

Annual status report 2005

Queensland Eel Fishery



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

This publication provides information on the Eel Fishery.

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Inquiries should be addressed to:
Manager, DPI&F Publications
Department of Primary Industries and Fisheries
GPO Box 46
Brisbane Qld 4001

Introduction

The Queensland eel fishery targets the longfin eel, *Anguilla reinhardtii*, and the shortfin eel, *Anguilla australis*, in rivers and freshwater impoundments. The Queensland commercial eel fishery is unusual in that the resource is harvested at two stages in the lifecycle—the adult stage and the glass eel/elver stage (juvenile eels < 30 cm) for both species. Commercial adult eel trappers collect adult eels from impounded waters; commercial fishers of juvenile eels take glass eels and elvers from rivers and supply seed stock for growout in aquaculture systems. Although adult eel trappers and juvenile eel collectors harvest eels at different life stages, use different gear and require different authorities, both target the same eel population. Accordingly, the Queensland eel fishery is managed for sustainability as a single fishery, inclusive of both species and life stages.

Description of the fishery

Fishing methods

Eel trappers are permitted to use eel traps or round traps to collect adult eels. Juvenile eel collectors are permitted to use fyke nets, flow traps and dip nets to collect glass eels and elvers.

Fishing area

Adult eel trappers may only collect eels from freshwater impoundments in east coast catchments listed on their authority. Permitted waters are restricted to:

- (a) an impoundment formed by a dam that is specifically listed on an eel authority (for example a public impoundment such as Cressbrook Dam)
- (b) a privately owned, artificially created impoundment within a catchment stated on an eel authority (for example a farm dam).

The majority of public impoundments are not open to commercial harvesting so the fishery comprises mainly private impoundments.

The collection of juvenile eels is allowed in the following 21 rivers: Albert, Barron, Brisbane, Burdekin, Burnett, Burrum, Caboolture, Coomera, Currumbin, Fitzroy, Johnstone, Kolan, Logan, Maroochy, Mary, Mooloolah, Mulgrave, Nerang, Noosa, Pine and Tully rivers.

Collection of juvenile eels is allowed at, or downstream of, the most downstream dam or weir and up to 200 m either side of the mouths of these rivers. A tidal barrage is not considered a weir for the purpose of these conditions. 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.

Main management methods used

The Department of Primary Industries and Fisheries (DPI&F) manages the eel fishery in accordance with ecologically sustainable development principles. 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 number of authorities issued to access the fishery
 - the adult eel fishery has 39 authorised fishers and is closed to new applicants
 - the juvenile eel fishery is restricted to 12 authorities
- restrictions on the type and design of apparatus and number of each gear type that can be used (Figure 1)

