

Shark Bay Beach Seine Figure 2 The annual catch (tonnes), effort (boat days) and catch per unit effort (CPUE, kg/boat day) for the total finfish fishery of Shark Bay over the period 1974–1998.

Lower West Coast Beach and Embayment Fisheries

MANAGEMENT OVERVIEW

Within this sector there are five managed fisheries focused mainly in the Cockburn Sound area, details of which are listed below.

West Coast Beach Bait (Fish Net) Managed Fishery:

There are 13 licensees in this fishery. Small pelagic fish are taken primarily by beach seine method within the coastal waters between the mouth of the Moore River, north of Perth, and Tims Thicket, south of Mandurah.

The major target species for this fishery is whitebait, *Hyperlophus vittatus*, with small quantities of other species being taken.

The whitebait stock in the south-west of Western Australia is found mainly in a thin coastal strip close to the coast and the stock size is relatively small. The exploitation rate by commercial fishers should not be permitted to increase above current levels.

The northern section of the stock is managed under the West Coast Beach Bait (Fish Net) Management Plan which applies to the area from Lancelin to Tims Thicket. Management of the southern section will come under the review of the south-west beach seine access arrangements, which are still to be finalised. Beach seining is the predominant method of fishing, which provides a measure of protection for the stock because of the limited ability to access the whitebait from the beaches.

The fishery is currently being assessed as to whether it qualifies under the Voluntary Resource Sharing Guidelines program.

Cockburn Sound (Crab) Managed Fishery: There are eight transferable Class A and eight non-transferable Class B licences with access to this fishery. This fishery has fully converted from using demersal tangle nets to using crab pots as the means of capture.

The future management arrangements for this commercial fishery are currently being reviewed under the Voluntary Resource Sharing Guidelines program. Outcomes from this process are likely to include



implementation of new management initiatives to facilitate an improved recreational share of the total annual crab catch from Cockburn Sound.

Cockburn Sound (Fish Net) Managed Fishery: There are six licence holders in this fishery. Fish are taken by gillnet, beach seine and haul net. The main species targeted are garfish and Australian herring. Other fish species including shark, whiting and mullet are taken opportunistically.

The catch of garfish and Australian herring has been rising steadily since the 1970s. The rate at which the catch of these two species is increasing is of some concern as they are both important recreational species. There is concern also that declining Australian herring catches on the south coast may impact on the Cockburn Sound fishery.

Cockburn Sound (Mussel) Managed Fishery: There are three licensees with access to this fishery. In 1997 the Minister for Fisheries approved an amendment to the management plan to permit licence transferability on a limited basis, allowing mussel dive licences to be transferred to holders of aquaculture licences endorsed to cultivate mussels in Cockburn Sound. This essentially integrates the wild-catch fishery with the farmed mussel sector in Cockburn Sound.

Cockburn Sound (Line and Pot) Managed Fishery: There are currently 34 licensed fishers in this fishery, although not all licensees exercise their fishing entitlement. The fishing methods employed include handline, longline and squid jigging; the pots used are unbaited octopus pots. Baited pots require the written approval of the Executive Director of Fisheries WA.

Many of the species targeted by this fishery are also targeted by recreational fishers, e.g. sharks, pink snapper, garfish and Australian herring.

Commercial landings of King George whiting, western sand whiting, squid and octopus from Cockburn Sound have declined in recent years. Possible reasons may include environmental factors, fishing pressure and market-driven forces, or a combination of these factors. While Fisheries WA remains cautious about this trend, the underlying reasons for these declines are yet to be fully investigated.

RESEARCH OVERVIEW

Data for monitoring the status of the various stocks taken from Cockburn Sound are obtained primarily from the CAESS records provided by industry. These data, together with biological knowledge from historical research, enable any unusual trends in catch to be evaluated.

Research during 1998/99 focused on the herring stock, and biological data are being gathered on garfish as part of an Australia-wide study. In addition, a series of research projects to examine the status of the blue crab stocks in Cockburn Sound has been funded by the Fisheries Research and Development Corporation (FRDC).

