

# Australian prawn farming

## An industry development plan

### 2008–10



This publication was developed in conjunction with the Queensland prawn farming sector of the Australian aquaculture industry. The report addresses the current and future issues that the industry believes are important to its future.

The Department of Primary Industries and Fisheries (DPI&F) seeks to maximise the economic potential of Queensland's primary industries on a sustainable basis.

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## Contents

Acknowledgements .....	1
Chairman’s message .....	2
Background .....	3
Current status of the industry .....	5
The future of prawn farming .....	7
Issues and actions .....	7
Broodstock .....	7
Biosecurity .....	10
Performance .....	11
Marketing and promotion .....	13
Table of actions .....	14
List of acronyms .....	15
Relevant publications .....	16
Further information .....	16

## Acknowledgements

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- New South Wales Department of Primary Industries
- Northern Territory Department of Primary Industry, Fisheries and Mines
- Department of Fisheries, Western Australia

Thanks also to the members of the prawn farming sector for their adoption and participation in the industry development planning process.

## Chairman's message

Prawn farming is a developing rural industry that supplies Australians with a high quality alternative to cheap prawn product imports. The industry provides valuable rural employment and operates in an environmentally sustainable manner.

However, there are issues impeding growth. The Australian Prawn Farmers Association has divided the issues into four categories:

- broodstock
- biosecurity
- improving performance
- marketing and promotion.

Industry is working with state governments to develop and implement a plan of action to address these issues, so that prawn farming can grow to its potential.

This publication documents the current plan of action, encapsulating strategy in a straightforward and understandable style.

The 2005–07 strategic plan (and its implementation report) demonstrated that the industry planning process is valuable. We hope the current plan will build on our past achievements.

A handwritten signature in black ink, appearing to read 'J. Harrison', followed by a long horizontal flourish.

**Jeff Harrison**  
Chairman  
Australian Prawn Farmers Association

## Background

In 2005, a two-year industry development plan was developed for the prawn sector of the Australian aquaculture industry. The 2005–07 plan had a national scope and was the joint effort of the Australian Prawn Farmers Association (APFA) and Queensland's Department of Primary Industries and Fisheries (DPI&F). The aquaculture industry and governments of New South Wales and the Northern Territory also contributed significant input (the other two jurisdictions within which prawn farming operated at that time).

Widespread consultation about the draft plan occurred. The final plan was published as *Australian prawn farming: an industry development plan 2005–07*.

The plan identified key issues constraining the prawn sector, and actions to address these issues.

In 2007 the plan was reviewed and the actions evaluated. The results—showing significant progress—were published as the *Australian prawn farming development plan: implementation report*.

Stakeholders agreed that further action was needed in several areas and that the planning approach was worthwhile.

## The new plan

After the July 2007 Prawn and Barramundi Farmers Conference, held in Brisbane, a new APFA committee was formed. This committee supported the industry development planning process, and endorsed the creation of the 2008–10 plan.

## Process

To develop the 2008–10 plan, the APFA and DPI&F began with a review of issues identified in the implementation report. Consequently:

- The APFA further defined the key issues.
- The APFA and the QDPI&F jointly developed a draft document.
- The draft was circulated to all contactable persons holding entitlements to farm prawns in Queensland, New South Wales, the Northern Territory and Western Australia for consultation (minimal comment was received from farmers, but one broodstock fisher provided input on the constraints on his activities).
- The process and content were also discussed with officers in other jurisdictions (New South Wales, the Northern Territory and Western Australia).
- Matters raised in the consultation were incorporated into this final version of the plan.

The APFA and DPI&F will review the plan in 2010 to determine the degree of implementation achieved and identify remaining issues.

## **Relevant strategies produced by the APFA**

### *APFA research and development strategy 2007–12*

In addition to this industry development plan, the APFA also developed a research and development plan—structured to match Commonwealth requirements for research funding.

### *Australian prawn farming industry training plan 2007–08*

The APFA also developed a plan to improve training and retention of quality staff. The training plan aims to build the industry’s capacity to produce world-class aquaculture prawns.

This industry development plan 2008–10 complements these two plans —it does not reiterate the topics.

## Current status of the industry

Prawn farms have operated in Queensland, the Northern Territory and New South Wales for some time, and the first farm was licensed in Western Australia in late 2007. Potential development of large-scale farming in Western Australia will depend on the success of the existing farm.

The major species farmed in Australia is the black tiger prawn, *Penaeus monodon*, with the banana prawn, *P. merguensis*, and kuruma prawn, *P. japonicus*, also under production.