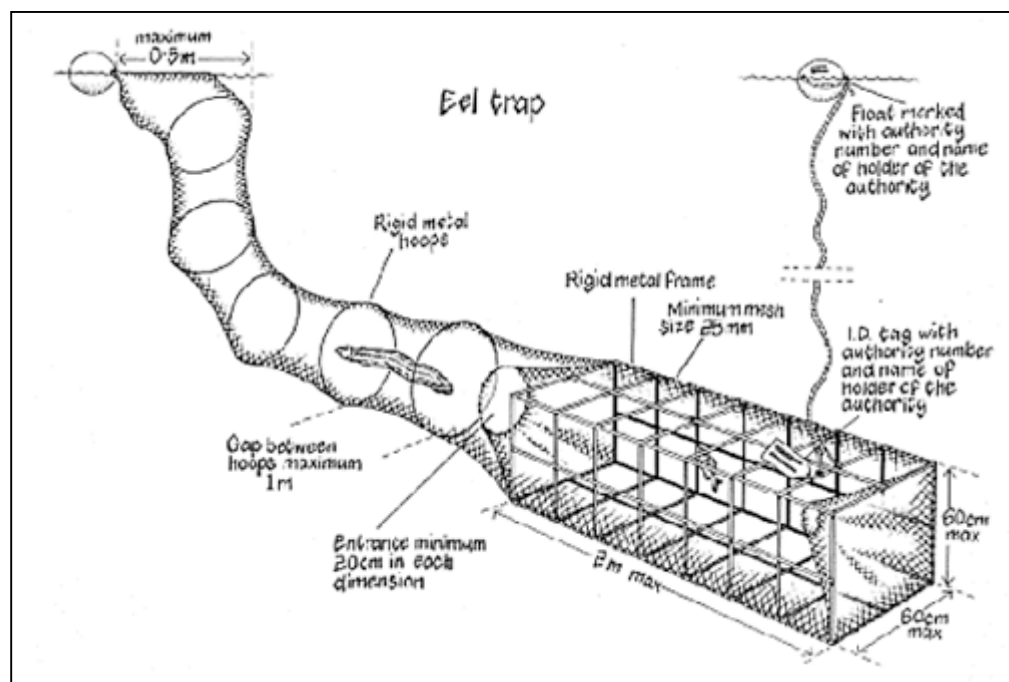


Figure 1: Eel trap used by adult eel trappers

- restrictions on the use of juvenile eels (may be sold to authorised aquaculture facilities within Australia only).

Approximate allocation between sectors

The Queensland eel fishery is almost entirely commercially based. Only a small number of eels are taken by recreational and Indigenous fishers.

Fishery accreditation under EPBC Act

The Queensland eel fishery was granted a five-year exemption from export controls of the *Environment Protection and Biodiversity Conservation Act 1999* in November 2004. The exemption expires in November 2009.

Fishery profile

Adult eel fishery

Total Harvest from all sectors: approximately 51 t

Commercial harvest 2004: 41 t

Recreational harvest 2002: 7766 individual eels (\pm 2728)

Indigenous harvest 2000: negligible—869 eels reported in NRIFS as caught by Indigenous fishers

Charter harvest 2004: none reported

Commercial Gross Value of Production (GVP) for 2004: approximately \$410 000

Number of authorities: 39 as of August 2005

Number of authority holders accessing the fishery in 2004: 19

Juvenile eel fishery

Commercial harvest 2004: approximately 120 kg

Commercial Gross Value of Production (GVP) for 2004: not available as management arrangements prevented sale*

Number of authorities: 12 as of August 2005

Number of authority holders accessing the fishery in 2004: 8

* For the 2003–04 financial year, 47.2 t of adult eel were produced from aquaculture for a reported gross value of \$517 000. The production originated from both the on-growing of juvenile eels and the on-growing of smaller adult eels. The reporting of production originating purely from juvenile eels will be separated in future seasons.

Catch and effort (target species)

Commercial

Commercial catch data have been sourced from the compulsory monthly catch returns database maintained by DPI&F (CFISH).

Logbook data indicate that adult eel catches have remained fairly stable since 1996, fluctuating between 40 and 60 t annually (Figure 2).

