

Report to farmers

Aquaculture production survey Queensland 2008–09

Ross Lobbeiger and Max Wingfield

Department of Employment, Economic Development and Innovation
June 2010

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List of acronyms

DAAF	Department of Agriculture, Forestry and Fisheries
DEEDI	Department of Employment, Economic Development and Innovation
FCR	Feed conversion ratio
FTE	Full-time equivalent
QSWAMP	Queensland Shellfish Water Assurance Monitoring Program

1. Production summary

The total value of the Queensland aquaculture industry has increased by 6.5% over the last 12 months, with the value of production increasing from \$80.3 million in 2007–08 to \$85.5 million in 2008–09. This increase was largely due to an increase in the marine prawn sector by more than 30% from \$43.0 million to \$55.8 million.

Although the value of aquaculture production has increased by 6.5% over the last 12 months, the wild catch fishery has remained stable. The proportion attributed to aquaculture has increased from 28.1% to 28.9% over the last 12 months (Table 1). In Queensland the total value of fisheries production, including aquaculture, in 2008–09 was \$295.5 million, which was 3.6% higher than the previous year.

Table 1. Queensland fisheries production—gross value (2004–05 to 2008–09)

ABARE figures			
Year	Total fisheries (\$m)	Aquaculture (\$m)	Aquaculture (%)
2004–05	262.8	64.5	24.5
2005–06	256.7	67.7	26.4
2006–07	276.9	71.9	26.0
2007–08	280.5	75.5	26.9
2008–09	293.9	83.9	28.5
Queensland figures ⁽¹⁾			
	Total fisheries (\$m)	Aquaculture (\$m)	Aquaculture (%)
2004–05	268.1	70.1	26.1
2005–06	261.1	72.1	27.6
2006–07	282.4	77.4	27.4
2007–08	285.3	80.3	28.1
2008–09	295.5	85.5	28.9

(1) The Queensland figures include hatchery production for farm stocking and impoundment restocking. Farm stocking details are excluded from the figures used by ABARE.

Sources: Australian Bureau of Agricultural and Resource Economics (ABARE), Fisheries Queensland, part of the Department of Employment, Economic Development and Innovation (DEEDI).

Table 2. Queensland fisheries production—gross value (\$ million) (2003–04 to 2008–09)

	2004–05	2005–06	2006–07	2007–08	2008–09
Marine prawns—includes prawn hatchery	\$48.1	\$47.9	\$44.4	\$43.0	\$55.8
Barramundi	\$11.9	\$14.0	\$18.5	\$24.3	\$21.4
Redclaw crayfish	\$1.3	\$1.3	\$1.4	\$1.1	\$1.0
Freshwater fish	\$0.9	\$1.5	\$2.2	\$2.3	\$2.6
Hatchery and aquarium	\$1.7	\$2.1	\$1.9	\$1.5	\$2.1
Edible oysters	\$0.7	\$0.6	\$0.5	\$0.6	\$0.5
Pearl oysters	n/a*	n/a*	\$1.7	\$1.3	n/a*
Other ⁽¹⁾	\$5.5	\$4.7	\$6.8	\$6.2	\$2.1
Total	\$70.1	\$72.1	\$77.4	\$80.3	\$85.5

* Not available for publication (included in 'Other').

(1) Includes eels, crabs, marine fish, marine hatchery and pearls in 2008–09.

The marine prawn industry produces three main prawn species—black tiger (*Penaeus monodon*), banana (*P. merguensis*) and kuruma (*P. japonicus*). The kuruma prawn sector is currently represented by one farm where production is minimal.

Production in this sector has increased by 30% from 2943 tonnes in 2007–08 to 3821 tonnes in 2008–09, while the value increased by 32% from \$41.5 million in 2007–08 to \$54.6 million in 2008–09. The average price decreased marginally from \$14.37/kg in 2007–08 to \$14.28/kg in 2008–09. The hatchery sales for the year were \$1.18 million compared with \$1.48 million in 2007–08.

The area harvested increased from 717 hectares in 2007–08 to 747 hectares in 2008–09. The number of producing farms decreased by 25% over the last four years, with only 22 farms in production in 2008–09 compared with 25 the year before.

Barramundi (*Lates calcarifer*) production decreased marginally (3%) from 2464 tonnes to 2400 tonnes in 2008–09. This is the first time in 13 years (since 1994–95) that the barramundi farming industry has not achieved an annual increase in production. The value of the industry has decreased by 12%, from \$24.3 million in 2007–08 to \$21.4 million in 2008–09. The average price on a whole-fish basis decreased from \$9.87/kg to \$8.90/kg.

The majority of production came from pond-based and cage-based systems. Over this period the number of producing pond-based farms decreased from 29 to 23. The number of tank-based systems decreased from six to three. There was just one sea cage operation.

Redclaw crayfish (*Cherax quadricarinatus*) increased marginally from 67 tonnes in 2007–08 to 68 tonnes in 2008–09. Over the same period, the value of redclaw sold as food remained stable at \$1.1 million. The number of producing farms in 2008–09 was 32, which was five less than in 2007–08. The average prices increased marginally from \$16.39/kg in 2007–08 to \$16.54/kg in 2008–09.

The freshwater fish growout sector currently produces silver perch (*Bidyanus bidyanus*), jade perch (*Scortum barcoo*), golden perch (*Macquaria ambigua*), Murray cod (*Maccullochella peelii peelii*) and sleepy cod (*Oxyeleotris lineolatus*). Freshwater fish (other than barramundi) production has increased in value from \$2.4 million in 2007–08 to over \$2.6 million in 2008–09.

In 2008–09 silver perch (10 farms with 18.8 hectares of ponds) accounted for 46% of freshwater fish production, jade perch (six farms with 6.9 hectares) 22%, Murray cod (four farms) 30% and other species 2%. Recirculating tank systems accounted for 17% (32 tonnes) of the total freshwater fish production. Silver perch production was 87.8 tonnes with a value of \$1.03 million. Murray cod production was 59 tonnes with a value of \$988 000. Jade perch production was 41.8 tonnes with a value of \$487 000. The average prices for silver and jade perch were \$11.75/kg and \$12.28/kg respectively, while Murray cod averaged \$16.90/kg.

Figure 1. Value of Queensland aquaculture production (\$ million)

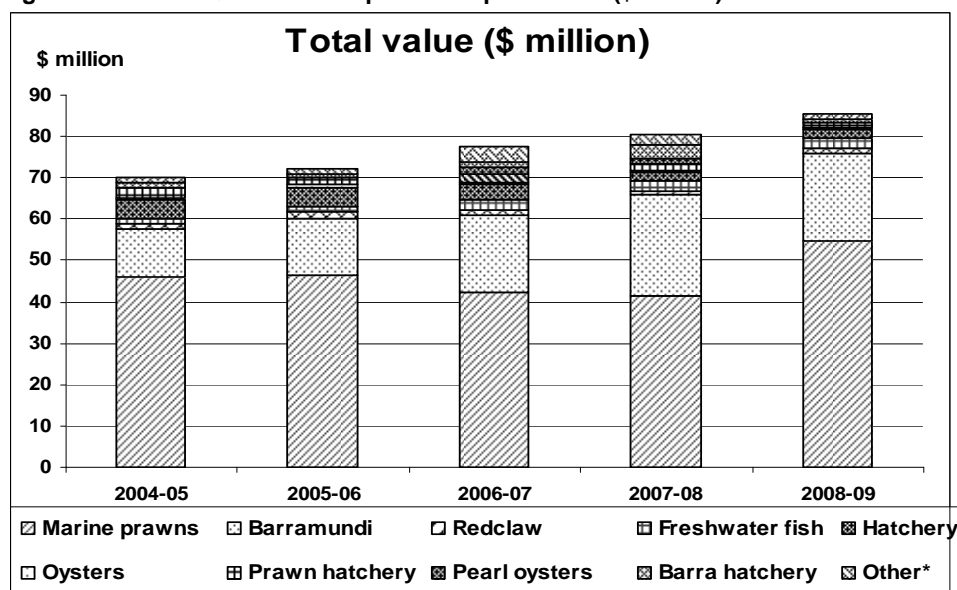


Table 3. Queensland fisheries production—tonnes (2004–05 to 2008–09)

	2004–05	2005–06	2006–07	2007–08	2008–09
Marine prawns	2964	3300	3085	2888	3821
Barramundi	1437	1745	2091	2464	2400
Redclaw crayfish	99	105	100	65	68
Freshwater fish	105	152	210	198	192
Other *	48	25	64	58	39
Total	4654	5328	5550	5673	6520

* 'Other' includes crabs, sea scallops, eels and marine fish.

