

West Coast Purse Seine Managed Fishery Status Report

Prepared by D. Gaughan and T. Leary, with management input by K. McCarthy

FISHERY DESCRIPTION

This fishery is based primarily on the capture of pilchards (*Sardinops sagax*) and the tropical sardine *Sardinella lemuru* (previously called scaly mackerel, hereafter referred to as sardinella) by purse seine boats in the waters off the west coast of Western Australia. However, the management plan also covers the take of Perth herring (*Nematalosa vlaminghi*), yellowtail scad (*Trachurus novaehollandiae*), Australian anchovy (*Engraulis australis*) and maray (*Etrumeus teres*).

Governing legislation/fishing authority

West Coast Purse Seine Management Plan 1989
West Coast Purse Seine Managed Fishery Licence
Fisheries Notice no. 312 – Purse Seine Prohibition
Fisheries Notice no. 571 – Pilchard Fishing Prohibition
Fisheries Notice no. 476 – Net Hauling Restrictions
Condition 176 on a Fishing Boat Licence
Condition 93 on a Fishing Boat Licence (specific area)

Consultation process

Purse Seine Management Advisory Committee
Department–industry meetings

Boundaries

The fishery operates between 33° S latitude and 31° S latitude (the metropolitan fishery) and there are also two purse seine development zones currently operating north and south of this area. The Southern Development Zone, for which there are three operators, covers the waters between 33° S latitude and Cape Leeuwin. The Northern Development Zone covers the waters between 31° S latitude and 22° S latitude and consists of one active operator (whose catch is not currently reported for confidentiality reasons). The metropolitan fishery mainly targets both pilchards and sardinella, the Southern Development Zone targets pilchards and the Northern Development Zone targets sardinella.

Management arrangements

This fishery is currently managed through a combination of input and output controls incorporating limited entry, capacity setting and controls on gear and boat size.

Currently a single total allowable catch (TAC), that applies to both the metropolitan fishery and the Southern Development Zone, is set annually for pilchards and another for other small pelagic species. These TACs are divided amongst the fishery participants, but are not tradeable, as individually transferable quota (ITQ) units would be. For the 2003/04 licensing period, there was a catch cap of 1,000 t for pilchards, with a combined limit of 1,500 t on the catch of other small pelagic species permitted to be taken by licensees. The Northern Development Zone has a separate TAC.

Vessels are restricted to less than 16 m in length, but an exemption to use a vessel approaching 20 m in length has

been in operation during this reporting period. This large vessel had spatial restrictions to keep it away from waters around Rottnest Island and from inshore areas.

Research summary

Directed research is currently only carried out on pilchards. This research continues to focus on fishery-independent spawning biomass surveys, as part of a five-year FRDC-funded project examining the regrowth of the pilchard stocks in Western Australia following the mass mortalities of the late 1990s. The most recent spawning biomass survey was carried out in the west coast purse seine fishery in July 2002, with another planned for July 2004. Monitoring of pilchard catches is undertaken monthly to provide robust age-composition data, from which relative recruitment strengths can be inferred. Biomass surveys, age-composition data and analysis of catches together allow the annual review of pilchard and compilation of the following status report. Owing to the importance of sardinella in the catch in recent years, there may be a need to undertake catch sampling of this species.

RETAINED SPECIES

Commercial production (2003): 1,164 tonnes

Landings

The combined catch of pilchards, sardinella and other minor species for the metropolitan and Southern Developmental Zone fishery areas decreased from 1,347 t in 2002 to 1,164 t in 2003; however, the Southern Developmental Zone contributed only 2 t of pilchards during this year. This level of harvest is still considerably less than the catches in the mid-1990s (West Coast Purse Seine Figure 1). The contribution of pilchards to the combined catch decreased to 300 t compared to 512 t in 2002. The sardinella catch increased from 701 t in 2002 to 773 t in 2003 (a further increase from 596 t in 2001). In addition, 75 t of maray, 12 t of yellowtail scad and 2 t of anchovy were landed. Overall, the catch reflects a steady availability or abundance of pilchards, and a further increase in the trend toward the utilisation of other species available to the fishery.

Fishing effort/access level

A small number of vessels continued to participate in the fishery in 2003. Together they fished a total of 525 days, a minor effort decrease of 3% from 2002 (543 days). It is not possible to estimate effort separately for the different species targeted.

Catch rate

The estimated catch rate for all small pelagic fish was 2,218 kg/day. Note that because factors other than abundance are influencing fishing effort, it is currently difficult to determine how this estimate relates to those from previous years.

