On 26 March 2009, the Department of Primary Industries and Fisheries was amalgamated with other government departments to form the Department of Employment, Economic Development and Innovation.


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### Fishery profile 2009

<table>
<thead>
<tr>
<th>Species targeted</th>
<th>Fishery season</th>
</tr>
</thead>
<tbody>
<tr>
<td>Longfin eel and southern shortfin eel</td>
<td>January to December</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Accreditation under the EPBC Act</th>
<th>Monitoring undertaken</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expires 1 May 2014</td>
<td>Commercial logbooks (CFISH)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Allocation between sectors</th>
<th>Logbook validation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predominately commercial</td>
<td>No</td>
</tr>
</tbody>
</table>

#### Adult Eel Fishery

<table>
<thead>
<tr>
<th>Commercial harvest</th>
<th>Total number of commercial licences in 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>21 t</td>
<td>19 as of December 2009</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Recreational harvest (2005)</th>
<th>Number of licences accessing the fishery in 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negligible</td>
<td>15</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indigenous harvest</th>
<th>Fishery symbols</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negligible</td>
<td>E</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Charter harvest</th>
<th>Commercial Gross Value of Production (GVP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>Approximately $231 000</td>
</tr>
</tbody>
</table>

#### Juvenile Eel Fishery

<table>
<thead>
<tr>
<th>Commercial harvest</th>
<th>Total number of commercial licences in 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>135.8 kg</td>
<td>13 as of December 2009</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Recreational harvest (2005)</th>
<th>Number of licences accessing the fishery in 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indigenous harvest</th>
<th>Fishery symbols</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negligible</td>
<td>JE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Charter harvest</th>
<th>Commercial Gross Value of Production (GVP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>No Estimate Available</td>
</tr>
</tbody>
</table>

#### Key fish resources

<table>
<thead>
<tr>
<th>Longfin eel (<em>Anguilla reinhardtii</em>) and southern shortfin eel (<em>A. australis</em>) East Coast stock</th>
<th>Stock status</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sustainably Fished</td>
</tr>
</tbody>
</table>

**Comment:** Historical commercial catch and catch rate data are variable and heavily dependant on environmental factors. Length frequency graphs show healthy distribution of individuals in length classes, for nine years. Current fishing pressure is considered sustainable under the current management regime—due particularly to strict conditions related to permitted fishing areas.
Introduction

The Queensland Eel Fishery (QEF) targets the longfin eel, *Anguilla reinhardtii*, and the southern shortfin eel, *Anguilla australis*, in rivers and freshwater impoundments. The QEF is unique in that the resource is harvested at two stages in the lifecycle—the adult stage (eels > 30 cm) and the glass eel/elver stage (eels < 30 cm) for both species. Commercial adult eel (E) trappers collect adult eels from impounded waters; whereas commercial juvenile eel (JE) fishers take glass eels and elvers from rivers and supply seed stock for grow-out in aquaculture facilities.

The majority of Queensland’s wild-caught adult eel catch is exported live to Asia, principally Hong Kong and Taiwan, with a small percentage of adult eels being sold frozen to European markets. A very small proportion of the harvest is sold fresh to local smokehouses which supply the domestic market.

This report covers fishing activity during the 2009 calendar year.

Fishery description

Fishing methods

In Queensland, commercial capture/harvest of adult eels is only permitted using baited eel traps or round traps which are usually set on the bottom of the impoundment. Adult eel traps consist of a single entry mesh funnel and a floated cod-end to hold the captured eels and ensure that captured eels are not over stressed and that air breathing non-target species may access the water surface to breathe. Traps are generally baited with pilchards or mullet.

Specifications on net design and setup are stipulated in the Queensland Fisheries Regulation 2008:

- the maximum size of an eel trap is $2.0 \times 0.6 \times 0.6$ m when set
- the maximum size of a round trap is a diameter of 1 m and a height of 0.6 m
- the frame of the trap must be made of a rigid material
- a trap (other than its pocket) must have a mesh size of at least 25 mm; any rigid mesh on the trap must be at least 22 mm in each of its dimensions
- a float of at least 150 mm in each of its dimensions must be attached to each trap
- the trap and trap float must be marked with authority number and full name of the authority holder
- the tail of the cod end must also be attached to a float or buoy of adequate size so that at least part of the cod end floats at the surface to allow trapped animals access to surface air.

