and reward for good fishing.
2. Look at alternative markets (live export etc).
3. Landing quota – simple given few points. Handling.

Gear:

1. Changes are expensive, complex formula to set up gear unit over time, maintain real time management implicit in thinking.
2. Headline length as a unit.
3. Require capping, increase costs over time.
4. Mid season- mid run difficult to change.
5. Trigger to close fishery could related to kg/headline length.

Risks and information gaps

The following table summarises the risks and information gaps relating to the alternative management options discussed.

Risks	Who	Time-line	Information GAP
Quota (kg)			
Costs	PIRSA Manager		Identify compliance (on shore/at sea) (PIRSA), research costs (SARDI), administration costs (PIRSA)
High grading/ discarding	Research Sub-committee	Oct 13	Camera on vessels? Audit gear structure – trigger investigation. Selective gear reduced small catch. Electronic reporting system vs prior reporting. Electronic logs.
Allocation	S. Sen	Nov 12	Advice on allocation methods. Cost to be determined. Explain different methods. A summary of case law trends. Table of past fisheries experiences.
Cost/security of finance[1]	A. Jarrett /G. Palmer	Nov 12	Is quota preferred than other units by banks for security? Considered it is more driven by fishery profitability. How would bank view security of alternative property rights? Based on profitability – understanding of banks. Asset backing influence.
Tradable rights – Gear/Nights/Effort unit			
Cost	PIRSA Manager		Identify compliance (on shore/at sea) (PIRSA), research costs (SARDI), administration costs (PIRSA)
Establishment cost	Research Sub-committee		Gear trials and research establishment and research design. Convert to new gear and trigger limit, universalising trigger limit. (Consult Jack Davis on quad gear).
Effort creep	Executive Office		Controls and management, modelling acceptable change. Dave Stirling fishing power model (with CSIRO).
Unit	SARDI/PIRSA		Developing the gear unit.
Nights/effort unit additional			
Effort creep Nights	SARDI		Understanding temporal variation – run in bio model. Going to be looked through model.
Value and tradability of nights	SARDI		Concern raised that the most efficient nights already fished, which will reduce tradability or value of nights if traded, greatly reducing the effectiveness of this tool to improve economic profitability.

Management Options

Recommendation: Investigate 4 options: Quote, Gear, Nights, Effort Units. Report covers off on all options, majority of investment should be guided into gear and quota.

Recommendation: The EOSC does not support the compulsorily implementation of amalgamations or compulsory buy backs that forces people out of the industry.

Recommendation: It was agreed that the corporate/self-governance model is economically the most profitable option, however this option is not achievable in the next two years given the fisheries culture. Consider incorporating into strategic plan.

Action: Report to members after December 2012 fishing and ongoing through process. Data report October 2013. Final Report 2014 to PIRSA.

Restructure

The option of an immediate restructure was discussed. It was highlighted that the only funding option available would be through the members investing into the buy back. Given current different gap expected license value by owners, against investment value for buyers, it is unlikely that there will be strong support for the buy back.

Resolution: It was considered that a buy back would need to be self-funded.

Recommendation: It was recommended that the members were approached to ascertain their interest in entering debt and request tenders for the sale of their licenses.

Resolution: Amalgamations were considered highly unlikely to be achieved in the short and medium term, given the fact that it would require the formation of partnerships which do not currently naturally exist.

Appendix 1.15. Agenda Industry Workshop 11 June 2014

Spencer Gulf and West Coat Prawn Fishermen' Association

ECONOMIC OPTIMISATION PROGRAM: Does the fishery's management require a change, and if so what type of change?

OBJECTIVE: Consider the development of changes to the fishery's management to allow for greater flexibility, profitability and sustainability.

Key questions:

- Do current management arrangements allow the fishery and individual businesses to adjust so as to continue to produce a profit as economic and biological changes occur?
- If not, does the fishery require management change & why?
- What is/are the preferred management change(s) and their costs and benefits?
- Will these changes make the fishery resilient to factors outside of the fishery's control?
- Where should responsibility lie for driving any changes in the fishery?

Workshop outline
Welcome by the Chair.
Exec/O provide a brief overview of process to date.

Session I: Is there currently a problem or given economic conditions change will there be a problem?
Purpose: ***To evaluate if there is agreement for change now or in the future***.

a. International prawn trends – what do you see in the future?
b. Domestic/ Spencer Gulf prawn trends – what is happening now?
c. Costs of fishing – what is happening to the gap between income and expenditure?

Members should consider the future of the prawn industry from a broad international perspective, such as demand patterns through to trends in factors that effect profitability such as fuel prices and the value of the Australian dollar.

Session II: How do we make a change?
Purpose: ***To establish a structured and agreed process on how and when any changes may be made, i.e. a process of decision making to achieve change including ground rules and triggers, additional to those already in the constitution.***

To discuss the drivers that may influence when a change will be required: i.e. develop triggers, in addition to who should drive any changes and how the members make the decision.

Session III: The preferred alternative management option for the future.
Purpose: ***To generate consensus on the preferred future management model***.
Exec/O will provide a presentation on the options suggested.
Members to work on the alternative options – pros/cons and solutions.

Session IV: Finalise future options and where to from here.
Purpose: ***Identify any gaps in information and members vote on their preferred options.***

The outcome from session IV will ideally be that there is one option from which a strategy can be developed.

Spencer Gulf and West Coast Prawn Fishermen's Association

General Meeting

10:00 – 15:00 11 June 2014

Port Lincoln Hotel, 1 Lincoln Hwy, Port Lincoln

Agenda

Consider the development of changes to the fishery's management to allow for greater flexibility, profitability and sustainability.

	Arrive (tea and coffee.)		9:45 - 10:00
1.	Welcome and Introductions	Chair	10:00 – 10:10
2.	Purpose and back ground	Executive Officer	10:10 – 10:30
3.	Workshop	Ian Cartwright	10:30 – 12:30
	Lunch		12:30 - 13:15
4.	Workshop	Ian Cartwright	13:15 – 14:30
5.	Other business	Chair	14:30 – 15:00

Appendix 1.16. East Coast Trawl Fishery Agenda Northern Workshops

East Coast Otter Trawl Fishery
Economic Performance and Management Opportunities Workshop

Wednesday 25th July 2012 – Cairns

Time: ***8:30 – 16:30***
Location: ***Admiralty Room***
Cruising Yacht Squadron
42-48 Tingira St Portsmith

Thursday 26th July 2012 - Townsville

Time: ***8:30 – 16:30***
Location: ***Burdekin Room***
Mercure Hotel
Woolcock St Townsville

AGENDA

1.	Welcome, introductions & Objectives		8:45
2.	Summary of East Coast Otter trawl Fishery	E Jebreen	9:00
3.	"Anderson's Assessment" of fisheries	T. Ward	9:20
4.	Economic analysis – summary of East Coast Otter Trawl fishery	E. Hoshino	9:40
5.	Discussion - do you agree with the assessment?	Group	10:10
	Morning Tea 10:30		
6.	Austral Fisheries - Northern Prawn Fishery experiences	David Carter	10:50
7.	Discussion - what are the key drivers for getting into the current situation?	Group	12:10
	Lunch 12:30		
8.	Spencer Gulf Experiences	SA Industry Reps	13:00
9.	Discussion and summary	Group	14:00
	Afternoon Tea 15:00		
	Discussion - does the Qld fishery need to be reformed to resolve the current situation and if so how should this be done?		
	Close 16:30		

Appendix 1.17. East Coast Trawl Fishery Agenda Southern Workshops

East Coast Otter Trawl Fishery
Economic Performance and Management Opportunities Workshop

Wednesday 1 August 2012 – Mooloolaba

Time: ***8:30 – 16:30***
Location: ***The Yacht Club***
33-45 Parkyn Pde
The Spit

Thursday 2 August 2012 – Hervey Bay

Time: ***8:30 – 16:30***
Location: ***Charlton Room***
Peppers Pier Resort
The Esplanade, Urangan

AGENDA

1.	Welcome, introductions & Objectives		8:45
2.	Summary of East Coast Otter trawl Fishery	E Jebreen	9:00
3.	"Anderson's Assessment" of fisheries	T. Ward	9:20
4.	Economic analysis – summary of East Coast Otter Trawl fishery	E. Hoshino	9:40
5.	Discussion - do you agree with the assessment?	Group	10:10
	Morning Tea 10:30		
6.	Individual Transferable Fishing Rights - A Pathway to Profitability??	Annie Jarrett	10:50
7.	Discussion - what are the key drivers for getting into the current situation?	Group	12:10
	Lunch 12:30		
8.	Spencer Gulf Experiences	SA Industry Reps	13:00
9.	Discussion and summary	Group	14:00
	Afternoon Tea 15:00		
	Discussion - does the Qld fishery need to be reformed to resolve the current situation and if so how should this be done?		
	Close 16:30		

Appendix 1.18. East Coast Trawl Fishery Workshop 1

Department of Agriculture, Fisheries and Forestry

East Coast Otter Trawl Fishery

Economic Performance and Management Opportunities Workshop

Queensland Government

Workshop Program

- Introductions…
- Objectives…
- Fisheries assessment process…
- Economic analysis…
- Group discussions…
- Transferable fishing rights…
- Northern prawn fishery experiences…
- Group discussions…
- Spencer Gulf prawn fishery experiences…
- Group discussions…

Workshop Guidelines

- Mobile phones…
- Listen to and respect other opinions…
- Focus on the issue…
- One person at a time…
- Avoid side conversations…
- Keep discussion constructive…
- …

Question for discussion…

- *What parts of the assessment are correct and which ones do you disagree with and why…?*