Recreational component: Nil

STOCK ASSESSMENT

Assessment complete: Yes

Stock assessment is completed for pilchards, which are

West Coast Bioregion

fully exploited on the west coast. The fishery-independent spawning biomass survey conducted in 2002 indicated that the pilchard stock was recovering strongly after the 1998/99 mass mortality event. The average age of individuals in the west coast pilchard catches in 2003 was nearly 5 years, with few fish caught below 4 years of age, which indicates little recruitment to the fishery in 2002/03. This represents a downturn from the good levels of recruitment in recent years. Assuming there has been strong recovery, as has been the case on the south coast, availability of the stock to the fleet has remained very low and sporadic. A further spawning biomass survey is scheduled for July 2004.

Although no stock assessment has been undertaken for sardinella in the metropolitan region, application of results obtained from a detailed study on sardinella in the Geraldton region indicate that the stock on the lower west coast is at the southern limit of its geographic range and is fully exploited when it occurs off Fremantle. The levels of exploitation are not thought to pose a risk to the viability of the spawning biomass.

Exploitation status: Fully exploited
Breeding stock levels: Adequate

NON-RETAINED SPECIES

Bycatch species impact: Low

This fishery specifically targets schools of pilchards and sardinella, so unwanted bycatch is insignificant. Other similar-sized pelagic fish which may sometimes be discarded include yellowtail scad, maray, anchovies and blue mackerel.

Protected species interaction: Low

Pilchards and other small pelagic fish are consumed by several species of seabirds, pinnipeds, cetaceans and protected sharks (white shark), but there is currently no evidence to indicate any indirect interactions between these and the purse seine industry in this region.

ECOSYSTEM EFFECTS

Food chain effects: Moderate

Small pelagic fish, typically pilchards or anchovies, occupy a pivotal position of energy transfer in food webs in which they occur and are often the main link between primary (phytoplankton) and secondary (zooplankton) production and larger predators. This trophic position has been termed the 'wasp's waist' since pilchards feed on many species and are eaten by many species.

The completion of FRDC project 98/203 (Gaughan et al. 2003) and research by Murdoch University has now provided clear evidence that some species of seabird are heavily reliant on pilchards and sardinella. These data, derived from local studies, have proven to be invaluable when discussing food chain effects during management deliberations. For example, various seabirds will predate on a variety of species of small pelagic fish and therefore the whole suite of small pelagic fish must be considered during management deliberations, not simply the primary target species. This is particularly the case in pelagic ecosystems (a) characterised by low productivity, as

is the case in southern Western Australia, and (b) in which the dominant species can change in abundance inter-annually (e.g. due to environmental factors), as is the case along the lower west coast.

In 'normal' circumstances (i.e. in the absence of disease events or extended periods of very poor recruitment) the quota for pilchards and other small pelagic species is set at a maximum of 10–15% of the spawning biomass, thus leaving 85–90% available to natural predators.

Habitat effects: Negligible

Purse seining appears to have very little effect on the habitat. Although the purse seine gear used in Western Australia can contact the sea floor in some areas, the relatively light construction of the gear suggests that there is no significant impact occurring to, for example, seagrass beds.

SOCIAL EFFECTS

The fishery employs approximately 17 full-time workers and 7 part-time workers.

ECONOMIC EFFECTS

Estimated annual value (to fishers) for year 2003: \$661,000

While some fish are utilised as high-value products for human consumption and recreational bait, slightly more than half of the catch in 2003 went to lower-value uses such as pet food and commercial rock lobster and finfish trap bait. This influenced the price paid to the boats this year to result in a net payment only 40% of the previous year (\$1.6 million). Owing to the 'booming' South Australian pilchard fishery, the demand for Western Australian product for use as tuna feed decreased throughout 2003.

FISHERY GOVERNANCE

Acceptable effort range for next season: Not available

The acceptable maximum catch is governed by changes in the TACs for pilchards and other small pelagic fish. For the 2004/05 licensing period a single TAC of 3,000 t has been set, to cover both these categories. When a formal quota system (TAC and ITQs) is adopted for this fishery, an acceptable effort range will be developed.

The fleet remains somewhat unstable in terms of long-term participants, with only a small number of vessels operating. In addition, some of these vessels operate only irregularly. As such, the TAC may again not be achieved in 2004.

The inability to consistently find pilchards around the metropolitan region may need further investigation.