Cockburn Sound Finfish Fisheries Status Report

Main Features

Stock assessment complete:

Not applicable (multi-species fishery)

Exploitation status:

Not applicable

Breeding stock levels:

Not applicable

Previous catch projections for year 1997:

49-125 tonnes (finfish only)

Catch current season (1998):

60.1 tonnes (catch excludes whitebait, pilchard, scaly mackerel, anchovy, blue sprat, molluscs and crustaceans)

Estimated annual value (to fishers) for year 1998:

\$120,000 (Cockburn Sound Line and Pot Managed Fishery and Cockburn Sound Fish Net Managed Fishery)

Catch projection next year (1999):

38-92 tonnes (finfish only)

Boundaries and Access

There are four managed fisheries which operate wholly and two managed fisheries which operate partly within Cockburn Sound. The Cockburn Sound (Mussel, Crab, Fish Net, and Line and Pot) Managed Fisheries operate entirely within Cockburn Sound, while the West Coast Beach Bait (Fish Net) and the West Coast Purse Seine Managed Fisheries operate partly within Cockburn Sound.

The gillnetting, crab netting (and potting), mussel diving and line and pot fisheries are all restricted to the waters of Cockburn Sound (Block 9600). The catches in this report are for finfish only and are mainly from the Cockburn Sound (Line and Pot) and the Cockburn Sound (Fish Net) Managed Fisheries. There are 34 fishers who have access to either one or both of these fisheries.

A status report for the whitebait stock follows. Separate status reports are given elsewhere in this volume for the West Coast Purse Seine, mussel (see Mussel Aquaculture) and crab (see West Coast Blue Swimmer Crab Stock) fisheries.

Annual Production

Main fishing method

Gillnet (set net), haul net, handline, octopus pot, beach seine and purse seine.

Landings

The total catch of finfish from Cockburn Sound reported here excludes bait fish (whitebait, pilchard, scaly mackerel, anchovy and blue sprat), molluscs and crustaceans. The reported catch is primarily from the Cockburn Sound (Line and Pot) and the Cockburn Sound (Fish Net) Managed Fisheries; however, the figures include the catch of finfish, other than those five species mentioned above, from the West Coast Beach Bait (Fish Net) and the West Coast Purse Seine Managed Fisheries, which conduct part of their operations within Cockburn Sound. From the early 1990s the catches increased to a peak in 1992 and have been declining to the current level of 60.1 tonnes in 1998 (Cockburn Sound Figure 1).

The catch of sea garfish increased steadily from 1980 to a peak value in 1994. Since that time, the catch has declined, with a substantial drop in 1997. A slight increase over the 1997 catches was reported in 1998 when 22.2 tonnes were landed (Cockburn Sound Figure 2).

Similarly, Australian herring catches showed a steady increase, reaching a peak in 1994 (around 50 tonnes). Since that time, catches have declined each year to 21 tonnes in 1998 (Cockburn Sound Figure 3).

Fishing effort

The fishing effort (measured as the number of fishing boat days) in Cockburn Sound provides an indication of the overall usage of the area by the commercial sector, since it is composed of a number of different fisheries and various fishing methods.

The fishing effort peaked during the early 1990s to 1,400-1,600 boat days. The effort declined to 882 boat days in 1997. The reported effort for 1998 was 1,169 boat days.

Catch rate

The catch rate for the different fisheries and the various fishing methods has averaged around 80 kg/boat day during the past 10 years. The peak catch rate was 101.8 kg/boat day in 1992 and the lowest reported catch rate was 43 kg/boat day in 1990. The 1998 catch rate was 51 kg/boat day.

Stock Assessment

Not applicable.

Breeding Stock Levels

Not applicable.