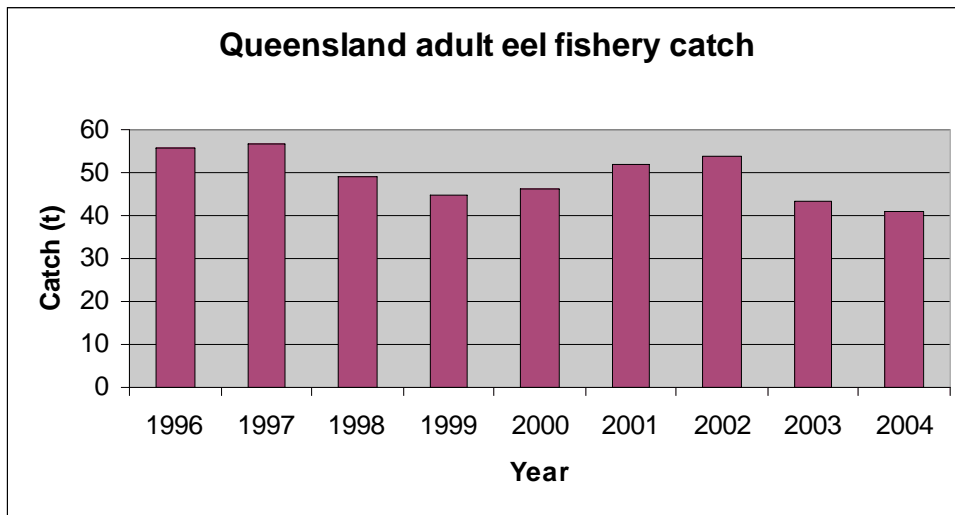


Figure 2: Queensland adult eel catch

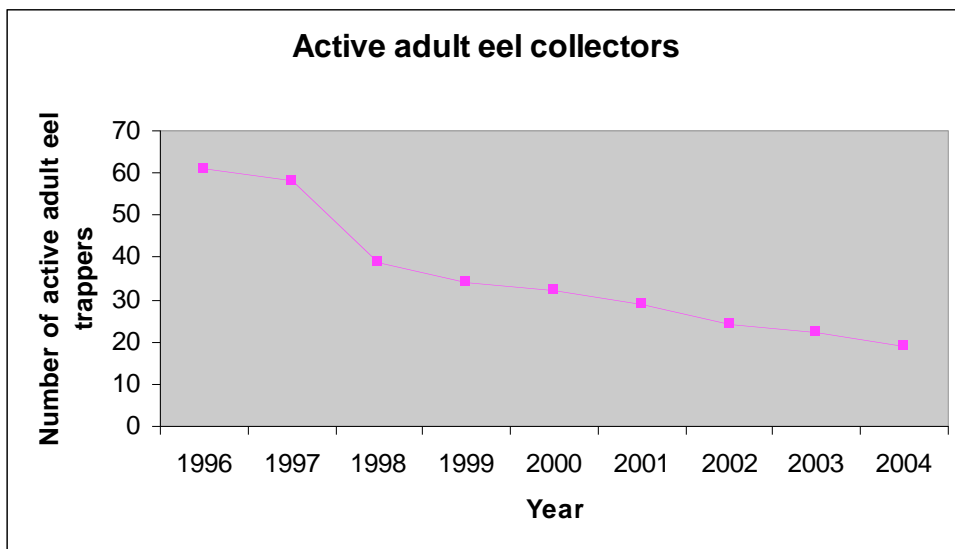


Figure 3: Active adult eel collectors

Since limits were placed on entering the eel fishery in 1999, the number of active operators has steadily declined (see Figure 3), probably as a result of inactive operators not renewing their authorities. This has led to a reduction in effort in the fishery. It is possible that the fishery is shifting towards fewer active fishers running more targeted and efficient operations. This would explain the stability of the catch, despite the reduction in the number of active fishers.

As a result of misreporting of the number of trap checks in the adult eel collection component of the fishery, the catch per unit effort (CPUE) cannot be accurately determined. Consequently, it is difficult to ascertain the status of the fishery from raw catch and effort information. A new logbook for the fishery, currently under development, will allow for better reporting of effort.

The catch of juvenile eels has fluctuated widely since 1996, with total annual catches of between 0.9 to 210 kg reported for the years 1996 to 2004 (Figure 4).

