The Essence of the Management Difficulties for Horse Mackerel

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Horse mackerel is taken in three South African fisheries:

- A directed midwater trawl fishery (adults)
- Predominantly as an unavoidable bycatch in the demersal trawl fishery (adults)
- A bycatch (juveniles) in the small pelagics fishery, particularly for anchovy.

The reason the midwater fishery is favoured is a large yield-per-recruit advantage when compared to the juvenile catch in the pelagic fishery. Thus the current annual Precautionary Maximum Catch Limit (PMCL) for the demersal and midwater operations is 44 000 tons, while the pelagic fishery is subject to a 5 000 ton Precautionary Upper Catch Limit (PUCL)

In years of high horse mackerel recruitment, it can become difficult for the pelagic industry to remain within this PUCL. A system of closure of areas where the bycatch proportion is high is applied. However during 2011, despite an *ad hoc* increase in the PUCL to 12 000 tons, the necessary closures reportedly led to substantial losses of potential anchovy catches by the pelagic industry (the TAC for anchovy was substantially undercaught, though this was not the only reason). Industry is accordingly seeking an adaptive system where the PUCL can be increased in years when the annual November hydroacoustic survey for pelagic species shows high juvenile horse mackerel abundance. A Management Procedure (MP) approach is being pursued towards this end, but a difficulty is that the juvenile horse mackerel abundance index from this November survey shows only weak correlation with recruitment estimates from the horse mackerel assessment, which is based on demersal swept-area surveys, as well as CPUE and length composition data from the fishery for the adults.

A further difficulty is that the data available are inadequate for the assessment to provide a reliable estimate of abundance in absolute terms. Management therefore has to consider the conservative assumption that swept-area estimates of adult abundance from surveys are unbiased in absolute terms, whereas it is known qualitatively that an appreciable fraction of the population is in midwater and not available to the demersal survey trawl gear. Thus is could be that sustainable catches at a substantially higher level are possible, and that the resource is being wasted under the current limitations.

The MP approach above is therefore planned to include as well an evaluation of an adaptive policy that allows a program of a slow but steady increase in catch until such time as resource monitoring indices indicate the need to cease or reverse this.

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