

West Coast Rock Lobster

Description of sector

History of the fishery:

The commercial harvesting of West Coast rock lobster commenced in the late 1800s, and peaked in the early 1950s, yielding an annual catch of 18 000 tons (Figure 1). Lobsters were predominantly caught with hoop nets prior to the 1960s and from 1965 more efficient traps and motorized deck boats were also used. Catches declined by almost half to 10 000 tons during the 1960s and continued to decline sharply to around 2 000 tons in recent years. The decline in catches is believed to be due to a combination of changes in fishing methods and efficiency, changes in management measures, over-exploitation, environmental changes, and reduced growth rates.

Catch history

A number of management measures have been put in place during the history of the fishery. A minimum size limit was introduced in 1933 (89 mm carapace length), which protected a large proportion of the slower-growing female component of the population, and a tail-mass production quota was imposed in 1946. However, catches declined sharply during the 1950s, particularly in the northern areas, in response to over-fishing. A minimum legal size limit of 76 mm carapace length was implemented in 1959, after which the catch increased to around 10 000 tons until the mid 1960s. However, catches declined again from 1966 and continued to decline during the 1970s when a minimum legal size limit of 89 mm carapace length was implemented. In 1979 the tail-mass production quota was replaced by a whole lobster quota, which led to the introduction of the Total Allowable Catch management system in the early 1980s.

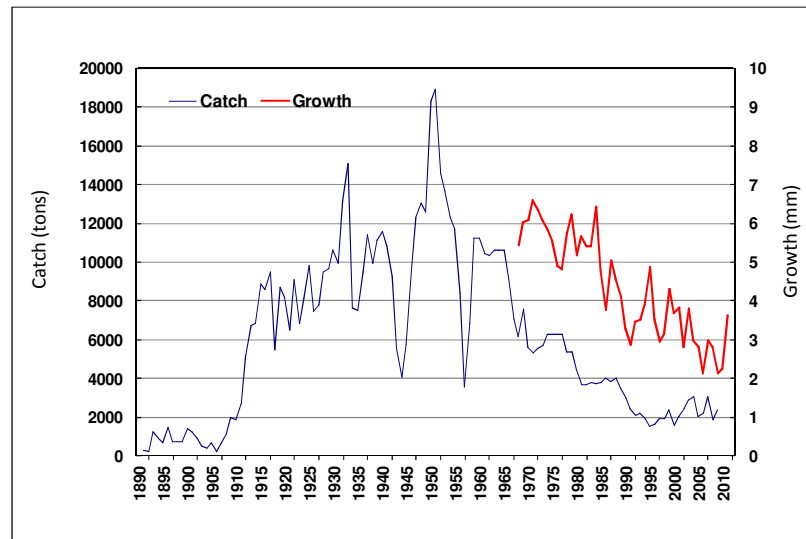


Figure 1. Historical catches of West Coast rock lobster, with the associated trend in growth indicated for the period post-1960. Replace with updated figure supplied in file: Updated Figs and Tables

Biological characteristics of main commercial species

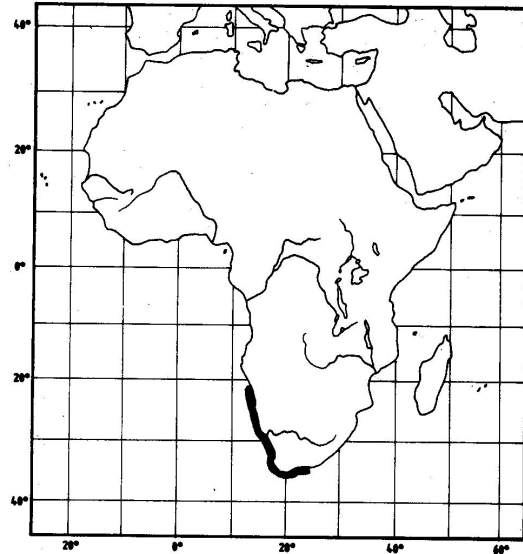
Geographical Distribution:

Restricted to southern Africa from Cape Cross,

Namibia around the Cape of Good Hope to Algoa Bay, Eastern Cape.

Habitat and Biology:

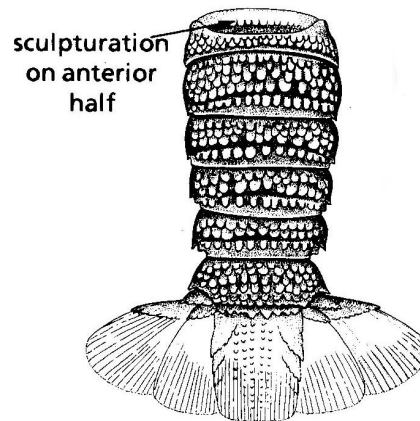
The bulk of the population occurs in coastal waters at depths between 0 and 50 m, but individuals have been caught at depths up to 200 m. Males moult between September and December. Females moult in April or May, after which copulation takes place. Ovigerous females are found from May to October.