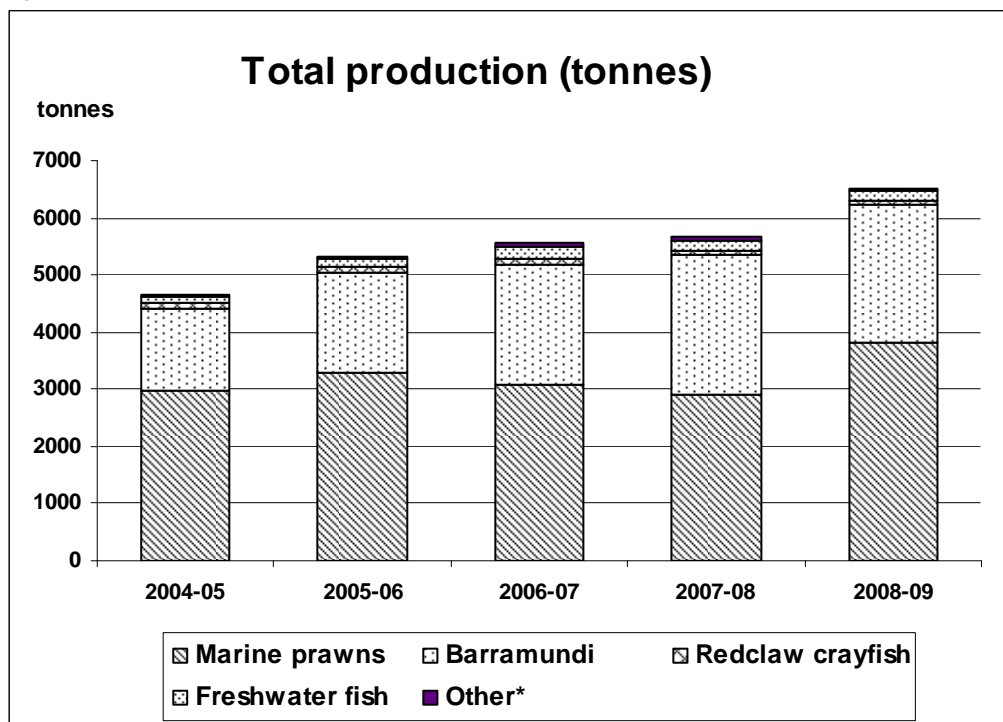
The hatchery sector, producing native fish fingerlings and ornamental aquarium species, had a 21% decrease in the number of sales. The value of the hatchery sector has decreased by nearly 37%, falling from \$6.66 million in 2007–08 to \$2.65 million in 2008–09.

Total edible oyster production decreased from 136 400 dozen in 2007–08 to 105 600 dozen in 2008–09. The value of the industry decreased from \$620 500 in 2007–08 to \$509 600 in 2008–09. The average price per dozen oysters increased by 6% from \$4.55 per dozen to \$4.83 per dozen. This production came from 25 oyster areas in 2008–09 compared with 32 oyster areas in 2007–08.

The total permanent labour force in the aquaculture industry decreased from 465 units in 2007–08 to 403 units in 2008–09. The marine prawn sector accounted for 200 units, or 49% of the total permanent labour force.

When numbers for permanent and casual labour are combined, employment in the Queensland aquaculture industry has decreased by 9% from 619 full-time equivalents (FTEs) in 2007–08 to 562 FTEs in 2008–09.

Figure 2. Queensland aquaculture total production (tonnes)



* 'Other' includes crabs, sea scallops, marine fish and eels.

2. Survey methods

Production statistics for the 2008–09 financial year were collected from all sectors of the Queensland aquaculture industry through a process whereby all holders of a current aquaculture development permit are required to complete a production survey.

In 2008–09 a web-based electronic version of the production survey was offered for the first time, with the older paper-based statistical return also being available. Although the online version was generally well regarded by those producers that accessed the web page, only 235 (49%) of the 476 eligible aquaculture authority holders completed the online version. The paper-based survey was completed by 83 authority holders (17%) and 53 (11%) reported their production directly by phone or email.

The result was that statistical returns were only received from 371 farms (78%) of the 476 registered producers that were contacted and required to complete the production survey. Although a great deal of effort was expended trying to chase up farms that did not submit statistical returns in 2008–09, the response rate of 78% was slightly lower than in previous years (i.e. 85% in 2007–08 and 88% in 2006–07).

The results presented in this report reflect the information provided by the industry through the statistical returns. In order to more easily interpret and document the data provided by farmers, this report groups the information into chapters which reflect the major industry sectors or species groups.

Non-producing farms were able to respond to the survey by selecting the 'nil production option' and were not required to provide further details about their operations. In some sectors, non-response by some of the larger growers can provide a result that under-represents the true industry situation.

The total numbers of survey responses for each species group could not be accurately determined in 2008–09 because the web-based survey only required farmers to submit information on the species they had produced. As most operators have more than one species group approved on their development permit, the electronic survey did not have the capacity to maintain a tally of separate species groups where a farm produced in one approved species group but not in another, or of what species group a 'nil production' should be attributed to.

The following are conversion factors and definitions used in the report:

Conversion factors

Fish production is reported on a whole-fish basis. For example, gilled and gutted barramundi to whole fish (0.89:1 on weight basis) and filleted barramundi to whole fish (0.48:1 on weight basis).

Fingerling fish

Fingerling fish are small fish in the 2–10 gram range.

Juvenile crayfish

Juvenile crayfish are immature crayfish in the 1–15 gram range.

Labour conversion

Labour FTEs are calculated by adding the total permanent labour units to the casual labour units converted to FTEs. Forty hours per week casual labour for 48 weeks per year is considered one FTE labour unit. Information collected in hours per week for permanent labour was converted to FTEs by dividing total hours by 40 hours.

3. Marine prawns

3.1 General

The value of the Queensland prawn industry has increased by 31% from \$41.5 million in 2007–08 to \$54.6 million in 2008–09. Total production increased from 2888 tonnes in 2007–08 to 3821 tonnes in 2008–09. Additionally, the hatchery sector sold post-larvae to a value of \$1.2 million.

Previous reports have separated kuruma prawn (*Penaeus japonicus*) production from the other two main species—black tiger (*P. monodon*) and banana prawns (*P. merguensis*). Kuruma prawn production has almost ceased in Queensland, with only one farm producing limited quantities for the Australian market. This sector has now been included in the general marine prawn group.

Twenty-two farms produced prawns in 2008–09 (25 in 2007–08) and two independent hatcheries (three in 2007–08) produced post-larvae.

