

South Coast rock lobster



Stock status	Unknown	Abundant	Optimal	Depleted	Heavily depleted
Fishing pressure	Unknown	Light	Optimal	Heavy	

Introduction

South Coast rock lobsters *Palinurus gilchristi* are endemic to the southern coast of South Africa, where they occur on rocky substrata at depths of 50–200 m. The fishery operates between East London and Cape Point and up to 250 km offshore along the outer edge of the Agulhas Bank, and fishing gear is restricted to longlines with traps. It is the second largest rock lobster fishery in South Africa, and is capital intensive, requiring specialised equipment and large ocean-going vessels. For this reason, it is restricted to a commercial sector.

Products (be it frozen tails, whole or live lobster) are exported to the USA, Europe and the Far East. Sales are affected by seasonal overseas market trends and competition from other lobster-producing countries. High prices on international markets and the declining Rand to Dollar exchange rate make the sector lucrative. Prices for commodities fluctuate and the sales prices in the USA in 2007/08 were the equivalent of R350–R400 per kg tail mass.

Longline trap-fishing is labour intensive and as such each boat requires approximately 30 officers and crew. The total sea-going complement of the fleet is about 300, nearly all previously disadvantaged individuals. In addition to sea-going personnel, the sector employs approximately 100 land-based factory (processing) and administrative personnel, mostly previously disadvantaged people. The total export value in 2007/2008 was approximately R150 million.

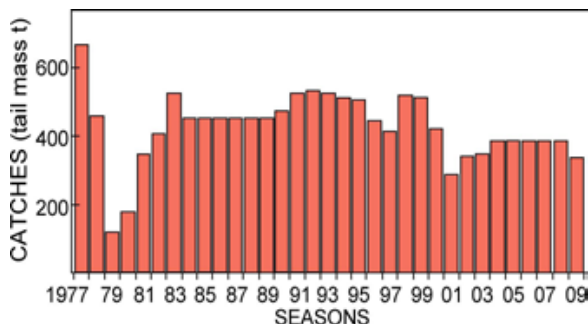


Figure 35: Annual catches of South Coast rock lobster, 1977–2009

History and management

The South Coast rock lobster was first described in 1900 and was recorded occasionally in trawler catches of soles taken at a depth of about 70 m. The commercial fishery only commenced in 1974, after the discovery of concentrations of rock lobsters on rocky ground at a depth of around 110 m off Port Elizabeth. Numerous local and foreign fishing vessels converged on the fishing grounds, giving rise to the expansion of the fishery. However, foreign fishing vessels had to withdraw from the fishery in 1976, when South Coast rock lobster was recognised as a species occurring wholly within South African waters. From 1977 onwards, the sector operated solely as a local commercial fishery.

The fishery has a management history stretching back to 1974. The fishery was initially regulated only by limiting the number of traps permitted per vessel. Catches and catch rates declined significantly between 1977 and 1979 (Figure 35). The introduction of management measures such as reduction of effort and catches during the early 1980s resulted in resource recovery (Figures 35, 36). An annual TAC was introduced in 1984, based on the performance of the fishery in the previous years. The TAC and limited entry stabilised the sector until the 1993/1994 season (Figure 35), and a more rigorous procedure for stock assessment was developed in 1994.

The fishing season for South Coast rock lobster is year-round, extending from 1 October to 30 September of the follow-

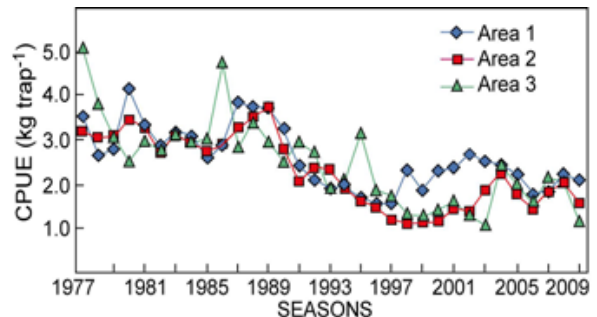


Figure 36: Trend in CPUE of South Coast rock lobster by area, 1977–2009

Table 11: South Coast rock lobster historical records of TAC, TAE and standardised CPUE by area

