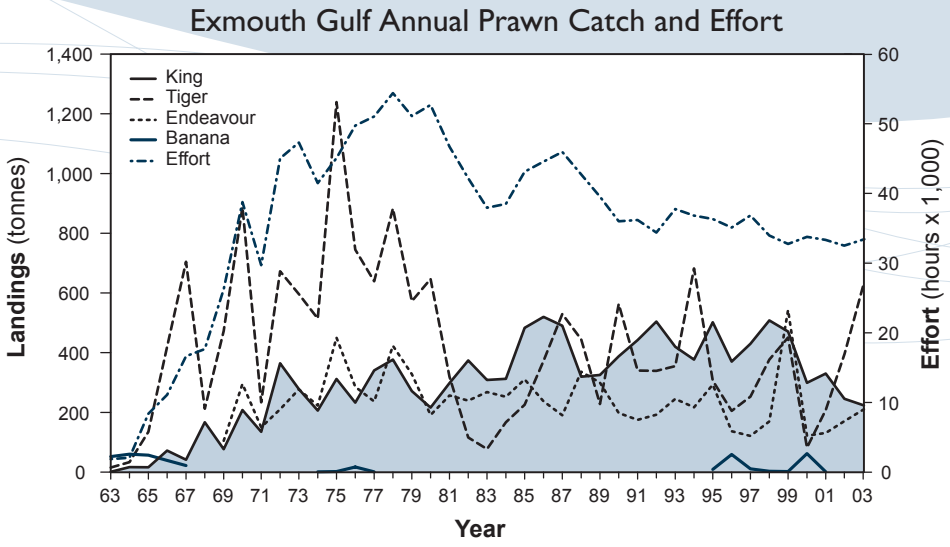


EXMOUTH GULF PRAWN FIGURE 2

Exmouth Gulf Prawn Managed Fishery annual landings and effort, 1963–2003.

Shark Bay Scallop Managed Fishery Status Report

Prepared by E. Sporer and M. Kangas, with management input by M. Holtz

FISHERY DESCRIPTION

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 using otter trawl by boats licensed to take only scallops (14 Class A licences) and boats that also fish for prawns in the Shark Bay Prawn Managed Fishery (27 Class B licences).

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).

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

Boundaries

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.

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).

Management arrangements

Management of the fishery is based on input controls which include limited entry, season and area closures, gear controls and crew limits.

Management 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 season commenced on 20 May in Denham Sound, which remained open for six days with 12 Class A scallop boats fishing the area. The opening of the extended nursery area for prawns on 21 May meant that 11 Class B scallop boats fished the Denham Sound area for one day only and then left to fish in the ENA. Fishing for scallops on the main Shark Bay scallop grounds commenced on 26 May; however, the Class A boats had ceased fishing after approximately 24 hours. Eleven of the 12 dedicated scallop boats then left Shark Bay to fish for scallops in the Abrolhos Islands and Mid West Trawl Managed Fishery, where the catch rates of scallops were significantly higher during this season. The one remaining Class A scallop boat ceased fishing for scallops by 10 June because of low catch rates and poor

quality of scallop meat. Denham Sound was re-opened on 1 August but no Class A scallop boat fished, and the Shark Bay scallop season officially closed on 1 November in conjunction with the closure of the prawn season.

The vessel monitoring system is 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).

Research summary

Research for monitoring the status of the scallop stock in Shark Bay is based on detailed research log book 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 three-year project with industry to review the impact of trawling on non-target species, funded by the FRDC, is due for completion in late 2004. A further FRDC-funded project is examining the biodiversity of bycatch in trawled and untrawled areas of Shark Bay. A project with Edith Cowan University has been examining the spatial distribution of abundance of the recruitment survey and the spatial distribution of catch during the fishing season.

RETAINED SPECIES

Commercial production (season 2003): 775 tonnes whole weight

Landings

The total scallop landings for this fishery, for both A and B Class scallop boats, were 775 t whole weight, of which 505 t were taken from the Red Cliff and North West Peron grounds and the remaining 270 t from Denham Sound during the six days of fishing in May. This catch was below both the projected catch of 1,200–1,900 t and the acceptable catch range (1,250–3,000 t), partly due to the low level of fishing effort (see below). The Class A fleet (12 boats fished in 2003) caught 428 t or 55% of the total catch, with the Class B fleet taking 348 t (Shark Bay Scallop Figure 1). Very low quantities of by-product, less than 1 tonne of bugs (*Thenus orientalis*), were recorded for the Class A fleet during 2003.

Fishing effort/access level

The total effort recorded by the Class A boats in 2003 was 1,598 hours, an 80% decline on 2002 and the lowest level of effort recorded in this fishery. This was due to boats preferring to fish the Abrolhos Islands, which recorded their best scallop catch ever in 2003.

