Small Pelagics Fishery

Main features

STATUS

- Eastern stocks:
  - Blue mackerel: not overfished and not subject to overfishing
  - Redbait: not overfished and not subject to overfishing
  - Jack mackerel: uncertain.
- Western stocks:
  - Blue mackerel: not overfished and not subject to overfishing
  - Redbait: uncertain
  - Jack mackerel: uncertain.

CURRENT CATCH (2007)

- Blue mackerel 1416 t; redbait 4262 t; jack mackerel 680 t.

MANAGEMENT METHODS

- Limited entry, total allowable catch (TAC) limits and trigger catch levels in four management zones.
- 75 licences in the fishery, but only 6 vessels were active in 2007.
- Permitted fishing methods: purse seining and mid-water trawling.
- Interim harvest strategy agreed to for one year only—development of a longer term strategy will continue.

Background

The Small Pelagics Fishery targets are jack mackerels (*Trachurus declivis*, *T. symmetricus*), blue mackerel (*Scomber australasicus*), and redbait (*Emmelichthys nitidus*). Yellowtail scad (*Trachurus novaezelandiae*) is managed as a byproduct species.

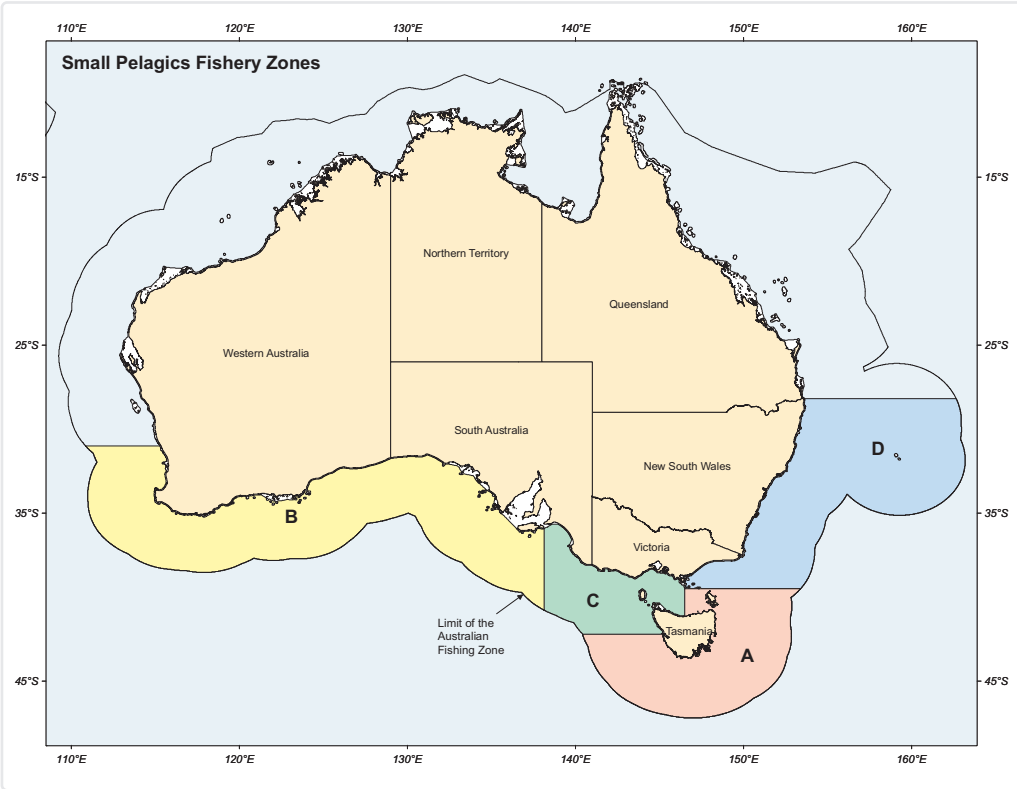
The fishery extends from southern Queensland to southern Western Australia, and is currently divided into four management zones:

- Zone A, off eastern and southern Tasmania
- Zone B, Western Australia and South Australia (to Kangaroo Island)
- Zone C, Kangaroo Island to Bass Strait
- Zone D, Bass Strait to southern Queensland.

Zone A and the adjacent Tasmanian state waters are managed cooperatively by the Tasmanian and Australian governments; however, arrangements are currently being reviewed. Zones B, C & D, which only include waters outside state waters (generally more than 3 nm from the coast), are managed by the Australian Government.

Historically, most Small Pelagics Fishery catches have been jack mackerel purse-seined in Zone A within 3 nm of eastern Tasmania. The fishery developed rapidly from an annual catch of 6000 t in 1984–85 to a peak of almost 42 000 t in 1986–87. Catches during the next decade were between 8000 t and 32 000 t. Catches taken since 1994–95 are confidential because of the small number of fishers involved (fewer than 5 boats), but between 1996 and 2002 have been the lowest on record—far below 8000 t. In 2003 and 2004, increased catches mainly comprised redbait. In 2007, catches were blue mackerel 1416 t; jack mackerel 680 t; and redbait 4262 t.

Previously, almost all of the purse-seine catch in Zone A was processed into fishmeal, with some frozen for use as rock lobster bait. In the past 2 years, much of the catch has



been used as feed for southern bluefin tuna (*Thunnus maccoyii*) aquaculture ventures around Port Lincoln.

In 2004, foreign fishing interests began to secure fishing rights to operate in the Small Pelagics Fishery. In response to stakeholder concerns about the impact of very large fishing vessels entering the fishery, the Australian Fisheries Management Authority (AFMA) froze all boat nominations.

In Zone A, the annual TAC for all target species combined is 34 000 t, of which 25 000 t is allocated as individual quotas and 9000 t is competitive. A 3800 t trigger catch level applies to the Tasmanian inshore diversified scalefish sector for vessels under 20 m.