Figure 1: Eel trap used by adult eel trappers.

The juvenile component of the QEF targets juvenile eels using a variety of different gear types, including fyke nets, dip nets and flow traps. Juvenile traps must contain bycatch reduction devices (BRDs) to minimise impacts on non-target species. The maximum total amount of fishing gear allowed to be used under an authority is:

- one small mesh eel fyke net:
  - with a maximum of two wings (length ≤ 15 m)
  - the fyke net must not exceed 4 m in height, width or diameter
  - the ends of the wings and the cod-end of the net must be marked with a reflective float bearing the holder’s name and address
  - the net may be fixed by anchor or supported on stakes
  - a float must be attached to the cod-end to ensure that incidentally captured air-breathing animals can access air to breathe.

- three small mesh dip nets
- three flow traps with an effective bycatch excluder that have been approved by the chief executive prior to use.

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1 Impounded waters are defined in the Queensland Fisheries Regulation 2008.
Fishing area

Adult eel

The adult eel fishery allows fishing in all Queensland East Coast Drainage Division catchments with the exception of all coastal island catchments (Figure 2). Within this area, trapping of adult eels is only permitted in:

1. artificially created private impoundments in those catchments listed on an eel authority (for example, a farm dam).
2. an impoundment formed by a dam that is specifically listed on an eel authority (for example, a public owned impoundment such as Cressbrook Dam).

The majority of public impoundments are not open to commercial harvesting, and as such, the fishery comprises mainly private impoundments.

Figure 2: Area open to adult eel trapping including regional delineations.

Juvenile eel

The juvenile eel fishery allows fishing in river basins associated with 21 rivers along the east coast of Queensland, which represent less than 10% of Queensland river systems.

Fishing is permitted in the Albert, Barron, Brisbane, Burdekin, Burnett, Burrum, Caboolture, Coomera, Currumbin, Fitzroy, Johnstone, Kolan, Logan, Maroochy, Mary, Mooloolah, Mulgrave, Nerang, Noosa, Pine and Tully rivers (Figure 3). Within these basins, juveniles may only be collected at, or downstream of, the most downstream dam or weir and up to 200 m either side of the mouth of the approved rivers. Collecting is also allowed in tributaries that enter the approved rivers downstream of the most downstream dam or weir for a distance of 1 km upstream of the confluence.

Figure 3: Map of permitted juvenile eel fishing rivers.

Key Species

The QEF targets the longfin eel, Anguilla reinhardtii, and the southern shortfin eel, Anguilla australis, in rivers and freshwater impoundments.

The longfin eel is distributed along the east Queensland coastline and found throughout eastern states of Australia; abundances are greatest in Queensland and New South Wales. The longfin eel makes up the majority of the adult eel catch in Queensland due to its extensive distribution. The southern shortfin eel is at its northern distribution limit in southern Queensland with higher abundances occurring in southern Australian states.

2 A tidal barrage is not considered a weir for the purpose of these conditions.
Southern shortfin and longfin eels are reported to vary in average length at maturity dependant on sex. Longfin eels are reported to grow to an average length at metamorphosis and maturity of 93 cm for females and 56 cm for males (Hoyle and Jellyman 2000). Southern shortfin eel females are believed to mature at approximately 55 cm whilst males mature at the legal size of 30 cm (Todd 1980).

All species of anguillid eels are catadromous, spending the majority of their life cycle in freshwater and estuaries. Adult eels migrate to the Coral Sea to spawn (Aoyama et al. 1999; Gooley et al. 1999). During the larval stage individuals are transported via the East Australian Current to near shore waters where they metamorphose into unpigmented ‘glass eels’ (Shiao et al. 2001; Beumer 1992). Glass eels then move upstream to grow and develop through a small, pigmented ‘elver’ stage into the large but still immature ‘adult’ eels. When adults reach sexual maturity they undergo marked changes in their appearance and become silvery. Anatomy and physiology also alter at sexual maturity and eels undertake a once only downstream migration to the spawning grounds, where it is believed they spawn and subsequently die.