Catch rate

A mean catch per unit effort of 267.5 kg/hr (whole weight) was recorded for the Class A fleet in 2003 compared to an average of 113 kg/hr for the previous ten years. This good catch rate was obtained as a result of the decision to cease fishing after a very limited fishing period, with most boats leaving to fish in the Abrolhos Islands and Mid West Trawl. The high catch rate indicates that a higher catch could have been achieved if more effort was applied.

Recreational component: Nil

STOCK ASSESSMENT

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, as measured using the data from the November 2002 scallop survey, was similar to that observed in 2001 for the main fishing grounds and slightly higher in Denham Sound. 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, allowing 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 relatively low in 2003, it is considered adequate to provide recruitment in the normal range for 2004.

Projected catch next season (2004): 1,870–2,800 tonnes whole weight

The catch projection for the 2004 season is based on the 2003 survey results. On the main fishing ground (North West Peron and Red Cliff) in Shark Bay, observed recruitment was higher than the previous year and there was a higher abundance of residuals due to the low fishing effort in 2003. This results in a catch range forecast for this area of approximately 1,430–2,140 t whole weight. This assumes that effort will return to the levels prior to 2003. Higher recruitment and residuals were observed in the Denham Sound area, giving a predicted catch range of 440– 660 t whole weight. The catch projection for the fishery as a whole is therefore in the range 1,870–2,800 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 2003, grids were installed into all nets to minimise the capture of large animals on Class A scallop boats. The risk to these animals is negligible now that grids have been fully implemented. No turtles were recorded as captured in the scallop fishery in 2003 by Class A boats.

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 2003, 4% 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.

SOCIAL EFFECTS

The estimated employment for the year 2003 was approximately 160 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 2003: $2.6 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 wholesale price across all grades of scallops was $3.36/kg whole weight or $16.80/kg meat weight. Meat weight is 20% of whole weight.

FISHERY GOVERNANCE

Acceptable catch range for next season: 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 of this acceptable catch range.

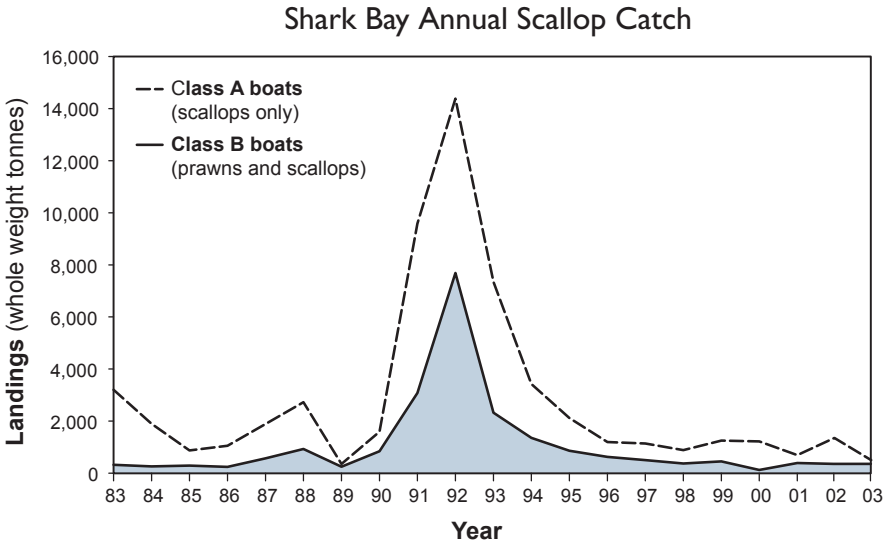
New management initiatives (2003/04)

A review of the season opening process was made for 2004, with selected areas to be opened to fishing earlier than the time indicated from recruit/residual scallop abundance indices. This new initiative will maximise the size and therefore value of scallop meat. As a counter-measure to fishing earlier, all fishing for scallops is to cease at a conservative catch rate level in these areas for the spawning period, thereby providing adequate spawning stock protection.

Following discussions between the Department, the trawl industry and the Shark Bay community, modifications to the southern boundary of trawl fishing in Denham Sound have been implemented for 2004 to reduce its impact on juvenile pink snapper recruitment and the recreational snapper fishery.

EXTERNAL FACTORS

A relationship exists between sea level (at Fremantle) and the recruitment of scallops in Shark Bay, particularly in the Red Cliff area. Generally, high sea levels (corresponding to strong Leeuwin Current) correlate with poor recruitment. The 2004 recruitment was better due to a weak Leeuwin Current. There is a need to examine the mechanisms that control recruitment success in greater detail in future 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 SCALLOP FIGURE 1

Annual scallop landings by fleet for the Shark Bay Scallop Managed Fishery, 1983–2003.