Question for discussion…

- *What are the key drivers that have led the fishery to its current situation…?*

Question for discussion…

- *How does the Qld fishery enhance the positive drivers and reduce the negative drivers to improve the current situation…?*

Appendix 1.19. East Coast Trawl Fishery Workshop 2

East Coast Otter Trawl Fishery

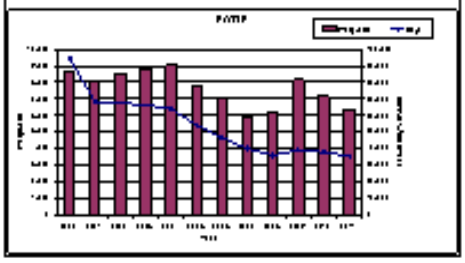
Queensland East Coast Trawl Fishery

Symbol	Active in 2011		Endorsed (31/12/2011)	
T1	295	310	397	423
T2	15		26	
M1	n/a		47	
M2	22		25	
T5	34		39	
T6	4		11	
T7	4		6	
T8	20		30	
T9	4		23	

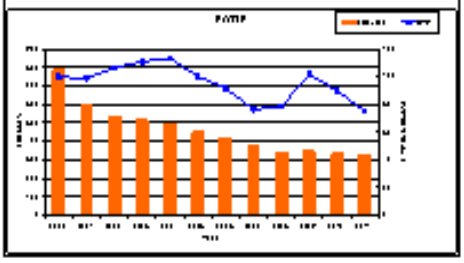
East Coast Otter Trawl
(includes t1/m1 BU usage)

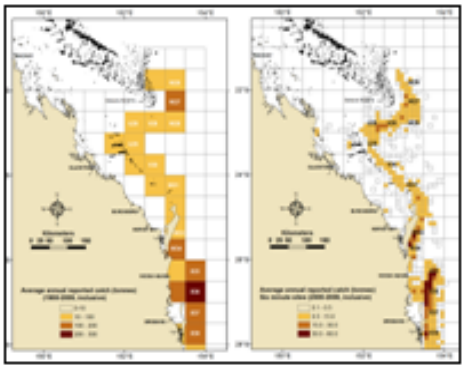
	Total Units (million)	Total Used (million)	Total Unused (million)	Used (%)	Unused (%)
2010	2.9	1.8	1.1	61.9	38.1
2011	2.9	1.7	1.2	59.4	40.6

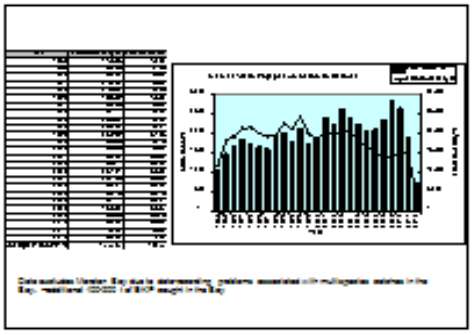
East Coast Otter Trawl
(includes t1/m1 BU usage)

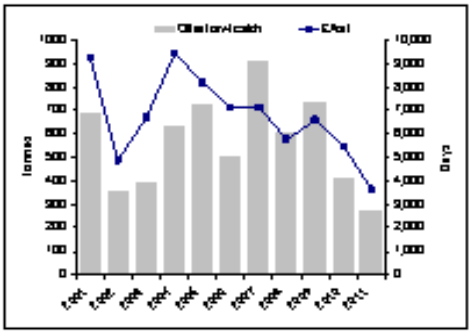


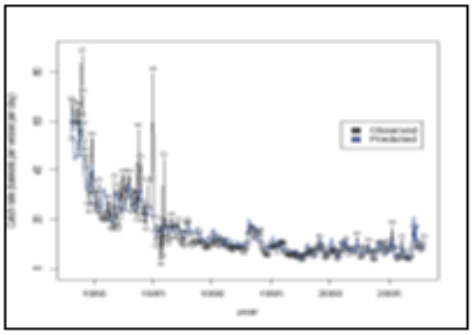
East Coast Otter Trawl
(includes t1/m1 BU usage)

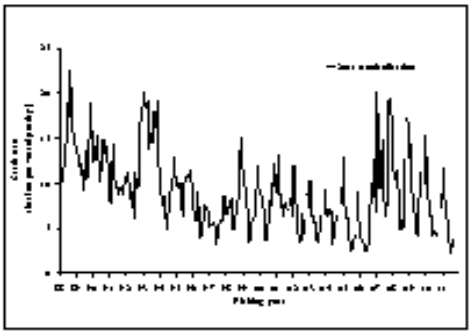


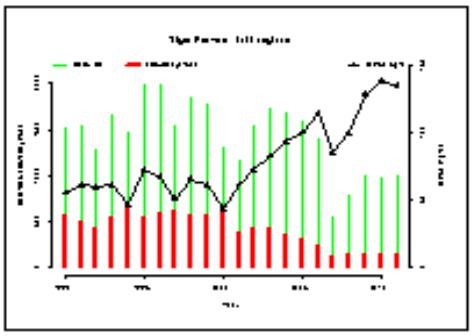


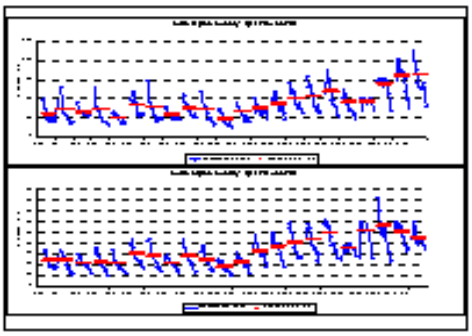



Days



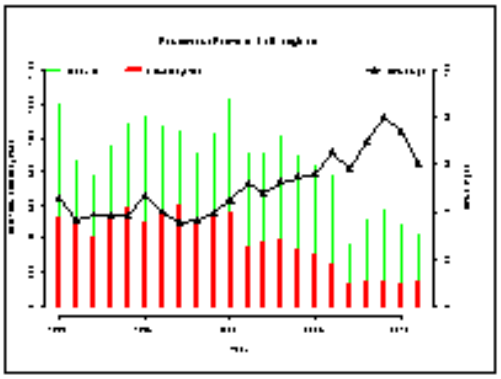


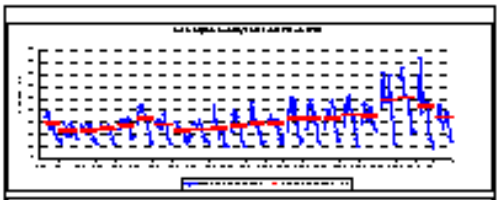


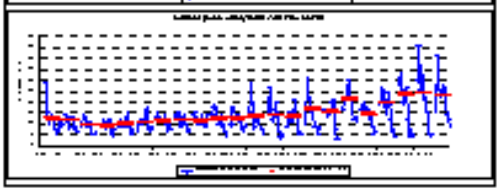


Tiger Prawn

- harvests ~ half of long term
- Effort ~ 30% of long term
- CPUE
  - generally upward since 2000 and
  - 70% higher
- Low harvest, effort and high CPUE are evidence of a low fishing mortality; recruitment overfishing unlikely



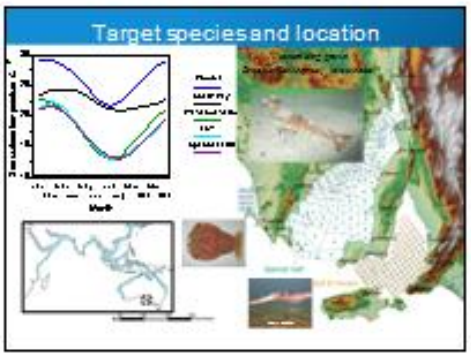


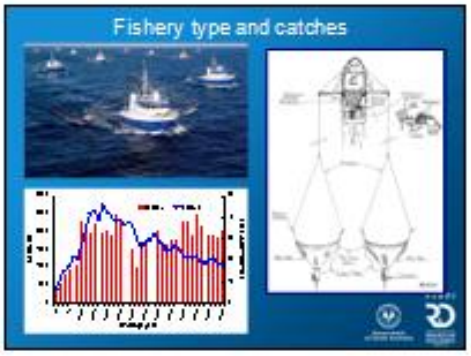


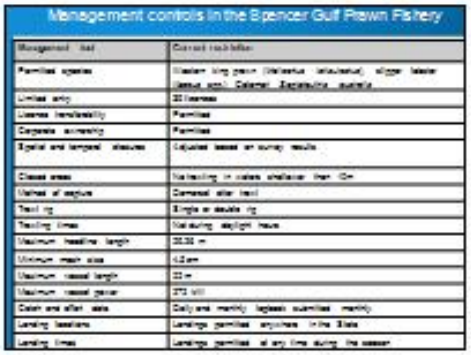
Endeavour Prawn

- harvests ~ half of long term
- Effort ~ 31% of long term
- CPUE
  - generally upward since 1997 and
  - 52% higher
- Low harvest, effort and high CPUE are evidence of a low fishing mortality; recruitment overfishing unlikely

Appendix 1.20. East Coast Trawl Fishery Workshop, Economic Performance







Sustainability

Surveys & harvest strategies

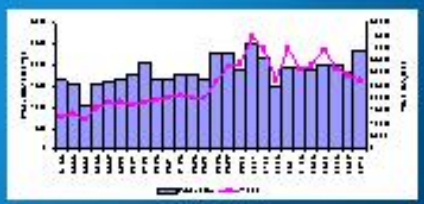
Fishery-independent surveys (Nov, Feb, Apr)

- Collaboration between SARDI & industry
- Stock assessment & other research (by-catch)
- Inform harvest strategy development (closures)

Fishery-dependent surveys (Dec, Mar, May, June)

- Industry driven 'Spot' surveys
- Inform harvest strategy management & adjustment

Spencer Gulf Prawn Fishery Value and Production (1984/85 to 2009/10)



Fishery Performance Indicators

James L. Anderson & Chris Anderson
WB & UW

Prepared for: The International Coalition of Fisheries Associations (ICFA) Vancouver, CA

Funding: ALURFI (Alliance for Responsible Fisheries), a public-private partnership created by Pew Charitable Trusts, the World Bank, TNC

Anderson and Anderson (2010)

Guiding Principles

- COMMERCIAL FISHING is a BUSINESS and should create wealth
- Ecological sustainability is NECESSARY, but NOT SUFFICIENT, for commercial fisheries to generate sustainable income and create wealth
- Community sustainability is necessary for sustainable wealth creation.

