

Data needed for future stock assessments of the South African hake resources

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This paper summarises the data needed (or perhaps needed) as input to the future southern African hake assessments which are to provide the Operating Models for the hake OMP revision exercise due for completion in September 2014.

Commercial data

Total catches

Annual catch in tons for the period 1917-2012, disaggregated by species and fleet (offshore trawl, inshore trawl, handline and longline), for the West and South coasts separately have been used in the recent Reference Case update (Rademeyer, 2012).

The species-split of the catches will be carried out external to the model as in the past. The current assumptions made to disaggregate the catches by species are summarised in Rademeyer (2012), though alternatives to that approach may also be explored.

For the box model used to take explicit account of movement, the species- and fleet-disaggregated catches need to be further broken down by region (effectively depth strata on the West and South coasts). Information in the CPUE data base can be used to split the offshore trawl catches by region post-1977. Given the paucity of data pre-1978, such finer splitting of the offshore catches will not be attempted, but rather the current formulation with spatial dis-aggregation at the level of West/South coast only will be used to establish starting conditions.

Catches made by the inshore trawl, longline and handline fleet on the South Coast will presumably be assumed to consist of *M. capensis* exclusively, as was done in the past. It is understood that these catches are made in waters shallower than 200m on the South Coast, i.e. possibly within three depth regions: 0-50m, 51-100m, 101-200m. For each of these three fleets, the proportion of the catch taken in these three regions needs to be specified (though given that these catches are small relative to the offshore trawl sector, great accuracy here is not needed, particularly as regards handline)..

Similarly, on the West Coast, the longline fleet is assumed to fish in relatively shallow waters. In previous assessments, the longline catches on the West Coast were assumed to consist of 30% *M. capensis*.

CPUE

The recent Reference Case update (Rademeyer, 2012) is fitted to species-aggregated ICSEAF CPUE for the periods 1955-1977 (West Coast) and 1969-1977 (South Coast) and species- and coast-disaggregated GLM CPUE series for the period 1978-2011. The species-disaggregated GLM CPUE comes from the splitting of the offshore catches, as described above.

The two historical CPUE series cannot be disaggregated by species or further broken down by depth region, as there are no effort-by-depth data available for this pre-1978 period. Rather the existing formulation for this period will be maintained (see above). The post-1977 GLM standardized CPUE indices for the offshore trawl fleet are coast- and species-specific (the catch data being based on the Gaylard and Bergh (2009) algorithm). These need to be updated to include (ideally) data through to 2012. If there are sufficient data to allow this, separate region-specific indices should be included.

Further if alternative species splitting approaches are to be considered, corresponding GLM analyses which build on those alternatives will probably need to be carried out.

Consideration is needed on whether other CPUE series might be used, specifically as derived from the inshore trawl and from longline fisheries, and to what extent this can be dis-aggregated by region.

Catches-at-length/age

Species-aggregated catch-at-length for all years and fleet combinations for which such data are available are needed. Species-disaggregated length frequency information from the commercial catch is not available (since this is based on cleaned (headed and gutted) fish).

At the moment the only data available are from the offshore trawl fleet and the longline fleet on the West and South coasts, and from the inshore trawl fleet on the South coast. The most recent data available at the moment are from 2000. The availability of data after 2000 needs to be established.

Survey data

Biomass estimates

Survey biomass estimates with associated standard errors for each species and survey, and disaggregated by depth strata, as are currently available are required.

Are these to be confined to estimates from the *Africana* surveys, or are the *Nansen* surveys on the West coast also to be incorporated?

Catches-at-length/age

Length frequencies for each species and survey, disaggregated by depth strata, as are currently available, are required.

These data should be disaggregated by sex where such information is available, in case the decision is made to maintain the current approach of sex-disaggregated assessments.

Age-length information

All age-length information (i.e. age-length keys) available is required. This should be disaggregated by survey, species and sex.

Other biological information

Maturity-at-age

Maturity-at-length for each species and sex is presently assumed to follow a logistic curve, with the parameter values from Fairweather and Leslie (2008), "stage 2, >40cm" for females, and Fairweather, pers. commn for males.

Are there plans to refine these values?

Weight-at-length

Weight-at-length for each species is calculated from the mass-at-length function with values of the parameters from Fairweather (2008), taking the average for the West and South coasts.

Are there plans to refine these values?

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