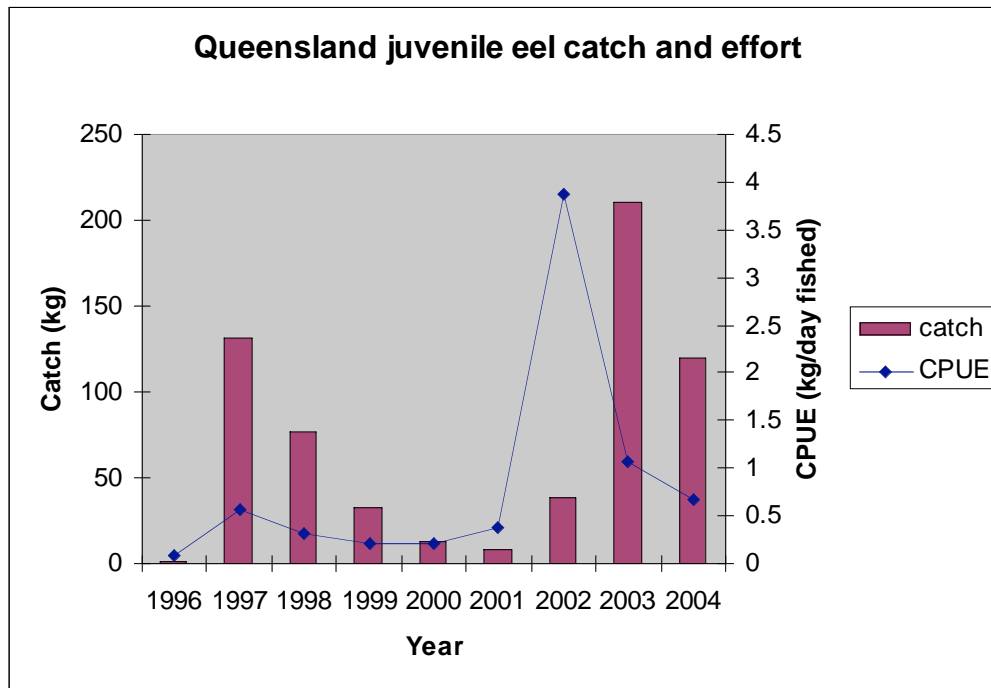


Figure 4: Queensland juvenile eel catch

Fluctuations in annual catches of juvenile eels are normal. 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. The variation in total catch from year to year is related to the high variability in abundance of juvenile eels entering individual river systems.

The number of approval holders remained steady in 2004 with 12 approvals issued. Of these 12 approvals only about five are used regularly.

Recreational

Information collected through the Queensland Recreational Fishing Information System (RFISH) diary surveys in 1997 and 1999 indicated that the harvest of eels by recreational fishers was negligible. Few fishers reported any catches, making it difficult to expand the sample harvest to a statewide estimate. The 2002 RFISH survey also showed that only negligible catches were taken, with the data suggesting that the majority (60%) of eels caught were released.

The National Recreational and Indigenous Fishing Survey (NRIFS) estimated that 7766 individual eels (± 2728) were harvested in Queensland. This estimate also includes the *Conger* species of eel which inhabits marine areas. It was estimated that approximately 44% of the eels caught were released.

Minimum size limits prevent juvenile eels (< 30 cm) from being collected by the recreational sector.

Charter

No eels were reported as being taken by the charter industry.

Indigenous

Indigenous community fishing activity was analysed for Queensland as part of the NRIFS conducted in 2000. In Queensland, 869 eels were reported as being taken by Indigenous fishers. These eels may have included other marine species (*Conger* species) in addition to the *Anguilla* species targeted by the commercial fishery.

Preliminary comparisons of raw data collected from 11 Indigenous communities in the north of Queensland, sampled as part of NRIFS, suggest that eels account for 0.05% of the total number of organisms harvested by the Indigenous fishers interviewed during the surveys.

Non-retained species / bycatch

There are no by-product species taken in the Queensland eel fishery, as eels are the only freshwater fish permitted to be taken for trade or commerce. The specificity of adult eel traps minimises the likelihood of interactions with non-target species. Restrictions on the apparatus permitted for juvenile collection and the locations where it can be used reduce potential impacts on bycatch. It is a condition of the authority that a record be kept of all bycatch and that any bycatch be released immediately.

Interactions with protected species

A new logbook is currently being developed for both adult and juvenile eel fisheries to facilitate reporting of any interactions with protected species. An education program has been developed and implemented to encourage more accurate reporting. It includes information on freshwater protected species and provides practical advice on how fishers can minimise their interactions with protected species.

Fishery impacts on the ecosystem

The impact of the eel fishery on the ecosystem is considered to be low. The apparatus used is considered to have only a 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 are in place to minimise potential impacts. The use of 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 has minimal impact on the ecosystems of natural waterways.