Sexual differentiation in eels appears to be influenced by a number of environmental factors (Zeller and Buemer 1995). Females generally occur further upstream (lower salinity and lower population densities), grow larger and mature later than males. Males tend to occur more frequently in downstream brackish and estuarine areas (Buemer 1992). There are no easily distinguishable visual differences between male and females (Moffatt and Voller 2002).

A recently published study and unpublished conclusions from postgraduate research suggest panmixia in juvenile eel populations (Kang-Ning and Wann-Nian 2007; Moore 2008). Both southern shortfin and longfin eel species are believed to belong to a single panmictic genetic stock; this recognises that the recruitment of juveniles within the species distribution is random.

Main management methods used

Fisheries Queensland manages the QEF in accordance with ecologically sustainable development principles. The fishery management methods differ between the adult and juvenile components of the QEF.

The adult wild-caught eel component of the fishery is managed under the Queensland Fisheries Regulation 2008, which is subordinate legislation to the Queensland Fisheries Act 1994.

The collection and grow-out of juvenile eels is currently controlled through conditions attached to Commercial Harvest Fishery Licenses under the Fisheries Act 1994, Development Approvals for Aquaculture under the Integrated Planning Act 1997 and the ‘Policy for Management Arrangements for the Commercial Harvesting and use of Juvenile Eels’ (The Juvenile Eel Policy).

A range of input and output controls are in place to manage the harvesting of eels including:

- a minimum size limit (30 cm) for commercial adult eel collectors and recreational fishers
- a recreational in-possession limit for freshwater eels (combined limit of 10 for all species)
- restrictions on which waters are open to collection activities
- a limit on the number of authorities issued to access the fishery:
  - the adult eel fishery has 19 authorities\(^1\) and is closed to new applicants
  - the juvenile eel fishery is restricted to 13 authorities
- restrictions on the type and design of apparatus and number of each gear type that can be used (Figure 1)
- restrictions on the use of juvenile eels (may be sold to authorised aquaculture facilities within Australia only).

Catch statistics

Commercial – adult eel

Between 2008 and 2009 the annual reported commercial catch of adult eels in Queensland decreased by 15%, from 24.7 t in 2008 to 21.1 t in 2009 (Table 1, Figure 4); principally as a result of a 25% reduction in the number of fishing effort days. In 2009, three fewer licences participated in the adult eel fishery; the absence of these licences was responsible for the noticeable drop in total catch and fishing effort between 2008 and 2009.

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\(^1\) This figure may increase to 20, as a result of a pending appeal application on an adult eel licence. The appeal has resulted from the Latent Effort Policy licence removals.
Harvest levels from the Fraser/Burnett and Moreton regions continue to dominate the total harvest in the Queensland Eel Fishery; however catches in these regions were lower in 2009 than 2008 by 22% and 33% respectively, contributing significantly to the reduced total adult eel harvest in 2009. Catches in the Northern Dry region increased by 99% between 2008 and 2009.

Table 1: Licences, days fished and total catch (tonnes) in the adult eel fishery 2002–09 (Source: Fisheries Queensland CFISH database as at 1 April 2010).