Many people believe that rock lobsters are scavengers. This is only partly true. Although lobsters are attracted to fish bait or dead organisms, they feed almost entirely on mussels and a variety of other invertebrates in their natural environment.

Features unique to species:

The large spines on the carapace are narrow, often 3 to 4 times as long as wide and not very different from the small spines. The sculpturation of the abdomen is denser, with relatively smaller squamae and a narrower smooth anterior area. Squamiform sculpturation occurs both anteriorly and posteriorly of the transverse groove on the anterior half of the first abdominal somite.



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Commercial fisheries

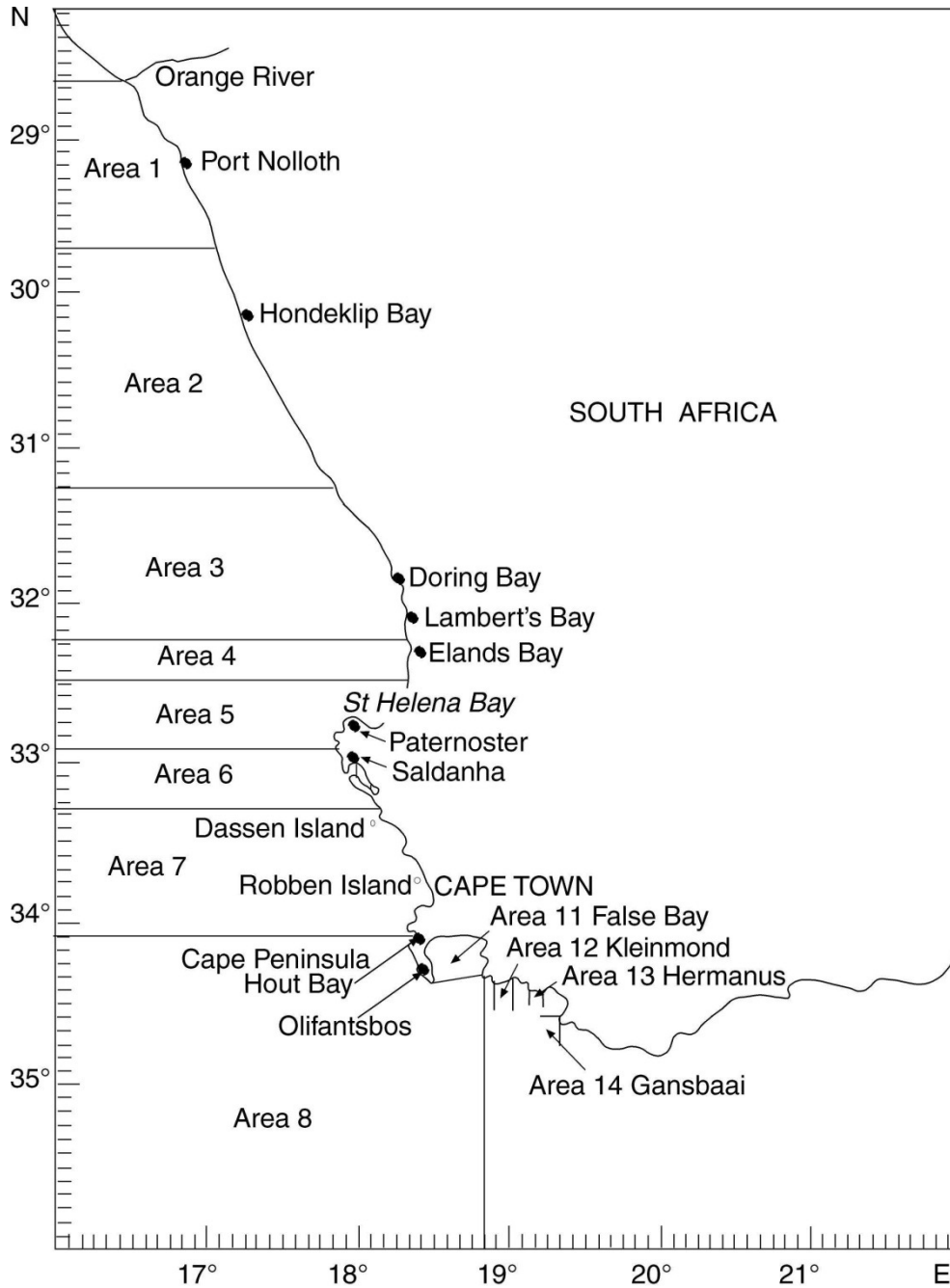


Figure 2: West Coast rock lobster fishing zones and areas. The five super-areas are A1-2 corresponding to Zone A, A3-4 to Zone B, A5-6 to Zone C, A7 being the northernmost Area within Zone D, and A8+ comprising Area 8 of Zone D in conjunction with Zone F.

