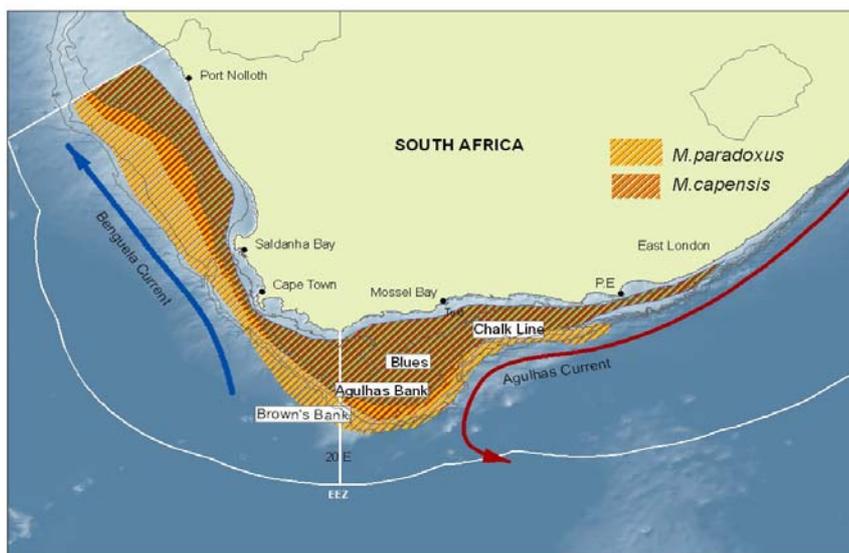
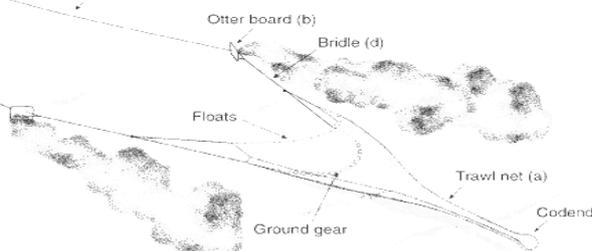


SPLITTING OF THE TWO HAKE SPECIES IN COMMERCIAL TRAWL CATCHES



A project initiated by the South African Deep-sea Trawling Industry Association for the collection of data on board trawlers to improve our understanding of hake



Two hake species are found in South African waters – the deepwater hake *Merluccius paradoxus* (black hake) and the shallow water hake *Merluccius capensis* (white hake). To most people there is no difference between the two species. In fact, because we have been unable to split the catches of the two species, hake have always been assessed as one stock. In the past, only quotas for all “hake” have been issued. The scientists and managers responsible for our hake stocks are now separating the two species.

The main reason for this is that the fishery has changed – there are more fisheries catching hake (longline, handline, trawl) and fishers are selectively catching either “Black” or “White” hake (driven by market preference). In these circumstances a single stock approach to managing the two hake species is less acceptable scientifically. This has serious implications for our trawl fisheries.

For these reasons, the managers of our hake fishery are now more concerned for the future of the hakes and are refining their methods to be able to assess the two species separately.



Deepwater hake (top) and shallow-water hake (bottom)

How do we tell them apart ?

The above picture shows some of the physical differences between the two hake species, but it is not as easy as it looks because it seems that there are intermediate forms. Ideally a fish should be examined HOGO (head on guts out). A trained Observer examines the eyes, the gills, body cavity and colour. For details of the identification characteristics see the attached sheet – we have summarised some of these features below :

	<i>M. paradoxus</i>	<i>M. capensis</i>
Eye	Proportionally larger than white hake	Smaller than black hake
Gill rakers	Dark with distinct black spots	Light colour, no black spots
Gut Cavity	Mostly black	Much lighter than in black hake
Body	Thinner, darker in colour, tail grey or “blueish”	Fuller bodied, more silverish in colour

How are the Hake catches being split for scientific purposes ?

Shallow water hake are caught inshore of 400 m – Deepwater hake are generally found offshore of the 150 m depth contour to at least 800 m. There are depths in the middle where **both species** reside (from about 150m to 400m). As a general rule, the younger the fish of either species the shallower the depth at which they are likely to be found. Thus the biggest white hake will be at 400 meters and the smallest black hake will be caught at 150m – the largest deep-water (black) hake are generally found at great depth. Not only is the size of the fish related to the depth of water, but also the species composition of the catch tends to vary with depth. It is generally thought that at about 325 m the trawl bag will contain an equal amount of (smaller) black and (bigger) white hake. And then, to make things more interesting, the larger hake eat the smaller ones! Not only do the sizes of hake vary with depth, but we suspect that water temperature and other environmental parameters affect where either species of hake are caught. These conditions may change throughout the year and depend on wind stress, mixing of the water, upwelling, oxygen content and even major climatic events such as *El Nino*.