Anderson and Anderson (2010)

- *A wealth-based fishery management system is one that is ecologically sustainable, socially acceptable and generates sustainable resource rents or profits.*
- Purpose: The Fishery Performance Indicators (FPIs) are designed to evaluate and compare the world's fisheries management systems based on their ability to generate sustainable wealth

Anderson and Anderson (2010)

- Greater attention must be focused on governance systems and economic factors
- It is not good enough to be just biologically sustainable; fisheries and the communities that dependent on them must generate sustainable wealth.

Anderson and Anderson (2010)

The creation of a Wealth-Based Fisheries Performance Indicators give

stakeholders who rely on fisheries for their livelihood

critical information to make the case for better fisheries management based on a broader set of criteria incorporating governance and economic factors

Jinderson and Jinderson (2010)

The Performance Indicators are Designed to Incorporate the Three 'Sustainabilities' Necessary for Wealth Creation

1) Economic Sustainability

2) Ecological Sustainability

3) Community Sustainability

Jinderson and Jinderson (2010)

Characteristics of Indicator Components

- Readily Available
- Accurate
- Quantifiable
- Relevant
- Understandable

Jinderson and Jinderson (2010)

Two Parts – Outputs and Inputs

1) Performance Indicators of wealth creation and accumulation (outputs)

2) Performance Factors that enable wealth creation (inputs)

Jinderson and Jinderson (2010)

The Fishery Performance Indicators - Outputs

- 54 components covering 11 dimensions:
  - Fish Stock Health & Environmental Performance
  - Harvest Performance
  - Harvesting Performance
  - Risk
  - Owners, Permit Holders & Captains
  - Crew
  - Market Performance
  - Processing & Support Industry Performance
  - Post-harvesting Performance
  - Processing Owners & Managers
  - Processing Workers

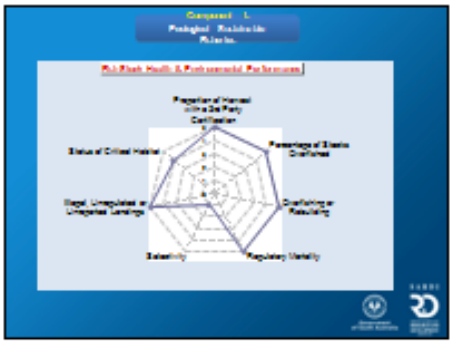
Jinderson and Jinderson (2010)

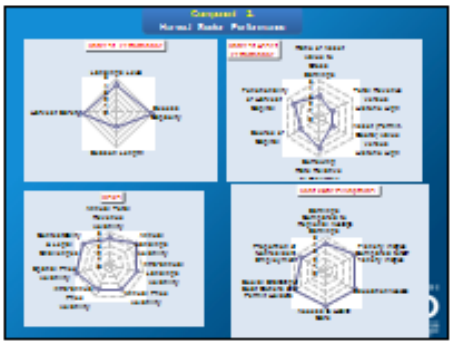
The Fishery Performance Factors: Inputs Enabling Wealth Creation

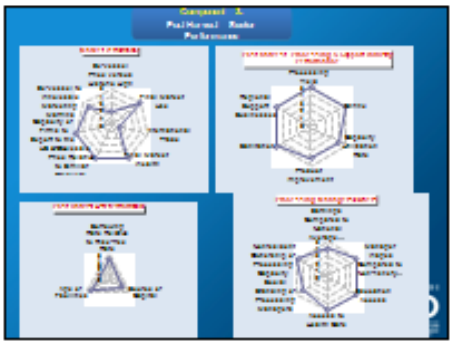
- 39 components covering 8 dimensions:
  - Macro Factors-Environmental, Economic & Community
  - Access Rights
  - Harvest Rights
  - Collection Action
  - Management Inputs
  - Management Participation
  - Markets and Market Institutions
  - Infrastructure

Jinderson and Jinderson (2010)

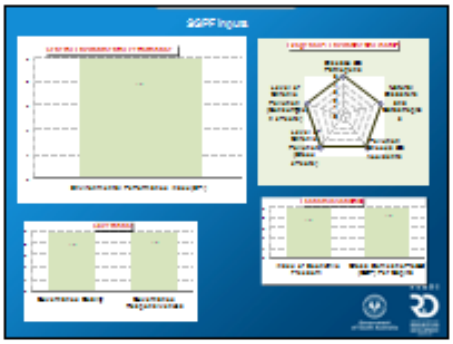

BGPF

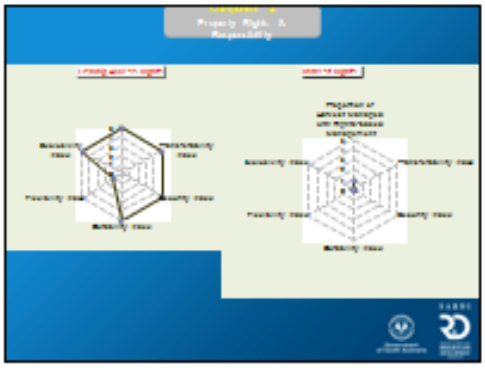


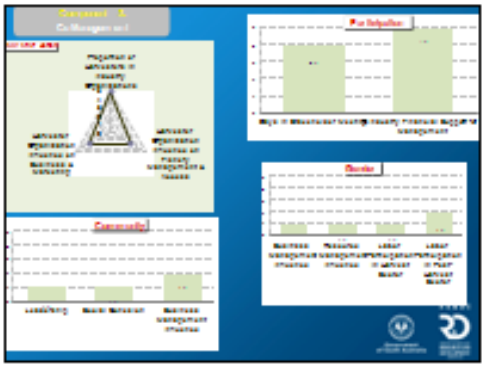


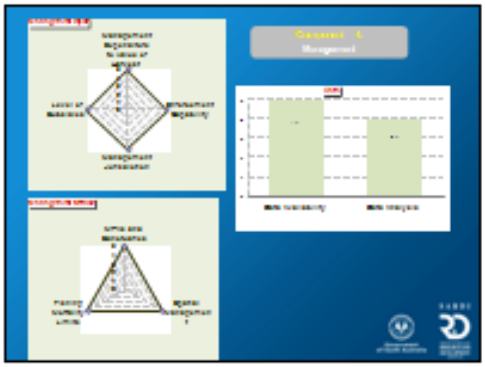


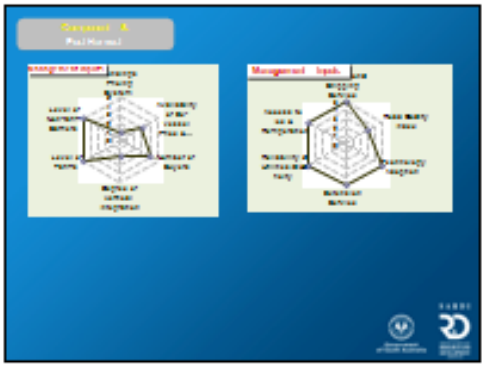

BGPF
Bakery Performance Indicators:: Input: (Enabling Wealth Creation)


