

**Application to the Department of Environment, Water,
Heritage and the Arts**

For

Re-Assessment of the Victorian Eel Fishery

Against the Guidelines for the Ecologically Sustainable Management of Fisheries

January 2009

1. Background

This report is to update the Department of Environment, Water, Heritage and the Arts (DEWHA) on changes to the Victorian Eel Fishery, to enable re-assessment of the fishery against the *Guidelines for the Ecologically Sustainable Management of Fisheries*.

In June 2003 the Victorian Department of Primary Industries (DPI) submitted the initial assessment of the Victorian Eel Fishery seeking exemption from the export controls under the Environment and Biodiversity Conservation Act 1999 (EPBC Act).

In May 2004 DEWHA (then the Department of Environment and Heritage) approved the management arrangements for the fishery for the purposes of the wildlife trade provisions in part 13A of the EPBC Act and amended the list of exempt native species to include fish taken from the Victorian eel fishery for a period of five years, until 1 May 2009.

The current Victorian Eel Fishery Management Plan is available on the Fisheries Victoria website:

www.dpi.vic.gov.au/fishing.

The initial DEH assessment is available on the DEWHA website:

www.environment.gov.au/coasts/fisheries.

2. Key Changes in the Victorian Eel Fishery since the last assessment

The Victorian eel fishery has continued to decline because of the prolonged drought in south eastern Australia, resulting in the reduction of suitable aquatic habitats for eels. In particular, stocking of eels into lakes and impoundments in western Victoria has virtually ceased, with most licences being placed in abeyance. This has had a flow-on effect to the wild fishery which supplies most of the re-stock for stock enhancement.

Similarly, the anticipated development of a glass eel fishery, as a source of re-stock for stock enhancement purposes, has not occurred because there is no requirement for re-stock.

Recovery of the Victorian eel fishery will not occur until the drought breaks, and even then it may take many years before some of the formerly productive lakes and swamps return to normal production.

There have been no new developments in the eel fishery, or changes to management arrangements contained in the 2002 Victorian Eel Fishery Management Plan. A review of the management plan will commence in early 2009, under the new stakeholder consultative arrangements that are soon to be introduced for Victorian fisheries.

3. Progress in Implementing the Recommendations of the Initial Assessment

Where possible, significant progress has been made in implementing the recommendations of the initial assessment. It has not been possible to progress some recommendations because of the absence of relevant fishing activities.

A report against the specific recommendation is contained in the attached Eel Fishery Status Report 2008. This report is an update of chapter 3.9 of the Victorian Fisheries Status Report – 2008, using 2007/08 catch data, which is the latest available data.

The full 2008 Victorian Fisheries Status Report is available on the Fisheries Victoria website: www.dpi.vic.gov.au/fishing.

Should any clarification or further information be required, please contact David Molloy, Eel Fishery Manager, on (03) 5258 0252 or e-mail on david.molloy@dpi.vic.gov.au

2008 Status Report

Victorian Eel Fishery

3.9.1 Description of the fishery

Target species

Target species are shortfinned eel (*Anguilla australis*) and longfinned eel (*A. reinhardtii*).

Prohibited species

Commercial eel fishers are only permitted to take shortfinned and longfinned eels, as well as carp, tench and roach. All other species must be returned to the water.

Fishing area(s)

The fishery focuses on harvesting eel stocks in Victorian coastal river basins south of the Great Dividing Range. Shortfinned eels are found across the state, but longfinned eels are only found in eastern Victoria.

Fishing methods

Commercial

Commercial fishers are only permitted to use fyke nets to take eels.

Recreational

Recreational fishers can take eels by angling with a rod and reel, or hand lines.

Indigenous/customary

Traditional owners (aboriginal communities) are known to have harvested and utilised eel resources in western Victoria since before colonial settlement. Aboriginal people continue to take eels for personal and customary uses in Victoria.

Historically, Traditional Owners are known to have constructed a sophisticated series of channels and networks across waterways in western Victoria using earthen embankments

and stone weirs to guide migrating eels into fish traps. Spears are also used by Traditional Owners to harvest eels.