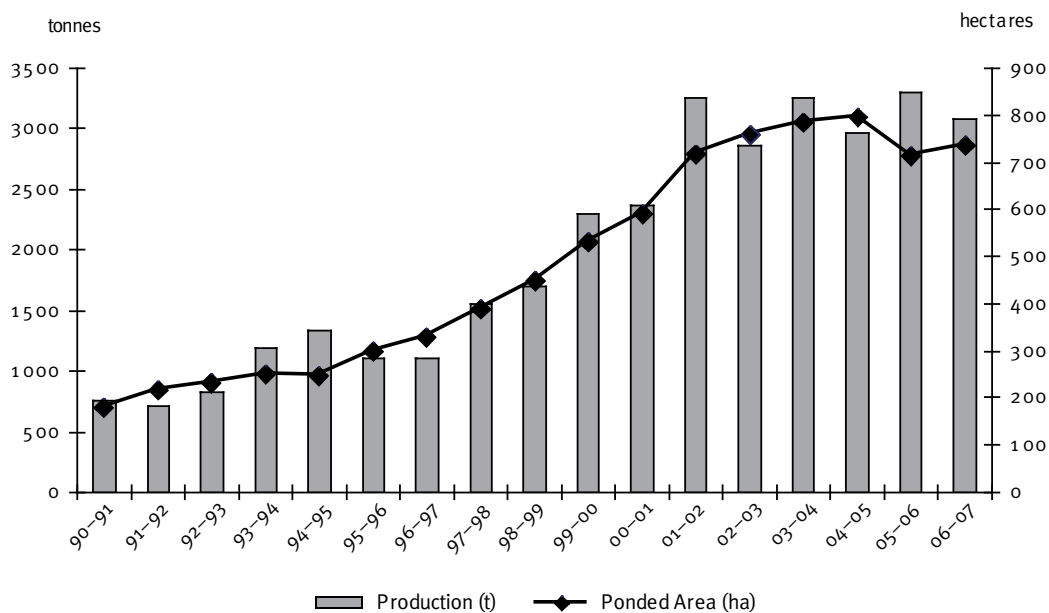
### Area

About 900 hectares of pond area is used for prawn farming in Australia. This figure has been static for several years, although there are indications that this will increase over the next two years.

### Production

The graph below shows trends in production quantity for Queensland farms.

**Queensland marine prawn production 1990–91 to 2006–07**



Data from *Report to farmers, Queensland 2006–07*

Production reached a peak in 2004–05 at 3300 tonnes. Over variable years some farms have attained as high as 11 tonnes a hectare however the average production from 1990–91 to 2006–07 has not exceed four tonnes a hectare. Not all jurisdictions have seen growth. Some aquaculture farms in the Northern Territory ceased to produce prawns or changed to other species, leaving only one producer. Western Australia currently has one farm under construction—anticipated to be operational in the near future.

### *More information*

Detailed information on farmed prawn production can be found in *Report to farmers: aquaculture production survey Queensland 2006–07*.

### **International context**

In Asia, the across-the-board adoption of white shrimp, *Litopenaeus vannamei*, as the main production species for farming has dramatically increased supply—flooding the Australian market—and substantially affected the price of all prawn and shrimp species.

### **Profitability**

The performance of individual farms varies significantly—both for production per hectare and the return for product. Economic analysis of existing farms has identified that the industry's potential profitability is significant. This means that there is still substantial potential to increase the profitability of many of the farms within the prawn farming sector. An economic analysis of prawn farming in Queensland<sup>1</sup> found that an average farm with 30 hectares of ponds could achieve a net return of \$1.30 per kilogram of prawns produced, with an internal rate of return of 15.3 per cent. Farms with higher yields per hectare could see significant increases in profit.

### **The Australian Seafood Cooperative Research Centre Company Ltd**

The Australian Government is investing substantial research and development funds through the Australian Seafood Cooperative Research Centre (Seafood CRC) Company Ltd, which was incorporated in June 2007.

The Seafood CRC delivers innovative and collaborative research that is industry driven across the whole of the seafood value chain. The Seafood CRC aims to increase:

- the profitability and value of the Australian seafood industry
- access to premium markets
- demand for Australian seafood.

The APFA plans to align and co-invest with the Seafood CRC on shared priorities to maximise its return on investment in research and development (R&D). The state R&D agencies, including DPI&F, are also diverting much of their aquaculture production and value-adding research to the Seafood CRC.