BGPF Inputs

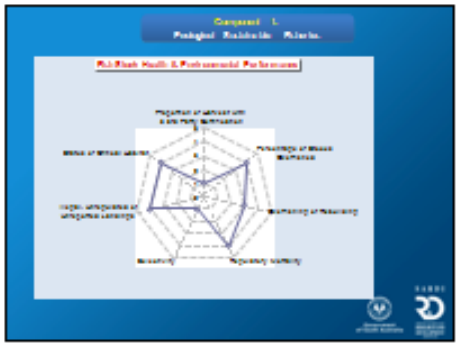


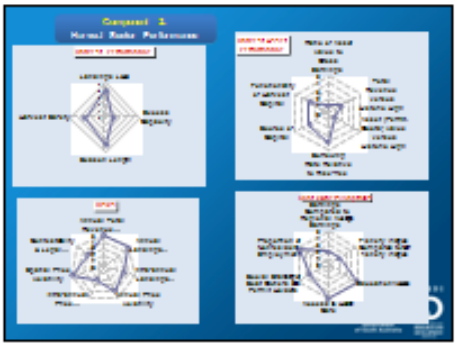


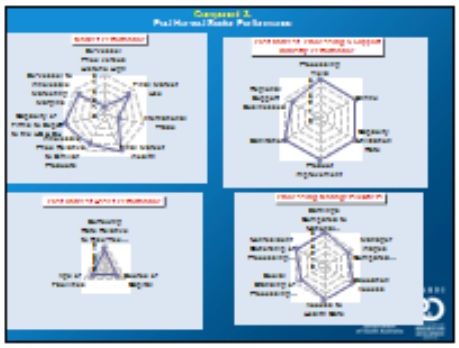


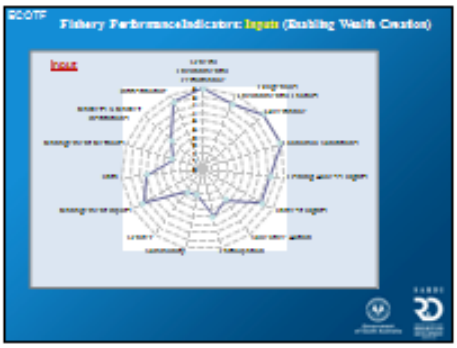


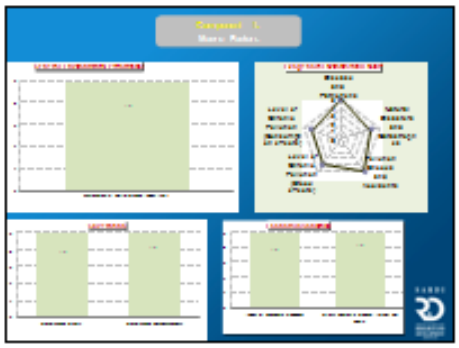

SPENCER GULF PRAWN FISHERY:
FISHERY PERFORMANCE INDICATORS
• FPIs capture issues in SGPF quite well
- poor systems for managing harvest and marketing catch
- poor harvest and harvest asset performance
• Issues in fishery are
- input controls cause inefficiency
too many licences/vessels
very short season
can't consolidate effort/catches to reduce costs
- falling prices
competition from aquaculture prawns
low product differentiation
poor marketing
Need to redesign operational procedures, fisheries management arrangements & restructure business structures

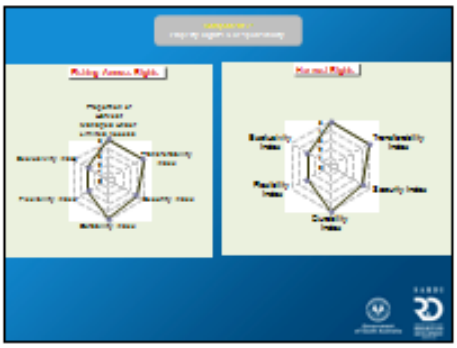


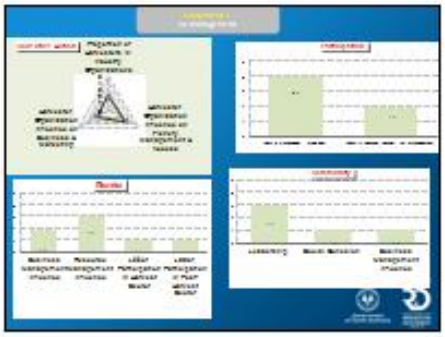


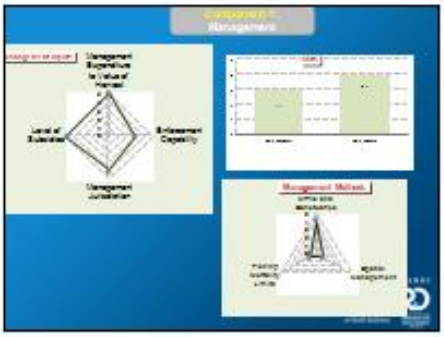


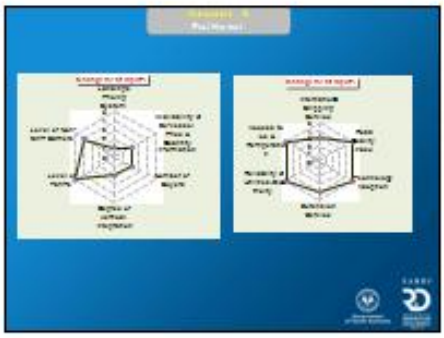

Fishery Performanceindicators: Inputs (Enabling Wealth Creation)
Input








Management Expenditure
Enforcement Capacity
Management Jurisdiction
Level of Subsidies




EAST COAST OTTER TRAWL FISHERY:
FISHERY PERFORMANCE INDICATORS
• Do FPIs capture issues in ECOTF?
- Poor harvest and harvest sector performance
- Good post-harvest and processor performance
• Issues in fishery are
- input controls cause inefficiency
too many licences/vessels
poor industry organisation
- falling prices
competition from aquaculture growns
low product differentiation
poor marketing systems
Potential to redesign operational procedures, fisheries management arrangements & restructure/business structures

Appendix 1.21. East Coast Trawl Fishery Workshop, Economic analysis

Economic Indicators for the East Coast Otter Trawl Fishery

Economic Performance and
Management Opportunities Workshop
1 August 2012 Mooloolaba
2 August 2012 Hervey Bay

Lisa Rippin
EconSearch Pty Ltd

Overview

- Economic Indicators
- Spencer Gulf & West Coast Prawn Fisheries
- East Coast Otter Trawl Fishery
- Further Research

Economic Indicators

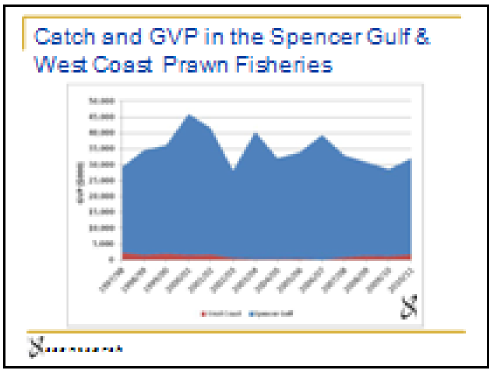
- Catch, gross value of production and prices
- Cost of management
- Boat level financial performance indicators
  - average income
  - operating costs
  - cost-price squeeze
  - profitability
  - return on investment

Economic Indicators

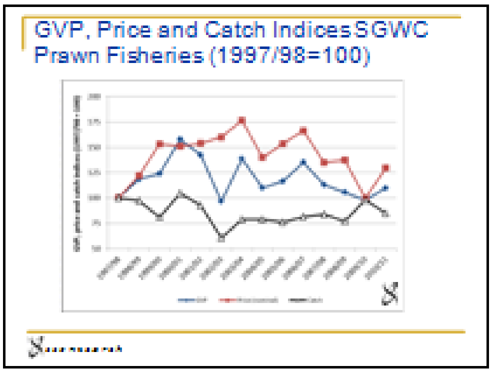
- Economic impacts
  - Output
  - GSP
  - household income
  - employment
- Economic rent
- Other indicators

Spencer Gulf & West Coast Prawn Fisheries

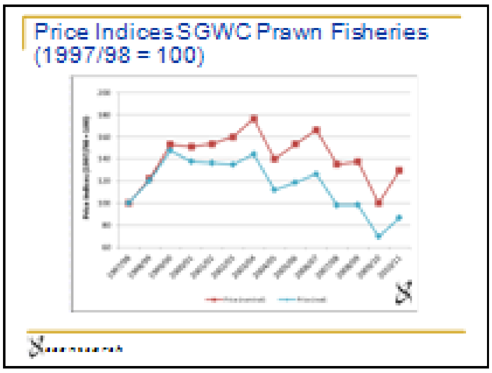
Catch in the Spencer Gulf & West Coast Prawn Fisheries



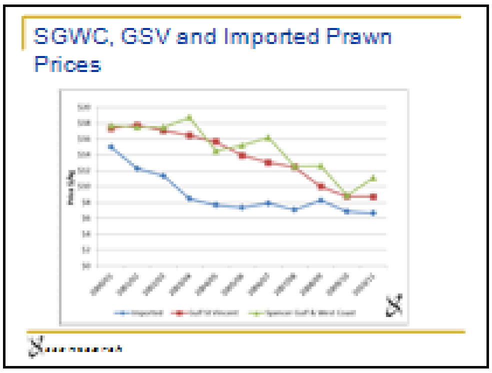
Catch and GVP in the Spencer Gulf & West Coast Prawn Fisheries



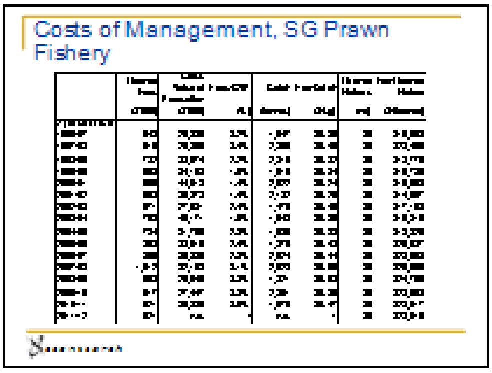
GVP, Price and Catch Indices SGWC Prawn Fisheries (1997/98=100)



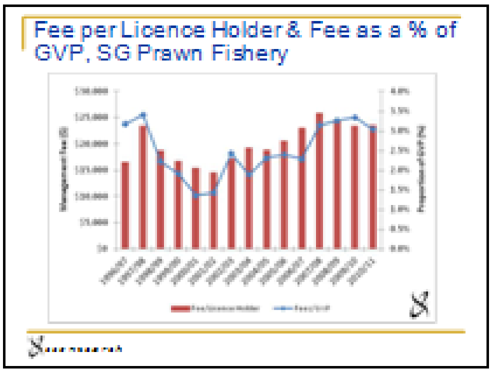
Price Indices SGWC Prawn Fisheries (1997/98 = 100)



