

FISHERY STATUS REPORT

SEA URCHIN FISHERY

1. Description of the fishery

Target species

Two of the six species of sea urchins that occur in Victoria are commercially targeted. Black urchins (*Centrostephanus rodgersii*), a large dark purple urchin with long spines are targeted predominantly in eastern Victoria. White urchins (*Heliocidaris erythrogramma*), a light purple green or creamy colour urchin with dark spines are targeted along the Victorian coastline.

Prohibited species

Unless otherwise authorised, the take of rock lobster, giant crab, jelly fish, scallop and abalone during commercial harvest of sea urchins is prohibited under the *Fisheries Regulations 1998*.

Fishing area(s)

Commercial fishery

The fishery is divided into two zones. The eastern zone includes the coastal waters east of Lakes Entrance out to the NSW boarder (primarily around Mallacoota) and the other zone is around the waters of Port Phillip Bay.

Recreational fishery

Recreational fishing can occur all along the Victorian coast.

Fishing methods

The edible parts of the sea urchin are the egg masses (roe) which is harvested from inside the animal. Sea

urchin roe is a prized delicacy in some Asian and Polynesian cultures, and the urchins are typically harvested seasonally when the roe is in the best condition. Targetability is limited by the seasonal condition of the animals.

Commercial

This is a dive fishery, and fishers use compressed air diving equipment and long metal tongs or gloved hands to remove urchins from the reef.

Recreational

Urchins are harvested using methods similar to those used in the commercial fishery but techniques include snorkelling and scuba diving.

Management arrangements employed in the fishery

Modern fisheries management continues to move away from single-species approaches towards the more broader consideration of fisheries in an ecosystem context. The management arrangements for the fishery are outlined in the *Fisheries Regulations 1998* and the conditions on the permit.

Persons are not permitted to fish for sea urchins in:

- the inter-tidal zone (waters less than 2m deep) between Thompson Creek at Breamlea and Arch Rock at Venus Bay (including Port Phillip Bay and Western Port)

- Marine National Parks and Marine Sanctuaries.

Commercial arrangements

The sea urchin fishery was declared a Developing Fishery by a Ministerial Direction in 1998 and is managed under a permit system. Commercial fishers wanting to harvest sea urchins for sale must have a general (sea urchin) permit. The nature of the fishery is that it provides a supplementary source of income to commercial abalone fishers, with the majority of the fishers operating in the Eastern Zone also authorised to dive in the abalone fishery around East Gippsland.

Up to 24 permits have been issued in the fishery at any one time, but only 11 permits are currently in operation. Permits are issued for a period of time between 1 to 3 years. Permit conditions specify fishing areas and permitted fishing methods. Only 3 of the 11 permits allow fishing within the Port Phillip Bay zone. Under the permit system, conditions may be changed on a needs basis by the Secretary. DPI is taking a precautionary approach to the management of this developmental fishery and applications for new permits in recent years have been rejected in light of the pending review of management arrangements.

The Eastern Victorian Sea Urchin Divers Association (EVSUDA) represents the majority of the permit holders and has established a voluntary Code of Practice (COP) in the eastern fishing zone. The COP specifies measures to promote good

and resource management practices by permit holders.

None of the catch is currently exported, however, the industry intends to pursue this option in future and possibly supply markets in Asia.

Permit holders are required to meet a minimum harvest level of 3000kg/year to retain their permit. DPI estimates that divers would need to work for approximately 20 days per year to meet the licence condition (based on assumed average catch rate of 150kg per day). This condition is in place to reduce latent effort and to ensure that management decisions can be made on an appropriate level of fishery dependant (catch) information.

To assist with monitoring and compliance activities, fishers are also required to report their intent to undertake fishing activity to DPI prior to undertaking fishing trips.

Recreational arrangements

A Recreational Fishing Licence (RFL) is required to take sea urchins (exemptions apply). A daily catch limit of 20 urchins applies to recreational fishers. Urchins must be landed whole, and the removal of roe or soft tissues prior to landing is prohibited.

Allocation between sectors

Both the commercial and recreational fisheries are relatively small and as such there is no formal allocation between the fishing sectors.

Fishery accreditation

The management arrangements are accredited under the Commonwealth

Environment Protection and Biodiversity Conservation (EPBC) Act 1999. The Department of Environment, Water, Heritage and the Arts (DEWHA) assessed the fishery and

declared the fishery as an approved Wildlife Trade Operation under section 303FN of the *EPBC Act* in December 2005 until December 2008.

2. Catch data

Total catch of target species

As no estimate of the recreational catch is available the total catch is unknown.