Prawn prices ranged from \$9.50/kg to \$17.50/kg and the average farm gate price decreased marginally from \$14.37/kg in 2007–08 to \$14.28/kg in 2008–09 (Table 4). The whole crop was sold on the domestic market.

3.2 Marine prawn production

3.2.1 Growout

Table 4 below illustrates marine prawn production from 2006–07 to 2008–09. Production has increased by over 30% from 2007–08 and this is the highest tonnages ever produced in Queensland. The number of producing farms has decreased from 25 to 22. However, average yields per hectare increased by 26% over the last 12 months and this is what contributed the jump in tonnes produced.

In 2008–09 the average stocking rate of the 13 intensive black tiger farms was 42 post-larvae per square metre and their average yield was 5670 kg/ha compared with the eight less intensive farms where the stocking rate was 24 post-larvae per square metre and the average yield was only 3780 kg/ha.

In 2008–09, 18 farms (21 in 2007–08) produced over 20 tonnes. In 2008–09, 14 farms (17 in 2007–08) produced over 50 tonnes (Table 5), while eight farms (10 in 2007–08) produced over 100 tonnes. In 2008–09, seven farms (seven in 2007–08) averaged over 6000 kg/ha/crop.

The total ponded area of farms has decreased by 7%, from 718 hectares in 2007–08 to 669 hectares at the end of 2008–09. This was mainly a result of two farms for sale that were not stocked. The area stocked was similar to last year (726 hectares) with 734 hectares stocked. The total harvested area increased from 713 hectares in 2007–08 to 747 hectares in 2008–09.

Pond sizes ranged from 0.6 to 1.77 hectares with an average size of 1.05 hectares. The average number of crops per pond per year increased from 1.0 to 1.1 crops per year. There was only one farm (five in 2007–08) that produced more than one crop per year. The average stocking rate increased from 37 post-larvae per square metre to 41 per square metre. Stocking rates varied from 21 to 56, with seven farms stocking at 40 or more per square metre (compared with 11 farms the previous season).

Table 4. Marine prawn production by aquaculturists in Queensland (2006–07 to 2008–9)

	2006–07	2007–08	2008–09
Total production (tonnes)	3085	2888	3820
Average price (\$/kg)	\$13.79	\$14.37	\$14.28
Total value (\$ million)	\$42.5	\$41.5	\$54.6
Average yields (kg/ha/crop)	3974	4054	5118

Table 5. Number of approved marine prawn farms and production levels in Queensland (2006–07 to 2008–09)

	2006–07	2007–08	2008–09
Production (tonnes)	No.	No.	No.
0.1 to 5.0	1	10	1
5.1 to 10.0	1	3	1
10.1 to 20.0	0	1	1
20.1 to 50.0	6	4	4
50.1 to 100.0	8	7	6
100.1 to 200.0	4	5	3
Over 200	6	5	6
Number of producing farms	26	25	22
Number of producing hatchery-only operations	4	3	2

The quantity of feed increased from 6521 tonnes in 2007–08 to 7307 tonnes in 2008–09. Over the same period the estimated feed conversion ratio (FCR) improved from 2.2:1 to 1.9:1. There was a change in the source of feed with a decrease in the use of overseas feed. In 2008–09 feed sources were 50% from Australia (29% in 2007–08) and 50% from overseas (71% in 2007–08).

3.2.2 Hatchery

Thirteen prawn hatcheries (13 in 2007–08) in Queensland produced an estimated 336 million post-larvae (310 million post-larvae in 2007–08)—see Table 6. The between-year comparative figures are further complicated by the production of banana prawns where pond-reared spawners are being used for post-larvae production rather than obtaining spawners from the wild. This aspect now also applies to black tiger prawns with more farms starting to use domesticated stock.

Table 6. Marine prawn hatchery production in Queensland (2006–07 to 2008–09)

	2006–07	2007–08	2008–09
Number of spawners purchased	4070	2712	2759
Number of spawners used	7928	2213 ⁽¹⁾	2730 ⁽¹⁾
Number of post-larvae produced (million)	320.2	310.0	336.6
Number of post-larvae stocked (million)	267.7	264.7	305.8
Number of post-larvae sold (million)	188.6	285.0	74.3
Value of post-larvae sold (million)	\$1.89	\$1.48	\$1.18
Average value of post-larvae (cents)	1.50	1.56	1.59

(1) Excludes farms that use domesticated animals.

3.2.3 Labour

The total labour employed on marine prawn farms over the last three years is shown in Table 7. The decrease in permanent labour of 8% was offset by the increased use of casual staff. Total casual hours employed has increased by 30% over the last 12 months from 174 282 to 227 303 hours.

The efficiency of permanent labour increased dramatically from 14.0 tonnes per unit to 19.1 tonnes in 2008–09. The casual hours per tonne remained the same at 59 hours per tonne.

The dollar output per labour unit employed in the industry has increased by 24% from \$138 000 in 2007–08 to over \$171 000. The number of FTEs employed in the industry has also increased from 300 FTEs to 319 FTEs.

Table 7. Labour use on marine prawn farms in Queensland (2006–07 to 2008–09)

	2006–07	2007–08	2008–09
Permanent labour (tonnes/unit)	13.7	14.0	19.1
Total permanent (units)	226	210	200
Casual labour (hours/tonne)	47	59	59
Total casual labour (hours)	145 676	174 282	227 303
FTE labour units	302	301	319
\$ output per labour unit	\$141 088	\$138 105	\$171 248

3.3 Hatchery sector

There were only two marine prawn hatcheries in Queensland that did not have growout ponds in the 2008–09 season. These hatcheries plus three other hatcheries associated with farms supplied post-larvae to the growout sector of the industry. All of the hatcheries produced black tiger post-larvae and supplied 47% of the marine prawn post-larvae sold in 2008–09 (or 12% of the total post-larvae stocked). The total value of production from these hatchery-only operations in 2008–09 can not be published as there were only two farms in production.

From the returns received, this sector employed six permanent employees (eight in 2007–08) No casual employees were employed by this sector in 2008–09. Total output per labour unit can not be published as there were only two farms in production.

3.4 Publications

O'Sullivan, D 2009, 'Gold Coast Prawn fully stocked with domesticated black tiger prawns – a world first', *Austasia Aquaculture* 24(4): 16–19

Robertson, C (Ed.) 2006, *Australian prawn farming manual: health management for profit*, DPI&F (available at www.aciar.gov.au/web.nsf/doc/ACIA-6XBTR9)

Biosecurity Australia policy memorandums relating to the importation of prawns and prawn products are available at www.daff.gov.au/ba/ira/current-animal/prawns

4. Barramundi

4.1 General

Barramundi (*Lates calcarifer*) growout production decreased slightly over the last 12 months. The product marketed (converted to a whole-fish basis) decreased by 3% from 2464 tonnes in 2007–08 to 2400 tonnes in 2008–09. This is the first time in 13 years (since 1994–95) that the barramundi farming industry has not achieved an annual increase in production.

The total value of production has decreased by 12%, from \$24.3 million in 2007–08 to \$21.4 million in 2008–09. The average price (whole-fish basis) decreased by 10% from to \$9.87/kg to \$8.90/kg.

Hatcheries sold barramundi fingerlings for growout, stocking and the aquarium trade. These figures are reported under sections 8.2 and 8.3.

4.2 Industry production

From the 305 aquaculture approvals authorising barramundi production, only 26 farms produced marketable fish in 2008–09. This compared with 35 producers in the previous year. Production came from 22 farms using pond-based systems, one farm using sea cages and three farms using recirculating systems (Table 8).