SGWC, GSV and Imported Prawn Prices



Costs of Management, SG Prawn Fishery

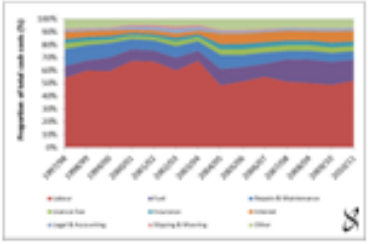


Fee per Licence Holder & Fee as a % of GVP, SG Prawn Fishery

Survey Results

- Financial performance indicators
  - Income, costs and profitability as an average per boat
- Economic impact of the fishery
  - Direct and flow-on economic benefit created as a result of the operations of the fishing industry
- Economic rent

Cost Shares, SGWC Prawn Fisheries



Cost-Price Squeeze, SGWC Prawn Fisheries

Income and Profit, SGWC Prawn Fisheries

Return on Investment, SGWC Prawn Fisheries

Economic Impact of the SGWC Prawns Fisheries in SA, 2010/11

Sector	Output $m	Employment Jobs	Household Income $m	Contribution to GSP $m
Direct effects				
Fishing	[illegible]	[illegible]	[illegible]	[illegible]
Processing	[illegible]	[illegible]	[illegible]	[illegible]
Flow-on effects	[illegible]	[illegible]	[illegible]	[illegible]
Total	[illegible]	[illegible]	[illegible]	[illegible]
Total/Boat	[illegible]	[illegible]	[illegible]	[illegible]
Total/Tonne	[illegible]	[illegible]	[illegible]	[illegible]

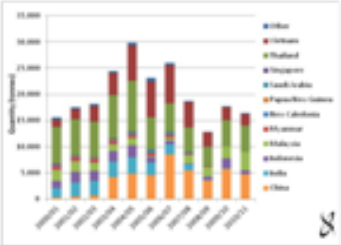
Economic Impact of the SGWC Prawns Fisheries in SA, 2010/11

Economic Rent in the SGWC Prawn Fisheries, 1997/98 to 2010/11 ($'000)

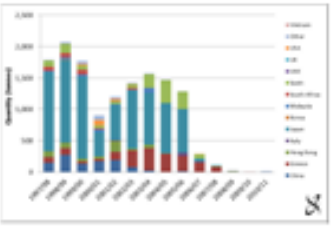
Other Indicators

- Prawn imports to South Australia
- Prawn exports from South Australia
- Exchange rates

Prawn Imports to SA by Country of Origin, 2000/01 to 2010/11



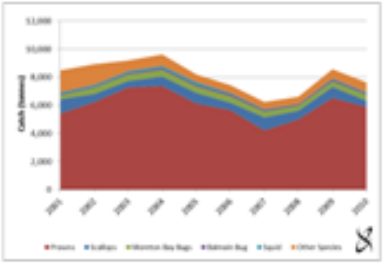
Prawn Exports from SA by Destination Country, 1997/98 to 2010/11



Exchange rates and SGWC Prawn prices, 1997/98 to 2010/11

East Coast Otter Trawl Fishery

East Coast Otter Trawl Fishery – Catch



East Coast Otter Trawl Fishery – GVP

East Coast Otter Trawl Fishery – GVP, Price & Catch

East Coast Otter Trawl Fishery – Price

East Coast Otter Trawl Fishery – Price & Exchange Rate

East Coast Otter Trawl Fishery – Cost Shares

	Average per boat	2010-11 TACC [b]
Total Boat Gross Income	[illegible]	
Variable Costs		
Fuel	101,118	27%
Repairs & Maintenance	53,323	13%
Labour	143,323	40%
Other	7,377	2%
Total Variable Costs	325,935	88%
Total Fixed Costs	45,757	12%
Total Boat Cash Costs	371,692	100%

East Coast Otter Trawl Fishery – ECOT and SGWC Prawn Fisheries

ECOT	2008/09	
	Average per boat	3 Year Average 2008-11
Total Boat Gross Income	[illegible]	
Variable Costs		
Fuel	[illegible]	27%
Repairs & Maintenance	[illegible]	8%
Labour	[illegible]	40%
Other	[illegible]	2%
Total Variable Costs	[illegible]	88%
Total Fixed Costs	[illegible]	12%
Total Boat Cash Costs	[illegible]	100%

SGWC Prawn	2008/09	
	Average per boat	3 Year Average 2008-11
Total Boat Gross Income	[illegible]	
Variable Costs		
Fuel	[illegible]	8%
Repairs & Maintenance	[illegible]	7%
Labour	[illegible]	40%
Other	[illegible]	5%
Total Variable Costs	[illegible]	70%
Total Fixed Costs	[illegible]	21%
Total Boat Cash Costs	[illegible]	91%

East Coast Otter Trawl Fishery – Income, Profit & Return on Investment

ECOT	2008/09	
	[illegible]	[illegible]
[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	
[illegible]	[illegible]	
[illegible]	[illegible]	
[illegible]	[illegible]	
[illegible]	[illegible]	
[illegible]	[illegible]	
[illegible]	[illegible]	

SGWC Prawn	2008/09	
	[illegible]	[illegible]
[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	
[illegible]	[illegible]	
[illegible]	[illegible]	
[illegible]	[illegible]	
[illegible]	[illegible]	
[illegible]	[illegible]	
[illegible]	[illegible]	

East Coast Otter Trawl Fishery – ECOT Fishery, M2 & T1/M2

	M2		T1/M2	
	2010-11	3 Year Average 2008-11	2010-11	3 Year Average 2008-11
Total Boat Gross Income	[illegible]		[illegible]	
Variable Costs				
Fuel	[illegible]	[illegible]	[illegible]	[illegible]
Repairs & Maintenance	[illegible]	[illegible]	[illegible]	[illegible]
Labour	[illegible]	[illegible]	[illegible]	[illegible]
Other	[illegible]	[illegible]	[illegible]	[illegible]
Total Variable Costs	[illegible]	[illegible]	[illegible]	[illegible]
Total Fixed Costs	[illegible]	[illegible]	[illegible]	[illegible]
Total Boat Cash Costs	[illegible]	[illegible]	[illegible]	[illegible]
Net Income Margin	[illegible]		[illegible]	
Gross Operating Surplus	[illegible]		[illegible]	

East Coast Otter Trawl Fishery – Further Research

- Last survey 2008/09
  - Need a survey every 3-4 years
  - Collect from all regions and fishery sectors
  - Time series
- Prepare economic indicators based on targets in the management plan
- Consider economic impacts
  - Direct and flow-on
- Others?

Economic Indicators for the East Coast Otter Trawl Fishery

Economic Performance and Management Opportunities Workshop
1 August 2012 Mooloolaba
26 July 2012 Hervey Bay

Lisa Rippin
EconSearch Pty Ltd

Appendix 1.22. East Coast Trawl Fishery Workshop, Experiences in the Northern Prawn Fishery

INDIVIDUAL TRANSFERABLE FISHING RIGHTS – A PATHWAY TO PROFITABILITY?

Annie Jarrett
Pro-Fish Pty Ltd
February 2012

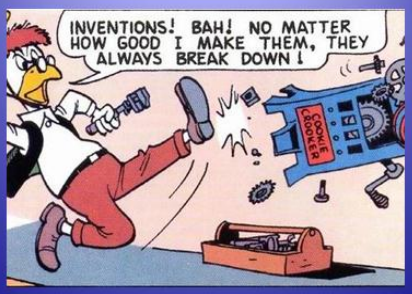
Fisheries Management: A Delicate Balancing Act

- *Eco-system Based Fisheries Management*
- *Bycatch Reduction*
- *Marine Protected Areas*
- *Environmental Certification*
- *Resource Stewardship – Community Pressure*
- *Harvest Strategies*
- *Fishery reference points – MSY v MEY*
- *Economic Efficiency*

But:

ITS HARD TO BE GREEN WHEN YOU'RE IN THE RED

- Unfavourable FX – AUD high & climbing
- Challenging market conditions
- Too much competition (aquaculture & domestic)
- Increasing costs (production, management, research)
- Reducing or static catches
- Too Many Boats??



4

Adjustment

- Globally most fisheries have suffered from over-capacity, effort creep & recruitment overfishing
- Most fisheries have required cuts in fishing effort and adjustments in fishing capacity
- Mechanisms for capacity adjustment :
  - buy backs (govt and/or industry funded eg Qld, NPF, TS)
  - compulsory reductions in TAEs/ TACs
- Capacity adjustment (excluding buy backs) needs basis eg form of individual transferable fishing rights system

Australian Prawn Fisheries

Individual Transferable Fishing Rights

The Benefits

- SECURE ON-GOING ACCESS (PROPERTY RIGHTS) FOR INDUSTRY; SOUND INVESTMENT BASE FOR FINANCIERS
- FLEXIBILITY FOR OPERATORS – INDIVIDUAL DECISIONS TO BUY, SELL OR LEASE ARE MARKET-BASED, NOT GOVERNMENT DRIVEN
- EFFECTIVE TOOL TO BALANCE FISHING EFFORT AND BIOLOGICAL & ECONOMICAL SUSTAINABILITY
- AN EQUITABLE TOOL FOR ADJUSTMENT IN THE FISHERY WHEN REQUIRED - (ADJUSTMENT PROPORTIONAL ACROSS THE FLEET)
- GENERALLY COST EFFECTIVE TO MANAGE AND ENFORCE
- HAVE PROVEN EFFECTIVE IN QLD, TORRES STRAITS & NPF PRAWN FISHERIES

ASSUMPTIONS FOR SUCCESS

- ALL INDIVIDUAL RIGHTS FULLY TRADABLE (SALE OR LEASE)
- RETENTION OF LIMITED ENTRY
- CLOSURES FOR BIOLOGICAL/ ECOLOGICAL PURPOSES
- CONTINUED USE OF ECBM/ BYCATCH MITIGATION
- ONGOING RESEARCH, DATA COLLECTION & COMPLIANCE PROGRAMS – MAY VARY WITH EACH SYSTEM
- NEED TO CONSIDER ECONOMICS AS WELL AS BIOLOGY