Catch Projection for Year 1999

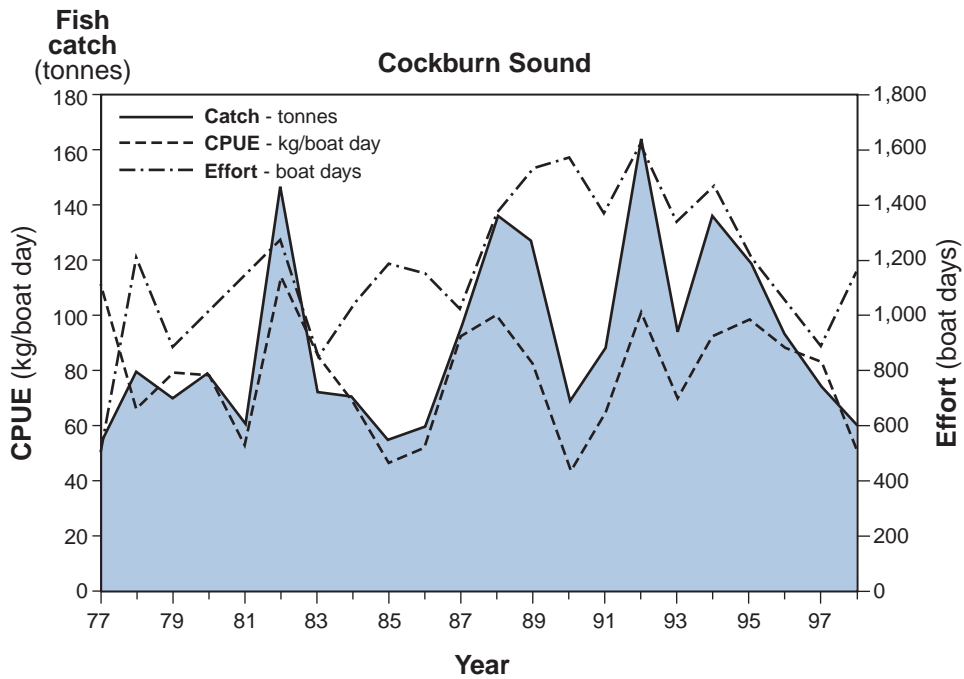
The catch prediction for 1999 is between 38 and 92 tonnes of finfish. This projection is derived by double exponential smoothed forecasting of the annual catches and the variation of observations around the predictions. The confidence intervals are set at 80%.

Product Value for Year 1997

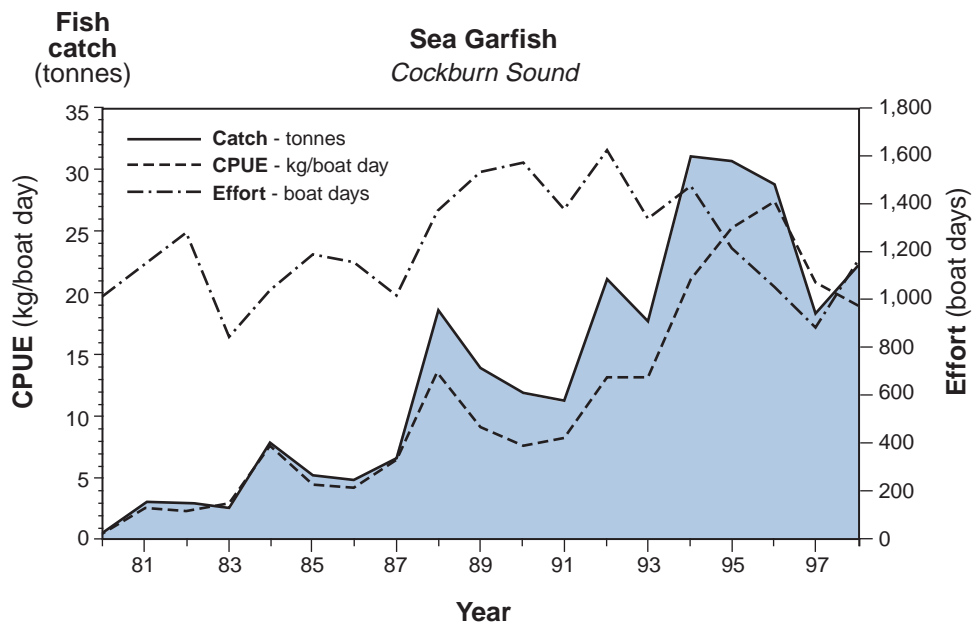
The estimated value of the finfish catch from Cockburn Sound for 1998 is \$120,000 (Cockburn Sound Line and Pot Managed Fishery and Cockburn Sound Fish Net Managed Fishery).