In Zones B, C & D, trigger catch limits have been established for each species:

ZONE	BLUE MACKEREL (t)	JACK MACKEREL (t)	REDBAIT (t)
B	5000	4000	1000
C	3500	2500	1000
D	3500	2500	1000

If catches reach these levels, available information is rapidly reviewed to determine whether further catches should be permitted. If there is no decision to increase catches, fishing must stop once catches exceed the trigger catch level by 25%.

→ SMALL PELAGICS FISHERY HARVEST STRATEGY

The interim harvest strategy proposes a three-tier system that applies to each of the target species.

- Tier 1: TAC is set as a percentage of the median spawning biomass estimated using a daily egg production method (DEPM). The percentage is determined by time since the last DEPM assessment; if that time is greater than 5 years, the stock is assessed under Tier 3.
- Tier 2: Assessment is conducted annually using catch-and-effort data and annual information on the age structure of the catch. The recommended biological catch (RBC), to be determined by the Small Pelagics Fishery Resource Assessment Group, cannot exceed maximum tonnages set out for each species.
- Tier 3: The assessment is conducted every 2 years and is based on catch-and-effort data, as well as observer data. The RBC for each stock is again determined by the resource assessment group, but may not exceed 500 t.

The harvest strategy will be finalised and implemented in 2008.

The stock assessments are based on spawning biomass estimated by recent daily egg production method assessments. Under the draft harvest strategy, a maximun harvest rate of 17.5% of the spawning biomass would determine the TACs for these species. Current catches are well below that figure.

Zone A remains the main area for fishing effort, but the fishing operations there have changed considerably over recent years. From 2002, trawling replaced purse-seining as the main method. Redbait, making up more than 70% of the catch, has replaced jack mackerel as the main species caught.

In 2006, there was a marked increase in catches in Zone B—a trend that continued into 2007. In recent years, no catch has been reported in Zone C. Catches in Zone D have remained low and stable.

There is considerable purse-seine capacity in Australia with which to catch small pelagic species, but rapid development is not expected unless market demand changes. Expansion of the fishery will require caution because small pelagic fish prey on phytoplankton and zooplankton, and are themselves prey for many species of fish, birds and marine mammals. Therefore, there is potential for their localised depletion or overexploitation. Overfishing of small pelagic fish stocks elsewhere in the world dramatically changed the populations of other species.

Dramatic declines in historical catches of jack mackerel in Zone A (eastern and southern Tasmania) are of concern.

Species targeted in the Small Pelagics Fishery are also taken in several other Commonwealth-managed and state-managed fisheries, mainly the trawl sectors of the Southern and Eastern Scalefish and Shark Fishery, the Eastern Tuna and Billfish Fishery and the Western Tuna and Billfish Fishery (where they are purse-seined for bait), and the New South Wales Ocean Haul Fishery. The take of small pelagic species in those fisheries also requires careful management.

In early 2005, AFMA decided to develop the Statutory Plan of Management for the Small Pelagics Fishery, including the allocation of individually transferable quotas. The plan is expected to be implemented in 2009.

Environmental issues

Interactions with marine mammals (fur seals and dolphins) are a key environmental issue for the fishery when mid-water trawls are used. A recent study commissioned by AFMA to quantify the nature and extent of interactions and to evaluate potential mitigation strategies showed that fur seals entered the net in over 50% of trawl operations during the study (Lyle and Willcox 2008). In contrast, no dolphin interactions

Small pelagics purse-seine net

Unloading blue mackerel, Eden

were recorded. The study highlights the need for well-designed seal exclusion devices when using this type of gear. AFMA has formed the Cetacean Mitigation Working Group to help develop long-term management strategies.

Research

In 2001, the Bureau of Rural Sciences released a global review of the state of knowledge of blue mackerel biology and fishery assessment. The review highlighted the variability of blue mackerel recruitment and the need to determine stock-abundance indicators by fishery-independent methods, such as aerial surveys or egg-abundance sampling.

In 2002, the Fisheries Research and Development Corporation (FRDC) agreed to fund a project led by the South Australian Research and Development Institute to develop and evaluate stock-assessment methods for blue mackerel in southern Australia. The results of that project, which were published in 2008, have contributed to the assessment of the status of the stocks.

In 2004, FRDC and AFMA funded a project led by the Tasmanian Aquaculture and Fisheries Institute project to evaluate egg production as a method of estimating spawning biomass of redbait off the east coast of Tasmania. Preliminary results from the project have contributed to the assessment of the status of this stock.

In 2006, FRDC funded a CSIRO-led project to examine small pelagic fish stock structure in southern Australian waters. Findings from the project strongly suggested the existence of a separate western stock of several of the target species, including blue mackerel.

A recent study of marine mammal interactions with mid-water trawling in this fishery (Lyle and Willcox 2008), commissioned by AFMA, has demonstrated a high level of interactions with fur seals and highlights the need for well-designed and tested seal exclusion devices.

Further reading

Bulman, C, Condie, S, Findlay, J, Hender, J, Ward, B & Young, J 2007, 'Management zones from small pelagic fish species stock structure in southern Australian waters', unpublished report to Fisheries Research and Development Corporation and Australian Fisheries Management Authority, FRDC project no. 2006/076.

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Ward, TM & Rogers, PJ 2008, *Evaluating the application of egg-based method for stock assessment of blue mackerel,* Scomber australisicus*, in southern Australia*, final report to the Fisheries Research and Development Corporation.

Ward, P, Timmiss, T & Wise, B 2001, *A review of biology and fisheries for mackerel*, Bureau of Rural Sciences, Canberra.