8

CRITERIA

- Equitable: need to identify existing shares & determine translation formula; the 'share' of rights held under one system must not be diminished in moving to a new system
- Flexible & Adjustable: operators need flexibility to adapt to changing circumstances & to maximise returns; fishery needs to be adjusted to respond to biological or economic changes
- Responsive – capable of adjusting the fishery on either biological or economic grounds in a timely manner
- Transferable: allows operators maximum flexibility to trade up or down to suit their own operational/market demands
- Economically efficient: retaining as few inputs as possible to maximise opportunity for economically efficient exploitation
- Simple & Cost Effective to manage: easily understood by industry; simple administration & enforcement; legally defensible

ALLOCATION

- ALLOCATION IS THE MOST CONTROVERSIAL ISSUE IN MOVING TO ANY NEW SYSTEM OR IN IMPLEMENTING ADJUSTMENT PROGRAMS
- FISHERS ARE GENERALLY MORE INTERESTED IN WHAT THEY ARE 'GOING TO GET' THAN HOW A NEW SYSTEM WOULD WORK
- FISHING HISTORY (EG CATCH, VESSEL SIZE; HP) FINANCIAL INVESTMENT; ADMINISTRATIVE DECISION; AUCTION/ TENDER ALL MECHANISMS USED IN ALLOCATIONS

Types of Individual Transferable Fishing Rights

- Input controls: gear units; boat units; boat days/ time units; effort units; pot units (Individual Transferable Effort Units or ITEs)
- Output controls: Individual Transferable Quotas (ITQs) – issued as kilos of fish/prawns

WHO HAS WHAT RIGHTS BASED MANAGEMENT SYSTEMS?

- Northern Prawn Fishery: limited entry/ gear units (ITEs – investigating ITQs)
- QLD Trawl: Limited entry/ effort units (ITEs)
- Torres Straits: Limited entry/ boat days (ITEs)
- South Australia: Limited entry/ boat license
- New South Wales: Limited entry/boat license
- Western Australia: (Exmouth Gulf/ Sharks Bay): Limited entry/boat license

12

Individual Transferable Effort Units (ITEs)

- Boat Days/ Time Units; Effort Units; Gear Units; Capacity/ HP Controls
  - Generally acceptable to industry – often based on catch history
  - Longer Term right than annual boat license
  - Generally accepted as 'property rights' and by financiers as 'collateral'
  - Generally cost effective to manage
  - Very effective at controlling fishing effort – constraints on boat numbers/size; gear; hp; fishing seasons
  -

ITE's

- Not always effective at controlling effort creep
- Impose economic inefficiencies – restrictions/ constraints on gear, boat size, fishing time
- Flexible and responsive for adjustment *but*
- Benefits of individual decisions to increase efficiency dissipated across the fleet
- Rent dissipation can occur if capacity adjustment doesn't occur (fishing inefficiently)

Individual Transferable Quotas -ITQs

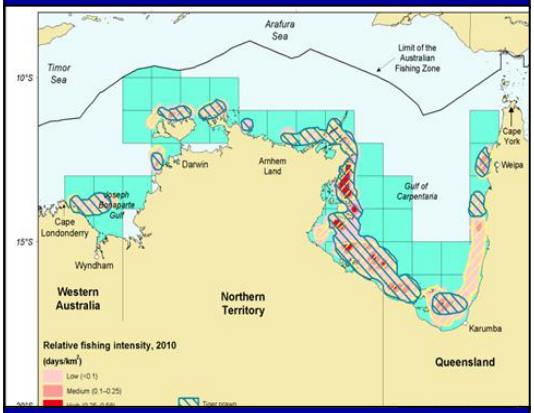
- A Total allowable Catch (TAC) determined by stock assessment model - Individual Transferable Quotas allocated (kgs of prawns) allocated
- Requires robust scientific data / stock assessment (+ economics if managing to MEY) & TAC predicting methodology – survey information can assist
- Best results generally in single, long lived species
- Few short life cycle (less than 6 years) multi species fisheries managed under ITQs tho some high volume, high value fisheries eg African anchovy/sardine , NZ arrow squid & Icelandic capelin fisheries
- No prawn fishery managed under ITQs (Mozambique Shrimp fishery closer to Total Allowable Catch system) – NPF investigating ITQs
- Issues: difficulty in TAC-setting; increased costs > $500000 pa

- ITQS CAN PROVIDE MORE EFFICIENCY GAINS THAN INPUT CONTROLS
- FLEXIBILITY TO MAXIMISE CATCH FOR LEAST COST; ECONOMIC EFFICIENCY; FACILITATES TRADE/ AUTONOMOUS ADJUSTMENT; LIMITS CATCH
- ECONOMIC THEORY – MOST BENEFITS ARE FROM QUOTA TRADING
- POTENTIAL LOSS OF REVENUE FROM HIGH GRADING/DISCARDING
- ISSUES OF 'CORPORATISATION' AND CONCENTRATION OF OWNERSHIP
- COMPLIANCE, RESEARCH AND ADMINSTRATION COSTS HIGHER – CAN CO-MANAGEMENT OFFSET?
- SINGLE SPECIES NATURE OF SGPF MAY BE SUITABLE TO QUOTA MANAGEMENT, SUBJECT TO STOCK ASSESSMENT
- REAL TIME MANAGEMENT MAY ALLOW TAC IN-SEASON UPDATES THO IMPACTS ON QUOTA TRADING

16

Northern Prawn Fishery

A case study
David Carter
CEO Austral Fisheries
NORMAC Member



Northern Prawn

- Australia's most valuable Commonwealth Fishery: GVP of $89 million
- 770,000 square kilometres; >8% fished; 6 - 7 months
- 52 trawlers; 19 owners
- Banana & Tiger Prawn Fisheries (endeavour/ king)

Northern Prawn

- 2011 – 7000 t banana; 800 t tiger
- Globally recognised as 'best practise' management; world class stock assessment; excellent environmental performance
- Marine Stewardship Council Certification underway
- Strong partnerships; co-management approach

20

The (NPF) Experience Cont.

1960's: Exploration followed by commercial trawling - open access fishery (no limited entry)

1974: Biggest banana prawn season on record; expansion of commercial fishery

1980: First 'Management Plan' for the NPF, 302 licenses

1985: The 'A unit' system introduced - individual transferable rights based - combination of under deck volume (hull) and horsepower specs/formula

Provided secure legally defensible fishing rights & basis for management costs/ buy back/ adjustment

1985: Industry-initiated buy back scheme; 2 for 1 boat replacement policy to address over-capacity/effort

1986: 25% reduction in season length; twin gear; daylight trawl ban

'A Units' - First efforts at control

- 'A Units' ineffective effort control; Operators 'rorted' horsepower and vessel configuration regs; Effort creep and stock depletion
- Inflexible adjustment tool; can only buy or sell under adjustment, not individually transferable
- Buy back based on A unit system slow and expensive: $45 million to remove 89 licenses over ten years
- Input restrictions to address stock depletion (twin gear/ closures/ daylight trawl ban) force inefficiencies/ reduce fleet profitability
- Additional 30% compulsory surrender of 'A' UNITS in 1993 – fleet reduced to 130 trawlers

- 2000: GEAR UNITS INTRODUCED . ALLOCATION PROPORTIONAL TO 'A' UNIT HOLDINGS. TRANSITION INCORPORATES 20% REDUCTION IN TOTAL HEADROPE - 10 BOATS LEAVE
- 2001: BOTH SPECIES OF TIGER PRAWNS CLASSIFIED AS 'OVERFISHED'
- 2002: TOTAL HEADROPE REDUCED 15%. INDIVIDUAL REDUCTION PROPORTIONAL TO GEAR UNIT HOLDINGS. 17 BOATS LEFT THE FISHERY
- 2002: DECREASED SEASON LENGTH TO IMPROVE SUSTAINABILITY OF BROWN & GROOVED TIGER PRAWNS
- 2005: TOTAL HEADROPE REDUCED BY 25% TO IMPROVE ECONOMICS OF THE FISHERY. 11 BOATS LEFT THE FISHERY
- *38 TRAWLERS REMOVED IN 5 YEARS (INTERNAL ADJUSTMENT).*
- *60% EFFORT REDUCTION IMPOSED MASSIVE ECONOMIC INEFFICIENCY - SMALL GEAR, SHORT SEASONS, LOW PRICES = ECONOMIC DISASTER.*
- *KOMPAS STUDY DETERMINES OPTIMAL BOAT NUMBERS - 2007 GOVT-FUNDED SAP REMOVES 43 BOATS*

GEAR UNITS IN THE NPF

- Total amount of gear and Fishing Season Length / Timing
- determined by bio-economic model
- Allocation of gear units based on agreed formula 9eg catch history)
- Each gear unit entitles operator to % of towable gear eg 1 gear unit = 10 cm
- A gear unit can comprise headrope only or combined headrope & footrope (NPF has a headrope constraint relative to footrope)
- Under adjustment, total number of gear units remains the same - the value of each gear unit changes

As an example in the NPF where each gear unit equals 10 cm of headrope & 11.5 cm of footrope, , after a 10% reduction each gear unit would equal 9cm of headrope & 10.35 cm of footrope

- System requires net size identification / gear unit register/ regular net checks
- Transfer of gear units only during closures to reduce compliance costs

24

Gear Units (cont)

