

Shark Bay Scallop Managed Fishery

Management Summary

The Shark Bay Scallop Managed Fishery is based on the take of southern saucer scallop (*Amusium balloti*), and is usually Western Australia's most valuable scallop fishery. The catch is taken by vessels licensed to take only scallops (14 class A licences) and vessels which also fish for prawns in the Shark Bay Prawn Managed Fishery (27 class B licences).

Management of the fishery is aimed at catching scallops at the best size and condition for the market, thereby maximising the economic return, while maintaining breeding stock levels. The scallop stock commences spawning in mid-April (continuing through until the end of November) and meat condition declines as spawning continues. Therefore, the opening date of the season is a compromise between breeding stock levels (measured by a pre-season survey of stock abundance) and the seasonal decline in meat condition associated with spawning.

The 2003 scallop fishing season commenced on 20 May and is scheduled to close on 1 November (the same day as the Shark Bay Prawn Managed Fishery), although it is likely that the dedicated class A vessels will cease fishing around June or July when catch rates become uneconomic. Primary management measures include limited entry, area closures, gear controls and crew limits. The Vessel Monitoring System continues to be an integral part of the fishery's management strategy for the control of spatial and temporal closures.

Bycatch reduction devices (specifically grids) were fully implemented at the start of the 2003 season by way of a condition on the managed fishery licence. Trials and implementation of secondary BRDs are not considered necessary in the fishery at this stage, given the large mesh size used (i.e. 100 mm mesh compared with 50 mm mesh used in the prawn fishery).

Catch in this fishery varies widely depending on the strength of recruitment, which is thought to be influenced by the strength of the Leeuwin Current. Most of the catch is marketed to south-east Asia as frozen scallop meat (roe-off).

The Shark Bay Scallop Management Advisory Committee has been replaced by the Joint Trawl Management Advisory Committee, which covers the Shark Bay Scallop, Shark Bay Prawn and Exmouth Gulf Prawn Managed Fisheries. Given the overlap between the three Gascoyne trawl fisheries it was considered more efficient to merge the previously separate MACs. The JTMAC, which provides high-level advice to the Minister on the management of these fisheries, held its inaugural meeting early in 2003. Detailed fishery management matters (e.g. opening/closing dates, spatial and temporal closures) are now dealt with directly between the Department and licensees.

Environment Australia has declared the fishery as being managed in an ecologically sustainable manner under the

provisions of the *Environment Protection and Biodiversity Conservation Act 1999*. While subject to a variety of recommendations, this approval allows product from the fishery to be exported for a five-year period.

Governing Legislation/Fishing Authority

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

Consultation Process

Joint Trawl Management Advisory Committee
Department–industry meetings

Research Summary

Research for monitoring the status of the scallop stock in Shark Bay is based on detailed research logbook records and factory receivals provided by industry. In addition, an annual research survey is carried out in November each year which, together with existing detailed biological knowledge, enables an annual catch forecast to be provided.

A collaborative project with industry to review the impact of trawling on non-target species has been evaluating gear modifications to reduce bycatch and improve product quality. A further FRDC-funded project is examining the biodiversity of bycatch in trawled and untrawled areas of Shark Bay.

The following status report summarises these research findings.

Shark Bay Scallop Managed Fishery Status Report

Prepared by M. Kangas and E. Sporer

FISHERY DESCRIPTION

Boundaries and access

The outer boundaries of the fishery encompass 'the waters of the Indian Ocean and Shark Bay between 23°34' south latitude and 26°30' south latitude and adjacent to Western Australia on the landward side of the 200 m isobath, together with those waters of Shark Bay south of 26°30' south latitude'. Within these general areas, scallop trawling only occurs in waters east of the outer islands of Shark Bay, in depths between 16 m and 40 m. In addition to the outer shelf region, a reef area eastward of the Naturaliste Channel, between the northern end of Dirk Hartog Island and the southern end of Bernier Island, is also closed to scallop (and prawn) trawling; and no scallop trawling is allowed east of a line extending northward from Cape Peron to the mainland.