<table>
<thead>
<tr>
<th>Year</th>
<th>Licences</th>
<th>Days</th>
<th>Catch (t)</th>
<th>CPUE (kg/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>24</td>
<td>380</td>
<td>53.8</td>
<td>141.53</td>
</tr>
<tr>
<td>2003</td>
<td>22</td>
<td>361</td>
<td>43.3</td>
<td>119.96</td>
</tr>
<tr>
<td>2004</td>
<td>19</td>
<td>267</td>
<td>41.0</td>
<td>153.48</td>
</tr>
<tr>
<td>2005</td>
<td>18</td>
<td>262</td>
<td>31.1</td>
<td>118.84</td>
</tr>
<tr>
<td>2006</td>
<td>17</td>
<td>219</td>
<td>18.0</td>
<td>82.02</td>
</tr>
<tr>
<td>2007</td>
<td>15</td>
<td>864</td>
<td>24.6</td>
<td>28.42</td>
</tr>
<tr>
<td>2008</td>
<td>18</td>
<td>885</td>
<td>24.7</td>
<td>27.87</td>
</tr>
<tr>
<td>2009</td>
<td>15</td>
<td>659</td>
<td>21.1</td>
<td>31.96</td>
</tr>
</tbody>
</table>

Catch per unit effort (CPUE kg/day) has been relatively consistent since 2007; approximately 32 kg/day of adult eels were harvested in 2009 (Figure 4). CPUE is not representative of natural adult eel stocks as adult eels are only harvested from artificial impoundments.

The continued reduction in fishable waters and the associated reduction in eel migration into impoundments make it increasingly harder for fishers to harvest large quantities of eel.

**Recreational**

The statewide recreational catch of eels is considered to be negligible. Refer to the ‘Recreational’ section of the 2008 Queensland Eel Fishery Annual Status Report for previous figures and catch statistics.

In 2010 Fisheries Queensland will commence a new statewide recreational fishing survey. This survey will provide current and robust data about the recreational harvest of freshwater eels and other species by Queenslanders. The results of this survey should be available by the end of 2011.

**Indigenous**

No estimates are available on the Indigenous harvest of adult eels.

**Commercial – juvenile eel**

Annual reported commercial catch of juvenile eels in Queensland decreased from 446 kg in 2008 to 136 kg in 2009 (Figure 5), this 30% decrease in catch is a direct result of a 65% decrease in the number of fishing effort days. This recent decrease adds to an already existing decline in catch and catch rate in the juvenile eel fishery. In 2009, the Burnett, Fitzroy, Gregory, Kolan, Logan and Mary Rivers recorded the harvest of juvenile eels. From the rivers fished, the Fitzroy and Mary Rivers produced the highest harvest levels, with data showing the Fitzroy River yielding the highest CPUE.

The juvenile eel fishery is temporal in nature with seasonal, weather and tidal cycles imposing natural restrictions and significant variation in both catch and fishing effort is expected. The variation in total catch from year to year is related to the high variability in abundance of juvenile eels entering individual river systems.

**Spatial issues/trends – adult eels**

In 2009, 39% and 34% of the total adult eel catch was harvested from the Fraser/Burnett and Moreton regions.
respectively. The spatial patterns associated with the adult eel fishery have remained the same for the past decade.

**Spatial issues/trends — juvenile eels**

The collection of juvenile eels is concentrated at specific river locations that favour collection (such as waterway barriers). In 2009, juvenile eels were harvested from six of the 21 rivers where collection is permitted. The spatial patterns associated with the juvenile eel fishery have remained relatively stable for the past three years.

**Socio-economic characteristics and trends**

The majority of eels, including wild-caught adult eels and juvenile eels grown in farms to export size, are exported live to Asia. In 2009, fishers were typically paid between $10/kg and $12/kg for wild-caught adult eels and $17/kg for juveniles that had been grown to a marketable size in captivity.

**Biological and ecological information**

**Monitoring Programs**

*Fishery independent monitoring*

Due to recent resourcing limitations, no monitoring of eastern coastal rivers was undertaken between 2007 and 2010; the independent monitoring of freshwater systems by Fisheries Queensland is not planned for 2010–11 or beyond. However, the Department of Employment, Economic Development and Innovation (DEEDI) is a partner in the South East Queensland Healthy Waterways Partnership which conducts biannual freshwater fish surveys using backpack electrofishers in 18 rivers and creeks in south east Queensland.

Eels were almost ubiquitous in catches between 2003 and 2010 and sometimes abundant and Fisheries Queensland has undertaken some preliminary analysis of these data to assess trends in eel catch rates. There is no indication of any long term declining trend with some seasonal and inter-annual variation in abundance of eels (Figure 6).

