Overview of the South African west coast rock lobster, hake and pelagic resources and fisheries

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WEST COAST ROCK LOBSTER

- The commercial fishery for *Jasus lalandii*, the South African West Coast rock lobster, began in the late 1800s and at its peak in the early 1950s yielded an annual catch of 17 000t. Although this annual catch has dropped to only some 2000t over recent years, the fishery remains South Africa's third most valuable in terms of landed value. Figure 1 illustrates the historic catch trend.
- The primary reason for the low TAC in recent years has been a marked drop in somatic growth rate that occurred at the end of the 1980s.
- A key problem in formulating TAC recommendations with longer-term objectives in mind, has been uncertainties about likely future trends in particularly somatic growth and recruitment.
- To address this problem, an "Operational Management Procedure" (OMP) was adopted in 1997 and has twice been re-evaluated and modified (2000 and 2003) in the light of further data and changing perceptions of resource dynamics.
- Current levels of harvestable biomass are estimated to be low compared to pristine levels – see Figure 2.
- The resource has been managed as a single stock until now. The stock is currently being assessed on an area-disaggregated basis (divided into five "super-areas"), and a new OMP that takes account of this disaggregation is currently being developed.

HAKE

- The South African hake resource consists of two species, the deep-water hake *Merluccius paradoxus* and the shallow-water hake *M. capensis*. The commercial fishery for this resource started after the turn of the 19th century and at its peak in the early 1970s yielded about 300 000t per year. Thereafter, annual catches fell substantially to some 150 000t. Decreased foreign activity with the introduction of a 200 nm EEZ accounted for most of this drop. Figure 3 shows the catch history in this fishery.
- The current hake fishery is the most important fishing industry in South Africa in terms of both revenue and local employment.
- The demersal hake fishery is split into four sub-sectors (according to factors such as species, geographical area, method, gear and vessel size): deep-sea

trawl, inshore trawl and more recently, hake-directed longline and hake-directed handline.

- Resource abundance trends are estimated by use of a species-disaggregated, coast-combined age-structure production model (ASPM). Estimated trends in spawning biomass are shown in Figure 4. Currently, the *M. paradoxus* resource is estimated to be below 10% of pre-exploitation levels, while *M. capensis* is estimated to be at about 50% of pristine. Both species show a clear downward trend over the last decade. This trend is also reflected in the CPUE series. The main reason for this decrease is below average recruitment for both species over the 1990s – see Figure 5.

Since 1990, the primary basis for scientific recommendations for TAC levels has been the OMP approach. Several OMPs have been developed for this resource, with the most recent one adopted at the end of 2006.

PELAGICS – ANCHOVY AND SARDINE

- The commercial fishery for *Sardinops sagax*, the South African sardine commenced in 1943 and landings rose dramatically during the late 1950s and early 1960s, peaking at 410 000t in 1962 and declining rapidly thereafter. The resource reached peak levels once again at the turn of the century resulting in an increase in TACs and landings (Figure 6a).
- The commercial fishery for *Engraulis encrasicolus*, the South African anchovy commenced in the early 1960s following the drastic decline in sardine catches. Anchovy catches increased steadily, peaking around 600 000t in 1987 and 1988. Landings decreased to a minimum of 40 000t in 1996, and then increased sharply to about 287 000t in 2001 (Figure 6b).
- The pelagic fishery including sardine and anchovy and on a smaller scale round herring (red eye) and horse mackerel is South Africa's second most valuable fishery in terms of landed value.
- A key problem in formulating TAC recommendations with longer-term objectives in mind, has been uncertainties about likely future trends for these short-lived species, in particular those of recruitment on which the anchovy fishery, in particular, relies.
- The sardine and anchovy purse-seine fishery is managed using a joint OMP. The first joint OMP for sardine and anchovy was implemented in 1994 and has been revised three times (in 1999, 2002 and 2004) in the light of further data and changing perceptions of resource dynamics. The primary inputs into the formulae for the TACs are the results of hydro-acoustic surveys of abundance carried out twice each year: for recruitment in May, and for the whole resource in November.
- The necessity for joint management of sardine and anchovy is a result of the operational interaction between the two fisheries, which arises because it is not possible to catch anchovy without an accompanying bycatch of juvenile sardine.
- The most recent full assessments of sardine and anchovy were carried out in 2004 when both resources were at peak levels. Hydro-acoustic survey observations have since indicated a decline in the sardine resource.