Fourteen boats with Class A licences (scallop only) and 27 boats with Class B licences (prawn and scallop) are endorsed to fish the waters of Shark Bay and Denham Sound. The boundaries for Class A boats are the waters of Shark Bay and Denham Sound west of longitude 113°30'36" E and north of a line running due east from the northern extremity of Cape Bellefin to Peron Peninsula (see Shark Bay Prawn Figure 1).

The 2002 scallop season commenced on 6 May in Denham Sound, and remained open for 10 days for scallop fishing only. Owing to the fishing arrangements for the opening of the extended nursery area for prawns, no Class B scallop boat fished the Denham area in May. Fishing for scallops commenced on the main fishing grounds in Shark Bay on 16 May. Trawling for scallops by Class A boats had ceased by the end of June because of low catch rates. Denham Sound was re-opened on 1 August but with only one Class A scallop boat fishing, and for one night only. The Shark Bay scallop season officially closed on 21 October.

Main fishing method

Otter trawl.

RETAINED SPECIES

Commercial production (season 2002):
1,770 tonnes whole weight

Landings

The total scallop landings for this fishery, for both A and B Class scallop boats, were 1,770 t whole weight, of which 1,300 t were taken from the Red Cliff and North West Peron grounds and the remaining 470 t from Denham Sound during the 10 days of fishing in May. This overall catch was within the acceptable range set and also within the projected range based on the pre-season survey. It represents an increase of 700 t compared to the catch in 2001.

The Class A fleet (all 14 boats fished in 2002) caught 1,399 t or 79% of the total catch, with the Class B fleet taking 371 t (Shark Bay Scallop Figure 1). Low quantities of by-product (8.5 t of blue swimmer crabs, *Portunus pelagicus*, 3.1 t of cuttlefish and 2.7 t of bugs, *Thenus orientalis*) were also recorded for the Class A fleet during 2002.

Fishing effort

The total effort recorded by the Class A boats in 2002 was 11,284 hours, a 30% increase on the very low effort in 2001.

Catch rate

A mean catch per unit effort of 124 kg/hr (whole weight) was recorded for the Class A fleet in 2002 compared to 81 kg/hr in 2001. This efficient catch rate was maintained as a result of the decision to cease fishing by the end of June.

Recreational component: Nil

Stock assessment complete: Yes

The status of the stock is determined from a pre-season survey of recruitment and residual stock carried out in November–December. This survey enables the start date of the fishery to be determined and allows management of the spawning stock. Recruitment of juveniles to the stock was at the low end of the range, as measured using the data from the November 2001 scallop survey. This low recruitment, apparently due to environmental conditions, resulted in a 2002 catch that was within the range projected. This follows a strong Leeuwin Current in 1999–2001, a feature which has previously been

correlated with low recruitment and is therefore not considered to reflect the impact of fishing. The survey design and analysis of the data provides separate catch forecasts for the Shark Bay (Red Cliff and North West Peron) and Denham Sound areas. This allows separate opening dates to be determined for each area to optimise scallop catches each season.

Exploitation status: Fully exploited

Breeding stock levels: Adequate

The management arrangements for the fishery are designed to ensure significant spawning has occurred each year before the bulk of the stock has been taken. Although the breeding stock level was low in 2002 as a result of the low recruitment, it is considered adequate to provide recruitment in the normal range for 2003.

Projected catch next season (2003):
1,200–1,900 tonnes whole weight

The catch projection for the 2003 season is based on the November 2002 survey. On the main fishing ground in Shark Bay, observed recruitment was similar to last year, providing a catch range forecast for this area of approximately 1,000–1,500 t whole weight. Higher recruitment was observed in the Denham Sound area, giving a predicted catch range of 200–400 t whole weight. The catch projection for the fishery as a whole is therefore in the range 1200–1,900 t whole weight.

NON-RETAINED SPECIES

Bycatch species impact: Low

Owing to the legislated design of the nets (which use 100 mm mesh) and the relatively short duration of the fishery, the total bycatch of fish is minimal.

Protected species interaction: Low

Protected species, occasionally captured, are released alive due to the relatively short duration of trawls. During 2002, grids were installed into one net to minimise the capture of large animals on Class A scallop boats, and full implementation is planned to take place in 2003. Once this occurs the risk to these species will be negligible.