Management arrangements employed in the fishery

The management arrangements for the fishery are outlined in the Fisheries Regulations and the Eel Fishery Management Plan (DPI 2002). No legal minimum lengths or closed seasons are applied to eel fishing in Victoria.

Commercial arrangements

Commercial arrangements vary within the fishery.

Management arrangements cover the wild harvest; stock enhanced waters and intensive aquaculture sectors.

Wild harvest fishery

There are no individual catch quotas or a total allowable catch for the wild harvest fishery. The life history of eels make it impossible to conduct traditional stock assessments and set TACs for the fishery.

The fishery is managed solely by input controls. An Eel Fishery Access Licence (EFAL) is required to take eels for sale or to use commercial eel fishing equipment in coastal rivers and streams. The maximum number of EFALs is capped at 18. The number, dimensions and mesh sizes of fyke nets that can be used by commercial fishers is also restricted.

The key strategy to ensure sustainability in the Victorian eel fishery is to limit the number of waters that are open to commercial fishing. Only about half of the coastal rivers and

streams across Victoria are open to commercial eel fishing. A number of waters were closed because of concerns about bycatch of aquatic mammals—particularly platypus—and water birds, and because of potential conflict with recreational fishers. The majority of rivers and streams open to eel fishing are only open in the lower and estuarine reaches.

To reduce fishing pressure, individual waterways are generally allocated to a single EFAL, but some larger waters are shared by more than one licence. Some fishers also have limited access to wildlife reserves and lakes and swamps on Crown land under a permit system.

Stock enhanced fishery

Stock enhancement involves stocking selected lakes and impoundments in western Victoria with elvers and small eel (snigs) for on-growing and recapture. Historically, a significant component of commercial eel production in Victoria came from this method of fishing, but the prolonged drought in western Victoria has severely impacted on this form of fishing.

Translocation of eels for stock enhancement purposes is conducted under an approved protocol for the eel fishery (McKinnon 2006) in accordance with the Guidelines for Assessing Translocations of Live Aquatic Organisms in Victoria (DPI 2003).

Only shortfinned eels are translocated for stock enhancement, and any stocking must be authorised under an Aquaculture (Crown Land – Eels) Licence (CLE). No additional food is added to the water, with the small eels feeding on natural foods found in selected lakes.

Twelve CLEs have been issued to people or companies who also hold an EFAL. Most CLEs are currently held in abeyance due to the continuing drought.

Intensive Aquaculture

A small number of Aquaculture (Private Land – Eels) Licences have been issued for eel aquaculture in intensive recirculating systems.

At present it is not technically feasible to reproduce eels from eggs. Juvenile stock for intensive aquaculture operations is harvested from the wild and on-grown. In Victoria EFAL holders take “glass eels” from the wild under permit using modified (fine mesh) fyke nets. These glass eels are transferred to aquaculture facilities where they are grown in tanks to market size.

Both species of eels can be grown in intensive aquaculture facilities.

Recreational arrangements

Unless exempt (see section 2.1.6), recreational fishers require a RFL to take eels in Victorian waters. There is a daily bag/possession limit of 10 eels (all species).

Customary arrangements

The DPI can issue permits to aboriginal communities for cultural and ceremonial purposes, to facilitate customary fishing practises undertaken outside the recreational fishing regulatory framework.

Allocation between sectors

There is no formal allocation between the fishing sectors.

Fishery accreditation

The management arrangements for the eel fishery are accredited under the Commonwealth EPBC Act and the fishery has been granted an exemption from the export control provisions for a period of 5 years from May 2004.

Catch data

Total catch of target species

As no estimate of the recreational catch (including customary catch) of eels is available, the total catch is unknown.

Commercial catch of target species

The total wild catch of eels in 2007/08 was 84 tonnes, comprising 56 tonnes of shortfinned eels and 28 tonnes of longfinned eels.

DPI's confidentiality policy for catch and effort data prevents public disclosure of data that relates to less than five licence holders. Because of this, the production of eels from either stock enhanced waters or intensive aquaculture cannot be reported.

