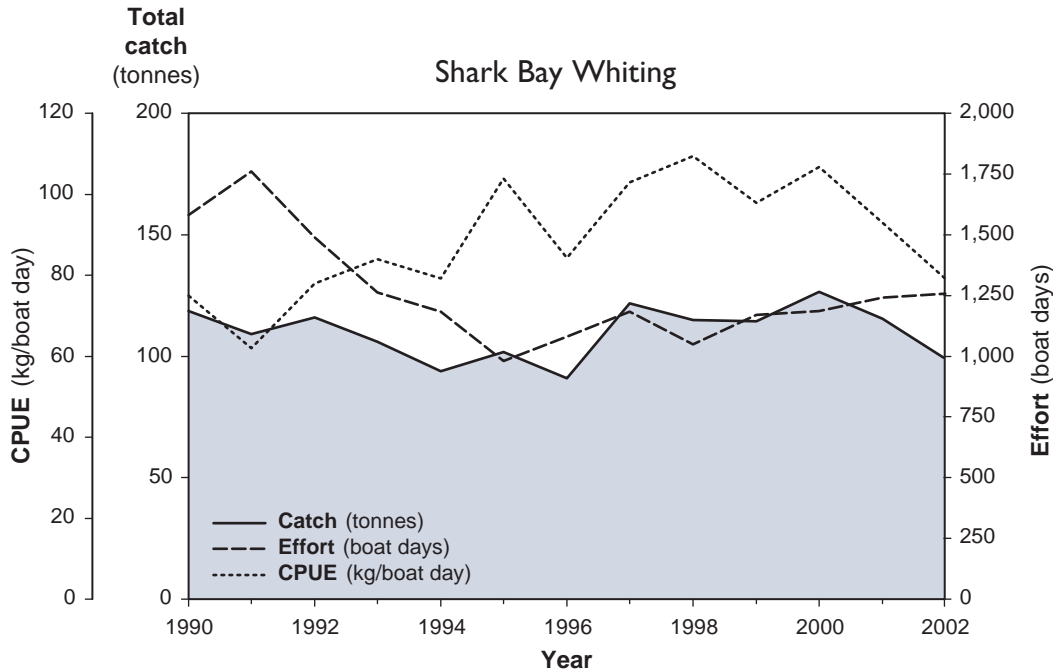


# GASCOYNE COAST BIOREGION



**SHARK BAY BEACH SEINE FIGURE 2**

The annual catch (t), effort (boat days) and catch per unit effort (CPUE, kg/boat day) for whiting from Shark Bay over the period 1990–2002.

## Shark Bay Snapper Managed Fishery

### Management Summary

The Shark Bay Snapper Managed Fishery has been in operation since the late 1980s and has been managed using a mix of input and output controls. The annual (1 September to 31 August) total allowable catch of pink snapper (*Pagrus auratus*) is currently set at 563,750 kg, which equates to 110 kg for each of the 5,125 units. The ongoing sustainability of the fishery is currently under review and a reduction in TAC is expected in the coming year.

A final application has been submitted to Environment Australia for the fishery as part of EA’s ecological sustainability reporting process under the *Environment Protection and Biodiversity Conservation Act 1999*. A public comment period was conducted during early 2003 and a formal assessment is currently being undertaken by EA.

#### Governing Legislation/Fishing Authority

Shark Bay Snapper Management Plan 1994  
Shark Bay Snapper Managed Fishery Licence

#### Consultation Process

Shark Bay Snapper Managed Fishery Working Group  
Department–industry meeting

### Research Summary

Detailed research on the offshore snapper fishery was undertaken during the 1980s and provides the scientific knowledge base for management. An FRDC-funded project which commenced in July 2000 has utilised the age data collected since the 1980s to assess the potential for increased yields from this oceanic snapper stock. The preliminary results from this research are now available.

Catch and effort monitoring data, the ESD report and the preliminary results from the FRDC project have been used to compile this status report.

## Shark Bay Snapper Managed Fishery Status Report

Prepared by M. Moran

### FISHERY DESCRIPTION

#### Boundaries and access

The Shark Bay Snapper Managed Fishery operates in the waters of the Indian Ocean between latitudes 23°34' S and 26°30' S and in the waters of Shark Bay north of Cape Inscription. Catches of snapper in the peak fishing season (May–August) were formerly subject to individual quotas, while gear controls applied in the off-peak season. Since 2001, the whole year’s catch has been subject to a single TAC and

individually transferable quotas. The snapper quota for 2002 was set at 563.7 t.

### Main fishing method

Mechanised headline.