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*Prices are based on consultation with commercial fishers. Prices have decreased slightly since the previous year, accounting for inflation and the recent drop in the value of the Australian dollar.*

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![Figure 6: Count of eels (Anguilla spp.) recorded during spring and autumn sampling in the Albert Logan rivers catchment as part of the Ecosystem Health Monitoring Program 2002–03 to 2009–10 (Source: Ecosystem Health Monitoring Program, Healthy Waterways Network).](image)

**Bycatch**

There are no by-product species taken in the QEF as eels are the only freshwater fish permitted to be taken for trade or commerce. Adult eel traps have been designed to minimise the likelihood of interactions with non-target species and to reduce the impacts on any individuals captured.

Previous research demonstrated that bycatch in the juvenile eel fishery is generally low and consists of small, abundant and common species (Gooley and Ingram 2002).

**Interactions with protected species**

A Species of Conservation Interest (SOCl) logbook was adopted within both the adult and juvenile eel fishery in November 2006 to facilitate reporting of any interactions with protected species.

**Adult eel fishery**

A total of 535 interactions were reported in the adult eel fishery during 2009; all interactions were with freshwater turtles. Of the reported interactions 99% were released alive (Table 2).

<table>
<thead>
<tr>
<th>Common Name</th>
<th>No. released alive</th>
<th>No. released dead</th>
<th>Total no. of interactions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshwater turtle</td>
<td>528</td>
<td>7</td>
<td>535</td>
</tr>
</tbody>
</table>
In 2009, 46% of interactions with freshwater turtles occurred in the Burrum River catchment in south east Queensland.

Options for amending eel trap design, with the aim of reducing interactions with SOCI, will be considered during the review of the freshwater management arrangements scheduled to occur in 2011.

**Juvenile eel fishery**

In 2009, there were no reported interactions with species protected under the EPBC Act.

**Ecosystem Impacts**

The impact of the eel fishery on the ecosystem is considered to be low. The apparatus used is considered to have minimal impact on the physical environment and non-target species. Restrictions on the number of traps and the locations in which they can be used in are implemented to minimise potential impacts. The use of the apparatus designs that are sensitive to the environment and non-target species is encouraged. The trapping of adult eels occurs mainly in artificially created environments (e.g. farm dams) and therefore the adult eel fishery has negligible impact on the ecosystems of natural waterways.

Man-made barriers such as dams or weirs may affect migration of fish to a variable degree, from short delays to complete obstruction depending on the dimensions and characteristics of the barriers (Northcote 1998). In Queensland, barriers to eel passage upstream such as dams, weirs and barrages have the potential to reduce recruitment into upstream freshwater environments where female eels develop and grow. Fisheries Queensland has completed a cost-benefit analysis of the potential to facilitate juvenile eel recruitment upstream past waterway barriers (for more information refer to the ‘Current Sustainability status and concerns’ section of this report).

**Sustainability Assessment**

**Performance against fishery objectives**

Fisheries Queensland applied the QEF Performance Measurement System (PMS) to the adult and juvenile eel fishery following submission to DEWHA in February 2007. The PMS was developed in consultation with representatives from the commercial fishing sector, other fishery stakeholders, fishery managers, researchers and assessment and monitoring staff to ensure that objectives were meaningful, defensible, precautionary and measureable against available data. The PMS was approved by a delegate of the Chief Executive and is a formal instrument for measuring the performance of this fishery.

The designated performance measures and the fishery’s adherence to them are outlined below.