Season	TAC (tail mass,t)	TAE (Allocated seadays)	Standardised CPUE (kg trap ⁻¹)		
			Area 1	Area 2	Area 3
1977/1978			3.527	3.189	5.100
1978/1979			2.640	3.040	3.798
1979/1980			2.780	3.084	3.019
1980/1981			4.158	3.435	2.493
1981/1982			3.286	3.269	2.991
1982/1983			2.849	2.660	2.805
1983/1984			3.185	3.099	3.156
1984/1985	450		3.092	3.001	2.901
1985/1986	450		2.548	2.708	3.001
1986/1987	450		2.887	2.865	4.737
1987/1988	452		3.835	3.229	2.805
1988/1989	452		3.700	3.492	3.377
1989/1990	452		3.660	3.695	2.928
1990/1991	477		3.211	2.753	2.469
1991/1992	477		2.368	2.016	2.915
1992/1993	477		2.053	2.318	2.661
1993/1994	477		1.862	2.279	1.814
1994/1995	452		1.901	1.837	2.030
1995/1996	427		1.640	1.584	3.106
1996/1997	415		1.507	1.406	1.806
1997/1998	402		1.474	1.114	1.662
1998/1999	402		2.258	1.049	1.241
1999/2000	377		1.800	1.055	1.199
2000/2001	365	2 339	2.232	1.066	1.336
2001/2002	340	1 922	2.295	1.377	1.515
2002/2003	340	2 146	2.586	1.302	1.221
2003/2004	350	2 038	2.431	1.783	0.976
2004/2005	382	2 089	2.349	2.169	2.316
2005/2006	382	2 089	2.148	1.668	1.898
2006/2007	382	2 089	1.685	1.336	1.468
2007/2008	382	2 089	1.752	1.755	2.064
2008/2009	363	2 675	2.129	1.940	1.948
2009/2010	345	2 882	1.993	1.468	1.062

Area 1: Kei River - Port Alfred

Area 2: Port Alfred - Jeffrey's Bay

Area 3: Jeffrey's Bay - Mossel Bay

ing year. The management strategy is a combination of TAC and TAE. The TAC limits the total catch and is based on an annual resource assessment, whereas the TAE is measured in fishing days allocated to each vessel. A vessel may fish until its fishing days expire or its quota is filled, whichever occurs first. The number of days spent at sea by each vessel is monitored. Catches may only be off-loaded in the presence of Marine Control Officers, and are weighed at designated off-loading points. Skippers must, at the conclusion of each trip, provide DAFF with accurate daily catch rate statistics.

The scientific recommendations for catch limits are based on an OMP which was introduced in 2008 and modified ('retuned') in 2010. The objectives of the OMP are to keep the interannual TAC change restricted to 5% and to increase the spawning biomass of the resource by 20% over the next 20 years.

Research and monitoring

The stock assessment model used for South Coast rock lobster (an age-structured production model) is based, *inter*

alia, on size and age composition of the catch, somatic growth rates, and population size estimates. A tagging programme supplies the critical growth and population size estimates, as well as estimates of migration. Lobsters are tagged by trained observers during commercial fishing operations. Recaptured lobsters are returned by commercial fishers, with details of the date and location of recapture. Tagging covers as wide an area and range of size classes as possible.

Scientific observers are deployed aboard commercial South Coast rock lobster fishing vessels. These observers primarily collect data relating to catch composition, take biological measurements (length, sex and reproductive state), estimate catch and effort, report on gear used, observe fishing practices such as discarding, dumping and bycatch proportions and also record the areas where fishing takes place. The data are utilised in the annual stock assessment used to determine the TAC.

Commercial CPUE data are captured from landing slips. These provide input data (CPUE, landings) for TAC and TAE management.

New research planned for this resource aims to use baited

'video fishing' techniques to offer a standardised, non-extractive method for estimating relative abundance and behaviour of South Coast rock lobster. Very precise and accurate length and biomass estimates will also be recorded by stereo-camera pairs. The baited underwater video camera traps will be used to monitor the effect that bycatch species have on catch rates, the fate of bait and other bycatch and discards, and to help measure metabolic rates, swimming speed and foraging behaviour of South Coast rock lobsters.