ECOSYSTEM EFFECTS

Food chain effects: Low

The ecosystem impacts of saucer scallop fisheries are unlikely to be significant, taking into account the typically high annual variation in abundance of the species and the high natural mortality associated with short life-cycles and natural death in the third year of life.

Habitat effects: Low

The scallop fleet operates over a limited portion of the licensed fishing area, primarily in the oceanic centre section of Shark Bay. Fishing is concentrated on a small sector of the typically bare sand habitat associated with concentrations of this species. In 2002, 14% of the area available for trawling was fished. As a result of the small area impacted and the short-term impact of the gear on sand habitats, the overall effect of fishing on benthic habitats is low.

GASCOYNE COAST BIOREGION

SOCIAL EFFECTS

The estimated employment for the year 2002 was 190 skippers and crew. There are also processing and support staff employed at Carnarvon, Fremantle and Geraldton. This and other trawl fisheries in the Gascoyne generate a major component of employment in the region.

ECONOMIC EFFECTS

**Estimated annual value (to fishers) for year 2002:
\$5.8 million**

The wholesale price of scallops varies depending on the type of product (grade and meat condition) and the market forces operating at any one time. The average price for scallops was \$3.30/kg whole weight or \$16.50/kg meat weight. Meat weight is 20% of whole weight.

FISHERY GOVERNANCE

Acceptable catch range: 1,250–3,000 tonnes whole weight

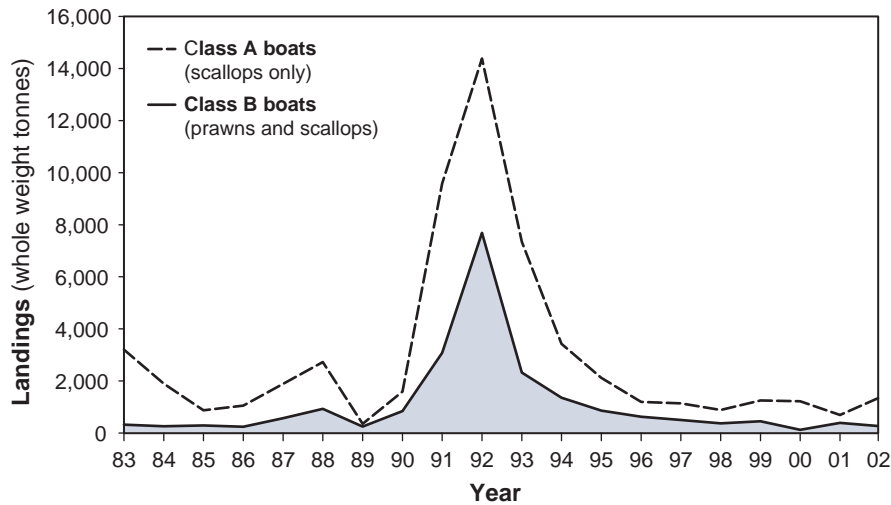
The acceptable catch range is approximately 1,250–3,000 t whole weight, based on catches over the five-year period

1995–1999. This period excludes the high catches of the early 1990s (Shark Bay Scallop Figure 1), apparently created by an unprecedented three years of El Niño conditions. The projected catch for next season, based on a pre-season survey, is at the middle to lower end of this acceptable catch range.

EXTERNAL FACTORS

A relationship exists between sea level (at Fremantle) and the recruitment of scallops in Shark Bay. Generally, high sea levels (corresponding to strong Leeuwin Current) correlate with poor recruitment. The 1999–2002 recruitment was low due to poor environmental conditions. There is a need to examine the mechanisms that control recruitment success in greater detail in future projects in order to explain more of the inter-annual variation that occurs. The recovery of this fishery to average catch levels (similar to those before the peak years of 1991–1993) is expected if environmental conditions (including the El Niño/Southern Oscillation index) become favourable.

Shark Bay Annual Scallop Catch



SHARK BAY SCALLOP FIGURE 1

Annual scallop landings by fleet for the Shark Bay Scallop Managed Fishery, 1983–2002.