General Comments

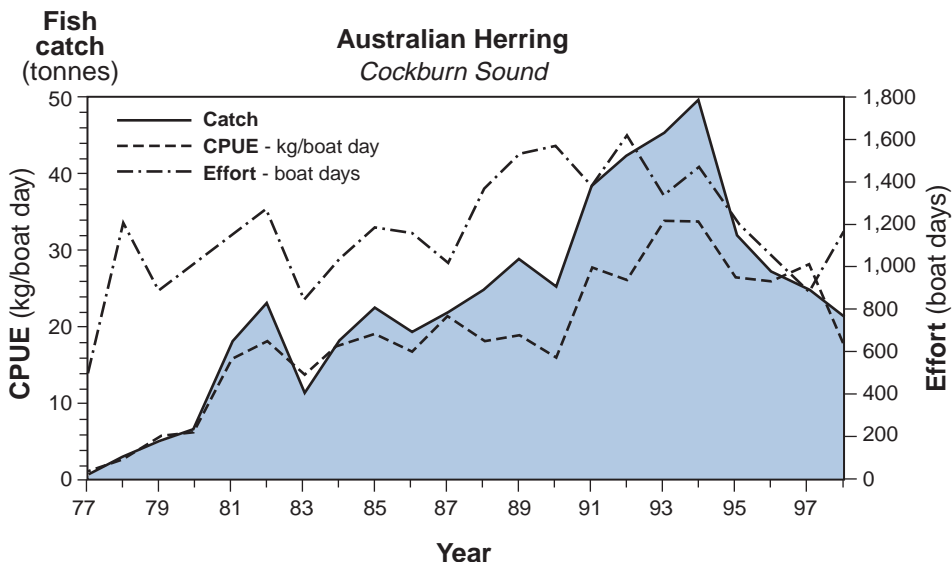
In addition to the commercial catches reported above, Cockburn Sound continues to provide one of the most popular sheltered recreational fishing areas in very close proximity to the Perth metropolitan area. About half of the 23 species of finfish that contributed to the 1998 commercial finfish catch are also important recreational species. They include tailor, Australian herring, trevally, King George whiting, garfish, yellowtail scad and pink snapper. Australian herring contributed 35% of the total commercial finfish catch from the Sound. The remaining six recreationally important species contributed 44% of the commercial finfish catch collectively. While relatively limited in overall value, the production from this fishery provides a valuable input to the metropolitan fresh fish market. Catch information from the small commercial sector also provides a valuable input to the research database for monitoring the abundance of these stocks which are also important to recreational fishing. Unfortunately, the lack of annual catch statistics from the recreational sector limits the ability to use these data for stock assessment purposes. However, the commercial CPUE does provide an index of annual abundance to monitor overall trends in stock availability to both sectors and to link to recreational data in years when surveys occur.



Cockburn Sound Figure 1 The annual catch, effort and catch per unit effort (CPUE) for finfish (excluding bait fish) for the Cockburn Sound fisheries over the period 1977-1998.



Cockburn Sound Figure 2 The annual catch, effort and catch per unit effort (CPUE) for sea garfish (*Hyporhamphus melanochir*) in the Cockburn Sound fisheries over the period 1980-1998.



Cockburn Sound Figure 3 The annual catch, effort and catch per unit effort (CPUE) for Australian herring (*Arripis georgianus*) in the Cockburn Sound fisheries over the period 1977–1998.

Whitebait Stock Status Report

Main Features

Stock assessment complete:

Yes

Exploitation status:

Fully exploited

Breeding stock levels:

Adequate

Previous catch projections for year 1998:

130-180 tonnes

Catch current season (1998):

107 tonnes

Estimated annual value (to fishers) for year 1999:

\$0.2 million

Catch projection next year (1999):

210-290 tonnes

Recreational component (1998):

Nil

Boundaries and Access

The West Coast Beach Bait (Fish Net) Managed Fishery extends from Lancelin in the north to Tims Thicket in the south (metropolitan and Mandurah regions), with access currently via limited entry licence. The south-west beach seine fishery extends from Tims Thicket in the north to Point D’Entrecasteaux. The whitebait fishery within this zone typically operates only between Cape Naturaliste and Preston Beach, which is termed the Bunbury region. Access arrangements for the whitebait fishery are currently under review.