- Headrope (controls swept area) good measure of fishing effort
- Easily measured & enforced - particularly compared to hp
- Enforcement – on shore measuring and net tagging; at sea checks
- System does not impede technical innovation – allows for removal of other inputs eg boat size/ hp restrictions/ gear types
- Operators can trade gear units to suit own operational/market demands

Gear units (cont)

- Flexible tool for adjustment - gives operators option of buying, selling, leasing gear units, amalgamating licenses or fishing with smaller gear
- Potential for effort creep with removal of boat size/ hp restrictions but can be adjusted
- Can result in economic inefficiencies (rent dissipation) if operators tow inefficient gear when adjustment occurs

The NPF Today

- From 302 to 52 trawlers/19 owners; flexible gear unit system – (no limits on gear: twin, quad, tongue nets; boat size); economically efficient
- Bio-economic model for tiger prawns; escapement policy for banana prawns; Catch trigger limits to determine season lengths (economic triggers)
- Harvest strategy includes Maximum Economic Yield (MEY) target reference point; MSY limit reference point
- Both species of tiger prawns now sustainable; 4 high yield banana prawns seasons (5000 – 7000 t);
- Industry Company; Co-management with AFMA – NPFI managing data, out-sourcing of surveys, crew member observer program; in MSC program; promotion
- GVP : $63m (130 Boats - 2004/5); $89 m (52 boats 2010/11)

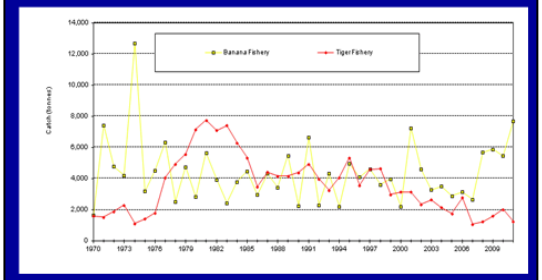
Table 1 Northern Prawn Fishery season dates

Fishing Seasons

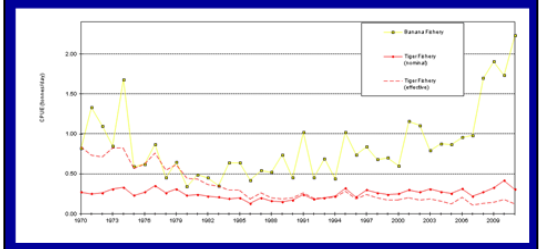
	2008–09	2009–10	2010–11
Tiger prawn season			
dates	1 August – 28 November 2008	25 July – 5 December 2009	1 August – 29 November 2010
duration	120 days	134 days	121 days
Banana prawn season			
dates	27 March – 5 June 2009	1 April – 10 June 2010	1 April – 24 June 2011
duration	71 days	72 days	86 days

28

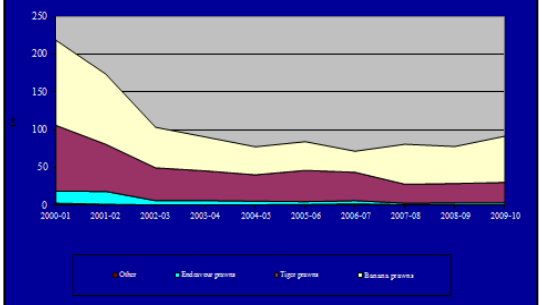
Catch in banana and tiger fishery (tonnes) 1970 - 2011



NPF CPUE 1970 - 2011



Northern Prawn Fishery: GVP 2010–11



THE LESSONS

- There is no 'perfect' management system

OUTPUT CONTROLS – INDIVIDUAL TRANSFERABLE QUOTAS (ITQ's): responsive & flexible for adjustment BUT generally inappropriate in short life cycle, multi-species fisheries due to annual variation in recruitment & potential for high grading & discarding; expensive to administer and enforce

INPUT CONTROLS – BOAT SIZE / HORSEPOWER/GEAR CONTROLS:

Not effective at controlling effort; not totally flexible or responsive for adjustment; impose economic inefficiencies; benefits of individual decisions to increase efficiency dissipated across the fleet

32

THE LESSONS cont.

- Trade-offs between costs and benefits in all systems
- The balance (competing objectives) changes – subject to complexity of management arrangements and degree of risk
- Closures effective for biological protection (eg seagrass/habitats/ small prawns) but impose economic impediments on operators
- Reductions in fishing effort MUST be implemented through the primary management tool to avoid increasing economic impediments
- Targets are rarely – if ever – met in time, on time. To achieve objectives: harvest strategy should include clear targets, objectives & decision rules, including economics

"The choice is clear – it's either SMART fishing or NO fishing!" - Tony Long, WWF

"Profit is not a dirty word" – Billy Thorpe

Lessons

- There is no right and wrong
  - Decide where you want to go and get on with it.
  - Fisheries management is more about people than fish
  - You can have the right people with the wrong system and you will have a winner.
  - What keeps you awake at night?
    - Fuel cost
    - Availability of good crew
    - Being able to sell your business when the time comes?
    - A succession plan?
    - The price of prawns?
      - Cant differentiate from the imports?
    - Regulators???
    - Profitablity
    - Climate change?

35

Appendix 1.23. Spencer Gulf Prawn Fishery

Spencer Gulf & West Coast Prawn Fishermen's Assoc. Inc.

Harvesting with Care in the State of South Australia

Greg Palmer

Co-management – Joint Steering Committee Workshop
6th April 2009

Real Time Management

- Detailed database of catch and effort statistics
- Extensive research since the late 1970's
- First prawn trawl surveys conducted in 1981
- In 1986, catch dropped from 2000t to 1200t
- Start of Real Time Management using area and time closures
- Partnership formed with PIRSA and SARDI

Year	Spencer Gulf
1968	383.7
1969	557.3
1970	815.5
1971	936.5
1972	1076.3
1973	1485.3
1974	2521.1
1975	1736.1
1976	2130.1
1977	2040.7
1978	1734.6
1979	1924.9
1980	2255.0
1981	2186.1
1982	2380.2

Early Beginnings

- Western King Prawns first trawled in 1909
- Fishery began in 1967
- Prawn permits issued (restricted entry) in 1968
- Used to fish 300 nights per year
- Vessels fished anywhere in the Gulf >10m

Benefits of Research

- Benefits of prawn research benefit fishermen
- Reduction in fishing effort – now only fish for approximately 55 nights per year
- 80% of prawns are caught in 8% of the Gulf
- Fishing effort is now focused

Early Beginnings

- Vessels had access to the West Coast
- 2 zones were created in the Spencer Gulf
- Spencer Gulf zones merged in 1971
- Option given to stay in tuna or prawns 1972/73
- 1976 Spencer Gulf and West Coast prawn fisheries separated
- 39 Spencer Gulf prawn fishing licences

3

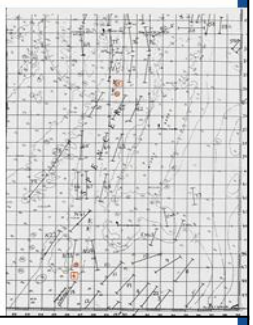
Evolution of Co-Management

- Goal: Manage the fishery ourselves with minimal involvement of the Government and have the finances to do this
- Cost savings, increased professionalism, forward thinking and planning, independence, autonomy

6

Evolution of Co-Management

- Industry takes on more responsibility in 2004
- Surveys coordinated by government and industry
- Harvest strategies jointly managed by industry, PIRSA and SARDI
- Data collected and reporting is managed by SARDI



The Future of Co-Management

Develop an alternative co-management model that meets requirements

Understand work involved for stakeholders

Implement model 'slowly' to ensure we get it right

Gain the support of all stakeholders

Questions?

Greg Palmer
Coordinator At Sea
Member, Management Committee
Email: palmfish@internode.on.net
Mobile: 0428 840 991

9

Appendix 1.24. East Coast Trawl Fishery Workshop, Outcomes

Discussion summary: Hervey Bay (Jebreen)

Drivers

- Stock sustainability;
- Economics/ profitability: inability to adapt to changing trends/ market trend/ regulatory imposts/ increasing operational costs

Challenges

- Individual profitability Vs fleet profitability
- Lack of understanding/acceptance of stock assessment
- Business structures – family/corporate/ succession planning
- Numbers of boats – more difficult for single boat owners
- Age of operators – ability to change careers
- Leadership (or lack there-of) to drive change

Are there any problems? If so, what are they?