Commercial catch of target species

Please see tables 1 and 2. Please note that because commercial fishers are allowed to process sea urchins at sea, the live weight for some catch was determined using a conversion factor established by DPI.

Incidental commercial catch

There was no reported catch of sea urchins in any other Victorian commercial fisheries. Such catch is considered negligible.

Recreational catch

A robust estimate of the recreational catch level is unknown in 2006/07.

The last National Recreational and Indigenous Fishing Survey conducted in 2001 (Henry & Lyle, 2003) reported no recreational sea urchin catch in Victoria but DPI officers have anecdotal evidence of low levels of recreational sea urchin harvest from Victorian coastal waters. The majority of the catch is thought to occur in the waters around Port Phillip Bay.

Catch trend

Steady commercial catch has varied between 44 and 63 tonnes for the years 2000 to 2007.

Effort trend

Decreasing.

The number of permits issued has declined in recent years. Logbook data suggests that remaining permit holders fish on average 116 days per year in Port Phillip Bay and 135 days per year around Mallacoota.

Catch rates

In a similar manner to the abalone fishery, catch per unit effort (CPUE) is unlikely to provide a robust indicator of biomass due to the nature of the fishery.

Total catch of non-target by product and by catch species

Due to the selective harvesting methods used in the sea urchin fishery, there is no significant bycatch or by-product species retained.

Spatial issues

Sea urchins are known to aggregate on certain reef complexes and there is a potential risk of serial depletion of sea

urchins in areas subject to repetitive fishing pressure.

- Hand collection only
- No fishing in fisheries reserves and marine protected areas.

This risk is managed by DPI by using input controls such as:

- Low commercial fishing effort through limited permit entry policy
- Conservative catch reference points

DPI monitors commercial fishing through a system where fishers must provide prior notification of their intent to fish before undertaking their trips.

	00/01	01/02	02/03	03/04	04/05	05/06	06/07
Centrostephanus (Black urchin)	21	22	37	20	25	13	19
<i>Heliocidaris</i> (White urchin)	12	7	8	9	12	7	12
Total	33t	29t	45t	29t	37t	20t	31t

Table 1 – Sea urchin harvest from Eastern Victoria (live weight, tonnes)

	00/01	01/02	02/03	03/04	04/05	05/06	06/07
Centrostephanus (Black urchin)	0	0	0	0	2	1	0
<i>Heliocidaris</i> (White urchin)	16	19	12	31	18	18	13
Total	16	19	12	31	18	18	13

Table 2 – Sea urchin harvest from Port Phillip Bay (live weight, tonnes)

3. Fisheries Management

Changes in management arrangements

There have been no substantive changes to management arrangements in the last 12 months.

Minor amendments were made in early 2007 to catch and effort reporting and pre-fishing notification reports.

Consultation processes

Management arrangements are reviewed annually in consultation with industry.

Given the developmental nature of the fishery and the small number of participants, consultation with the urchin industry occurs via informal structures. In general terms, consultation on significant management issues for the urchin fishery will be through meetings with

permit holders for Port Phillip Bay and representatives form the EVSUDA.

Performance of the fishery

The findings from Blount and Worthington (2003) suggest that annual catch of up to 5% of the unexploited biomass of *Heliocidaris erythrogramma* and *Centrostephanus rodgersii* is highly sustainable.

Fisheries Victoria has implemented a trigger reference point of 5% of the unexploited biomass for the sea urchin fishery, which is considered conservative.

Trigger points form a key part of the conservative harvest strategy, and include a set of decision rules that limit fishing effort and catch within an area for a given species. Trigger points provide increased certainty to industry and managers about safe harvest levels that should not be exceeded.

Reported commercial catches are monitored annually by DPI to ensure the fishery is managed consistent with ESD principles.

Fisheries compliance

There is no formal compliance strategy for the sea urchin fishery. Compliance activities are undertaken on a needs basis, and operations are based on

surveillance activities and other intelligence gathered by field staff. This is supplemented by the commercial fishing activity reports made by permit holders.

Cross-jurisdictional management arrangements

Commercial sea urchin fisheries exist in New South Wales and Tasmania, but no need for formal cross-jurisdictional management arrangements has been identified, and as such none are in place.

Management review processes

Commercial catch is monitored through catch returns recorded in commercial log books.

Under the management strategy for this fishery, a noticeable increase or decrease in total catch across the fishery will trigger a review of the management measures in consultation with the fishing industry. This has not been required to date given the current level of catch (and effort) in relation to the trigger points.

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 1999*.