The assessments of these two resources will be updated this year, taking area-disaggregation into account to some extent and possibly considering a multi-stock hypothesis for sardine. The joint OMP will then be revised to take this latest information into account.

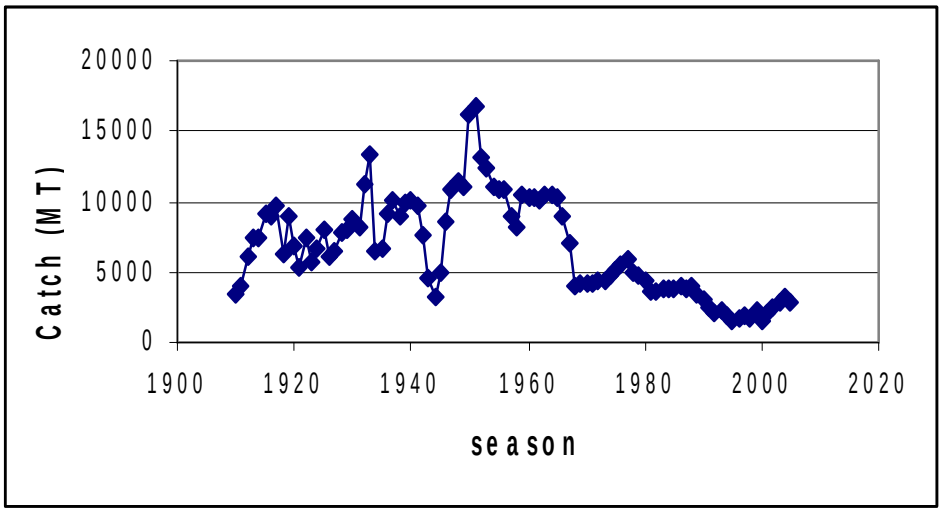

Figure 1: Historic annual commercial catch record for the west coast rock lobster.

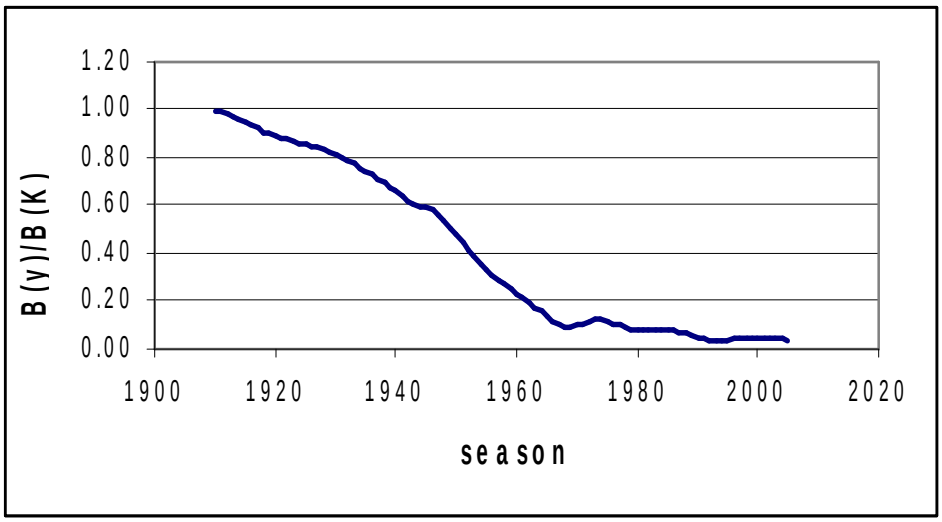

Figure 2: Currently estimated harvestable (carapace length above legal limit of 75 mm) biomass trend, expressed as a ratio of pristine biomass, for the west coast rock lobster.

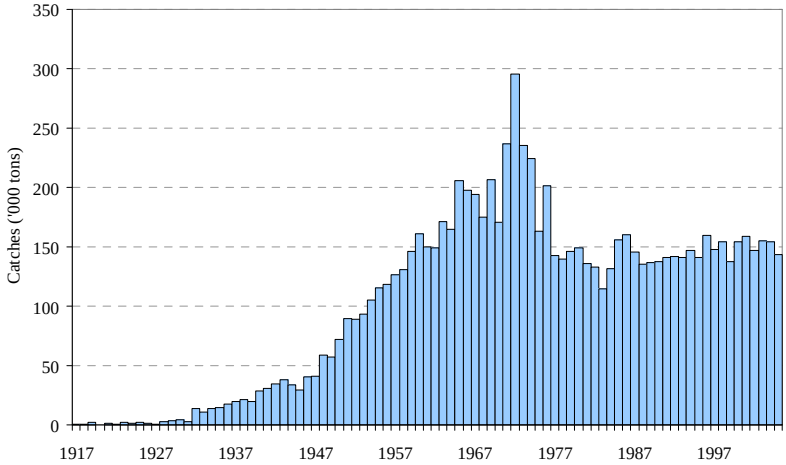

Figure 3: Catch time series for South African (west and south coast and species combined) hake.