<sup>1</sup> Ross Lobegeiger undertook the study and published the results in *Queensland Aquaculture News* (Issue 30, Sept 07).

## The future of prawn farming

The APFA believes that the growth of the prawn farming sector is essential. The *APFA R&D Strategy 2007–12* (APFA R&D strategy) aims to increase the gross value of industry production from approximately \$50 million to \$120 million.

Industry participants have shown renewed confidence. Western Australia is currently developing a large-scale farm. In Queensland, several farms are expanding their production area and in early 2008 the state government approved an additional 250 hectares for one particular farm.

The APFA believes that addressing key issues will boost expansion of domestic production of prawns and assist the establishment of new prawn farming ventures. These issues are:

- broodstock
- biosecurity
- improving performance
- marketing and promotion.

## Issues and actions

### Issue 1: Broodstock

Adult broodstock prawns are an essential requirement of the farming process. The sexually mature prawns are mated in a hatchery, producing post-larvae (PL) that are transferred into ponds for growout.

To meet farming requirements, the supply of broodstock prawns must be:

- adequate in number
- reliable
- timely.

### Access to broodstock

At this time the only readily available commercial supply of broodstock prawns is from the wild and the majority of these are taken from the north-east coast of Queensland.

Black tiger prawns suitable for broodstock are restricted in their natural distribution and are only successfully fished in limited areas. Commercial fishing of these prawns generally requires specialised techniques for the capture, storage and transport of the broodstock.

To date, Queensland is the main source of broodstock prawns—supplying farmers in New South Wales, Queensland and the Northern Territory. Fishers report that obtaining broodstock is increasingly difficult, and that there are inadequate financial incentives. In 2005 the Great Barrier Marine Park Authority (GBRMPA) implemented a new marine park zoning scheme that reduced Queensland's prawn fishing grounds. This had a major effect on the collection of black tiger prawn broodstock, and on the Australian prawn farming industry. The zoning restrictions encouraged commercial prawn fishers to sell many of the broodstock prawns as food items, further limiting broodstock supplies.

APFA feels that constraints on prawn fishers, along with the current closures, work against the industry. Similar comment was made by a broodstock fisher. APFA contends that the closures should—at every appropriate interval—be reviewed, with a view to re-opening key areas.

DPI&F are reviewing regulations that manage fishing in the remaining Queensland broodstock grounds and expect to complete the Regulatory Impact Statement (RIS) in late 2008. Input from the prawn farming sector was received and integrated into the proposed new management arrangements—most likely introduced before the end of 2008. It will then take a season to estimate the effect of these changes.

#### **Action 1**

Once new regulations and/or management arrangements are implemented for prawn broodstock grounds in Queensland the process will be to monitor compliance, assess the impact and respond accordingly. (APFA and DPI&F)

### **Broadening broodstock supply**

Limited numbers of broodstock prawns were harvested in the Northern Territory after broodstock fishing grounds were identified. Regular supply chains and the reliability of this source are not yet established. Northern Territory prawns and those sourced from the east of Cape York appear to be a separate genetic stock. The emerging prawn farming sector in Western Australia will most likely acquire its broodstock prawns from adjacent waters. Some demand may emerge for trade between jurisdictions, raising biosecurity issues regarding translocation of genetic stocks and diseases.

#### **Action 2**

Assess and continue to develop new sources of broodstock prawns. (APFA, state and territory fisheries agencies and AFMA)

### **Broodstock movement in the wild**

Previous studies identified that demand for wild broodstock exceeds supply during the industry's preferred market cycle. To meet the peak demand experienced at Christmas, farmers need wild broodstock as early as September (this depends on whether the farm is in Cairns or Brisbane), so that a crop can be harvested around mid-December.

Unfortunately, wild prawn broodstock is prolific in the inshore grounds around mid-January to late April but supply drops from then till late June. From July to December the catch is considerably reduced and the quality of the prawns is poorer.

There is a need to understand why the industry can take broodstock prawns from one broodstock ground at a given time, but not at other times. Do prawns move, or do they adopt behaviours that make them less susceptible to conventional fishing practices? Better understanding would assist continuity and timeliness of the supply.

### Action 3

Initiate research to track the movements of individual broodstock prawns after periods of peak harvest and peak industry demand. Seek funding for this research from sources including the Australian Government. (APFA and DPI&F)

### Reliable supplies of broodstock

Reliable new sources of broodstock from the Northern Territory and Western Australia are not yet assured. The main supply of broodstock prawns still comes from Queensland, where it currently depends on the expertise of two individuals. The industry has no succession plan in place. This presents a high risk for the prawn farming sector. A fisher has suggested that an increased return for broodstock would provide additional incentive for operators to remain in the fishery.