Incidental commercial catch

There was no reported catch of eels in any other Victorian commercial fisheries during 2007/08.

Recreational catch

Unknown in 2007/08
There is no reliable estimate available.

Catch trend

Decreasing
This is attributed to low stock levels due to the effects of extended drought in Victoria.

Effort trend

Decreasing
There are no current effort figures reported for the fishery but anecdotal reports suggest effort is decreasing due to the effects of extended drought.

Catch rates

Unknown

Total catch of non-target byproduct and bycatch species

A total of 54 bycatch species were recorded during a three-year bycatch monitoring program conducted by DPI (DPI in prep). In

general, bycatch mortality rates were very low, with most bycatch being released alive.

The program involved independent monitoring of commercial eel catches in the field and over 1300 net days were monitored across a range of fishing locations.

Bycatch varies considerably across different waterways around the State. The most common bycatch species were:

- common galaxiid
- yellow eye mullet
- gudgeon spp
- Australian smelt
- redfin.

Pygmy perch were a recorded bycatch species of potential conservation significance, but were only encountered in very small numbers at two sites in Victoria.

A formal bycatch risk assessment was conducted by a panel with expertise across several key disciplines including ESD-based natural resource management, aquatic ecology, commercial and recreational fishing, and fisheries policy. (DPI (in prep) Monitoring of Bycatch in the Victorian Eel Fishery). The results of the bycatch risk assessment showed that the fishery has a low ecological impact on all forms of bycatch typically encountered in the fishery.

Fisheries Management

Recent Management Changes

There have been no changes to the policies and strategies contained in the 2002 management plan. A number of changes have been made to the licensing arrangements for the fishery over the past 12 months including:

- Specific waters that are allocated to an EFAL may be transferred between licences. This allows holders with multiple licences to rearrange their allocated waters to optimise efficiency.

- CLE holders may apply for permits to retain carp, tench and roach that are taken during eel harvesting operations. This brings CLEs into line with EFALs
- Some lower reaches of streams that feed CLE waters have been added to the licence. These areas had previously been fished under permit.

Consultation processes

Most active licence holders belong to the Victorian Eel Fishermen's Association

(VEFA), which is affiliated with the commercial peak body Seafood Industry Victoria (SIV). The VEFA normally meet quarterly and DPI staff regularly attend the meetings to discuss issues.

The eel fishery is covered by the Inland Fishery Committee of the Fisheries Co-Management Council, although there is no specific eel representative on the committee.

Performance of the fishery

Production from the eel fishery is highly variable and depends on many factors including environmental conditions, habitat and fishing pressure.

Traditional stock assessment techniques are not applicable for eel fisheries. There are no biomass estimates for the State or for any individual water basins.

The management plan proposed that a trigger point be set at a 20% reduction in the mean catch for the preceding three years. If the trigger was reached, a formal review of the fishery would be triggered.

Between 1979 and 2002 commercial eel catch has varied between 125 and 450 tonnes, but the catch is now 80 tonnes. Although the specified trigger was reached several years ago, there has been no formal review of the fishery. It is generally acknowledged by both industry and government that the primary reason for this decline is the prolonged drought in Victoria, particularly in western Victoria.

Fisheries compliance

There is no formal compliance strategy for the eel fishery and data on inspection and compliance rates for the fishery have not been analysed.

Routine Inspections

Almost all routine inspections relating to the eel fishery are conducted on the commercial sector. Operators report waters being worked and inspections are conducted at random.

Recreational fishers are inspected opportunistically, but very few of the 30,000 recreational anglers inspected each year in Victoria are involved in targeted eel fishing.

Targeted Operations

The intelligence network has indicated that this fishery is currently of low compliance

risk, and as such, no relevant operations were conducted during the reporting period. DPI will continue to monitor the situation and may conduct further targeted compliance activities to validate this assessment.

Cross-jurisdictional management

There are commercial eel fisheries in Queensland, NSW, Victoria, Tasmania and New Zealand.