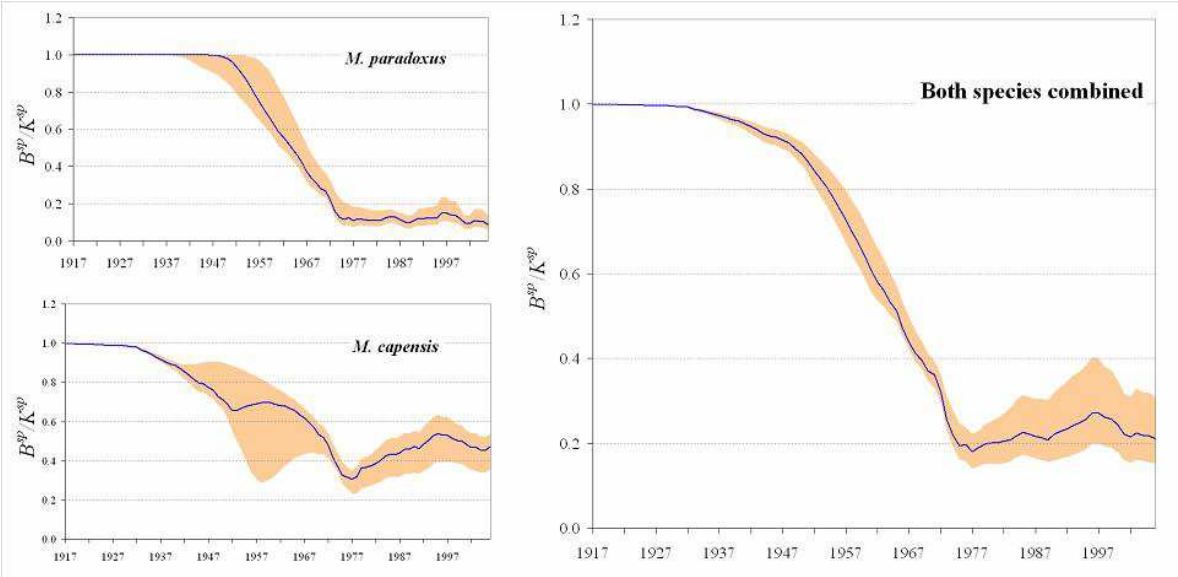

Figure 4: Trajectories of spawning biomass for the South African hake. The median is indicated by a thick line while the shaded area represents the full uncertainty across a Reference Set of alternative assessments (minimum and maximum for each year).

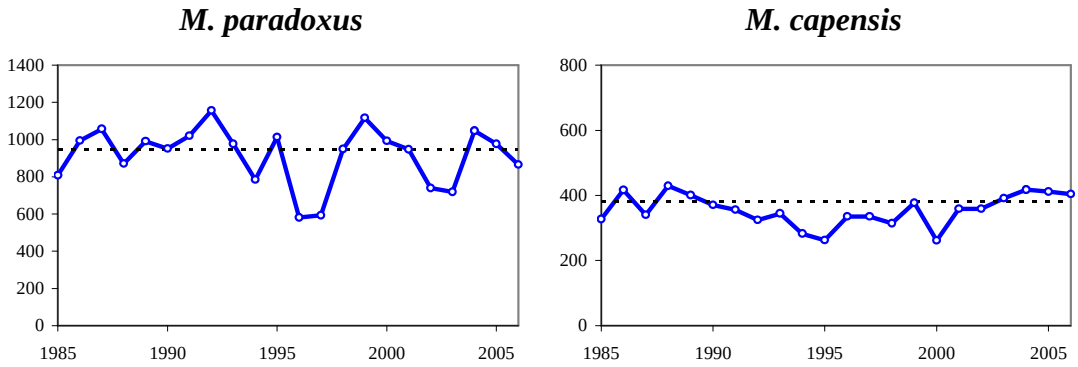

Figure 5: Time series of recruitment residuals for *M. paradoxus* and *M. capensis* for one scenario of the RS. The dashed lines show the average levels over the 1985-1990 period.