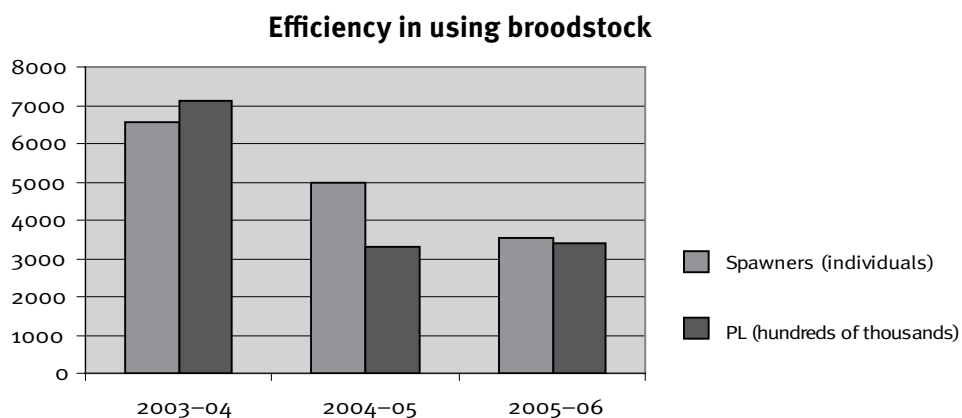
### Action 4

Work closely with Queensland prawn broodstock suppliers and fishers to ensure continuity of supply to the prawn farming sector. (APFA and DPI&F)

### Getting the best from broodstock

Supply of broodstock currently exceeds demand during peak marketing times—availability of stock at these times must be optimised.

Efficiency in using broodstock is variable. (See the following graph.)



Adapted from *Report to farmers 2005-06*

There are several key steps in the production chain. Capture by trawling and transport to farms can stress or injure prawns. Farmers report that the quality of broodstock they receive can vary dramatically. Conversely, broodstock suppliers report that some farmers are more adept at getting the best from prawns once they have received them. To get the best possible return from the limited broodstock supply, best-practice guidelines must be defined for all stages of harvesting, handling and caring for broodstock, and then disseminated throughout the industry.

### Action 5

Hold a workshop to develop best-practice guidelines for harvesting, transporting, handling, husbandry, mating and maturation of broodstock prawns. Document and disseminate the outcomes. (APFA and DPI&F)

## Domesticated broodstock

There is a need to close the prawn life cycle in captivity and have domesticated broodstock available to farmers. Broodstock prawns taken from the wild:

- are subject to natural genetic variation and are not selected for their suitability for domestication
- carry with them a suite of natural pathogens and parasites
- may not be in peak breeding condition when acquired
- may suffer from trauma
- offer an apparently inconsistent and unreliable supply.

The Australian prawn farming sector may have to compete—in the near future—with countries that have genetically improved stock.

The APFA R&D strategy proposes improving domesticated broodstock. The plan also proposes strategies to evaluate methods for the commercial induction of all female prawn populations to increase growth.

Recent Australian research has yielded significant advances in domesticated prawns bred through several generations. Despite this progress, the uptake of domesticated genetic lines of prawns is limited and at this stage the direction forward is unclear.

High performing lines need to include some genetic variability to prevent future inbreeding. Holding different genetic lines of quality broodstock at several separate locations can maintain genetic variability. This would minimise the risks posed by untoward events such as biosecurity breaches.

Genetic lines of domesticated prawns may create intellectual property (IP) issues, which could impact on access, or cost of access, to the higher performing lines. It is better to resolve these IP issues before they become a problem.

### Action 6

Document a clear strategy on domestication of black tiger prawns, including the management of intellectual property issues. (APFA, AIMS, CSIRO and DPI&F)

## Issue 2: Biosecurity

Prawn farming, in many overseas countries, has experienced diseases of economic significance. It is essential to prevent the entry of exotic pathogens into Australia to protect the:

- domestic prawn farming sector
- commercial fishing sector
- conservation status of wild populations of prawns.

In 2007, Biosecurity Australia issued policy memorandum 2007–16, *Importation of prawns and prawn products – revised interim quarantine measures*. This document defined restrictions on the importation of prawns indicating that unless the source of prawns was free of specific diseases, the prawns must have head and shell removed or be highly processed. These interim measures could be removed if the threat of disease incursion was considered low. Given the high risk to the domestic sector, the industry should lobby Biosecurity Australia to make these restrictions permanent.