Table 8. Barramundi production and authorities in Queensland (2006–07 to 2008–09)

	2006–07	2007–08	2008–09
Total production (tonnes whole-fish basis)	2091	2464	2400
Average price (\$/kg)	\$8.86	\$9.87	\$8.90
Total value (\$ million)	\$18.52	\$24.31	\$21.36
Pond production (tonnes)	No.	No.	No.
0.01 to 1.0	3	4	2
1.1 to 10.0	10	7	2
10.1 to 50.0	7	9	9
50.1 to 100.0	2	4	4
Over 100.0 ⁽¹⁾	5	5	6
Number of producing farms ⁽¹⁾	27	29	23
Tank production (tonnes)	No.	No.	No.
0.01 to 1.0	0	0	1
1.01 to 5.00	4	5	1
5.1 to 10.0	0	0	0
Over 10.00	2	1	1
Number of producing farms	6	6	3
Pond and tank production	No.	No.	No.
Total number of producing farms	33	35	26

(1) Includes one sea cage farm.

4.3 Pond production

Total farm ponded area increased by 16%, with 184 hectares available in 2008–09 (compared with 158 hectares in 2007–08); and the number of available ponds increased by one to 361. For the first time in recent years a small portion (1%) of the production was exported to overseas markets.

The number of ponds stocked decreased from 218 ponds in 2007–08 to 202 in 2008–09. During the same period, the stocked area remained unchanged at 97 hectares. The average pond area was 0.49 hectares.

The reported number of fingerlings stocked nearly doubled from 2.0 million in 2007–08 to 3.8 million in 2008–09. Over the same period, the density at which fingerlings were stocked in ponds also doubled from 20 300 fingerlings per hectare to 39 600 fingerlings per hectare. Much of this increase was due to one large farm stocking nursery ponds at very high densities.

The total feed used in ponds and cages increased from 3230 tonnes in 2007–08 to 3580 tonnes used in 2008–09. The data for this period includes details from Queensland's only sea cage farm that cannot, for confidentiality reasons, be released in its own category. However, this sea cage data has not been included in the pond volume and density calculations as it is not directly comparable and would significantly alter these averages. FCR remained at 1.5:1. Ninety-one per cent of the feed was manufactured in Australia.

Table 9. Pond production information in Queensland (2006–07 to 2008–09)

	2006–07	2007–08	2008–09
Total production (tonnes whole-fish basis) ⁽¹⁾	1995	2464	2400 ⁽²⁾
Average price (\$/kg) ⁽¹⁾	\$8.81	\$9.87	\$8.76
Total value (\$ million) ⁽¹⁾	\$17.57	\$24.31	\$21.36 ⁽²⁾
Market (% sold within Australia) ⁽¹⁾	100%	100%	99%
Number of ponds stocked	217	218	202
Total area stocked (hectares)	101	97	99
Average area (hectares)	0.47	0.44	0.49
Total fingerlings stocked (million) ⁽¹⁾	2.85	1.97	3.83
Fingerlings stocked/hectare	28 300	20 300	39 600
Feed used (tonnes) ⁽¹⁾	2926	3230	3580
Feed source (% manufactured in Australia) ⁽¹⁾	100%	97%	91%
Estimated FCR ⁽¹⁾	1.6:1	1.5:1	1.5:1

(1) Includes one sea cage farm.

(2) Includes all barra production so as not to disclose tank-based production details.

4.4 Tank-based production

In 2008–09, only three tank-based farms reported production of barramundi (six in 2007–08). Because of the low number of producing farms and the fact that the most of the reported tank-based production came from a single farm, it is not appropriate (due to confidentiality issues) to release detailed information on this sector of the industry.

In recent years, the tank-based sector of the industry has produced just under 100 tonnes of fish (96 tonnes in 2006–07 with a value of \$950 000 and 82 tonnes in 2007–08 with a value of \$890 000). Traditionally, tank systems have been able to achieve a higher average price than pond systems due to the increased focus on direct sales to niche markets and a higher proportion of live sales. Tank-based systems are generally able to stock more densely and achieve better FCRs due to the more highly controlled culture environment.

4.5 Fingerling production

Barramundi fingerling production decreased from 9 million in 2007–08 to 8.7 million in 2008–09. Ten operations produced barramundi fingerlings during the year (see sections 8.2 and 8.3 of this report for restocking and aquarium sales).

A total of 3 million fingerlings worth \$621 000 were sold for growout in 2008–09 (4.2 million worth \$3.1 million in 2007–08). Average fingerling price was 21 cents each in 2008–09 (compared with 72 cents in 2007–08). The decrease in fingerling price probably correlates to a decrease in the size of the fingerlings when sold.

4.6 Farm labour

The total permanent labour employed in the industry decreased from 93 units in 2007–08 to 80 units in 2008–09. Productivity has increased from 26.5 tonnes of fish per permanent labour unit in 2007–08 to 30.1 tonnes of fish per permanent labour unit in 2008–09.

Total casual labour for the sector decreased from 41 400 hours in 2007–08 to 35 900 in 2008–09.

When the permanent and casual labour inputs are combined for the barramundi farming sector the total number of FTE labour units decreased from 115 in 2007–08 to 98 in 2008–09. Over the same period the dollar output per labour unit for the sector increased from \$212 000 to \$218 000.

4.7 Publications

Curtis, M and Wingfield, M 2004, *Recirculation aquaculture systems information*, Information Series QI 04047

Macbeth, M et al. 2002, *Selective breeding in barramundi: technical report for the Australian Barramundi Farmers Association*, Information Series QI 02067

Department of Primary Industries and Fisheries 2008, *Queensland barramundi farming status report (2008)* State of Queensland
(available at www.dpi.qld.gov.au/documents/Fisheries_Aquaculture/Barramundi-status-report-2008.pdf)

5. Redclaw

5.1 General

Production of redclaw crayfish (*Cherax quadricarinatus*) increased marginally from 66.9 tonnes in 2007–08 to 67.8 tonnes in 2008–09. This small increase follows a sharp decrease during the previous reporting period when production fell from 100 tonnes (2006–07). During the 2007–08 to 2008–09 period, the total value of adult redclaw sales (sold primarily as food, with some broodstock sales) increased marginally from \$1.07 million to \$1.12 million.

From the 241 aquaculture approvals authorising redclaw production in 2008–09, there were 32 farms that reported production of redclaw, compared with 37 farms in the previous year (Table 10).

5.2 Growout

The number of farms that produced more than 1 tonne decreased from 16 in 2007–08 to 14 in 2008–09. These 14 farms produced 91% of the state's redclaw production, with the top five farms producing 64% of the total production.

In 2008–09, the average price obtained for redclaw crayfish was \$16.54, which was slightly higher than the \$16.39 achieved in 2007–08. The average prices reported ranged from \$13.00/kg to \$25.00/kg, although most sold in the \$14/kg to \$18/kg range.

The total available ponded area on farms decreased from 84 hectares in 2007–08 to 58 hectares in 2008–09. The number of growout ponds stocked with redclaw decreased from 500 to 414 in 2008–09, totalling 45 hectares (55 hectares in 2007–08). In 2008–09, 40 hectares of ponds was harvested compared to 47 hectares in 2007–08. The average pond size has remained at 0.11 hectares.

Average farm productivity (calculated from harvested growout area) was 1680 kg/ha, which was an increase from the 1420 kg/ha achieved in 2007–08. The average yield for the 20 farms producing over 500 kg was 1710 kg/ha. For the 14 farms producing over 1000 kg the average was 1810 kg/ha, and for the five farms producing over 5000 kg the average productivity was 1930 kg/ha. Average yields for the 14 farms producing over 1000 kg ranged from 1100 kg/ha to 3300 kg/ha, with four farms producing over 2000 kg/ha.