## RETAINED SPECIES

**Commercial production (season 2002): Snapper 487 tonnes  
Other species 158 tonnes**

### Landings

The Shark Bay Snapper Managed Fishery operates on the ocean stock of snapper, which is distinct from the inner Shark Bay stocks. Commercial catches of snapper from the ocean stock in 2002 were slightly higher than the previous year, at 487 t compared with 467 t in 2001. The snapper fishery also took 158 t of other finfish species compared with 105 t in 2001. Moreover, the composition of this catch differed from 2001 by having a high component of outer-shelf species such as goldband snapper (*Pristipomoides* spp.). The outer-shelf fishery has grown rapidly since it began in 2000. The catch of these other species is detailed in Shark Bay Snapper Table 1.

### Fishing effort

The effectiveness of fishing effort varies markedly on a seasonal basis, peaking in June and July. Fishing effort in the managed snapper fishery, calculated as the total catch for the year divided by the May–August CPUE, was 1,320 standard May–August boat days in 2002, compared with 894 days in 2001. This level of effort to take the catch of 487 t falls outside the acceptable range of 820–950 days used to take the average 500 t catches of the 1990s.

This high effort to take the smaller than average catch is an indicator of low abundance of snapper and was a trigger for the review of the fishery which is currently in progress.

### Catch rate

An improved method of calculation has been used in this year's report to more accurately reflect fishing effort targeted mainly at snapper. This was considered necessary because fishers' monthly catch returns report total line-fishing effort, without distinguishing between effort targeted at snapper and that targeted at other demersal scalefish. In the new calculation, only catch and effort figures for boats which caught 4 t or more of snapper in the two-month peak period were used. Consequently, historic catch rate levels will not reflect those reported previously.

The average catch per boat day for licensed vessels during the peak months (June–July) was 555 kg in 2002. This is approximately 21% lower than the average catch rate observed during the 1990s of 700 kg/boat day (Shark Bay Snapper Figure 1).

**Recreational component:** **7.5%**

The Gascoyne Recreational Fishing Survey, conducted between April 1998 and March 1999 (Sumner et al. 2002),

estimated that the boat-based recreational catch of snapper from the oceanic stock was 14 t, approximately 2.5% of the commercial catch. In addition, there is a recreational catch of oceanic pink snapper taken on charter boats. This was reported to be 24 t (5% of the commercial catch) in 2002.

For the genetically distinct inner bay stocks of snapper (not covered by this status report), most of the catch is taken by recreational fishers and is now subject to separate management arrangements. Research to assist the management of these stocks is reported in the recreational fisheries section on pp. 161–164.

**Stock assessment completed:** **Yes**

The oceanic pink snapper stock is now considered to be over-exploited. A stock production model assessment of this stock completed in the mid-1980s estimated the maximum sustainable annual yield to be around 600 t. The average commercial catch during the past 15 years has, however, only been approximately 500 t. One of the main objectives of the FRDC-funded project which commenced in July 2000 was to use more advanced age-structured modelling techniques to assess the potential for increased yields from this stock. The preliminary results from this project indicate, however, that the 600 t value was probably an over-estimate of the sustainable yield. Thus, the stock appears to have been declining slowly since the early 1990s, despite commercial landings of only 500 t. Consequently, the total allowable catch will be revised downwards based on the final results of this project.

One clear result is that, as for other snapper stocks in Australia and New Zealand, the levels of annual recruitment can be highly variable. There was a peak in recruitment during the early 1990s, following which recruitment levels declined to reach relatively low levels by the late 1990s. These low levels of recruitment came at a time when there were still adequate breeding stock levels (i.e. > 40% unfished level, see below) and are therefore most likely attributable to environmental effects on the survival rate of eggs, larvae and early juveniles. Additional fishery data from 2001, 2002 and 2003 will be used to update the stock assessment and provide advice for ongoing management prior to the peak fishing season in 2004.

An additional threat to the fishery's sustainability may be posed by the rapidly expanding activity of the wetline fleet, which is not licensed to land pink snapper taken within the boundaries of the fishery, and therefore releases them at sea. At the depths fished, most returned snapper die, with a consequent increase in the total fishing mortality.

**Exploitation status:** **Over-exploited**

**Breeding stock levels:** **Inadequate**

Snapper breeding stock level for the oceanic stock has been estimated as part of the current FRDC project to be currently below 30% of the unfished level. The target for species such as snapper is to maintain breeding stock levels above 40% of the unfished level. Appropriate management actions to initiate restoration of the stock to this level will be taken in 2004 based on the final results of this project.