Collaborative research between DAFF and the South Coast Rock Lobster Fishing Industry Association aims to examine the spatial and temporal distribution of berried females throughout the known distribution range of the lobsters and to investigate the possibility for introduction of a fishery-independent survey for this resource.

The effect of benthic environmental factors on daily catches of the lobster has not been investigated to date. However, new research is directed at establishing these relationships.

Current status

In 1977–1979/1980, fishing effort was above sustainable levels, and catches declined rapidly to 122 t tail mass (Figure 35). The decline in catches was partly as a result of the withdrawal of the foreign vessels from South African waters in 1976 as well as overfishing. By the end of the 1970s, several of the remaining local fishing vessels were forced out of the fishery by low catch rates. Gradual recoveries of catches between 1980 and 1984 and of catch rates between 1980 and 1982 were accompanied by a resurgence of interest in the fishery by fishers who had previously withdrawn. In response to the possibility of overfishing, a TAC was introduced and quotas were allocated to companies that were active in the fishery. This measure effectively limited the number of participants in the fishery.

The TAC initially restricted the total catches to 450 t tail mass (970 t whole mass) per year (Table 11); fluctuations in the TAC up to 1994 included the addition of 2 t (tail mass) for research purposes in the 1988/1989 fishing season, and the addition of 25 t in 1990/1991. The latter increase was justified by the inclusion of a previously unfished area off the Ciskei coast after 1990. The TAC remained stable at 477 t up to the 1993/1994

fishing season (Table 11).

Resource assessments introduced in 1993–1994 indicated that an annual catch of 477 t could not be sustained. Consequently, a programme of annual TAC reductions was initiated in 1994–1995, reducing the TAC in steps of 25 t per year. In spite of the steady reduction in the TAC (from 477 t in 1994–1995 to 365 t in 2000–2001), the 2001 assessment of the resource indicated that the reductions had failed to impact significantly on the trend of declining abundance. The 2001 CPUE-index indicated that the abundance of this resource declined by 65% over the 12 years between 1988 and 2000 (Table 11, Figure 36). The exploitable biomass is currently around 27% of pristine, spawner biomass is around 31% of pristine and maximum sustainable yield is approximately 359–440 t tail mass. The TAC declined from 382 t in 2007–2008 to 345 t in 2009–2010 (the maximum 5% reduction allowed by the OMP for two consecutive years) (Figure 34). The reasons for the decrease are because of the slight net downward trend in CPUE over the past five years (Figure 35) when a weighted average is taken over the three areas, and because the average CPUE over the past three years is less than the average over 2003–2005.

Further reading

- Groeneveld JC. 1997. Growth of spiny lobster *Palinurus gilchristi* (Decapoda: Palinuridae) off South Africa. *South African Journal of Marine Science* 18: 19–29.
- Groeneveld JC. 2003. Under-reporting of catches of South Coast rock lobster *Palinurus gilchristi*, with implications for the assessment and management of the fishery. *South African Journal of Marine Science* 25: 407–411.
- Groeneveld JC, Branch GM. 2002. Long-distance migration of South African deep-water rock lobster *Palinurus gilchristi*. *Marine Ecology Progress Series* 232: 225–238.
- Groeneveld JC, Mellville-Smith R. 1994. Size at onset of sexual maturity in the South Coast rock lobster *Palinurus gilchristi* (Decapoda: Palinuridae). *South African Journal of Marine Science* 14: 219–223.
- Groeneveld JC, Rossouw GJ. 1995. Breeding period and size in the South Coast rock lobster, *Palinurus gilchristi* (Decapoda: Palinuridae). *South African Journal of Marine Science* 15: 17–23.
- Pollock DE, Augustyn CJ. 1982. Biology of the rock lobster *Palinurus gilchristi* with notes on the South African fishery. *Fisheries Bulletin of South Africa* 16: 57–73.