General ecosystem health

Barriers to eel passage upstream such as dams, weirs and barrages have the potential to reduce recruitment into upstream freshwater environments where female eels grow.

Spatial issues / trends

The collection of juvenile eels is concentrated at specific river locations that favour collection (such as at waterway barriers). For the 2003–04 season, collectors of juvenile eels were most active in the Albert, Burnett and Fitzroy rivers.

Socioeconomic characteristics and trends

The majority of eels, including wild-caught adult eels and juvenile eels grown on farms to export size, are exported live to Asia, with prices from \$10/kg to \$12/kg. Prices have remained stable over the past few years.

Research and monitoring

Recent research and implications

The DPI&F and the Fisheries Research Development Corporation (FRDC) project *Biological data and model development for management of longfinned eel fisheries* has been completed. The major conclusions include the following:

- Modelling suggests that longfinned eels stocks are best managed by maintaining substantial areas closed to the fishery to enable maturation and escapement of spawning stock. (The Queensland eel fishery is currently managed in this manner.)
- Fishery independent CPUE data obtained from the DPI&F Long Term Monitoring Program (LTMP) are suitable for evaluating trends in eel stocks in rivers and can be used to generate an index of abundance for legal sized (adult) longfin eel stocks.
- Densities of eels in large dams are too low for monitoring by electrofishing and the characteristics of large water bodies make electrofishing an unsuitable technique for assessing trends in eels stocks in the region.
- There was no significant evidence for a decline in eels in south-east Queensland rivers that could be attributed to either adult eel harvest or juvenile eel collection.
- It is acceptable to use check marks from longfin eel otoliths for age-based models.
- Spawner production and productivity of the fishery is likely to be improved through improved passage for juvenile eels past waterway barriers such as dams and weirs.
- The project developed a user-friendly eel fishery management model to enable fisheries managers to investigate different management alternatives and their likely effects on trends in yield to the fishery and sustainable production of spawners.

The project results support DPI&F's assertion that the management arrangements in place for the Queensland eel fishery are conservative and ensure the sustainability of the resource.

Monitoring programs and results

LTMP freshwater surveys occur annually. Eels are sampled in all of the east coast river catchments in the monitoring program.

Table 1: LTMP catch data for longfin eel

River	Average catch (number of fish per 30 min. 'on time' electrofishing)				
	2000	2001	2002	2003	2004
Logan–Albert	2.63	2.84	1.52	1.01	2.84
Noosa	1.4	1.35	1.55	1.0	1.99

Mary	3.0	4.66	3.53	2.53	2.75
Herbert	8.86	6.96	5.46	2.87	13.46
Johnstone	4.44	3.52	6.01	3.51	6.31
Daintree	13.29	10.71	8.76	2.88	10.12

Analysis of the LTMP data was undertaken as part of the FRDC project already outlined.

Collaborative research

Different models for managing eel fisheries across Australia were assessed as part of the DPI&F and FRDC eel project. New South Wales Fisheries also carried out a complementary and collaborative research program through a related FRDC project.

Fishery management

Compliance report

Data for the 2004–05 financial year indicate that four eel fishers were inspected. A total of three breaches were recorded against one trapper for a range of offences.

A new Compliance Activity System is being developed by DPI&F that will record detailed information on enforcement and compliance actions performed by the Queensland Boating and Fisheries Patrol (QBFP). The system will include:

1. Breach Reports Issued (including offences and court outcomes)
2. Unattended Breach Reports
3. Fisheries Infringement Notices (FINS) issued
4. All field activities (from new Field Occurrence Logs)
5. Complaints made via the Fishwatch hotline (including follow up actions).

All offences and field activities will also be recoded to six nautical mile commercial fishing grids. This will allow enforcement activities and offences to be represented spatially and to guide reviews of compliance strategies. Progress to date includes the development of the new system to record Breach Reports, Unattended Breach Reports and Fisheries Infringement Notices. The new Field Occurrence Logs were trialled in Cairns and implemented across Queensland in July 2005.