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Target Species</strong></td>
<td></td>
</tr>
<tr>
<td>A. Total annual catch of adult eels exceeds the highest reported historical annual catch (1996–2005).</td>
<td>Not triggered</td>
</tr>
<tr>
<td>The highest historical annual catch was recorded in 1998 at 56.84 t. The annual catch of adult eels in 2009 was 21.06 t; 63% below the highest historical catch.</td>
<td></td>
</tr>
<tr>
<td>B. Annual effort in the adult eel fishery shows a continual decreasing trend for three consecutive years.</td>
<td>Not triggered</td>
</tr>
<tr>
<td>Annual days fished and numbers of licences operating in the fishery have remained stable over the past three years.</td>
<td></td>
</tr>
<tr>
<td><strong>Bycatch Species</strong></td>
<td>Not measured</td>
</tr>
<tr>
<td>The risk ranking assigned to bycatch species issues in the ERA process increased from the previous assessment of the adult eel fishery.</td>
<td></td>
</tr>
</tbody>
</table>
### Performance Measure

#### Protected Species

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Interactions with threatened, endangered or protected species (TEP species) show an increasing trend over three years in the adult eel fishery.</td>
<td>Not triggered</td>
</tr>
<tr>
<td>B. The risk ranking assigned to TEP species issues in the ERA process increased from the previous assessment of the adult eel fishery.</td>
<td>Not measured</td>
</tr>
</tbody>
</table>

#### Target Species

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. The proportion of nominated rivers fished exceeds the highest historical proportion of rivers fished (2002–05), for both elvers and glass eels.</td>
<td>Triggered</td>
</tr>
<tr>
<td>B. Annual catch exceeds the highest historical annual catch (2002–05), for both elvers and glass eels.</td>
<td>Not triggered</td>
</tr>
<tr>
<td>C. Annual effort per river shows a continual increasing or decreasing trend for three consecutive years, for both elvers and glass eels.</td>
<td>Triggered</td>
</tr>
</tbody>
</table>

- **Triggered**: The highest historical proportion of nominated rivers fished is 24%; equivalent to five of the 21 nominated rivers. In 2009, six rivers were fished (including one non-permitted river) exceeding the highest historical proportion by 5%.

- **Not triggered**: In 2009, 136 kg of juvenile eels were harvested. This does not exceed the highest historical annual catch of 214 kg.

- **Triggered**: There has been a continual decline in the number of days fished in the Burnett, Fitzroy and Kolan Rivers. This is the fourth consecutive year that this performance measure has triggered.

#### Bycatch Species

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>Performance</th>
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<tbody>
<tr>
<td>The risk ranking assigned to bycatch species issues in the ERA process increased from the previous assessment of the juvenile eel fishery.</td>
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<tr>
<td>A. Interactions with threatened, endangered or protected species (TEP species) show an increasing trend over three years in the juvenile eel fishery.</td>
<td>Not triggered</td>
</tr>
<tr>
<td>B. The risk ranking assigned to TEP species issues in the ERA process increased from the previous assessment of the juvenile eel fishery.</td>
<td>Not measured</td>
</tr>
</tbody>
</table>
The Queensland Eel Fishery Performance Measurement System was reviewed in January 2010 by DEEDI representatives and experts. The finalised outcomes of this review will be publicly available when the reviewed PMS is published during 2010. The revised PMS will be assessed against in the 2011 Queensland Eel Fishery Annual Status Report.

**Responses to 2008 effort year triggers**

The following responses pertain to the triggered juvenile eel fishery performance measures from the 2009 Queensland Eel Fishery Annual Status Report.

*Juvenile Target Species Performance Measure 1a*

The highest historical proportion of nominated rivers fished (2002–05) is 24% or five out of the 21 nominated rivers. In 2008, six rivers were fished exceeding the highest historical proportion by 5%.

The number of rivers fished over the past six years has remained between four and six of the total 21 nominated rivers. The proportion of rivers fished therefore remains consistently low. This associated with the other controls in place in the fishery to ensure passage of a percentage of juvenile eels even in rivers where fishing occurs, means that the additional river fished is not considered to have had a negative impact on preservation of eel stocks. No further management action is recommended.

*Juvenile Target Species Performance Measure 1b*

The highest historical annual catch (2002–05) is 214kg. In 2008 the annual catch was 446kg.

Total annual catch did increase for the two years after the policy was released and in 2008, while total catch remained above the historical level, it did decrease from 2007. CPUE will continue to be monitored to try and determine if there is any indication that eel abundance is being impacted beyond what can be explained my natural variation in recruitment.