4. Research and Monitoring

Research completed

Previous studies have collected information on density, biomass and

roe quality of sea urchins in Port Phillip Bay and eastern Victoria (Worthington & Blount, 2003). Information collected included an

estimate of species density based on surveying fixed sites in each region and combining this with existing information to derive biomass estimates for each species.

Monitoring programs

Commercial fishers record catches in logbook provided by DPI and submit these forms on a monthly basis.

Sea urchin stocks are also monitored as part of the abalone stock assessments, where divers note the prevalence of sea urchins and other key organisms.

5. Status of target stock

Stock assessments

Incidental data on sea urchin abundance is collected at specific sites as part of the annual fishery independent surveys for Victorian abalone communities. This information is considered by DPI scientists as part of the annual review of abalone stocks and reef ecosystems.

Collaborative research

No collaborative research projects or programs are currently in place.

Future research and monitoring

There are no planned research projects or programs currently proposed for this fishery, but further survey work will be considered as part of the review of management arrangements proposed to be conducted by DPI.

Resource concerns

No current resource concerns have been identified. The catch of sea urchins is estimated between 1 to 5% of the unexploited biomass and this falls within the sustainable harvest level.

Stock recovery strategies

Not applicable at present.

6. Protected species

Interactions with protected species

There are no recorded interactions with protected aquatic biota.

Interaction reduction strategies

Due to the selective harvesting methods used in this dive fishery, no specific risks have been identified that require a management response.

It is a Commonwealth Government requirement that all interactions with protected species are reported in

fisheries accredited under the *EPBC Act 1999*.

DPI developed a Protected Species Action Plan for monitoring and reporting interactions with protected species that was introduced in 2008. Under the plan, fishers are required to report any interactions with protected

species on daily catch logs, and these reports are used by DPI to provide regular summaries to DEWHA.

Permit holders have been provided with a copy of the Actions Plan and a Protected Species Identification Guide.

7. Ecosystem effects including the effects of fishing

Ecological risk assessments

A Risk Assessment was conducted in 2007 (DPI – Internal working document). Risks assessed as moderate or high are considered by DPI to require a management response. The following two threats were identified:

- Effect on the eastern sea urchin population from serial depletion
- Effect on Port Phillip Bay sea urchin population from serial depletion.

Under current management arrangements and harvest levels it is believed the level of residual risk has been reduced to appropriate levels.

Fishery impacts on the ecosystem

The selective harvesting practices used in the fishery have minimal impacts on substrate and associated biota.

Ecological impact reduction strategies

DPI is working to ensure harvest levels are maintained at safe levels, and do

not exceed trigger points. The Eastern Zone Abalone Industry Association is currently proposing research be conducted to investigate reef habitats dominated by sea urchins in recognition of their potential to substantially modify the algal community such that it no longer provides suitable habitat for abalone. This proposal is supported by DPI, due to the benefits it may provide to managing the abalone and sea urchin fisheries consistent with ecosystem based fisheries management principles.

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

None identified.

8. Social and economic values of fishing and fishery governance issues

Social benefits

Only limited social data is available for this developing fishery.

Commercial

Eleven general fishing permits are issued in the fishery. Usually one permit holder would own and operate a boat with assistance from one deck hand. The fishery therefore provides a small amount of direct employment for such commercial operators.

Processing can be undertaken on land but the majority of processing is done by fishers on board their vessels (at sea).

Recreational

Sea urchin roe is considered to be a delicacy in some Asian and Polynesian communities and may have some cultural significance.

Economic benefits

No formal economic monitoring is undertaken for this fishery and only limited economic data is available.

Gross Value of commercial production in 2005/06 was \$1,051,000 and in 2006/07 was \$908,000.

The fishery provides a supplementary source of income for some abalone divers in the East Gippsland region.

FISHERY GOVERNANCE

Target catch/effort range

The fishery is classified as a developmental fishery and only limited historical catch data is available. A harvest strategy has been implemented to restrict annual catch to fewer than 5% of the unexploited biomass. Trigger points are also in place to maintain the sustainability of the resource.

Catch and effort is regulated through limiting the number of commercial permits issued and through a voluntary minimum size limit in the eastern Zone. A compulsory bag limit is also in place in the recreational fishery.

DPI has concerns over some of the data gaps in the fishery and as a precaution, is not currently accepting any new commercial permit applications until a more thorough assessment of the fishery is completed.

New management initiatives

Electronic catch reporting for commercial permit holders is proposed to be trialled in 2010.

DPI is proposing to review the management arrangements within the next 2 years. The review will focus on future research, spatial management, compliance and governance aspects of the fishery, including cost recovery.