Changes to management arrangements in the reporting year

No changes to the management of the adult eel fishery have been made since the submission of the ecological assessment report to DEH in late 2002.

The juvenile eel fishery is currently under review, with the draft policy (*Management arrangements for the commercial harvesting and use of juvenile eels*) to be finalised. The draft policy is not intended to decrease existing fisher rights, or increase fishing areas or permitted apparatus.

Consultation / communication / education

One of the DPI&F's ongoing roles is the promotion of regulations applying to commercial and recreational fishers, including those relating to eels. Nearly 160 000

recreational fishing brochures giving size and possession limits were distributed in 2004. In addition, approximately 500 stakeholders were sent the four editions of the fisheries newsletter, *Fish*, produced during 2004. The newsletter highlights recent achievements, latest research, and proposed changes to management arrangements. In February 2004, DPI&F introduced FishFlash, an email-based newsletter with links to the latest fisheries news. Approximately 300 stakeholders subscribe to FishFlash, which is now up to its 18th issue.

Consultation also occurs through the Freshwater Management Advisory Committee (Freshwater MAC) with meetings generally held twice a year. Freshwater MAC provides an opportunity for stakeholders to advise DPI&F on management measures for the eel fishery.

Consultation on the draft policy, *Management arrangements for the commercial harvesting and use of juvenile eels*, is currently underway.

Complementary management

Formal discussions with New South Wales and Victorian fisheries agencies in regards to complementary management have not yet occurred. However, officers from the different agencies are in regular informal contact.

Fishery Performance

Appraisal of fishery in regard to sustainability

The logbook data suggest that a slight decrease in total catch has occurred, probably in response to a reduction in the number of active fishers participating in the fishery. The recently completed DPI&F and FRDC project suggests that, based on fisheries independent information from the Long Term Monitoring Program, the fishery is being managed in a sustainable manner.

Progress in implementing DEH recommendations

The recommendations made by the Australian Government Department of the Environment and Heritage (DEH) in regard to addressing any uncertainties or risks that were identified can be found at:

<http://www.deh.gov.au/coasts/fisheries/qld/eel/decision.html>. DPI&F has made progress in implementing a number of these recommendations. For example:

- A policy document, *Management arrangements for the commercial harvesting and use of juvenile eels*, has been released for stakeholder consultation and will be finalised shortly.
- A review of the objectives of the *Fisheries (Freshwater) Management Plan 1999* to include fishery specific objectives for the adult eel fishery has commenced. Performance indicators and performance measures will be developed once the objectives have been finalised.
- A new logbook, including a section for reporting Species of Conservation Interest is currently being developed for both the adult and juvenile eel fisheries. A draft will be circulated for stakeholder comment in the near future.

- A protected species education program for commercial and recreational fishers has been developed and materials have been distributed to commercial and recreational fishers.
- Fishery independent monitoring continues annually through the Long Term Monitoring Program.
- A review of all monitoring activities in freshwater is currently underway with the view to developing a more efficient monitoring strategy that addresses all of the objectives of the freshwater management plan. This includes investigating sampling of impoundments and unimpounded rivers to monitor eel abundance.

Management performance

No performance measures and/or reference points have yet been developed for the fishery. These measures will be developed by the end of 2006 by DPI&F in conjunction with Freshwater MAC and its associated Scientific Advisory Group.

Resource concerns

There is some concern about the effect of waterway barriers on eel migration. Juvenile eels are unable to negotiate the fish passage devices currently in operation. As part of DPI&F's obligations to the DEH, a cost-benefit analysis of the possible solutions to this issue will be undertaken.

Concern has also been expressed regarding the potential for increased effort in the juvenile eel collection fishery if interstate trade in juvenile eels is permitted, as is currently proposed in the draft management arrangements for the juvenile eel fishery.

Information compiled by

Anita Wohlsen, Andrew Walls

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Len Olyott, Claire Andersen

Front cover

Long fin eel - *Anguilla reinhardtii*

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