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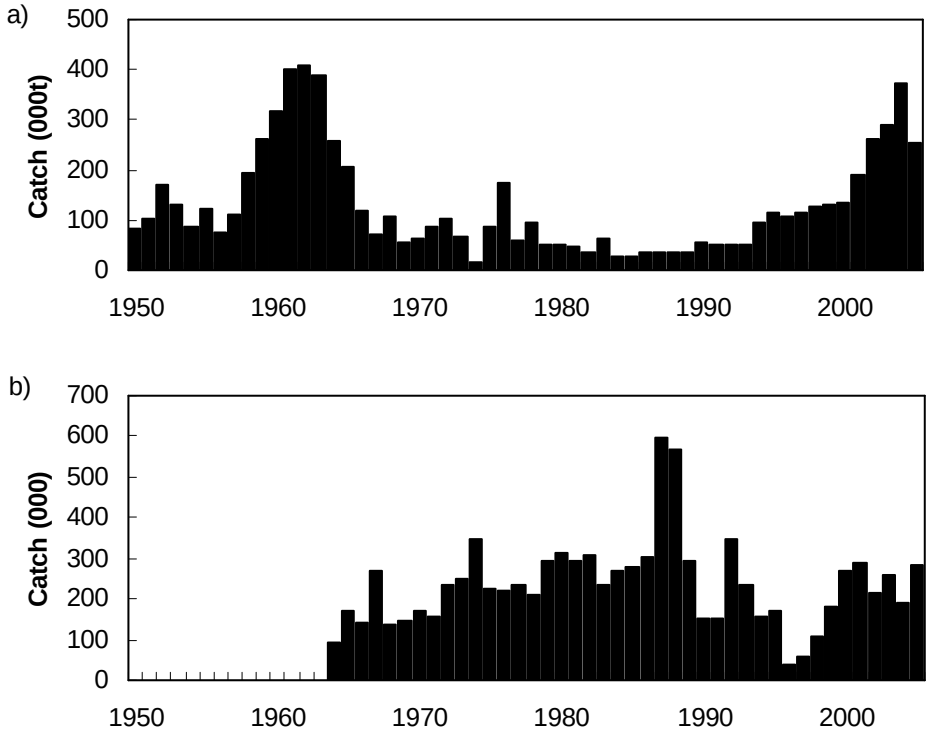

Figure 6: Historic annual commercial catch record for a) sardine and b) anchovy.

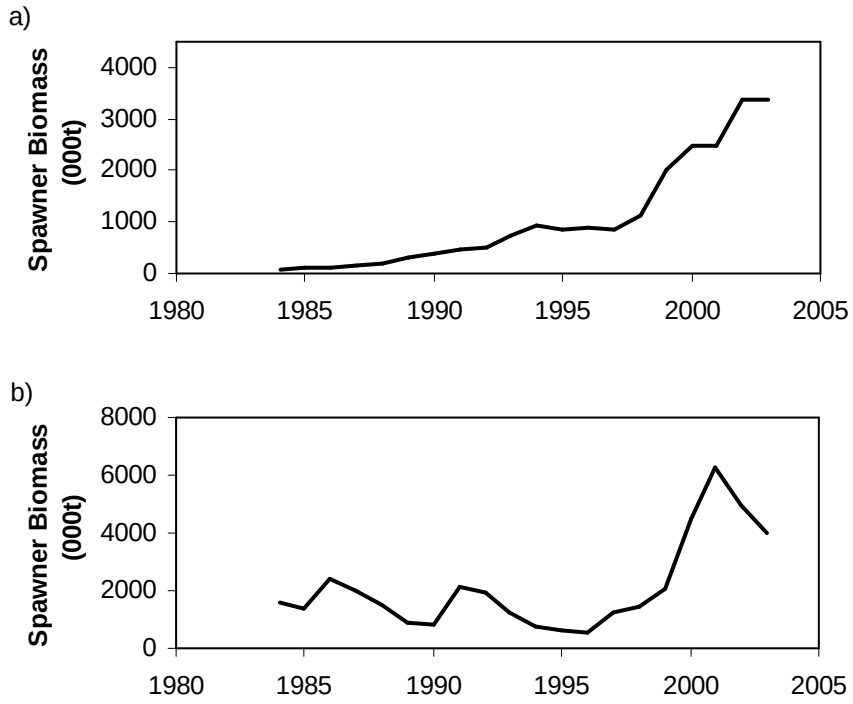

Figure 7: Current estimates of November spawner biomass for a) sardine and b) anchovy.