*Juvenile Target Species Performance Measure 1c*

There has been a continual decline in the number of days fished in the Burnett River over the past three consecutive years, 2006 – 177 days, 2007 – 16 days and 2008 – 3 days.

The changing level of effort applied to the different river systems open to eel trapping is most likely an indicator of the variable nature of eel recruitment and despite the reduction in effort at the Burnett River, overall effort in the fishery has remained fairly consistent with the previous year. The panmictic nature of the eel population also means that reduced recruitment to a particular river system is unlikely to be related to any previous issue of localised overfishing. Catch and effort will continue to be monitored over the entire fishery as an indicator of recruitment for the population.

Fisheries Queensland have considered the factors contributing to the triggers in consultation with fisheries scientists, fisheries management officers and assessment and monitoring staff and found that they do not currently present an immediate risk to the sustainability of the Queensland Eel Fishery.

**Current sustainability status and concerns**

The QEF is maintained through a multitude of precautionary management arrangements which are aimed towards maximising the probability that the Queensland eel resource will remain ecologically sustainable in the long term. Fisheries Queensland manages the adult eel fishery principally through extensive spatial closures (harvesting only in publicly owned and privately owned artificial impoundments). Trapping is excluded from natural waterways ensuring an appreciable proportion of the population are able to mature and migrate to spawn without being exposed to commercial fishing pressure. The adult eel component of the QEF is a closed fishery to new applicants with a limited number of active fishers; restricting the maximum effort level and therefore protecting resource availability. Similarly, harvesting of glass eels and elvers is only permitted in a small number of rivers/ estuaries (21 rivers which represents less than 10% of river systems in Queensland).

Anecdotal evidence and past research suggests that bycatch in both the adult and juvenile eel fishery is low. The gear utilised in the adult eel fishery is highly selective and observed bycatch in the juvenile eel fishery has been mostly limited to abundant and common species of glassfish (Gooley and Ingram 2002). A Species of Conservation Interest (SOCI) logbook was implemented in both the juvenile and adult eel fisheries in November 2006 and the resulting data are discussed in the ‘Interactions with Protected Species’ section of this annual status report.

Fisheries Queensland have recently developed and implemented a stock status reporting framework (a copy of the final report can be found at: [http://www.dpi.qld.gov.au/28_16916.htm](http://www.dpi.qld.gov.au/28_16916.htm)) which uses...
defined exploitation criteria to determine the status of a stock using current biological information, independent and dependent monitoring data, and fishery logbook data. In May 2010, a stock status workshop was held to discuss the status of freshwater eel stocks in Queensland. A suite of information was considered; length frequency data across nine years, index of abundance from fishery independent monitoring, commercial logbook catch and catch rates, local and non-local scientific journal articles and expert knowledge on biological characteristics of the species in question. From the information presented Fisheries Queensland experts and representatives were able to make an assessment of the east coast freshwater eel stock and determine an exploitation status. The east coast freshwater eel stock was considered ‘Sustainably Fished’. Historical commercial catch and catch rate data are variable and heavily dependent on environmental factors. Length frequency graphs show healthy distribution of individuals in length classes, for nine years. Current fishing pressure is considered sustainable under the current management regime—due particularly to strict conditions related to permitted fishing areas.

There is some concern about the effect of waterway barriers on eel migration. As part of Fisheries Queensland’s management of this issue, an economic cost-benefit analysis titled ‘Benefit-Cost Analysis for Proposed Juvenile Eel Recruitment Past Waterway Barriers’ (Maroske 2009) was employed to investigate the benefits associated with proposed juvenile eel recruitment past waterway barriers. A trap-and-transport fish passage system was identified as the most appropriate method to facilitate juvenile eel recruitment upstream (in terms of efficient eel passage and cost effectiveness). The trap-and-transport juvenile eel passage system is a structure specific to the characteristics of migrating juvenile eels and employs the use of a short elver pass (ramp that juvenile eels can climb up) and collection container. The juvenile eels that enter the collection chamber are then physically transported upstream past the waterway barrier. Analysis of the trap-and-transport passage system revealed that the likelihood of the mechanism succeeding in improving juvenile recruitment upstream was dependent upon its design, which in turn was based on available resources. Overall, the analysis suggested that the high costs associated with building and maintaining an effective juvenile eel passage system would have to result in significantly increased eel recruitment for it to be an economically worthwhile initiative. As a result it is difficult to justify the facilitation of trap-and-transport passage systems in the eel fishery as this exercise is not considered economically feasible, given the current lack of available resources and the total value of the fishery.

