

## Summary of South Coast rock lobster (*Palinurus gilchristi*) fishery

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### Biology

- 1) A temperate water (12- 18 °C) endemic species occurring on rocky substrata at 50 - 200 m depth along the southern coast of South Africa, between Cape Point and East London (Figure 1).
- 2) A slow-growing species showing spatial trends in growth rates. Annual CL-increments of a 70 mm male are estimated at 1.5 mm at Port Alfred and 3.5 mm from Cape Agulhas to Algoa Bay. von Bertalanffy growth parameters  $L_{\infty}$  and  $\kappa$  are estimated from linear regressions of annual growth increments, obtained from a long-term tag-recapture database.
- 3) Adult *P. gilchristi* moult once per year, mainly in November to February. Juveniles may moult more often, and the moulting season of smaller individuals (< 70 mm CL) is earlier than for larger adults, mainly from September to November.
- 4) Females reach sexual maturity at 59 – 62 mm CL at Port Alfred and 64 – 71 mm CL from Cape Agulhas to Algoa Bay.
- 5) The breeding period is indistinct; at least 20% of females in catches are egg-bearing, independent of month. Peak breeding periods are July-October (60-85% of females bearing eggs) and March (50% of large females egg-bearing).

## History and management of the fishery

- 1) Commercial exploitation by local and foreign fishing vessels began in 1974, but in 1976 foreign vessels withdrew when the species was recognized as endemic to the South African continental shelf. The south coast rock lobster support the second largest lobster fishery in South Africa. The fishery operates in deep water (50-200m) off the South Coast. The fishery is capital-intensive, requiring specialised equipment and large ocean-going vessels – for this reason it is restricted to a commercial sector.
- 2) The fishing season is year-round from 1 October to 30 September the following year.
- 3) Fishing gear is limited to plastic top-entry barrel-shaped traps set in strings of 100 - 200 traps from large fishing vessels (30 – 60 m length).
- 4) 1974 - 1979/80: Fishing effort and catches increased above sustainable levels followed by a near collapse of the resource.
- 5) 1980/81 - 1983/84: Effort and catches were reduced and the resource recovered somewhat (Figure 2).
- 6) 1984/85 - 1999/2000: TAC management strategy invoked in 1984. Effort gradually increases as catch rates decline by 5 - 10% per year. The TAC is always caught in full. After 1993/94, managers reduce the TAC in steps of 10 – 25 tons per annum. A major debate during the last part of that period was whether catch rate reductions reflected a decline in abundance or an effort saturation effect.
- 7) A change in fishing strategy during the 1990s included an increase in numbers of traps set per vessel and an increase in trap soak-times.
- 8) 2000/01: The demise of Hout Bay Fishing, a company responsible for large scale under-reporting during the 1990s; catch statistics were adjusted to account for estimates of the illegal catches.. The number of vessels in the fishery was reduced from 13 to 9 and a combined TAC and TAE management strategy was implemented. The TAE was implemented primarily to prevent future under-reporting.
- 9) 2000/01 - 2004/05: A reduced TAC and lower fishing effort resulted in five (incl. 2004/05) consecutive years of increases in catch rates.
- 10) Figure 1 illustrates the three sub-areas which are A1E, A1W and A2+3. The decision to move from a one stock assessment model to one that identifies three stocks followed the recommendations of the International Workshop in July 2007. It was evident from a close examination of the data (CPUE, CAL and tag-recapture data) that there were substantial differences in certain regions. A clustering analysis of south coast rock lobster fishing grid-blocks based on the similarity of first the CPUE trend and then the tag-recapture data were conducted.

These analyses led to the definition of the three sub-areas (A1E, A1W and A2+3) shown in Figure 1.

- 11) An OMP for recommending the TAC for south coast rock lobster was first developed and implemented in 2008. A number of further OMPs have been developed since for the management of this resource. In 2010, following updated assessments of the resource, and two more years of monitoring data, a retuned version of OMP-2008 (“OMP-2008 retuned”) was agreed and used to provide TAC recommendations for the 2010 and 2011 seasons.
- 12) The assessment model was updated in 2013 and incorporated a number of recommendations made at the December 2012 IWS. These updates were incorporated into the development of a new OMP which was completed in 2014 – (“OMP-2014”). The assessment model was based on three sub-areas (see Figure 1), but recruitment arising from the total spawning biomass.
- 13) The initial OMPs were “slope based” with CPUE as input, whilst the current OMP-2014 is a “target-based” OMP also based on CPUE.
- 14) OMP-2014 has a spawning biomass recovery target of 30% (median terms) over the 20 year period from 2006 to 2025 (i.e.  $B_{sp}(2025/2006)=1.3$ ). The TAC for the first season on implementation (2014) was to increase by 5% and thereafter the OMP rules would be used to set the TAC. A maximum inter-annual TAC change is set at 5%.
- 15) A review of the methods used to calculate the effort limitation in terms of number of sea day (TAE) was undertaken in 2008. Effort for these control purposes is now measured in terms of “fishing days”. The method for determining the total number of such fishing days permitted is based on the calculation of a base catch rate for the fishery each year.

### **Data available**

Data for the south coast rock lobster fishery are analysed at a sub-area level, with three sub-areas being identified. The data available for use in the stock assessment OM are:

- Catches – collected at a sub-area level
- CPUE: GLM analyses are run for each of the three sub-areas
- Catch-at-length data from the fishery are available for each sub-area and for males and females separately.

Figure 2 shows the total catches for the resource as well as the GLM CPUE trends for each of the three sub-areas.

Figure 1: The fishing grounds showing the discrete fishing sub-areas.

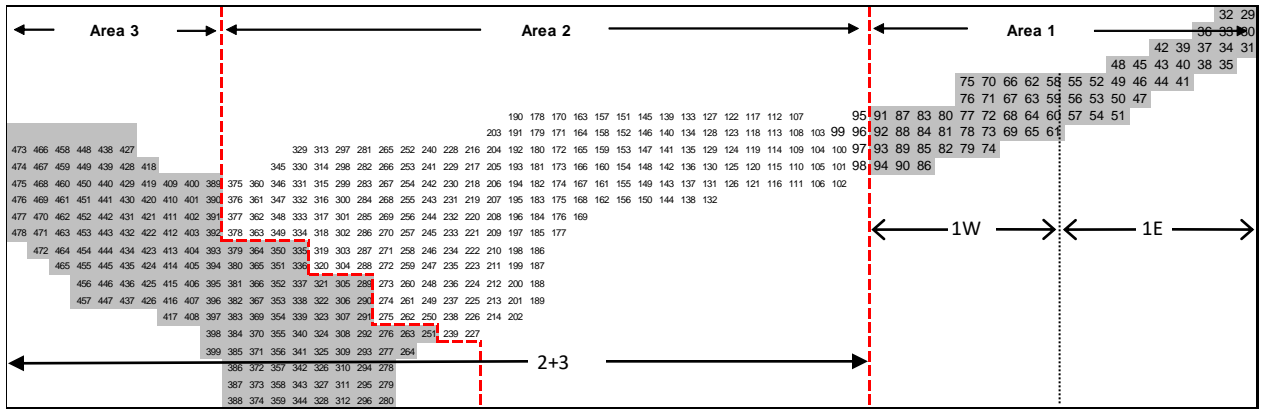


Figure 2: The total catches (top) and CPUE (for each fishing sub-area – bottom plot) of the South Coast rock lobster fishery.