#### **Action 7**

Lobby the Australian Government to make current prawn import restrictions permanent. (APFA and state government fisheries agencies)

Whilst the major biosecurity concern for the domestic industry is the incursion of exotic disease, endemic disease management is also important to overall industry production. Local producers would benefit from a best-practice manual capturing the significant amount of work available about biosecurity management for the domestic prawn farming industry.

#### **Action 8**

Compile a best-practice biosecurity management guide for domestic producers that captures both federal and state government practices and policies for practical on-farm use. (APFA and government agencies)

### **Issue 3: Performance**

The industry needs production standardised across all farms. The APFA R&D strategy aims for continued improvement in the operational effectiveness and efficiencies of prawn farms to decrease the cost of production and increase yields per hectare. This objective is consistent with the mission of the Seafood CRC.

#### **Boosting productivity**

Inefficient pond operations will result in poor productivity. The tendency among producers is to significantly increase levels of production without corresponding increases in pond area. Efficiency varies across the industry, suggesting that overall improvement is feasible. The APFA R&D strategy aims to increase average production from 4 tonnes per hectare to 8 tonnes per hectare.

Assessing and developing benchmarks for other parts of the production chain may improve efficiency (for example, improving the standard of seed-stock to boost growth rates and pond use efficiency). The APFA R&D strategy proposes benchmarking all prawn farm operations to facilitate increased efficiencies.

The APFA R&D strategy proposes to investigate effective and efficient management information systems for prawn farm management.

#### **Action 9**

Continue workshops to define best-practice farming benchmarks, and publish the results. (APFA)

## Increased investment

There was minimal growth in the prawn farming sector in recent years, possibly due to investor uncertainty, unrealistic returns and government restrictions. However, at the time of drafting this plan, growth appears to have resumed, with existing farms increasing pond area, and new large-scale farms established in Western Australia and Queensland. The provision of planning advice, information on legalities, approvals process, and data on costs and returns of prawn farming will increase investor understanding of the industry. It is important that the industry and potential new investors are provided with up-to-date advice on matters effecting their existing or potential investment.

### Action 10

Develop, update and make available investor guidelines on Australian prawn farming. (DPI&F and APFA)

## Strong environmental credentials

Seafood wholesalers, retailers and consumers want increasing assurances that the production process is sustainable and the quality of consumer product offered for sale is assured.

The APFA R&D strategy aims for continuous improvement of environmental practices and performance. There are pre-existing standards available to demonstrate best practice (for example, the ISO 1400). The Global Aquaculture Alliance has proposed another set of standards, and the Food and Agriculture Organisation of the United Nations is producing global guidelines for accreditation of aquaculture. However, while achieving these environmental standards is desirable, many existing farms can only afford to upgrade in stages.

As an interim step, farms should develop an environmental management plan (EMP).

### Action 11

Each farm to develop an EMP for evaluation by a third party. (APFA and individual operators)

An EMP can also deal with matters of health and safety, as well as other employment standards, in order to acquire, train and maintain skilled staff. The EMP provides each operator a framework for continuous improvement to reach these standards.

Additionally, the industry should ensure that whole-of-chain stakeholders are aware of these standards.

## More skilled staff

There is a shortage of skilled staff and managers in the prawn farming industry. The APFA has developed a plan that aims to:

- attract new staff
- train existing but untrained staff
- nurture leadership
- develop communication and business skills
- provide incentive-based training schemes
- improve the business skills of senior management, company directors and farm owners.

#### Action 12

Implement actions identified in the *Australian prawn farming industry training plan 2007–08*. (APFA)

### Issue 4: Marketing and promotion

The APFA has proposed a unified marketing and promotion plan: *Passion for Prawns*.

#### Product price

Economic analysis indicates that farm profitability is dependant on product price. The APFA R&D strategy aims to assist Australian prawn farmers to efficiently deliver a product that meets consumer demand in current and new markets—increasing the average farm-gate value of farmed prawns from \$14 per kilogram to \$16.50 per kilogram.

The APFA R&D strategy proposes identifying new domestic and international markets for Australian farmed prawns. The plan also aims to develop a system to collect and disseminate market intelligence to foster better decisions—this strategy is within the scope of the *Passion for Prawns* program and appears consistent with the mission of the Seafood CRC.