Research
Recent research and implications
 Fisheries Queensland is not aware of any research specific to the QEF during the reporting year.

Collaborative research
There has been no collaborative research this year.

Fishery management
Compliance report
During 2009, three inspections were conducted in the Queensland Eel Fishery (two juvenile eel fishery inspections and one adult eel fishery inspection), including one commercial fishing inspection. No offences were detected and no significant issues were identified by either industry or Fisheries Queensland.

Changes to management arrangements in the reporting year
No changes to management arrangements were made within the adult or juvenile eel fisheries in 2009.

Implementation of the Policy for the Removal of Excess Fishing Capacity in Queensland’s Line, Crab, Beam Trawl and Eel Fisheries was completed in early 2010. Application of the policy resulted in the removal of 12 latent eel licences (one of those decisions is still subject to an ongoing appeal). There are now 19 licences in the fishery (a maximum of 20 if an appeal is successful). Fisheries Queensland will continue to monitor the effectiveness of the policy on reducing latent effort in the Queensland Eel Fishery. Fisheries Queensland plans to review the management rearrangements for the Queensland Eel Fishery now that the removal of latent effort has been undertaken.

Communication and education
Promotion of regulations applying to both commercial and recreational fishers, including those relating to eels, is an ongoing role for Fisheries Queensland. Consultation with stakeholders in this fishery occurs through many mechanisms:
On a strategic level the Queensland Fisheries Management Advisory Committee (QMAC) considers the Queensland Eel Fishery in the context of all Queensland fisheries and prioritises issues associated with it accordingly. Once fisheries management priorities have been determined, the department may establish a small number of Technical Advisory Groups (TAGs) to provide technical information that will assist Fisheries Queensland to pursue these priorities (which may or may not impact the Queensland Eel Fishery).

Fisheries Queensland may also establish technical working groups to generate information upon which to base decisions. These groups may be permanent or adhoc and can be fishery-specific or broader. They may be established to provide advice to the Department or to inform the decisions of a body such a QMAC.

Fisheries Queensland consults directly with industry members through attendance at industry association meetings, port visits, newsletters and by other means. There are also legislated requirements for consultation; such as Regulatory Assessment Statements (RAS) that ensure stakeholders in the fishery are consulted about significant changes in management arrangements.

The **Fisheries (Freshwater) Management Plan 1999** was repealed in March 2010. All relevant legislation from the Plan was moved into the Queensland Fisheries Regulation 2008. It should be noted that no significant changes were made to the legislation. To view the legislative instrument which was used to make these amendments, please visit: [www.legislation.qld.gov.au](http://www.legislation.qld.gov.au)

**Complementary management**

As part of the outcomes of the Queensland Eel Fishery Performance Measurement System review conducted in January 2010, Fisheries Queensland engaged in discussions with New South Wales, Victoria and Tasmanian Fisheries representatives. Due to the panmictic nature of the longfin and southern shortfin eel species, Fisheries Queensland has drafted a performance measure which takes into consideration the total harvest of eels in all four Australian east coast states. The functional outcome of finalising this measure will mean that Fisheries Queensland will be required to engage in regular cross-jurisdictional communication with state fisheries representatives, which will aid in the identification and mitigation of issues regarding the sustainability of eel stocks and ensure that future management arrangements consider changes in the east coast eel population.

**References**


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**Image**

Longfin eel – *Anguilla reinhardtii*