Total feed purchased in 2008–09 was 144 tonnes, which was an 18% increase on the 122 tonnes used in 2007–08. The estimated average feed conversion ratio increased from 1.8:1 in 2007–08 to 2.1:1 in 2008–09.

In 2008–09, the majority of product (99%) was sold on the domestic market. The proportion of domestic sales increased from the previous year when 97% of product was sold domestically.

Table 10. Redclaw crayfish production and authorities in Queensland (2006–07 to 2008–09)

	2006–07	2007–08	2008–09
Total production (tonnes)	100.2	65.5	67.8
Average price (\$/kg)	\$14.45	\$16.39	\$16.54
Total value (\$'000)	\$1448	\$1074	\$1121
Pond production (kg)	No.	No.	No.
1 to 100	9	9	6
101 to 500	12	7	6
501 to 1000	8	5	6
1001 to 5000	11	11	9
Over 5000	6	5	5
Number of producing farms	46	37	32

5.3 Tank-based production

No tank-based production was reported in 2008–09.

5.4 Juvenile production

Data on the production and sale of juvenile redclaw was not sourced for 2008–09; however, redclaw farmers reported that 40 000 juvenile redclaw were purchased during this period. The reported number of juveniles stocked decreased from 2.6 million (26 farms) in 2007–08 to 2 million (25 farms) in 2008–09. The average stocking rate of juveniles into growout ponds decreased from 4.7/m² to 4.4/m².

5.5 Labour

The redclaw industry appears to be streamlining its labour input, with total permanent labour employed decreasing from 31 units in 2007–08 to 19.5 units in 2008–09. The total hours of casual labour used on farms decreased from 2410 hours in 2007–08 to just 700 in 2008–09.

These cutbacks in the labour force appear to have resulted in substantial improvements in labour efficiency, with the number of permanent labour units used to produce one tonne of crayfish decreasing from 0.5 units in 2007–08 to 0.3 units in 2008–09. The number of casual hours also decreased from 22 hours per tonne in 2007–08 to 10 hours per tonne in 2008–09.

When the permanent and casual labour inputs are combined, the sector employed 20 FTE labour units in 2008–09 (compared with 32 FTE labour units in 2007–08). The product output per labour unit increased from 2090 kilograms (\$34 200) in 2007–08 to 3410 kilograms (\$56 500) in 2008–09.

5.6 Publications

Bitomsky, J 2008, *Scoping analysis: redclaw industry development* (available through Kleinhardt Business Consultants or DEEDI)

McPhee, C, Jones, C and Shanks, S 2004, 'Selection for increased weight at nine months in redclaw crayfish (*Cherax quadricarinatus*)', *Aquaculture* 237: 131–40

Mosig, J 2008, 'Redclaw growers win funds, breed a better product', *Austasia Aquaculture* 22(4): 9–14

Stevenson, J 2005, *Notes from the 6th annual redclaw conference*, 9 and 10 September 2005, Queensland Crayfish Farmers Association

Wingfield, M (Ed.) 2004, *Proceedings of the 5th annual conference*, Queensland Crayfish Farmers Association, Conference and Workshop Series QC 04001

6. Freshwater fish

6.1 General

The total production from the freshwater fish sector (species other than barramundi) decreased marginally from 198 tonnes in 2007–08 to 192 tonnes in 2008–09. Over the same period the value of the sector still managed to increase slightly, rising from \$2.4 million to \$2.6 million.

The three main species produced are silver perch (*Bidyanus bidyanus*) jade perch, or Barcoo grunter, (*Scortum barcoo*) and Murray cod (*Maccullochella peelii peelii*). There was only minor production of sleepy cod (*Oxyeleotris lineolatis*) and golden perch (*Macquaria ambigua*). Silver perch production was valued at \$1.03 million with an average price of \$11.75/kg; jade perch production was valued at \$487 700 with an average price of \$12.28/kg; and Murray cod production was valued at \$988 500 with an average price of \$16.89/kg.

Silver perch production increased by 15% (from 2007–08) to 87.8 tonnes, whereas jade perch production fell by 29% to 41.8 tonnes and Murray cod production increased by 2% to 58.5 tonnes. In 2008–09 silver perch accounted for 46% of freshwater fish production (39% in 2007–08), jade perch 22% (30% in 2007–08), Murray cod 30% (29% in 2007–08) and all other species 2%. Recirculating tank systems accounted for nearly 17% (32 tonnes) of the total freshwater fish production (compared with 26% or 52 tonnes in 2007–08).

From the 241 aquaculture approvals authorised to grow freshwater fish in 2008–09, there were 11` farms that reported production (13 farms produced in 2007–08). Eight of these farms primarily used pond-based systems and three primarily used recirculating tank systems. All of the authority holders are approved to grow barramundi and a number of different freshwater species. Many of the producing farms sold a number of different species.

6.2 Silver perch

Ten farms produced and sold silver perch in 2008–09. Nine of the producing farms used pond-based systems and one tank-based farm also produced fish. In 2007–08, all of the 10 producing farms were pond-based.

In 2008–09 silver perch production increased by 15% from the 76.2 tonnes produced in 2007–08 to 87.8 tonnes. This increase brought production back up to much the same level as was achieved in 2006–07. The average price (whole-fish basis) increased substantially (28%) to \$11.75/kg from the \$9.20/kg achieved in 2007–08. With both production and price increasing in 2008–09, the total value of the sector increased by 47% rising from \$700 600 (2007–08) to \$1.03 million.

6.2.1 Pond systems

The total ponded area of farms producing silver perch decreased from 30 hectares in 2007–08 to 21 hectares in 2008–09. Over the same period, the total area stocked with silver perch increased from 17 hectares to 18.8 hectares and the area harvested decreased from 21.8 hectares to 14.7 hectares. The number of fingerlings stocked decreased from 275 000 to 233 000. The average stocking rate decreased from 15 900 per hectare to 12 400 per hectare.

Table 11. Silver perch production by aquaculturists in Queensland (2006–07 to 2008–09)

	2006–07	2007–08	2008–09
Total production (tonnes whole-fish basis)	89.9	76.2	87.8
Average price (\$/kg)	\$8.81	\$9.20	\$11.75
Total value (\$'000)	\$792	\$701	\$1031
Average yield (kg/ha)	4160	3500	5890
Number of farms	13	10	10

Total food used decreased marginally from 177 tonnes in 2007–08 to 176 tonnes in 2008–09. Over this same period the FCR improved from 2.3:1 to 2.0:1. There was a strong shift towards imported feeds, with 72% of the feed being imported in 2008–09 compared with just 4% in 2007–08.

6.2.2 Recirculation systems

In 2008–09 there was only one tank-based farm that reported any production of silver perch; therefore (for confidentiality reasons), the production details cannot be released.

6.3 Jade perch

Jade perch production in 2008–09 totalled 41.8 tonnes, which was a 26% decrease from the 58.9 tonnes produced in 2007–08. In 2008–09 production came from four pond-based systems and two tank-based operations. Table 12 combines production from both pond and tank systems.

From the responses received, the number of authority holders that produced and sold jade perch has decreased gradually over the last three years. In 2008–09 the total value of sales decreased by 10% to \$514 000, while the average price increased substantially (26%) to \$12.28/kg.