Monitoring

Research and monitoring of West Coast rock lobster continues to provide and improve essential data inputs for assessing the sustainability of the stock, its management and setting annual catch limits for the fishery. Indices of abundance such as catch-per-unit-effort (CPUE) derived from the fisheries-independent monitoring survey and commercial catch statistics, annual assessments of somatic growth rate, and estimates of recreational and Interim Relief catch, are used as input data to the Operational Management Procedure assessment model.

Catch monitors record fishing effort and catch landed by commercial near-shore and offshore right holders and Interim Relief fishers on landing slips after each fishing trip. Recreational catch is estimated from catch and fishing effort statistics reported during an annual recreational telephonic survey.

Growth of West Coast rock lobsters is monitored by tagging pre-moult male lobsters (>75 mm carapace length) along the West Coast from July to November. Growth increment and release-recapture times are incorporated into a 'Moult Probability Growth Model' to estimate the growth per moult cycle.

Information on sex, reproductive state, size frequency and by-catch are also recorded during fisheries independent monitoring surveys and ship-based observer monitoring surveys onboard commercial vessels to derive abundance indices of sub-adult, legal-sized male and female (>75 mm carapace length) lobsters which are used as inputs into the size-structured assessment model. This information together with environmental data is also used in providing ongoing scientific advice for management of the resource. Historical fisheries-independent survey data and analysis methods have been recently rechecked, and changes in weather conditions have been identified as a source of variation in catch per unit effort. The associated effects of changes in bottom oxygen, temperature and current speed on catch rates is also currently being investigated.

The Operational Management Procedure assessment model provides projections of future biomass under the assumption that future recruitment and growth will follow trends similar to those observed in the past. New research projects are being developed to provide indices of future recruitment, growth and catch to refine Operational Management Procedure projections of future biomass. Studies on the recruitment of post-larval and juvenile lobster have been initiated to establish a long-term index of pre-recruit abundance that could be used in predicting future recruitment and catch (6-7 years in advance). The function of internal energy sources in regulating growth and reproduction in females is under investigation, to formulate energy-growth-reproduction conversion factors for predicting future trends in growth and reproductive potential.

Management Strategy

The biomass of male West Coast Rock Lobster above the 75 mm CL minimum size limit is currently at 3.5% of pristine levels ($B^{75m}/K=0.035$) The OMP adopted in 2011 is empirically based. This means that it uses data collected from the fishery directly for calculating the TAC. No population model is fitted to input data as for previous OMPs. As in the past four indices are used as input data to the OMP in order

to set the TAC – trap CPUE, hoop net CPUE, Fisheries Independent Monitoring Survey (FIMS) and somatic growth.

In 2010 hoopnet CPUE decreased in Super Areas 1+2 and 3+4 but increase in Super Areas 5+6 and 8⁺ while trap CPUE increased in Super Areas 7 and 8⁺. FIMS CPUE declined in Super Areas 5+6, 7 and 8⁺ but increased sharply in Super Area 3+4 indicating the possible start of a recovery following the walkout events of the 1990s. Growth rates in Super Areas 1+2, 3+4, 5+6, and 8⁺ showed a continued decline while Super Area 7 was the only area to show an increase in somatic growth rate in 2010. Critical values are the values below which an Exceptional Circumstances rule in the OMP would be invoked. This rule ensures that immediate and substantial reductions in TAC can be invoked to ensure sustainable utilization in the event of very poor resource performance.

Catch estimates reported from recent telephone surveys have indicated that the annual recreational catch has not decreased substantially since 2000, but rather remained in the vicinity of its estimated level for earlier years of some 300 tons. However, over recent years there are indications of some catch decrease with catches in 2010 estimated at 107 tons. This is in line with the intended decrease in recreational catch brought about by a severe reduction in recreational season length. A thorough analysis has been conducted on the catch returns (details of catches made) received from fishers fishing under the Interim Relief provisions over the last few years. The estimated catch of the Interim Relief sector in 2010 was about 270 tons..

The biomass of lobsters above the legal minimum size is currently at 3.5% of pristine levels. If the recovery target of 35% is met the resource biomass will increase to 4.8% of pristine by 2021.

Every effort to reduce illegal harvesting, including substantially improved compliance with permit conditions for reporting of catches should be instituted to ensure that sound resource management and resource rebuilding is not compromised.

Current Research

- Biochemical and physiological indicators for growth and reproduction of South African rock lobsters
- Separation of stocks of WCRL by means of genetic methods
- Impact of ocean acidification on growth and reproduction of WCRL.

Publications on beneficiation (chronological order)