- Lack of Profitability
- Over-allocation of effort (latent/unused + operational)
- Industry Voice
- Efficiency/costs
- Investment in the industry (vessels, people,
- Marketing/prices
- Structure of the fishery

Considerations

- Need for/ Mechanisms for adjustment:
  - Compulsory reductions: effective at achieving hard targets/ non-discriminatory/ controversial – will result in immediate benefits
  - Buy backs: Government/Industry funded
    - Voluntary – less controversial, slow, ineffective subject to $$$
    - Compulsory component – effective at achieving hard targets/ non-discriminatory/ controversial but immediate benefits
    - Limited (if any) government funding
    - Difficult to get industry agreement to funding – needs to include hard targets to achieve profitability for those remaining – low interest rates offer opportunities

Over-allocation of effort/licences (latent/unused + operational)

- Agreed that there is excessive effort/licences in the fishery (majority suggest it is the priority)
- The first issue that needs to be addressed
- Separate latent/unused effort and operational effort
- Whatever approach, make sure that there is a reduction in the number of participants
- Too many boats at the fleet level (EJ)
- No management controls at the stock level (EJ)
- Need to keep enough capacity for potential increases (EJ)
- How to fix it?
  - Combination of industry/government strategy/contribution (agreed)
  - Industry need a co-ordinated approach to government (happened?)
  - Dave Sterling – tender process
  - Example only- 20% voluntary 40% government purchase
  - Still need to make sure you remove licences.
  - EJ – might be more costly to voluntarily forgo effort, cheaper to buy it up front on tender (government financed)
  - Other investors

Industry Voice- a co-ordinated industry

- Need leadership and organisation
- Difficult to be an active fisher as well as attending meetings/ think of issues
- Already discussed the establishment of a peak body, fully cost recovered and based on GVP across all fisheries (Steve)
- A lot of industry that don't want to remain in the fishery still have a big say
- Add the costs to licence fees (EJ unsure, but convince the Minister it's a good idea and your nearly there)
- Very diverse ideas on what individuals need/want from or for the fishery
- Need a clearer policy direction for the objectives of the fishery, with reference points etc

Efficiency/costs

- Need to be profitable to keep crews
- Fishing smarter, greater co-management, after effort has been removed.
- EJ- ideally after sustainability issues are removed, can reduce operational limitations ie gear restrictions

- Difficult without output controls
- Need smarter approaches to fish for scallops, structured rotational harvests

Marketing/prices

- Import competition (tough to fix)
- Product differentiation
- Dollar influences import price/competitiveness
- Collaboration/co-ordination between fishers/industries.
- Differentiation by species (ie kings)?
- Timing and volume of catches on the market influence domestic price
- Lack of vertical integration
- Issues with storage, cash flow, etc
- Challenges are there in the post-harvest sector as well

Structure of the fishery

- This is something that can occur more effectively down the track once effort is removed
- Is the current arrangements appropriate?
- Better to break it down to component fisheries?
- Example scallops.
- Dave Sterling – need to have a better understanding of when and where to fish EKP
- Most people like the flexibility to be able to change between species
- EJ- Can still be one fishery, but managed as discrete stocks eg real time management measures of commercial catch rate

Investment in the capacity of the fishery (capitol and people)

- Hard to stay ahead of the game without profitability
- As an example, one company chose to strategically invest in capitol, people up front
- Or, after rationalisation there needs to be investment back into the fishery up front to get it kick started again

Ensure you are geared up to handle the extra piece of the pie.

Appendix 1.25. East Coast Trawl Fishery Workshop, Outcomes 3: Synthesis of regional meetings

Background

The East Coast Otter Trawl Fishery (ECOTF) is a multi-species fishery that operates throughout the waters of Queensland from Cape York to the Queensland/New South Wales border. The fishery has approximately 422 licenses of which 350 are active vessels fishing a total of 37,000 nights per year landing approximately 8,000 t of seafood, directly employing more than 1500 people and has a Gross Value Production of approximately $100M per annum. The main target species have all been recently assessed as sustainably fished with effort at or below MSY levels.

Over the past 20 years the trawl industry has reduced effort, increased efficiency and adopted better fishing practices such as turtle excluder and by-catch reduction devices. These changes have significantly reduced ecological risks presented by the fishery. Some challenges remain for the fishery such as excess fishing capacity, a few high ecological risks for some species and habitats, and low profitability. These remaining problems put pressure on fishing businesses and regional communities.

The fishery experienced a period of improved profitability between 2000 and 2004 following a previous structural adjustment and the introduction of the Trawl Management Plan. Short periods of profitability are commonly experienced after structural adjustments where remaining fishers enjoy reduced competition and a larger share of fishery resources. Post structural adjustment improvements in profitability are rarely maintained in the long term, and this is especially true for fisheries with inadequate management rules to constrain catch (output) or effort (input) to profitable levels. A high Australian dollar combined with increasing input costs, such as fuel, has reduced the profitability and competitiveness of the Queensland East Coast Otter Trawl Fishery.

Recently the opportunity has been taken to review the fishery's management framework and address specific issues that have been identified by industry since the development of the management plan. These issues include:

1. Excess of effort units in the Fishery;
2. Constraints on technical efficiency;
3. The appropriateness of current bycatch mitigation requirements;
4. Spatial management arrangement not covering all relevant areas;
5. Improving the effectiveness of the current seasonal closures;

6. Ensuring the greatest benefit is derived from the scallop replenishment areas;
7. The appropriateness of the current fishing gear restrictions; and
8. Regulatory driven discarding of certain species.

Through the review process stakeholder advisory groups have identified a need for a reduction in real effort in the fishery to reduce competition between fishers. This would lead to improved average catch rates, increased fishing opportunities throughout the fleet, reduced risk to the marine environment through lower bycatch volume and reduced habitat interactions, and would allow for increases in fishing efficiency through regulatory reform. The advisory groups have also identified the need for an adaptive co-management strategy to establish stock specific management controls, to ensure prawns and scallops taken by the fishery are of a valuable size and stocks are not fished below ecologically sustainable levels. This strategy would serve to reduce operating costs, increasing operator flexibility and industry resilience to changing social, economic and environmental pressures on the fishery. As with any change there is a range of challenges that are faced. These challenges include a diversity of operations and business structures, lack of understanding or acceptance of stock assessment processes and a lack of leadership willing to drive change in the industry.

Stakeholder Meetings

A series of regional stakeholder workshops were scheduled as part of the CRC project looking to identify opportunities for improving the economic performance of the East Coast Otter Trawl Fishery.

The project was looking to measure and compare the economic performance of selected prawn fisheries (Spencer Gulf, Gulf St Vincent and ECOTF) as well as rock lobster and abalone fisheries. The aim was to assess the effectiveness of factors that enable wealth creation within the specific fisheries using wealth-based fishery performance indicators. Key speakers from the Spencer Gulf and Northern Prawn Fishery provided attendees with some unique perspectives on common problems faced by all fisheries at some time or another and innovative solutions that have delivered economic improvements in these particular fisheries.

Through identifying innovative operational procedures, business structures and management systems in other fisheries potential options were discussed to improve the economic performance of the ECOTF. At the workshops stakeholders were asked to consider the ideas and experiences presented and discuss these in the context of the issues facing the East Coast Otter Trawl Fishery identifying the benefits, problems, adaptability of the fleet to change and the economic impacts relevant to the fishery.

The meetings were held in Cairns, Townsville, Hervey Bay and Mooloolaba. A total of ~30 industry participants attended across the four meetings with a range of interests represented including fishers, fleet managers, business owners, processors and marketers. Participants engaged in the meetings whole heartedly and provided valuable input into discussions about options to address key issues facing the fishery.

Key Issues Identified

- Over-allocation of effort (unused + active)
- Lack of Profitability
- Efficiency constraints
- Structure of the fishery
- Industry Voice
- Investment in the industry (vessels and people)
- Marketing/prices

Meeting Discussion

Overcapacity

Participants agreed that there is excessive effort/licences in the fishery with the majority suggesting it is the priority issue to be addressed.

Surplus effort stymies any attempts to increase profitability because as profit improves, effort increases and this drives down the profit again.

There is a need to separate latent/unused effort and operational effort in any approach to effort reduction.

Whatever approach, make sure that there is a reduction in the number of participants/boats.

Too many boats at the fleet level dilute profits.

Need to keep enough capacity for potential increases in effort or efficiency.

Participants discussed the potential for a staged effort unit reduction but the situation requires that efficiency is improved now, not in a piecemeal process over time.

How to fix it?

- Combination of industry/government strategy/contribution
- Industry need a co-ordinated approach to government
- tender process
- Still need to make sure you remove licences.
- might be more costly to voluntarily forego effort, cheaper to buy it up front on tender (government financed)
- Other investors

Economics/Profitability

The size of the slice of the pie is critical despite the size of the pie going up and down.

Its not good enough to "just" be biologically sustainable, the fishery needs to be financially viable enough to self fund the required regulatory reform.

Economic survey data required every 3-4 yrs to inform management framework.

The aim should be to get a return on investment to counter opportunity costs.

Operation needs to be profitable to keep crews.

Fishing efficiency

Fishers find it hard to stay ahead of the game without profitability in the industry.

Fishing smarter, greater co-management, after effort has been removed is required.

Ideally after sustainability issues are removed the government can reduce operational limitations ie gear restrictions.

After rationalisation of the effort/fleet there needs to be investment back into the fishery up front to get it kick started again.

Individuals need to ensure they are geared up to handle the extra piece of the pie.

Efficiency increases are difficult to manage without output controls.

Need smarter approaches to fish for scallops, structured rotational harvests.

Regulatory reform

This is something that can occur more effectively down the track once effort is removed.
Need a clearer policy direction for the objectives of the fishery, with reference points.
No current management controls at the stock level.
Are the current arrangements appropriate?
Better to break it down to component fisheries?
Most people like the flexibility to be able to change between species.
Can still be one fishery, but managed as discrete stocks eg real time management measures of commercial catch rate.

Stakeholder Engagement

The fishing industry needs leadership and organisation.
Industry need to develop answers to the issues through a key industry leadership group.
It is difficult to be an active fisher as well as attend meetings/ think of issues
The world is run by those that attend.
Industry needs to value representation.
Discussed the establishment of a peak body, fully cost recovered and based on GVP across all fisheries and add the costs to licence fees
A lot of industry that don't want to remain in the fishery still have a big say
Very diverse ideas on what individuals need/want from or for the fishery

Markets/Pricing

Import competition impacts prices (tough to fix)
Product differentiation needs to be developed
Industry heavily controlled by markets, dollar influences import price/competitiveness.
More collaboration/co-ordination between fishers/industries.
Differentiation of product by species (ie kings)?
Timing and volume of catches on the market influence domestic price, this needs to be better managed to optimise prices.
Lack of vertical integration
Issues with storage, cash flow, etc
Challenges are there in the post-harvest sector as well