It is thought that there is a single genetic stock for each species. Spawning of both species is thought to occur in marine waters in the vicinity of the Coral Sea, but no precise spawning location has been identified for either species. Larvae are transported southwards along the east Australian coast where they metamorphose into glass eels and swim into coastal bays and estuaries.

The respective distribution of both eel species is extensive and there is considerable overlap. Shortfinned eels are distributed from subtropical Queensland to western Victoria, Tasmania and New Zealand. Longfinned eels are found from far north Queensland to eastern Victoria and in small numbers in New Zealand.

Despite their widespread distribution, eels spend most of their life in freshwater sections of coastal river basins, so each State and New Zealand manages their eel fisheries separately.

No cross jurisdictional management or compliance issues have been identified.

Management review processes

The Eel Fishery Management Plan (DPI 2002) is due to be reviewed. DPI anticipates commencing this review in early 2009, once proposed new stakeholder consultative arrangements are in place to ensure that the review process, and the preparation of a new

management plan, is conducted in full consultation with stakeholder groups.

The Minister has the ability to amend a management plan at any time if required, but this has not been necessary.

Threat abatement and recovery plans

Not required

Domestic and international agreements

It is a Commonwealth Government requirement that all interactions with protected species are reported in any fishery that has export accreditation under the EPBC Act. DPI has developed a Protected Species Action Plan (November 2007) for monitoring and reporting interactions with protected species.

Research and Monitoring

Research completed

None currently being conducted.

Monitoring programs

Catch and effort in the wild fishery is monitored using daily catch logs completed by all EFAL holders.

Catch and effort data for the stock enhanced fishery is also provided in daily catch logs by CLE holders.

Production from intensive aquaculture facilities is reported bi-annually through the aquaculture production form.

Collaborative research

None

Future research and monitoring

No research projects for the eel fishery are currently planned.

Commercial fishers have applied to the FRDC for funding to investigate improved bycatch reduction devices in fyke nets.

Victoria is planning to participate in broad regional climate change studies that will be relevant to the eel fishery

3.9.5 Status of target stock

Stock assessments

Traditional fishery stock assessment techniques are not applicable for eel fisheries due to the discrete nature of eel populations and lack of data on the reproductive biology of the species.

There is no evidence of stock structure within eel populations and it is assumed that eel populations consist of a single genetic stock for each species. Fishery independent monitoring of glass eels in south eastern Australia (Gooley et al 1999) found that recruitment of glass eels is not significantly different between rivers which are commercially fished and those which are not.

The sustainability of eel harvesting is dependent on allowing the escape of a sufficient numbers of spawning eels from coastal rivers to marine waters to allow migration to the spawning grounds. The key strategy to ensure sustainability in the Victorian eel fishery is to limit the number of waters that are open to commercial fishing. The management arrangements in the fishery have closed about half of Victoria major coastal rivers to eel fishing. A significant number of catchments are not fished at all. Escapement from fished waters, when combined with escapement from stocks in closed waters, is considered sufficient.

Resource issues

Eel populations vary significantly due to a range of environmental and habitat factors.

Eel populations have declined dramatically over the past decade, which is reflected in the lower commercial production. This is primarily attributed to the prolonged drought in south eastern Australia which has reduced

suitable aquatic habitats available to eel species. The decline is not considered to be due to fishing.

Stock recovery strategies

Stock recovery in the Victorian eel fishery will not occur until the drought breaks. Even following the end of the drought, DPI expects that it will be many years before some lakes and swamps return to normal production.

The DPI and the commercial eel fishers have held discussions to determine ways to assist the fishery to recover when the drought breaks. This could include stockings elvers and small eels into Victorian waterways, possibly using eel stocks from other States. Any such proposal will require further consideration and assessment under the guidelines for assessing translocations of live aquatic organisms in Victoria (DPI 2003) before proceeding.

3.9.6 Protected species

Interactions with protected species

During the three year bycatch monitoring program (DPI in prep), pygmy perch were the only aquatic species of potential conservation significance recorded. A total of three mortalities were recorded across two locations.