# GASCOYNE COAST BIOREGION

Given the very rapid increases in catch of the outer-shelf component of the wetline fishery in this area (Shark Bay Snapper Figure 2), the sustainability of some deep-water scalefish species may also be of concern. Although there are insufficient data to assess the status of these species at present, the issue requires immediate management attention and careful monitoring in the future.

## NON-RETAINED SPECIES

**Bycatch species impact:** Negligible

There is very little discarding of unwanted bycatch in the managed snapper fishery, as virtually all the catch consists of demersal fish with a medium to high market value. However, pink snapper itself may now have become the discarded bycatch of the wetline boats, with potential negative effects for sustainability of the stock (see 'External Factors').

**Protected species interaction:** Negligible

The line fishing methods used do not catch any protected species

## ECOSYSTEM EFFECTS

**Food chain effects:** Low

Food chain effects are considered to be low because the quota system restricts catches to a small percentage of the total biomass of snapper. While the stock is currently going through a low period, corrective management action will be taken to restore the adult stock to above 40% of its unfished level. Juvenile and sub-adult stocks have not been affected by the snapper fishery as the catch of under-size fish is minimal.

**Habitat effects:** Negligible

The nature of the fishery, targeting aggregations of adult snapper using hooks and lines, means that the fishery has no impact on the habitat.

## SOCIAL EFFECTS

Nine boats fished both peak and off-peak seasons (about nine months) with an average crew of 3. This rose during the peak season (four months) to a total of 25 boats (including 9 trawlers) with an average crew of 5.

## ECONOMIC EFFECTS

**Estimated annual value (to fishers) for year (2002):**  
\$3 million

The value of the pink snapper taken in the fishery was \$2.25 million, while other finfish species added a further \$750,000.

## FISHERY GOVERNANCE

**Acceptable effort range:** 709–930 days

Based on catch per unit effort levels during the period 1990–2000, the acceptable effort range to take the 2003 total allowable commercial catch of 563.7 t would be 709–930 standard June–July boat days. This range has been estimated using an improved set of catch rates developed in 2002. However, the range may be revised following the current review of the fishery.

## EXTERNAL FACTORS

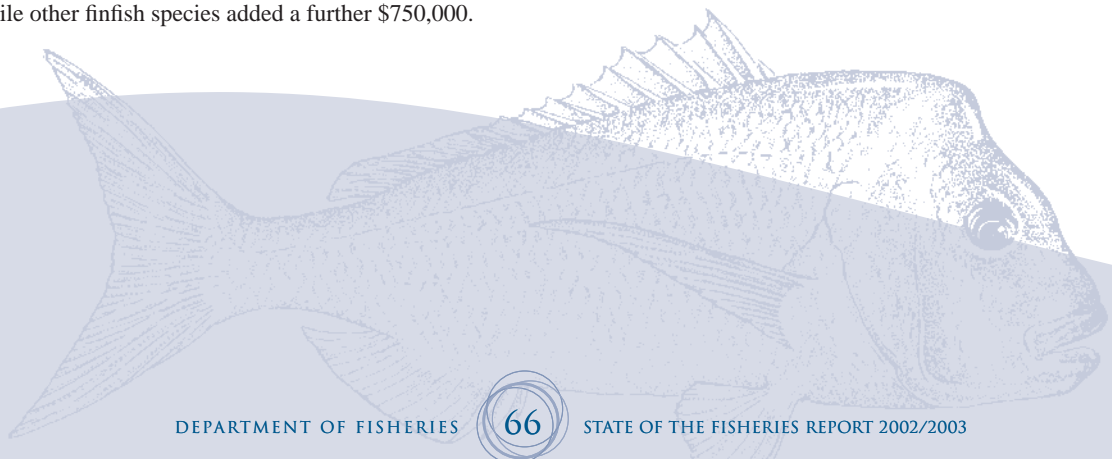
Wetline boats operating in the region (i.e. commercial line-fishing boats without a Shark Bay Snapper Managed Fishery licence) have been taking increasing catches of scalefish species other than snapper in recent years. A considerable, but unknown, quantity of snapper are therefore caught and returned to the sea by these fishers, many of which will not survive. This increased mortality on the stocks is likely to be an additional threat to the sustainability of the snapper fishery.