Uncertainty about the real nature of the species association with depth casts doubt on current mathematical procedures for splitting the two species.

For now, the scientists assume that the relationship between the hake species and depth is the same in all areas, the proportions of the two species at different depths is constant and that there is no difference throughout the year or between years. These assumptions are based only on research trawl data obtained on the Fisheries Research Ship *Africana*. Although the observations have been made over a long period, the year-to-year data vary a lot and the information was obtained from cruises that only took place once or twice a year and in the same season every year either on the West or South Coasts.

It is possible that the findings are distorted by the circumstances under which the scientific observations were made and this may lead to misinterpretation of the biomass (amount) of each hake stock in the sea. That in turn, will have a critical impact on how much of each species can be caught ! This will naturally affect the livelihoods of everybody in the trawling community, both now and far into the future.

What are the aims of this project ?

To address this problem, SADSTIA and CapFish have set up a 24-month sampling programme called the “Hake Species Split Project” (HSSP). The HSSP has been split into two phases : 1) A long-term (24 month) sampling program undertaken by two individuals accompanying at least two wetfish/freezer trawlers each per month (four trips per month) and 2) A short-term sampling strategy using the wetfish fleet to simultaneously collect data from different locations around the coast at that same time as MCM conducts their research cruises.

Data collected by the Observers (data collectors) will include the following on a trawl by trawl basis :

- gear type deployed
- depth and times fished
- a breakdown (sample) of the hake species proportions
- the samples of each species are measured for length
- a temperature, salinity and light intensity unit is deployed on the net at each trawl

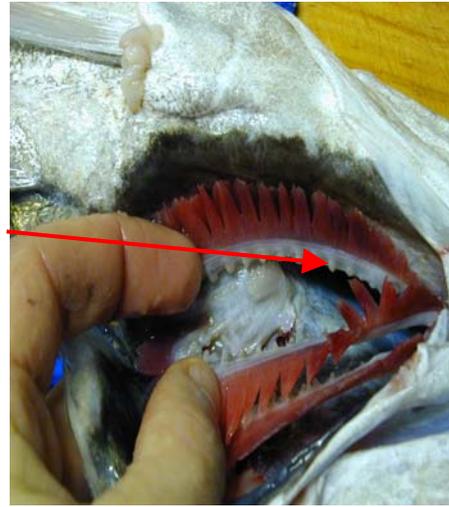
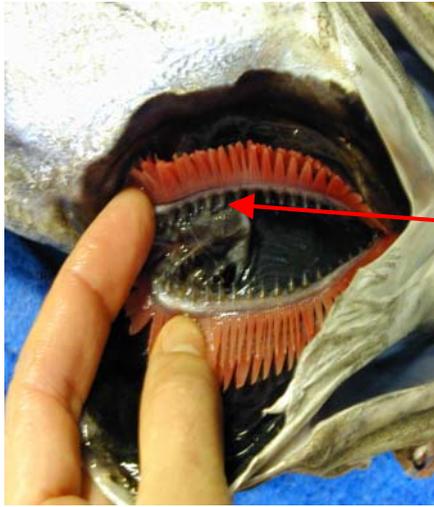
The HSSP aims to test and ultimately improve the information used in the mathematical models. The HSSP is **your programme** funded by industry working with the support of the scientific community. Give the Observers your **fullest support** and **co-operation** as the success of the project may determine your future.

If you wish to have more information, please communicate with the Observers or contact the following :

Roy Bross	South African Deep-Sea Trawling Industry Association	: 021 - 425 2727
Dave Japp	Capricorn Fisheries Monitoring cc (CapFish)	: 021 – 425 2161
Dr Robin Leslie	Marine & Coastal Management (MCM)	: 021 – 402 3141