6.3.1 Pond systems

The total ponded area of farms decreased from 8.8 hectares in 2007–08 to 6.9 hectares in 2008–09. Over the same period, the total area stocked to jade perch decreased from 8.0 hectares to 4.4 hectares. The area harvested decreased from 8.4 hectares to 4.2 hectares and the average yield increased from 6.5 t/ha to 9.5 t/ha. In 2008–09 the number of fingerlings stocked in ponds was 107 000 compared with 88 000 the previous year. Over the same period, the average stocking rate increased from 11 000 per hectare to 24 000 per hectare.

Total food used decreased from 120 tonnes in 2007–08 to 76 tonnes in 2008–09; the FCR improved from 2.2:1 to an estimated 1.9:1. In contrast to the silver perch sector, jade perch feed is still largely supplied by Australian manufacturers with overseas suppliers only accounting for 15% of the feed used (8% in 2007–08).

6.3.2 Recirculation systems

In 2008–09 there were only two tank-based farms that reported any production of jade perch; therefore (for confidentiality reasons), the production details cannot be released.

Table 12. Jade perch production by aquaculturists in Queensland (2006–07 to 2008–09)

	2006–07	2007–08	2008–09
Total production (tonnes whole-fish basis)	51.2	58.9	41.8
Average price (\$/kg)	\$8.86	\$9.74	\$12.28
Total value (\$'000)	\$454	\$573	\$514
Average pond-based yield (kg/ha)	8740	6470	9360
Number of producing farms	8	7	6

6.4 Murray cod

Murray cod production in 2008–09 totalled 58.5 tonnes, which was a marginal (1 tonne) increase from the previous year. However, the total value of the industry decreased marginally (1%) to \$989 000. The average farm gate price also decreased slightly (3%) from \$17.40/kg in 2007–08 to \$16.90/kg in 2008–09.

6.4.1 Murray cod production details

Because all Murray cod production came from only four farms, all published information must combine production from both pond-based and tank-based systems so as not to breach client confidentiality. There were a total of 207 000 Murray cod fingerlings stocked in 2008–09 (compared with 170 000 in 2007–08).

Table 13. Murray cod production by aquaculturists in Queensland (2006–07 to 2008–09)

	2006–07	2007–08	2008–09
Total production (tonnes whole-fish basis)	65.1	57.5	58.5
Average price (\$/kg)	\$14.40	\$17.40	\$16.90
Total value (\$'000)	\$937	\$1002	\$989
Average pond-based yield (kg/ha)	5160	n/a*	n/a*
Number of producing farms	4	4	4

* Not available for publication.

The total food used increased from 89 tonnes in 2007–08 to 105 tonnes in 2008–09. The FCR increased from 1.5:1 to 1.8:1. There was a shift towards imported feeds, with 75% of the feed being imported in 2008–09 compared with 48% in 2007–08.

6.5 Other species

Other species authorised for production in both pond-based and tank-based systems include golden perch (*Macquaria ambigua*), sleepy cod (*Oxyeleotris lineolatis*), Australian bass (*Maquaria novemaculeata*) and sooty grunter (*Hephaestus fuliginosus*). The relatively small quantities produced and the limited number of producers means that detailed information cannot be provided in this report.

The combined production of these species in 2008–09 was 3.7 tonnes valued at \$72 100 (compared with 4 tonnes valued at \$74 500 in 2007–08). Because both golden perch and sleepy cod are well regarded in the market place, the average price was relatively high at \$19.50/kg.

6.6 Labour (freshwater fish)

The total number of permanent labour units in the freshwater fish growout sector decreased from 18 in 2007–08 to 12 in 2008–09. For silver perch, the output has increased from 8.6 tonnes per permanent unit in 2007–08 to 11.7 tonnes per permanent unit in 2008–09. Over the same period, jade perch production increased from 10.8 tonnes per labour unit to 11.7 tonnes. The output for Murray cod decreased from 15 tonnes per labour unit to 9 tonnes per labour unit.

Combined casual labour for all freshwater fish species in 2008–09 was 12 000 hours (which is an enormous increase on the 480 hours reported in 2007–08). The total FTEs for the freshwater sector were 17.5 units in 2008–09, which was a slight decrease from the 18 units in 2007–08.

The dollar output per labour unit for the sector increased strongly for the fourth consecutive year, rising to \$149 000 (compared with \$48 000 in 2005–06, \$94 000 in 2006–07 and \$130 000 in 2007–08). For silver perch, the output increased from \$78 900 in 2007–08 to \$137 300. Jade perch increased from \$105 600 to \$144 200 while Murray cod decreased from \$261 300 to \$154 100.

6.7 Publications

Rowland, SJ 2009, 'Review of aquaculture research and development of the Australian freshwater fish silver perch, *Bidyanus bidyanus*', *Journal of the World Aquaculture Society* 40(3): 291–324

Rowland, SJ et al. 2007, *Development of a health management strategy for the silver perch aquaculture industry*, New South Wales Department of Primary Industries

Rowland SJ et al. 2007, *Diagnosis, treatment and prevention of the diseases of the Australian freshwater fish silver perch (Bidyanus bidyanus)*, New South Wales Department of Primary Industries

7. Eel culture

7.1 General

Production from the eel aquaculture industry in Queensland has continued to decrease steadily since it peaked at 71.8 tonnes in 2001–02.

In 2008–09 there were only two eel farms selling farmed eels and these two farms work closely together effectively selling as a single entity. Due to the very low number of producing farms in 2008–09, no production data from the eel farming sector can be reported as it would compromise client confidentiality. The data from the eel farming sector has therefore been included in the sundry category of this report

The primary species of eel grown by Queensland aquaculturists is the long-finned eel (*Anguilla reinhardtii*), with much smaller quantities of short-finned eel (*A. australis*) also grown.

Over the last three years all eels produced were exported and marketed live. Table 14 summarises the farm pond and tank stocking and production details for the period 2006–07 to 2008–09.

In addition to the sale of adult eels, management arrangements introduced in 2005 allow for the sale of juvenile eels. This has resulted in the sale of a substantial quantity of weaned juvenile eels.

Table 14. Eel production by aquaculturists in Queensland (2006–07 to 2008–09)

	2006–07	2007–08	2008–09
Total production (t)	32.4	28.7	n/a
Total value (\$)	\$544 800	\$491 960	n/a
Average price (\$/kg)	\$16.80	\$17.10	n/a
Number of producing farms ⁽¹⁾	4	4	2
Ponds—total area (ha)	2.6	3.0	n/a
Ponds—average area (m ²)	2000	2700	n/a
Tanks—total volume (m ³)	58	134	n/a
Tanks—average volume (L)	1810	3810	n/a
Stocking—glass eels and elvers (no.)	423 000	656 200	n/a

(1) Two of the farms work closely and effectively sell as a single entity.

7.2 Publication

Department of Primary Industries and Fisheries 2006, *Policy for the management arrangements for the commercial harvesting and use of juvenile eels*, State of Queensland (available on the DEEDI website at www2.dpi.qld.gov.au/extra/pdf/fishweb/juveelspolicy.pdf)

8. Hatchery and aquarium

8.1 General

The hatchery and aquarium sector produced a wide range of fish for use in aquaria, commercial growout and stocking in public impoundments. Table 15 summarises statistics for the major species produced in 2007–08 and 2008–09.

The total value of this sector more than halved from \$6.6 million in 2007–08 to \$2.65 million in 2008–09. Over the same period, sales for the sector decreased from 9.6 million to 7.6 million. The major impact on the value of the sector was due to barramundi fingerling production. Barramundi fingerling sales decreased over 70% and the value of the individual fish decreased by 65%.

In 2008–09, the number of fingerlings species sold for farm stocking decreased from the previous year (from 4.6 million to 1.1 million). Exotic ornamental sales decreased by over 60% from the previous year and the native ornamental sales also decreased by more than 65%.