Five bycatch species of protected fauna were also recorded; Australasian grebe, coot, cormorant, water rat and eastern snake-neck tortoise. The mortality rates for protected species associated with commercial eel fishing in Victoria are presented in Table 1.

Interaction reduction strategies

Bycatch reduction devices (BRDs) are commonly used in commercial fyke nets and include the addition of escape tubes (a short piece of 40 mm diameter PVC tubing sewn into the mesh of the fyke net near the cod end, to allow small eels and fish to escape. Plastic grids can also be added to the entry funnel of the net to prevent the entry of aquatic fauna and larger fish.

Although commonly used by commercial fishers, BRDs are not compulsory in all waters. Permit conditions for commercial fishing conducted in wildlife reserves usually include a requirement to include BRDs.

A draft Code of Conduct for the management of bycatch in the eel fishery has been prepared (McKinnon 2007).

3.9.7 Ecosystem effects including the effects of fishing

Ecological risk assessments

Fisheries Victoria has conducted in-house ESD fishery risk assessments for all major fisheries. The assessments included ecological, economic/social, and governance risks. The risk assessment for the eel fishery was conducted in 2008.

Fishery impacts on the ecosystem

The ecological component of the risk assessment included threats to retained species, non-retained species, and environmental impacts of the fishery.

No high or moderate high risks were identified. One moderate low risk – the effect of eel fishing on platypus populations was identified.

Ecological impact reduction strategies

The current mitigation strategies in place include closing of rivers and streams where significant platypus populations are known to occur. Most rivers and streams that are open to eel fishing are generally restricted to downstream/estuarine reaches where platypus do not usually occur.

Exclusions devices can be required to be fitted to nets in specified waters on a case by case basis.

External (non fishing) impacts on the ecosystem and critical fish habitats

External (non fishing) influences are thought to play a large role on critical fish habitats for eels. Issues such as the regulation of water flows and the construction of barriers (ie dams and weirs) can limit the passage of fish up and down streams and impact on life and breeding cycles. In addition, drought and associated reduced flows have significantly reduced available habitat and the quality of some remaining aquatic habitats. The presence of

introduced (noxious) pest species such as European carp can also affect the fishery as these species can compete for food and habitat.

Table 1. Mortality of protected species associated with commercial eel fishing in Victoria

Water	Protect Species	No.dead	Mortality rate (net days per mortality)
Merri River	Pygmy perch	2	60.0
Lake Purrumbete	Pygmy perch	1	124.0
Lake Wellington	Water rat	4	42.5
Lake Wellington	Tortoise	3	56.7
Lake King	Tortoise	2	11.0
Lake Colac	Cormorant	1	43.0
Foster (dam)	Cormorant	1	65.0
Foster (dam)	Australian grebe	1	65.0
Lake Purrumbete	Australian grebe	1	124.0
Lake Wellington	Coot	1	170.0

3.9.8 Social and economic values of fishing and fishery governance issues

Economic and Social benefits

Only limited economic and social data is available for the eel fishery. There is no formal monitoring of economic or financial indicators in the fishery.

During good seasons in the past the fishery provided employment for up to 70 people in the catching and processing sector, which can provide significant economic benefit for regional communities. Most of the catch has historically been exported to Europe, providing export income for the State.

Due to the decline in eel stocks, there are very few people currently employed full time in the fishery.

Fishery governance

Target catch/effort range

Fishery catch and effort in the commercial fishery is controlled in the main by limiting entry and limited waters open to fishing.

Participation in the recreational fishing sector is not limited (other than by requirement for non-exempt persons to have a valid Recreational Fishing Licence). There is no minimum size for eels, but a bag limit of 10 per day (all species) applies.

References

DPI (2003) Guidelines for assessing translocations of live aquatic organisms in Victoria.

DPI (in prep) Monitoring of Bycatch in the Victorian Eel Fishery. Fisheries Victoria Management Report Series.

DPI (2002). Victorian eel fishery management plan. Compiled by the Eel Fishery Management Plan Steering Committee. DPI, Melbourne.

McKinnon, L.J. (2006) Victorian Protocol for the Translocation of Eels. Fisheries Victoria Management Report Series No 27. Melbourne.