To maintain and maximise the price of Australian produce it is important to differentiate Australian produce from imports. The introduction of labelling requirements has assisted the consumer to differentiate the type and origin of prawn products.

#### Action 13

Evaluate opportunities for funding to support product differentiation. Apply for funding. (APFA)

#### Build consumer confidence

Using food safety systems, Australian prawn farmers can now trace the prawns they distribute back to the source ponds.

It is possible to add value to product tracing to build consumer confidence. For example, some primary industries—particularly beef producers supplying the Japanese market—have developed systems that allow consumers to trace the product back to the original producer.

#### Action 14

Value-add to existing trace systems—develop online farmer profiles, assign product codes to the profiles and allow consumers to investigate the original producer and origin of their prawns. (APFA and DPI&F)

## Table of actions

Issue		Action	Who
Broodstock	1	Once new regulations and/or management arrangements are implemented for prawn broodstock grounds in Queensland, monitor compliance, assess the impact and respond accordingly.	APFA and DPI&F
	2	Assess and continue to develop new sources of broodstock prawns.	APFA, DPI&F, Fisheries WA, Fisheries NT and AFMA
	3	Initiate research to track the movements of individual broodstock prawns after periods of peak harvest, and peak industry demand. Seek funding from sources including the Australian Government.	APFA and DPI&F
	4	Work closely with Queensland prawn broodstock suppliers and fishers to ensure continuity of supply to the prawn farming sector.	APFA and DPI&F
	5	Hold a workshop to develop best-practice guidelines for harvesting, transporting, handling, husbandry, mating and maturation of broodstock prawns. Document and disseminate the outcomes.	APFA and government agencies
	6	Document a written strategy on domestication of <i>P. monodon</i> , including the management of intellectual property issues.	APFA, AIMS, CSIRO, DPI&F
Biosecurity	7	Lobby the Australian Government to make current prawn import arrangements permanent.	APFA and state government fisheries agencies
	8	Compile a best-practice biosecurity management guide for domestic producers that captures both federal and state government practices and policies for practical on-farm use.	
Performance	9	Continue workshops to define best-practice farming benchmarks, with dissemination of results.	APFA
	10	Develop, update and make available investor guidelines on Australian prawn farming.	APFA and DPI&F
	11	Each farm to develop an EMP (3rd party evaluated).	APFA and individual operators
	12	Implement actions identified in the <i>Australian prawn farming industry training plan 2007–08</i> .	APFA
Marketing and promotion ( <i>Passion for Prawns</i> )	13	Evaluate opportunities for funding that supports product differentiation. Apply for funding.	APFA
	14	Value-add to existing traceability systems—develop online farmer profiles, assign product codes to the profiles and allow consumers to investigate the original producer and origin of their prawns.	APFA and DPI&F

## List of acronyms

AIMS	Australian Institute of Marine Science
APFA	Australian Prawn Farmers Association
CRC	Cooperative Research Centre
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DPI&F	Queensland Department of Primary Industries and Fisheries
EMP	Environmental management plan
GBRMPA	Great Barrier Reef Marine Park Authority
IP	Intellectual property
PL	Post-larvae
R&D	Research and development
RIS	Regulatory Impact Statement

## Relevant publications

### Available from DPI&F at [www.dpi.qld.gov.au](http://www.dpi.qld.gov.au)

*Australian prawn farming: an industry development plan 2005–07.*

*Australian prawn farming: an industry development plan—implementation report*

*Report to farmers: aquaculture production survey Queensland 2005–06*

Available from the Australian Prawn Farmers Association at [www.apfa.com.au](http://www.apfa.com.au)

*Australian prawn farming industry: training plan 2007–08*

*Five year research and development plan for the Australian prawn farming industry 2007–12*

### Available from individual agencies

*Importation of prawns and prawn products—revised interim quarantine measures*, Biosecurity Australia policy memorandum 2007–16. Visit: [www.daff.gov.au/ba](http://www.daff.gov.au/ba)

*Country of origin food labelling advice for consumers*, Food Standards Australia New Zealand. Visit [www.foodstandards.gov.au/](http://www.foodstandards.gov.au/)

## Further information

The Australian Prawn Farmers Association ([www.apfa.com.au](http://www.apfa.com.au))

DPI&F ([www.dpi.qld.gov.au](http://www.dpi.qld.gov.au))

The Australian aquaculture portal ([www.australian-aquacultureportal.com](http://www.australian-aquacultureportal.com))

Australian Seafood Cooperative Research Centre ([www.seafoodcrc.com/](http://www.seafoodcrc.com/))