In assessing the management arrangements, DPI will also be seeking to strengthen management

arrangements associated with identified risks including:

- Processing product at sea
- Increasing confidence in how the sea urchin catch is calculated.

9. Progress in implementing fishery assessment recommendations

Recommendation	Progress as of 30 June 2008
<p>1. Fisheries Victoria to advise DEWHA of any material change to the Victorian sea urchin Fishery's management arrangements that could effect the criteria on which EPBC decisions are based, within 3 months of that change being made.</p>	<p>Ongoing No changes to the management arrangements requiring notification to date.</p>
<p>2. Within 18 months Fisheries Victoria to develop a fishery specific objective linked to performance indicators and performance measures for impacts on the ecosystem.</p>	<p>Ongoing No specific performance measure for the ecosystem exists and measures have focused on the target species to date. In Port Phillip Bay, the total biomass of white urchin was estimated as 9,100 tonnes. In eastern Victoria, the total biomass of the black urchin was estimated as 3,300 tonnes compared to 1,500 tonnes for the white urchin, (Blount & Worthington 2003). The findings from Blount and Worthington (2003) suggest that annual catches of 1 to 5% of the unexploited biomass of white and black urchin should be sustainable. Fisheries Victoria and industry has considered these findings and has decided to implement a 5% reference point for both black and white urchins. Please also see sub-heading Performance of the fishery (page 3)</p>
<p>3. Fisheries Victoria to monitor the status of the target species and ecosystem of the fishery in relation to the reference points.</p>	<p>Ongoing Any noticeable increase or decrease in total catch across the fishery triggers an informal review of management measures in consultation with industry.</p>

<p>Within three months of becoming aware of a reference point being triggered Fisheries Victoria to finalise a clear timetable for the implementation of appropriate management responses.</p>	<p>This has not been required to date.</p> <p>Under sections 67 and 152 of the <i>Fisheries Act 1995</i>, Victorian fisheries can be closed quickly on a spatial, temporal or gear –specific basis by ‘Fisheries Notice.’</p>
<p>4. Fisheries Victoria to develop and implement a robust system to validate commercial logbook reporting of catch and effort in the fishery within 2 years.</p>	<p>In progress and ongoing</p> <p>DPI conducts routine inspections of logbooks completed by permit holders to validate the quality of data.</p> <p>Fisheries Victoria is also in the process of building a new catch and effort recording system for commercial licence and permit holders. A component of the new system will provide for permit holders to enter their catch data into a secure database accessed through the internet. In time, it is envisaged that entering personal catch data directly into the new on–line system will replace the requirement to send in returns from the Departmental logbook each month to Fisheries Victoria.</p>
<p>5. Fisheries Victoria to continue to develop and implement research strategies to address key gaps in the knowledge of sea urchin biology and ecological community. Should new information lead to the realisation that current take is unsustainable, or is having harmful effects on the target species or on the wider ecological community, Fisheries Victoria should implement strategies to address these issues.</p>	<p>In progress</p> <p>As a part of the review of the fishery, DPI will conduct a risk assessment for the fishery; which will amongst other things, include current knowledge gaps and research priorities.</p> <p>Please see section 4 under monitoring programs.</p>
<p>6. Within 18 months, Fisheries Victoria to develop a process to improve estimates of recreational and Indigenous take and factor these into management arrangements.</p>	<p>In progress and ongoing</p> <p>Recreational and indigenous fishing trends are being monitored through routine field staff observations/inspections. This process is based largely in the Port Phillip Bay region as anecdotal reports indicate that the indigenous or recreational take of urchins in East Gippsland is negligible or nil.</p>
<p>7. Within 2 years Fisheries</p>	<p>Complete. Finer scale data collection and reporting</p>

<p>Victoria to develop and implement finer scale data collection and reporting and management measures to mitigate the risk of localised and serial depletion of sea urchins in the fishery.</p>	<p>systems have been implemented in commercial logbooks. The need for finer scale spatial management has been mitigated by highly conservative trigger reference points and current catch levels.</p> <p>The proposed online catch reporting system has potential to provide more real time catch monitoring for the industry and managers. This provides a possible tool to encourage the more planned distribution of fishing effort by commercial divers should this be required in future.</p>
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10. References

The National Recreational and Indigenous Fishing Survey (Henry & Lyle, 2003).

Worthington, D and Blunt, C. (2003) *Research to develop and manage the sea urchin fisheries of NSW and eastern Victoria*. NSW Fisheries Final Report Series No. 56. FRDC Project No. 1999/128.