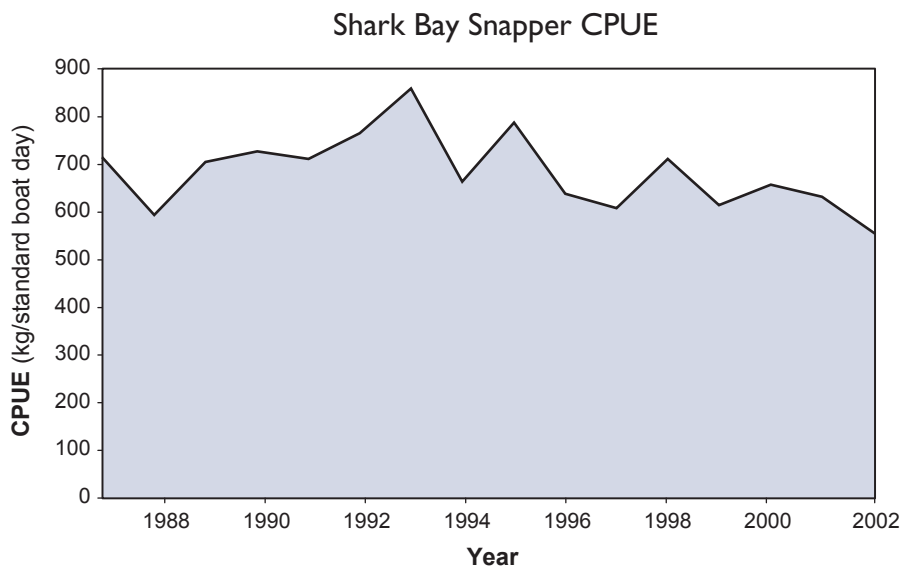
Under the Offshore Constitutional Settlement, Commonwealth-licensed trawlers may operate in the region outside the 200 metre isobath. A trawler has been operating consistently in the region of the managed snapper fishery in recent years and also catches an unknown quantity of snapper.

## SHARK BAY SNAPPER TABLE I

Catches in the years 2001 and 2002 by Shark Bay Snapper Fishery licensed boats, in the area between 23° S and 26° S, of species other than pink snapper (excluding mackerels which are reported on pp. 97–102).

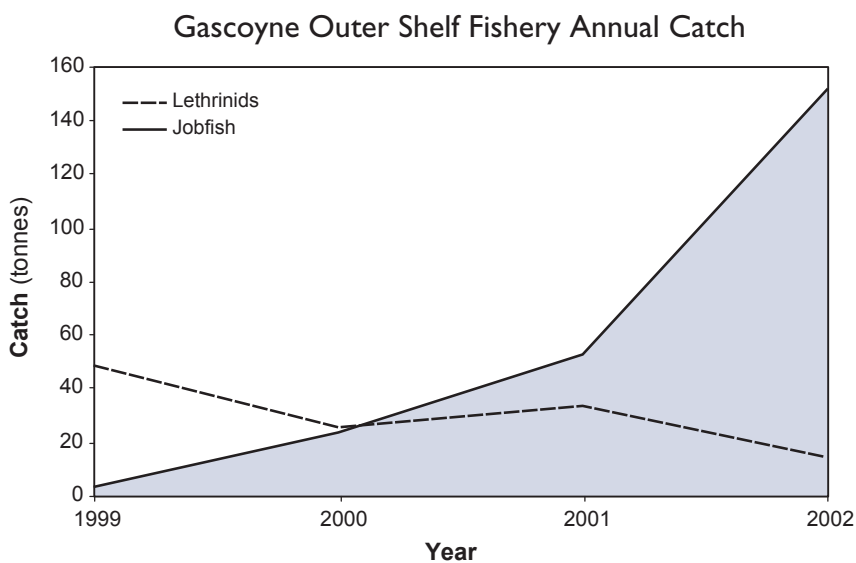
SPECIES		TONNES 2001	TONNES 2002
Emperors	Lethrinidae	31.1	27.0
Mulloway	Sciaenidae	15.9	21.4
Cods	Serranidae	11.3	19.8
Red emperor	<i>Lutjanus sebae</i>	9.1	9.5
Trevallies	Carangidae	8.1	9.3
Jobfish	<i>Pristipomoides</i> spp.	5.1	42.1
Other		24.4	28.7
<b>Total</b>		<b>105.0</b>	<b>158.0</b>





**SHARK BAY SNAPPER FIGURE 1**

Catch per unit effort by year from 1987 to 2002 for the Shark Bay Snapper Managed Fishery. Units are kg whole weight of pink snapper per standard boat day. As catchability varies markedly throughout the year, peaking in June and July when the fishing effort is focused on snapper, the CPUE for line fishing from June–July is used as the index of abundance.



**SHARK BAY SNAPPER FIGURE 2**

The increasing catches in the area between 23° S and 26° S, by non-holders of Shark Bay Snapper Managed Fishery licences, of deep-water snappers (= jobfish, goldband snapper) and decreasing catches of inner-shelf emperors (lethrinids), illustrating the expansion of the wetline fishery in the region and the shift of focus from the inner to the outer shelf.