Over the last 12 months, the total number of fish sold by the hatchery sector has decreased by 20%, while the value has decreased by over 65%. This has mainly been a reflection of the high priced barramundi cod and cobia sales to overseas destinations the previous year together with a significant decline in the value of barramundi fingerlings sold. Marine species for the aquarium trade, commercial growout and for stocking are reported collectively in Table 15 as 'Marine hatchery and aquarium'.

Table 15. Hatchery production of native fingerlings and ornamental aquarium species in Queensland (2007–08 and 2008–09)

Species	2007–08			2008–09		
	Sales (No.)	Value (\$)	Avg (\$)	Sales (No.)	Value (\$)	Avg (\$)
Barramundi (farm and stocking)	4 847 190	\$3 489 420	\$0.72	3 641 076	\$925 992	\$0.25
Golden perch (farm and stocking)	463 840	\$83 450	\$0.18	2 460 981	\$520 964	\$0.21
Australian bass (farm and stocking)	1 780 400	\$266 710	\$0.15	(1)	(1)	(1)
Silver perch (farm and stocking)	363 270	\$74 320	\$0.20	432 861	\$102 911	\$0.24
Jade perch (farm)	84 590	\$15 820	\$0.19	179 000	\$47 563	\$0.27
Murray cod, Mary River cod and sleepy cod (farm and stocking) ⁽¹⁾	107 110	\$74 070	\$0.69	207 655	\$134 198	\$0.64
Ornamental fish (exotics) ⁽²⁾	1 547 360	\$659 560	\$0.43	546 797	\$278 684	\$0.51
Ornamental fish (natives) ^{(2) (3)}	420 323	\$277 210	\$0.66	140 612	\$142 544	\$1.01
Other ⁽⁶⁾	(5)	\$109 060		(5)	\$284 318	
Marine hatchery and aquarium ^{(1) (4)}	(5)	\$1 606 000		(5)	\$210 832	
Total (returns received)	9.6 m	\$6.66 m		7.6 m	\$2.65 m	

Notes:

- (1) Species combined as insufficient producers to maintain individual confidentiality.
- (2) Species grouped as individual species data was not obtained.
- (3) All native freshwater fin fish sold to aquarium trade (e.g. rainbows, native ornamentals, saratoga and lungfish, as well as barramundi, golden perch etc.).
- (4) Includes oyster and pearl oyster spat, barramundi cod, cobia, Australian bass, mangrove jack, mullet, aquarium fish, export fingerlings and larvae, seahorses, corals and sandfish production.
- (5) Combines different phyla and developmental stages and therefore not appropriate to include numbers.
- (6) Includes Australian bass, aquarium fish and larvae.

8.2 Stocking and growout species

The hatchery operations that produced the stocking and growout species listed below used 152 ponds in 2008–09, compared with 217 ponds in 2007–08. Over this period the total ponded area decreased from 32 hectares to 28.8 hectares. The average pond area increased from 1500 m² in 2007–08 to 1900 m² in 2008–09. The sector also used 109 tanks totalling 430 m³ in 2008–09 compared with 93 tanks totalling 550 m³ in 2007–08.

8.2.1 Barramundi

Barramundi (*Lates calcarifer*) fingerlings were produced in 10 hatcheries (down from 13 in 2007–08). Total production for 2008–09 was 8.7 million fingerlings, which was down slightly from the 9 million produced in 2007–08. A major portion of the barramundi fingerlings produced is grown on farms that incorporate both hatchery and growout production. Fingerlings that are retained by the hatchery farm for growout are not considered as sales. Such operations account for a substantial proportion of the fingerlings produced.

There were 3 million fingerlings sold to other farms for growout (valued at \$621 000), which compared with 4.2 million sold for \$3.1 million in 2007–08. The reduction in value of these sales was largely a result of the average price per fingerling falling from \$0.72 in 2007–08 to \$0.21 in 2008–09, but total numbers sold also decreased by 28%. The decrease in fingerling price probably correlates to a decrease in the size of the fingerlings when sold.

The number of fingerlings sold for stocking increased marginally from 653 000 (\$438 000) in 2007–08 to 668 000 (\$295 600) in 2008–09. Over this period the average price for fingerlings sold for stocking decreased from \$0.67 to \$0.44.

8.2.2 Golden perch

Golden perch (*Macquaria ambigua*) fingerling production was undertaken by four hatcheries (five also in 2007–08). The total value of fingerling sales in 2008–09 was \$520 960. Production increased dramatically from 464 000 in 2007–08 to 2.46 million in 2008–09. Good seasonal conditions allowed some drought-affected farms to return to fingerling production. Stocking accounted for the vast majority of sales (2.4 million) valued at \$512 400. The farming sector purchased only 21 000 fish.

8.2.3 Australian bass

Australian bass (*Macquaria novemaculeata*) were produced primarily for impoundment stocking. Production occurred in two hatcheries in 2008–09 (four in 2007–08). Production and sales cannot be reported separately for confidentiality reasons.

8.2.4 Silver perch

Silver perch (*Bidyanus bidyanus*) fingerling production was undertaken by nine hatcheries in 2008–09 (six in 2007–08) and increased from 402 000 in 2007–08 to 632 000 in 2008–09. The number sold increased from 363 270 in 2007–08 to 432 800 in 2008–09. Over this period, sales to growout operations increased by 50% from 150 000 (\$27 200) to 227 700 (\$50 200). Sales to stocking decreased slightly from 214 000 (\$47 000) to 204 500 (\$51 900).

8.2.5 Jade perch

Jade perch, or Barcoo grunter, (*Scortum barcoo*) fingerlings came from four hatcheries (four in 2007–08). All sales were to the farm growout sector, with some fry and fingerlings being sold overseas. Sales more than doubled from 84 590 (\$15 800) in 2007–08 to 179 000 (\$47 500) in 2008–09. Part of this increase was largely due to improved seasonal conditions, with some hatcheries able to start production after the drought conditions of the previous season.

8.2.6 Murray cod, Mary River cod and sleepy cod

Murray and Mary River cod (*Maccullochella* spp.) and sleepy cod (*Oxyeleotris lineolatus*) sales were combined to maintain confidentiality of the information supplied by the four hatcheries that produced any of these fish (four hatcheries produced cod in 2007–08). Sales for these species increased from 107 110 (\$74 070) in 2007–08 to 174 250 (\$109 500) in 2008–09. Growout farms purchased 40% of the fingerlings (60% in 2007–08), with the rest going to the stocking program.

8.3 Freshwater aquarium and ornamental species

The producers growing freshwater aquarium and ornamental species (listed below) used 244 ponds in 2008–09 (compared with 267 ponds in 2007–08). Ponds covered an area of 10.3 hectares in 2008–09 (14 hectares in 2007–08). The average pond area decreased from 520 m² in 2007–08 to 420 m² in 2008–09. The sector also used 970 tanks totalling 880 m³ in 2008–09 (1240 tanks totalling 690 m³ in 2007–08).

8.3.1 Exotic ornamental fish

Exotic freshwater ornamental fish were produced by six hatcheries in 2008–09 (nine in 2007–08). The number of fish sold decreased from 1.55 million fish in 2007–08 to 547 000 in 2008–09, and the value decreased from \$659 560 to \$278 680.

8.3.2 Native ornamental fish

Native freshwater ornamental fish (including lungfish and saratoga) were produced by seven farms in 2008–09 (16 in 2007–08). The number of fish sold decreased from 420 320 (\$227 210) in 2007–08 to 140 610 (\$142 540) in 2008–09.

