Australian Prawn Farming Manual

Health Management for Profit
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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Acknowledgments

This publication is the product of considerable effort by a diverse range of people with extensive experience in both the Australian and international shrimp farming industry. The content of the Australian Prawn Farming Manual is drawn from their knowledge as prawn farmers, research scientists, consultants, government extension providers or trainers who assist in the development of the prawn farming sector. Contributors were invited to provide written sections on their specialised area of expertise, and the draft document was collated and edited according to a plan formulated by the Prawn Manual Steering Committee.

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Using this manual
Throughout this manual the following coloured boxes contain:

- **Important facts**
- **Useful information**
- **Handy hints**
Part 1

Establishing a prawn farm – what you need to know
Prawn farming in Australia

Overview of the prawn farming industry

The Australian prawn farming industry produces more than 3500 tonnes of prawns a year, valued at over $47 million, and is based on approximately 900 hectares of ponds and 12 hatcheries (Lobegeiger and Wingfield 2004) (see Figure 1.1). The industry is based primarily in Queensland, the bulk of production being in north Queensland between Ayr and Port Douglas. Other significant prawn farming areas in Queensland include Mackay, Bundaberg and the Sunshine Coast and Gold Coast regions. Prawn farms in New South Wales are located in the Northern Rivers region from Ballina south to Coffs Harbour. Prawn farming is also conducted in the Northern Territory near Darwin and is under development on the northern coastline of Western Australia.

Figure 1.1 Prawn farming areas in Australia
The industry is mostly based on the farming of three endemic species:

- the black tiger prawn *Penaeus monodon* (Figure 1.2)
- the banana prawn *Fenneropenaeus merguiensis* (Figure 1.3)
- the kuruma prawn *Penaeus japonicus*.

![Figure 1.2](image1.png) The black tiger prawn *Penaeus monodon*

![Figure 1.3](image2.png) The banana prawn *Fenneropenaeus merguiensis*

Other species such as the brown tiger prawn *P. esculentus*, the school prawn *Metapenaeus* spp. and the eastern king prawn *P. plebejus* were trialled or grown in the pioneering stages of the industry but did not provide significant production results or commercial success. Various other endemic species that are commercially farmed in other countries, including the grooved tiger prawn *P. semisulcatus* and the indicus prawn *P. indicus*, have also been trialled in Australia without any significant uptake in the industry. The three main species listed above have been adopted in the industry primarily due to a combination of their strong market value and successful hatchery/growing technology that is suited to Australian conditions.

Prawn farming is well established as an industry in many other tropical and subtropical regions of the world, although it is more generally known as shrimp farming in the Americas, Asia and the Middle East. The world prawn farming industry grew dramatically from the early 1980s and by 2004 farmed prawns accounted for approximately 2 million tonnes, or 50 per cent of world production. Because of the enormous demand, over-extended fisheries were unable to supply their markets, and shrimp farmers doubled the world’s supply of shrimp in 30 years (Rosenberry 2004).
During the pioneering stages of industry development, Australian prawn farmers trialled farming methods used in other countries such as Taiwan, Thailand, Indonesia and the USA, but then modified the techniques to suit the Australian environment and workplace. Considerable industry and government investment in research and development (in genetics, growout technology, environmental and health management) has also provided a steady stimulus for the industry to expand. Despite its current small size in terms of gross production, the Australian prawn farming industry is now considered internationally as a leader in best practice management and product quality.

Using an international scale of classification (Table 1.1), virtually all Australian prawn farms are managed as intensive farms.

### Table 1.1 Levels of intensification in international prawn farming

<table>
<thead>
<tr>
<th>Level</th>
<th>Feeding</th>
<th>Aeration</th>
<th>Yields in kg/ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extensive</td>
<td>no</td>
<td>no</td>
<td>less than 500</td>
</tr>
<tr>
<td>Semi-intensive</td>
<td>yes</td>
<td>no</td>
<td>500–2500</td>
</tr>
<tr>
<td>Intensive</td>
<td>yes</td>
<td>yes</td>
<td>2500–10 000</td>
</tr>
<tr>
<td>Super-intensive</td>
<td>yes</td>
<td>yes</td>
<td>10 000+</td>
</tr>
</tbody>
</table>

In Australia, the seasonal staging of crops on different farms varies depending on location, marketing strategy, hatchery supply and other issues. Farms south of Mackay tend to produce one crop a year during the summer (because it is too cold in the winter months), whereas farms in the tropical north have the potential to produce two crops. However, many farms in the north stock one crop per year to capitalise on the higher fresh prawn prices around the Christmas period.

**What is being a prawn farmer really like?**

Prawn farming is a high-risk, capital-intensive industry that is site-specific and requires technical expertise. It is clearly more difficult to be financially successful in prawn farming than in conventional farming of livestock or horticulture. If you want to become a prawn farmer, you need to do a great deal of planning and consider financial and lifestyle issues.

Be prepared to work long hours, and forget about the idea of public holidays and weekends — prawns must be fed and looked after! On the positive side, the work is varied and done outdoors, and tasks change throughout the season, although every farmer is glad to see the last day of harvest. Due to the dynamic environment in which the prawns are raised, however, farmers must understand and manage the sudden changes in conditions that can occur at any hour of the day or night.

Prawn farmers must be aware that they are in an agribusiness industry; they should not just concentrate on production, but must also have a firm hand on risk management, marketing and liaison with various government bodies. And it helps if they have a healthy risk threshold!
The success of any aquaculture venture depends on sound initial planning. This is especially important in prawn farming, and should involve the development of a comprehensive business plan that identifies the enterprise goals, market feasibility and the requirements for production. Once these forecasts have been made, it is then possible to predict the financial feasibility and make cash flow projections.

Effective business planning will also assist in the selection of an appropriate site, generally the most critical step in establishing an aquaculture facility and a successful aquaculture business (see Chapter 2). In general, the business plan will dictate the design and size of the farm and specify the equipment and infrastructure required.

Four factors determine the success of any aquaculture venture:

- the production economics, which determines the profits of the venture
- the marketing of the product, which boils down to what price you can get, based on quality and quantity
- the comparative advantages that your product possesses
- the economic opportunity cost of undertaking aquaculture compared with other available activities.

Commercial aquaculture is driven by profit. By choosing to grow prawns for a living, you will be guided primarily by economics. However, technology can be a limiting factor, for example, in the availability of seed stock from hatcheries. Without considering risk, a high-value species would be chosen over a lower-value species. Purely commercial ventures require significant investment and are inherently risky, whereas family or small-scale aquaculture ventures have lower capital and technical requirements, are more easily managed and can provide a relatively stable return.

A wide range of commercial, regulatory, environmental and technical issues involved in establishing a new prawn farm need to be considered. Appendix 1 has more information on these factors, including PrawnProfit software that enables financial decision making for new and existing prawn farming ventures.

At a glance

- Prawn farming is a high-risk industry with a strong reliance on technology.
- It is imperative to find a good site. Many aspects of site selection are important, but good water quality and suitable soils for pond construction are vital.
- An important part of establishing a prawn farm is financial analysis of the business model you are considering, depending on the size of the farm, stocking densities etc. Before you commit to significant investment, economic analysis models such as PrawnProfit (see appendix 1) can help you in the assessment of business viability.
- State and Commonwealth governments have a wide range of information (technical, legislative and economic) to help you decide whether to invest in prawn farming.