CAPFISH
Hake identification sheet

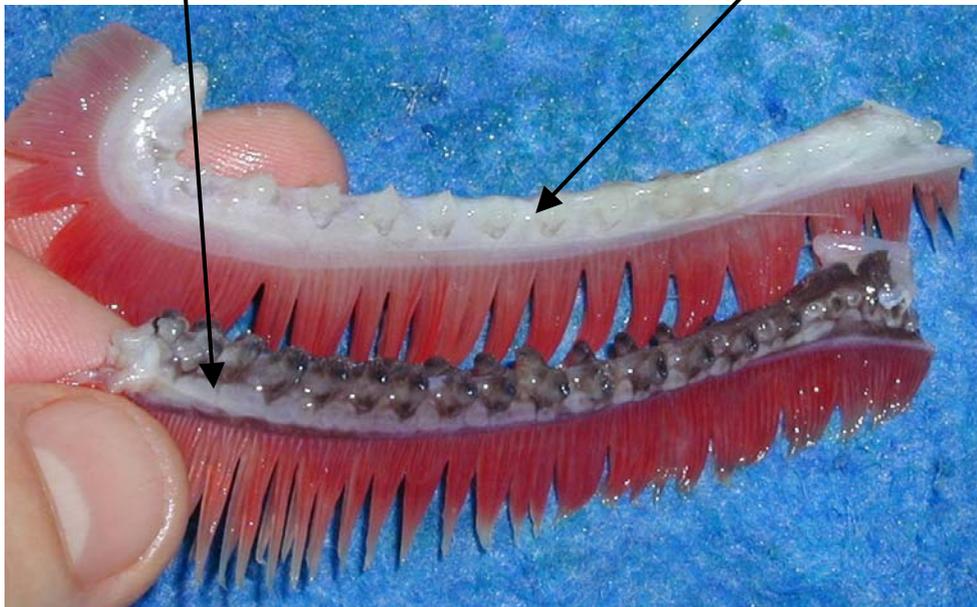
Note the Gills : *M. paradoxus* gill rakers are darker in colour and longer than the gill rakers of *M. capensis*



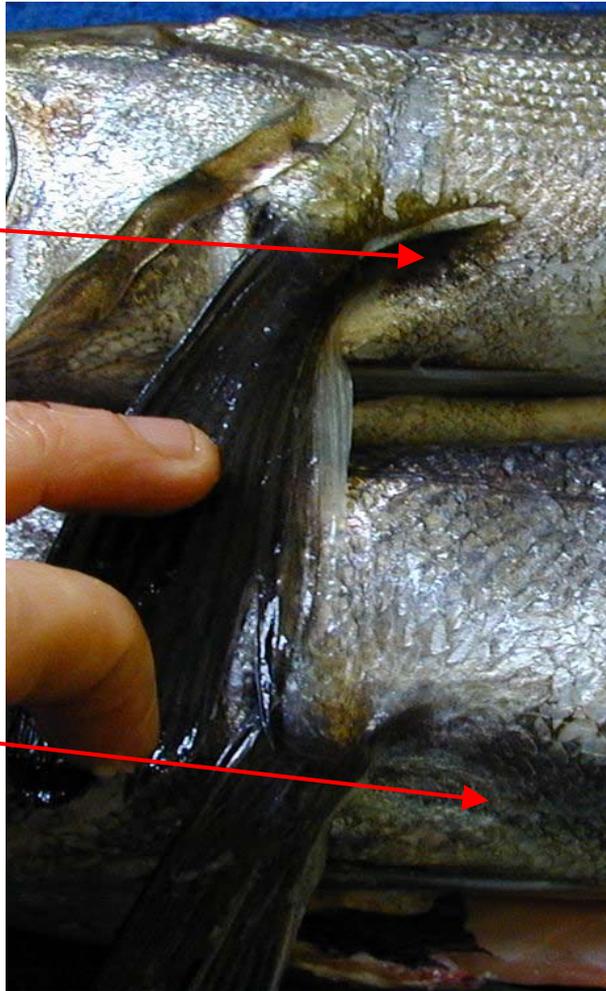
Gill Rakers

M. paradoxus

M. capensis



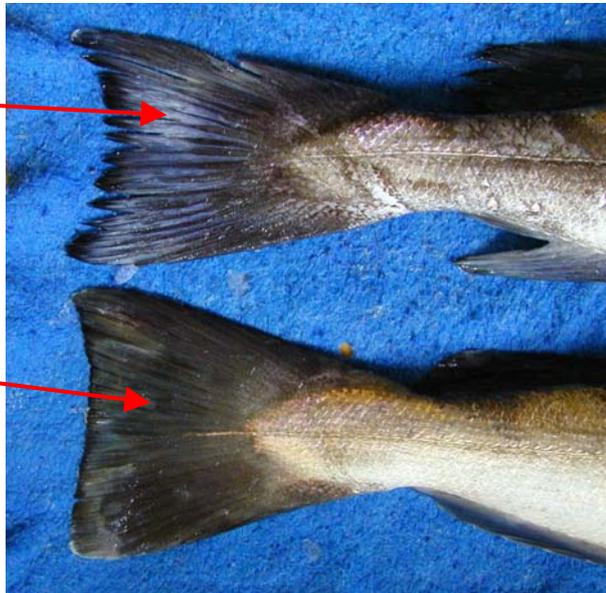
M. capensis has a dark spot with lime green edges on the area underneath the pectoral fin.



The skin colour underneath the pectoral fin of *M. paradoxus* is similar to the colour of the area surrounding the pectoral fin.

Tail-Fin colour

Note the grey colour of the tail of *M. paradoxus* .



Note the absence of grey on the fin of *M. capensis*.