8.4 Marine hatchery and aquarium

The marine hatchery and aquarium group covers a diverse range of species, including oyster and pearl oyster spat, barramundi cod, cobia, mangrove jack, mullet, aquarium fish, seahorses, corals and sandfish production. There were 10 hatcheries that sold product in 2008–09 (compared with four in 2007–08). Only the value of sales is reported in this section—the group is so diverse that it is not meaningful to tally and compare numbers of oyster spat with numbers of fish.

The value of production has been strongly influenced by sales of reef fish fingerlings in previous years. Sales have now decreased from \$1.606 million in 2007–08 to only \$210 000 in 2008–09.

8.5 Labour (hatchery and aquarium)

Statistics for the whole sector show that it now has 65 permanent staff (64 in 2007–08) and employed 16 100 hours of casual labour (15 500 hours in 2007–08). This equates to 74 FTEs employed in the sector, which was an increase of two units from 2007–08. Output per labour unit decreased from \$92 830 in 2007–08 to \$34 900 in 2008–09.

8.6 Publications

DAFF 2010, *A strategic approach to the management of ornamental fish in Australia*, Department of Agriculture, Fisheries and Forestry

Lupton, C and Cheetham, R 2009, *Aquaculture Association of Queensland (AAQ) commercial hatchery code of best practice*, AAQ

Industry & Investment NSW 2010, *Hatchery quality assurance scheme*, Industry and Investment NSW

9. Pearl oyster culture

9.1 General

The value of the pearl oyster industry in Queensland is not available for publication in 2008–09 as a result of farms not supplying full information. Three farms reported production in 2008–09, with the value being reported in the 'Other' category of this report. The main species cultured are the gold lip oyster (*Pinctada maxima*), black lip oyster (*P. margaritifera*), and penguin oyster (*Pteria penguin*).

Table 16. Pearl oyster production by aquaculturists in Queensland (2006–07 and 2008–09)

	2006–07	2007–08	2008–09
Value of production (\$ million)	\$1.706	\$1.292	n/a
Number produced—round and baroque	26 700	21 240	n/a
Average price each (\$)	\$62	\$57	n/a
Stocks on hand as of 30 June			
- Stock after 1 st operation	43 700	11 300	n/a
- Stock after 2 nd operation	15 300	3 000	n/a
- Stock after 3 rd operation	300	800	n/a
- Unseeded	70 600	38 300	n/a

10. Edible oyster production

10.1 General

In Queensland all aquacultured oyster production occurs south of Hervey Bay and is confined to the culture of rock oysters (*Saccostrea glomerata*) on 'furniture' placed on tidal land, predominantly above mean low water.

A total of 107 oyster areas authorised for aquaculture were surveyed during 2008–09, with only 66 statistical returns received. The total production in Queensland has decreased by 23% from 136 000 dozen in 2007–08 to 105 600 dozen in 2008–09; however, the value of the industry has decreased by 18% from \$620 500 in 2007–08 to \$509 600 in 2008–09. The average price per dozen oysters has increased by 6% from \$4.55 per dozen in 2007–08 to \$4.83 per dozen in 2008–09.

Oyster sales are one measure of change in an industry. To provide other indicators on industry growth and performance, the numbers of shells introduced on to the authorised areas, stock losses and the stock on hand details are provided in Table 18. The number of shells introduced to leases fell by 30% (–17% in 2007–08) while the number of shells held on leases at the end of June increased by 19% (compared with 29% at the end of June 2008).

Table 17. Edible oyster aquaculturists in Queensland (2006–07 to 2008–09)

	2006–07	2007–08	2008–09
Number of oyster areas surveyed	110	110	107
Number of responses	97	83	66
Number of oyster area not stocked	–	42	25
Production (dozens)	No. of areas	No. of areas	No. of areas
Nil	61	51	77
1 to 500	16	13	7
501 to 1000	5	5	4
1001 to 2000	5	6	5
2001 to 5000	4	2	4
5001 to 10 000	2	2	3
Over 10 000	4	4	3
Total producing oyster areas	36	32	25

Table 18. Edible oyster introductions, losses and stocks on hand in Queensland (2007–08 and 2008–09)

	2007–08	2008–09	Change (%)
Shells introduced (dozen)	217 261	151 000	–30.4%
Losses (dozen)	123 276	129 000	+4.0%
Number on hand (30 June)	433 538	515 750	+19.0%

Table 19. Edible oyster production in Queensland (2006–07 to 2008–09)

	2006–07	2007–08	2008–09
Total production ('000 dozen)	141.0	136.4	105.6
Total value (\$)	\$534 000	\$620 500	\$509 600

Oysters are sold in a range of different sizes to meet market requirements. The three main categories used by the industry are bistro, bottlers and plate size. Table 20 summarises the different product types, average prices and the percentage of each product type. Bottlers make up 47% of the product marketed at an average price of \$3.46 per dozen (3% lower than 2007–08). The highest value product (\$7.75 per dozen) is the plate size, which make up 19% of the product sold. Prices for this size decreased by 4% per

dozen. Bistro oysters at \$5.63 per dozen accounted for 28% of production. Average prices increased by 6% from the previous year.

Table 20. Edible oyster marketing information for Queensland (2006–07 and 2008–09)

Packaging type	2007–08		2008–09	
	Price per dozen (\$)	Market (%)	Price per dozen (\$)	Market (%)
Bottlers	\$3.58	53%	\$3.46	47%
Bistro	\$6.58	24%	\$5.63	28%
Plate	\$7.88	9%	\$7.75	19%
Others	\$2.62	14%	\$2.81	7%
Average return—all oysters	\$4.55		\$4.83	

10.2 Labour

Total permanent labour employed in the industry was 14 units (21 in 2007–08), while total casual employment increased from 1300 hours in 2007–08 to 4330 hours in 2008–09. This converts to 17 FTEs employed in the industry, which represents a decrease of five from the previous year.

In terms of labour efficiency, the production per FTE for 2008–09 was 6400 dozen (compared with 6100 dozen in 2007–08). Total industry output decreased from \$28 000 per labour unit in 2007–08 to \$30 800 per labour unit in 2008–09.

10.3 Publications

O'Sullivan, D 2009, 'Plan allows for expanded oyster production in Moreton Bay marine park', *Austasia Aquaculture* 23(3): 12–16

DPI&F 2005, *Queensland oyster industry development plan*, State of Queensland (available on the DEEDI website at www2.dpi.qld.gov.au/fishweb/16413.html)

DPI&F 2007, *Queensland oyster industry development plan: implementation report*, State of Queensland (available on the DEEDI website at www2.dpi.qld.gov.au/fishweb/16413.html#13)

QSWAMP sampling guideline (available on the DEEDI website at www2.dpi.qld.gov.au/extra/pdf/fishweb/FAMOP005.pdf)

11. Specialised areas—status report

11.1 Marine aquaculture planning (Great Sandy Region)

The Great Sandy Regional Marine Aquaculture Plan (GSRMAP) is due to be completed in the second half of 2010. The aim of the plan is to establish guidelines for sustainable marine aquaculture development, and to streamline and standardise assessment processes for future aquaculture applications within the boundaries of Great Sandy Marine Park.

The plan will identify new areas for aquaculture within the Great Sandy and Hervey Bay region and the management controls to operate in these areas. The GSRMAP will provide greater confidence and clarity to industry and the community for future non-intensive aquaculture development within the marine park boundaries.

11.2 Further information

Contact Sam Miller (Senior Planning Officer) on (07) 3224 2108 or aquaculture.planning@dpi.qld.gov.au

Further information on aquaculture planning is available online at www.deedi.qld.gov.au (click on 'Fisheries' under 'Queensland industries').