Annual Production

Main fishing method

Beach seine net.

Landings

The figures presented here are for the catches of whitebait only; incidental finfish catch figures have been included in the Cockburn Sound status report.

Metropolitan: The catch of whitebait (*Hyperlophus vittatus*) for the metropolitan region during 1998 was



31.2 tonnes, an increase on the 1997 catch of 24.4 tonnes (Whitebait Figure 1). As the catches of whitebait from Mandurah for the past two years have been minimal (less than 1 tonne in 1998), they have now been included as part of the catch for the metropolitan region.

Bunbury: As expected there was a big reduction in catch, with only 76 tonnes caught compared to 294 tonnes the previous year (Whitebait Figure 1). This may be attributed both to natural variations in stock size and to a reduction in effort following stockpiling of product from the very good catch in 1997. Catches were again dominated by the summer period in this region, in contrast to the metropolitan region where good catches were made during winter.

Fishing effort

Given the nature of this fishery, no meaningful measure of effort and therefore catch rate can be obtained.

Catch rate

See Fishing effort above.

Stock Assessment

The only annual assessment for this fishery comes from the total catch. This shows that the abundance was lower in 1998 than in 1997, as predicted by the Leeuwin Current/whitebait model, although the actual catch was less than predicted. The means by which the Leeuwin Current influences catch levels is still not known. The strong Leeuwin Current in 1998 indicates that the 1999 catch is likely to increase. However, experience has shown that years of very good catches are followed by periods of relatively lower catches, so any increase in catch may not be as substantial as that suggested by the model.

Breeding Stock Levels

Modelling and plankton sampling indicate that the typical stock size of whitebait is probably less than 1,000 tonnes for the entire west coast.

Catch Projection for Year 1999

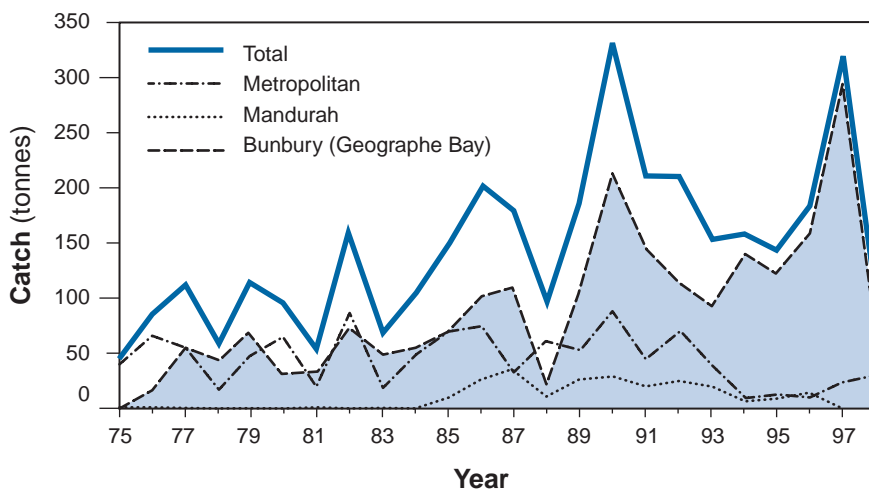
In general, the Leeuwin Current in 1998 was moderately strong, increasing in some months to extremely strong. The Leeuwin Current/whitebait model therefore suggests that the 1999 catch will be greater than that for 1998. The estimated catch project for 1999 is 210-290 tonnes. However, if the large catch in 1997 made a significant impact on the breeding stock, then an annual catch of less than 210 tonnes may occur.

Product Value for Year 1998

Price was similar to that obtained in 1997, with an average of \$1.80/kg. Total catch value in 1998 was about \$0.2 million.

General Comments

Annual catch in this fishery will most likely continue to exhibit large fluctuations under the influence of environmental factors. This fishery will therefore continue to be regulated through limited entry access and gear restrictions, and is in the process of becoming fully managed. It is anticipated that the Leeuwin Current/whitebait model will be critically reviewed during 1999.



Whitebait Figure 1 Total annual catch of whitebait for each region from 1975 to 1998 (note that as of 1998 if the Mandurah catch is < 1 tonne it will be added to the metropolitan catch).