New management initiatives (2003/04)

A revised management plan is being developed for this fishery. The new plan will include the Southern and Northern Development Zones. These regions, along with the metropolitan fishery, will thus be managed as zones within a single West Coast Purse Seine Fishery, with all operators fishing under a managed fishery licence rather than under an endorsement on their fishing boat licences.

Implementation of the new management plan will see the fishery change to a formal quota system with ITQ units and a TAC. The ITQ unit values will be reviewed annually and changed, as required, depending on stock assessment data.

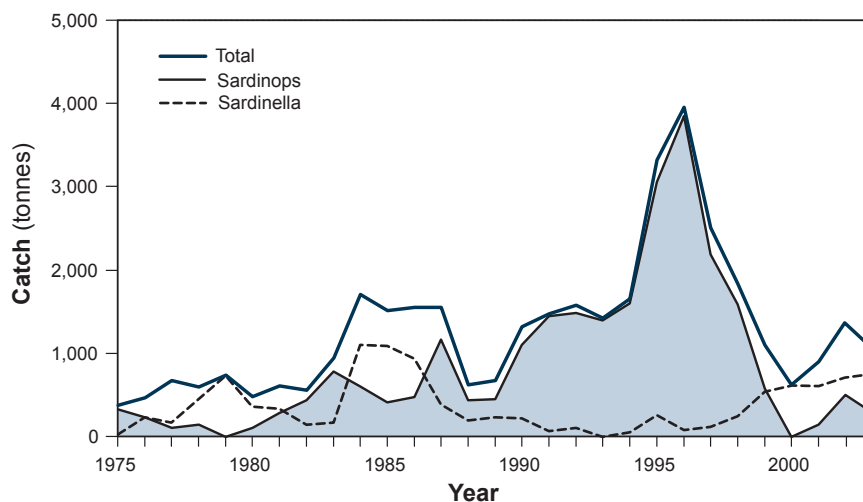
The concept of managing ecosystems, rather than single species, was presented to the Purse Seine Management Advisory Committee during 2001. Small pelagic fish represent a conceptually easy group for which to begin implementing ecosystem-based fisheries management. This issue represents a complex shift in the management philosophy for purse seine fisheries in Western Australia and continues to undergo further development. During 2003 this concept was put into practice, with the setting of TACs for 2004/05 reliant on consideration of the region having a 'sardine' carrying capacity, for pilchards, sardinella and other small pelagic fish, in the range of 20,000–30,000 t. Although this range represents the longer-term level of small pelagic biomass in the region, note that the 'sardine' biomass could sometimes be higher, but could also be lower.

EXTERNAL FACTORS

The major factor influencing the pilchard stock in recent years has been the impact of the pilchard herpes virus epidemic in 1998/99. The fishery is also heavily influenced by the contribution of the two dominant pelagic species, which dictates the make-up of the catch in any one year. The influences of environmental factors on the two species are not yet well understood, but oceanographic variability appears to affect the distribution and availability of both species.

The continued lack of significant quantities of pilchards in the Southern Development Zone remains a concern. The results from a plankton survey in 2004 will be closely scrutinised to assess whether or not there are sufficient spawning pilchards in the traditional grounds north of Cape Naturaliste.

West Coast Purse Seine Annual Catch



WEST COAST PURSE SEINE FIGURE 1

Annual catches of pilchards (*Sardinops*) and sardinella in the West Coast Purse Seine Fishery.

West Coast Demersal Scalefish Fishery Status Report

Prepared by J. St John and J. King

FISHERY DESCRIPTION

The 'west coast demersal scalefish fishery' describes a significant subset of the state's wetline fishery, which has access to species or fishing methods not currently subject to a management plan. The wetline fleet comprises both 'wetline only' vessels and the 'wetline' activities of vessels with other managed fishery licences, and is currently limited only by the overall ceiling on fishing boat licences.

The main fishing methods used in demersal wetline fishing are handlines and droplines. The major areas for wetlining

within the west coast bioregion are the Abrolhos Islands, Perth metropolitan area and the south-west coast.

The west coast demersal scalefish fishery focuses primarily on West Australian dhufish (*Glaucosoma hebraicum*) and pink snapper (*Pagrus auratus*), but also targets a number of emperors (*Lethrinus* species), baldchin groper (*Choerodon rubescens*) and coral trout (*Plectropomus leopardus*) as well as taking a range of other species including sharks. Some of these species are also caught in other commercial managed fisheries using demersal gillnets and longlines, as well as in the recreational and charter boat sectors.

Governing legislation/fishing authority

Fish Resources Management Regulations 1995
Fishing Boat Licence