

Midwater Trawl Industry contribution for tabling at the 2nd BENEFIT Horse Mackerel stock assessment workshop to be held 5th – 11th December 2004, UCT, Cape Town

South Africa

Horse mackerel (*Trachurus trachurus capensis*) have been harvested commercially by Midwater trawlers along the South African south coast since the 1960s and have contributed up to 40% of the landings in this region. Despite this, research on the stock has been largely limited to incidental data collection during bottom trawl surveys of hake by Marine and Coastal Management (MCM), and the collection of commercial catch and effort data.

Stock assessments of the resource have been attempted, but because of concerns regarding the quality of the data, the outputs could only be used for management purposes “with caution”.

For the past six years a dedicated mid-water trawl fishery showed consistent catches in a very small area between 24degS and 26degS. All catch data were collected with assistance from a dedicated observer program. Data collections are by trawl and specify specie, size and some length/weight frequencies. It appeared that the past surveys only covered areas accessible to the bottom hake directed trawl surveys, whilst the dedicated Midwater fishery is only operating on the shelf break working between depths of 150m – 400m. Limited bottom trawling is possible in the area due to the nature of the bottom and therefore >80% of trawls are conducted only at night when the fish is dispersed into the Midwater region.

This year the fishery experienced a noticeable drop in catches from May to August. Oceanographic data supplied by CLS in France, indicated significant changes in sea surface and sub surface temperatures with significant absence of boundary or frontal zones and resultant chlorophyll concentrations.

It is felt that the role of diel migrations, both vertical and across the shelf break forms a crucial function of any stock assessment and resulting recommendations for management. The role of seasonal changes in oceanographic conditions in the migrating patterns of the fish has to be understood and taken into account.

Considerations:

- study and understanding of behavior of horse mackerel
 - diel behaviour, both vertical and horizontal across shelf

- seasonal migration behaviour both along and across shelf; postulating seasonal and spawning migration patterns
- escaping behaviour during trawling; important when attempting to trawl close or near bottom; speed of trawling; especially when targeted trawl estimates are used in stock assessment putting in the clear the “catch ability coefficient” of past bottom trawls
- understanding influence of oceanographic changes on fish distribution and abundance
- above understanding will have to be taken into consideration in timing of future surveys
- use of acoustics in combination with targeted trawl surveys during horse mackerel trawl surveys
- analysis of commercial catch effort data collected over past six years

Namibia

Contrary to previous believe the 2003 survey highlighted the presence of horse mackerel across the whole population range across the shelf break, ranging from the 150m - 350m isobaths. Further indications where that juvenile horse mackerel were mainly present inshore in water depths of 25m- 50m.

The survey also found high concentrations of horse mackerel shoals in frontal zones between warm offshore waters and cooler shelf waters. This phenomenon is also widely known to the trawler operators and is used to track and target the fish. Many trawler operators use advanced satellite based systems to monitor these oceanographic changes and movement of frontal systems. There are obvious seasonal changes in the presence and movement of warmer offshore and Angolan current waters, mixing with the cooler inshore waters generated by the upwelling cells. These frontal systems move up and down the coastline, as well as inshore/offshore during seasonal changes.

In Namibia, the commercial Midwater trawl fleet is restricted to operating in waters deeper than 200 meters. In Angola, it is our understanding that vessels operating on horse mackerel by means of Midwater trawling are restricted to waters further than 6 and 8 miles from the shoreline. The 6 and 8 nm apply to vessels of different sizes. In South Africa Midwater trawl vessels are restricted to waters deeper than 110 meters.

The Midwater trawl industry would appreciate it if this distinguished forum could shed some light on the different fishing restrictions applied in the 3 countries. It should be noted that the Midwater trawl industry in Namibia is in discussion with the authorities in order to seek relief of the 200 meter restriction and we argue in favour of a restriction that would allow us to fish inshore of the 200 meter isobaths, specifically in the northern areas.

Considerations for research:

- influence of oceanographic changes to spatial distribution and biomass, covering inter-annual fluctuations in biomass and spread of populations
- clarity of above influences on the depth limitations imposed on Midwater fisheries in Namibia
- target strength (both in Namibia and South Africa); also influence of vertical diel migration on target strength
- dead zone problems during survey, both at night (below surface dead zone) and day time (bottom dead zone)
- catch ability coefficient of survey trawls, especially with regards to possible biases in size; function of speed of trawl; function of hydraulic flow characteristics into net when small mesh liners are used; function of escaping behaviour of larger fish