McKinnon, L.J. (2007) Draft Code of Conduct for the management of Bycatch in the Victorian Eel Fishery. Fisheries Victoria Management Report Series.

Progress in implementing eel fishery assessment recommendations

Recommendation	Progress
1. <i>DPI to inform the Australian Government Department of the Environment, Water, Heritage and the Arts- DEWHA) of any future amendments to the Eel Fishery Management Plan or managerial commitments made in the submission.</i>	Ongoing No changes to the plan requiring notification to date.
2. <i>DPI to investigate the feasibility and need for research to test the panmixia assumption in <i>Anguilla australis</i>. Should the Australian study on <i>A. reinhardtii</i> determine that eel stocks harvested in the fishery are not panmictic, DPI to develop and implement management measures to ensure that catchment fidelity is adequately taken into account and that objectives can still be achieved.</i>	Completed This matter was considered by the Australian and New Zealand Eel Reference Group (ANZERG) in December 2005. The longfinned eel study at Southern Cross University had some preliminary results, but was not continued. There was some evidence of possible stock structure, but only on a broad regional scale, (not at a State level) and certainly not at catchment level. ANZERG concluded that the results of the longfinned study do not justify a similar shortfinned study. Victoria will consider this matter again if further eel studies that this is required.
3. <i>DPI to collect information on the recreational and indigenous harvest of eels to ensure that all removals of eels are accounted for in the overall management of the fishery.</i>	Not completed The DPI does not consider that traditional stock assessment modelling where all fisheries removals are accounted for to be appropriate for the eel fishery due to the discrete nature of eel populations in individual non-connected catchments and because eels are understood to form a single spawning stock in Marine waters. Information on recreational catch is obtained through general recreational fishing surveys, but no specific information is currently being collected on Indigenous or recreational catch of eels. Based on information from general recreational fishing surveys, DPI considers that Indigenous and recreational catch of eels is not significant.

4. *To control the level of harvest and the potential impacts on bycatch species and the ecosystem in the glass eel sector, DPI to develop and implement within the life of the Victorian Eel Fishery Management Plan (by July 2007) a precautionary management strategy for this sector. The strategy is to be reviewable and include performance measures linked to defined management triggers and responses. It should also include mechanisms to enable ongoing monitoring of the fishery and take into account the impact of environmental conditions on the fishery.*
- Not completed**
There was virtually no commercial glass eel fishing during the three year by-catch study because of the impact of drought and researchers were unable to collect independent bycatch data to be used in a risk assessment.
- As the drought has continued during this period, there has only been very limited glass eel fishing and the commitments with respect to the glass eel component of the fishery cannot be met at this time.
5. *DPI to develop and implement a strategy to monitor and minimize the impact on bycatch and protected species of the glass eel sector of the fishery. DPI to develop a robust system for validating bycatch data in the adult and glass eel sectors of the fishery. DPI to also develop and implement an education program to complement the recent introduction of bycatch reporting requirements on logbooks in an effort to enhance data reliability.*
- Ongoing**
See comments in recommendation 4 (above) regarding recent lack of glass eel fishing.
- DPI has conducted a three year independent by catch study of the adult fishery and completed a bycatch risk assessment.
- The DPI introduced a Protected Species Action Plan for marine fisheries (November 2007). The reporting form included in catch and effort log books allows fishers to report any protected species interactions. This form will be modified for use in the eel fishery, and DPI will provide DEWHA with regular summaries of reported interactions once this system is implemented.
6. *In the process of conducting a risk assessment of the adult eel fishery, DPI to investigate the potential impact of fyke nets on air-breathing bycatch. Where the likelihood of capture is medium or high risk, DPI to require all fishers operating in those waters to create an opportunity for air breathing animals to breathe/escape.*
- Ongoing**
A bycatch risk assessment for the fishery has been conducted. (DPI 2007) No high or medium-high risks to air-breathing bycatch were identified.
- The effect of eel fishing on platypus populations was ranked as medium-low risk and appropriate mitigation measures are in place.
-