



FISHING RESPONSIBLY

Fishing is important in South Africa both economically and socially. South Africa has a long coastline, and is bordered by the Atlantic and the Indian Oceans, which have a uniquely diverse mix of cold and warm-water organisms.

However, the bounties of the oceans are not endless. It really matters how we fish in the sea!

Using computer-based modelling as a tool, scientists are exploring how we can **avoid damaging one group of fish by fishing another**. For example, research has shown that many fish that grow to large sizes and which give good prices when sold as food for our dinner tables, depend on small fish for their own food. If we fish too much of these small fish, we may harm the large fish, and in turn limit what is available for our dinner tables.



Food Webs

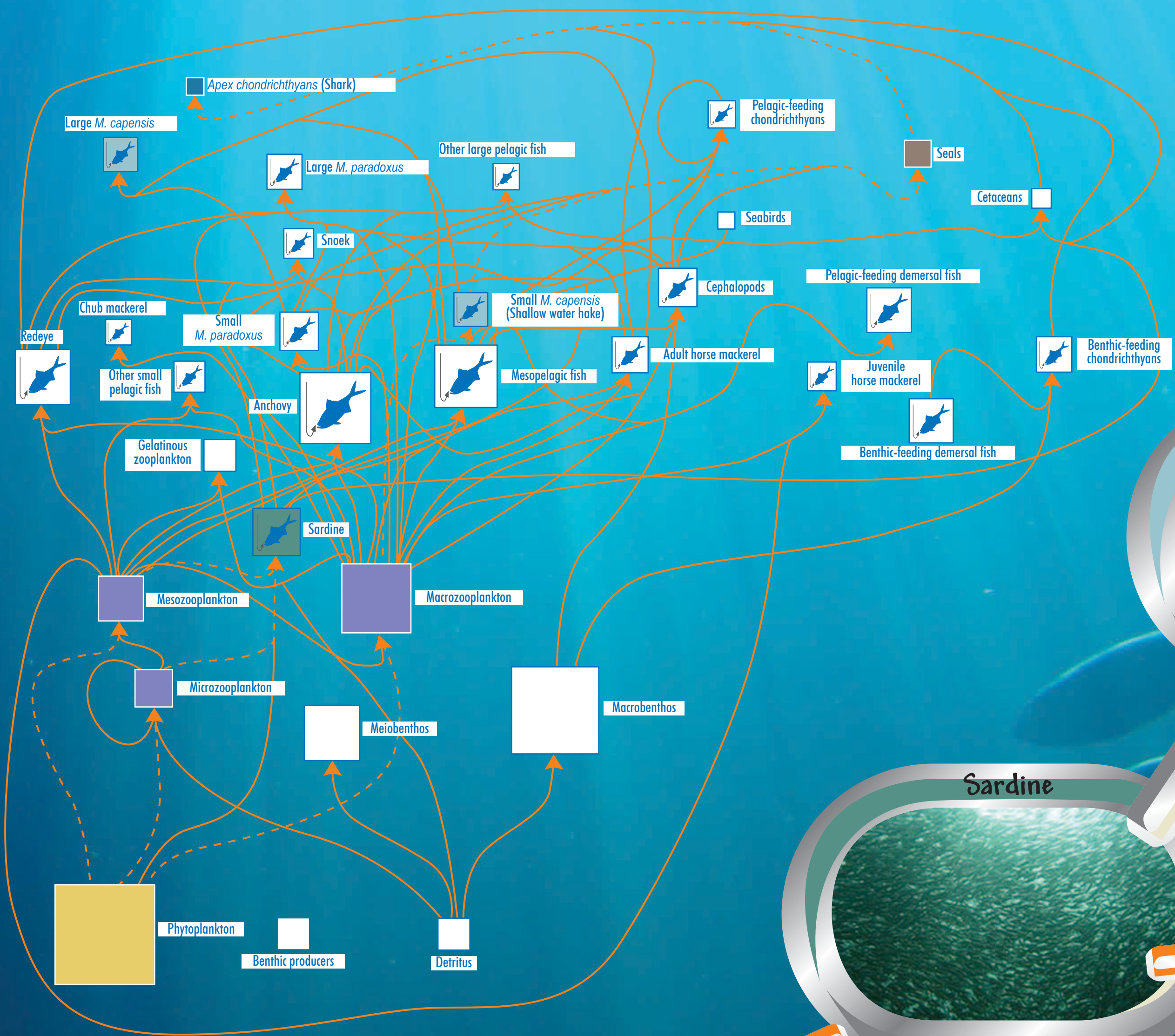
Organisms that live in the sea are inter-connected with one another through intricate **foodwebs** and we need to **develop good fishing strategies** that are sustainable.

The flow of energy through a food web can be modelled if we know the population size of each species and what and how much each species eats. **Food web models allow us to explore the effects of fishing on other species in an ecosystem.**

For example, if sardine (pilchards) are heavily fished, we may be affecting the food supply available to hake, which eat sardine. Thus, if we fish out the food of hake (like sardine and anchovy), we could limit how much hake we will be able to catch!

And it goes further than this - seabirds eat small fish like sardine and anchovy too, so **fishing can affect the survival of seabirds.**

Snoek are a popular fish to eat.



Marine food webs are complex!

Phytoplankton

Zooplankton

Purse seiner

Sardine

Shallow Water Hake

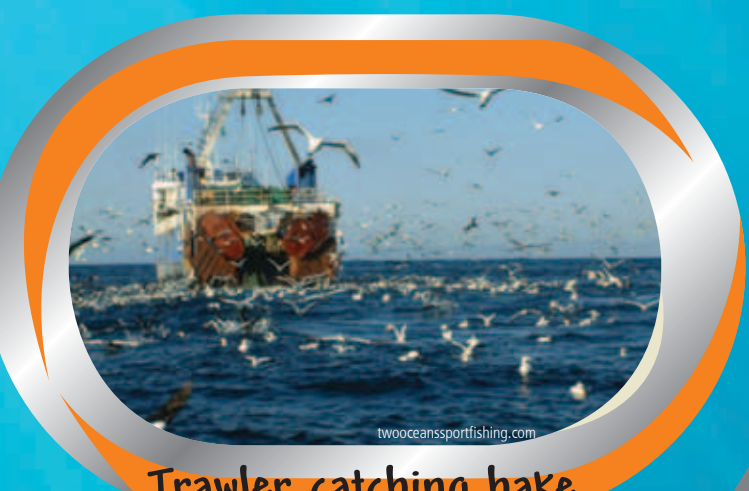
Penguins



Sharks



Seals



Trawler catching hake



Shallow Water Hake

Mathematical models are useful in penguin management. Our model of all the threats to African Penguins enables us to find out which threats cause the biggest decline in the penguin population.

This helps fishery and conservation managers to take the necessary actions to conserve penguins.

DID YOU KNOW?

African Penguins are **ENDANGERED** - their numbers are declining so fast that they require special conservation.

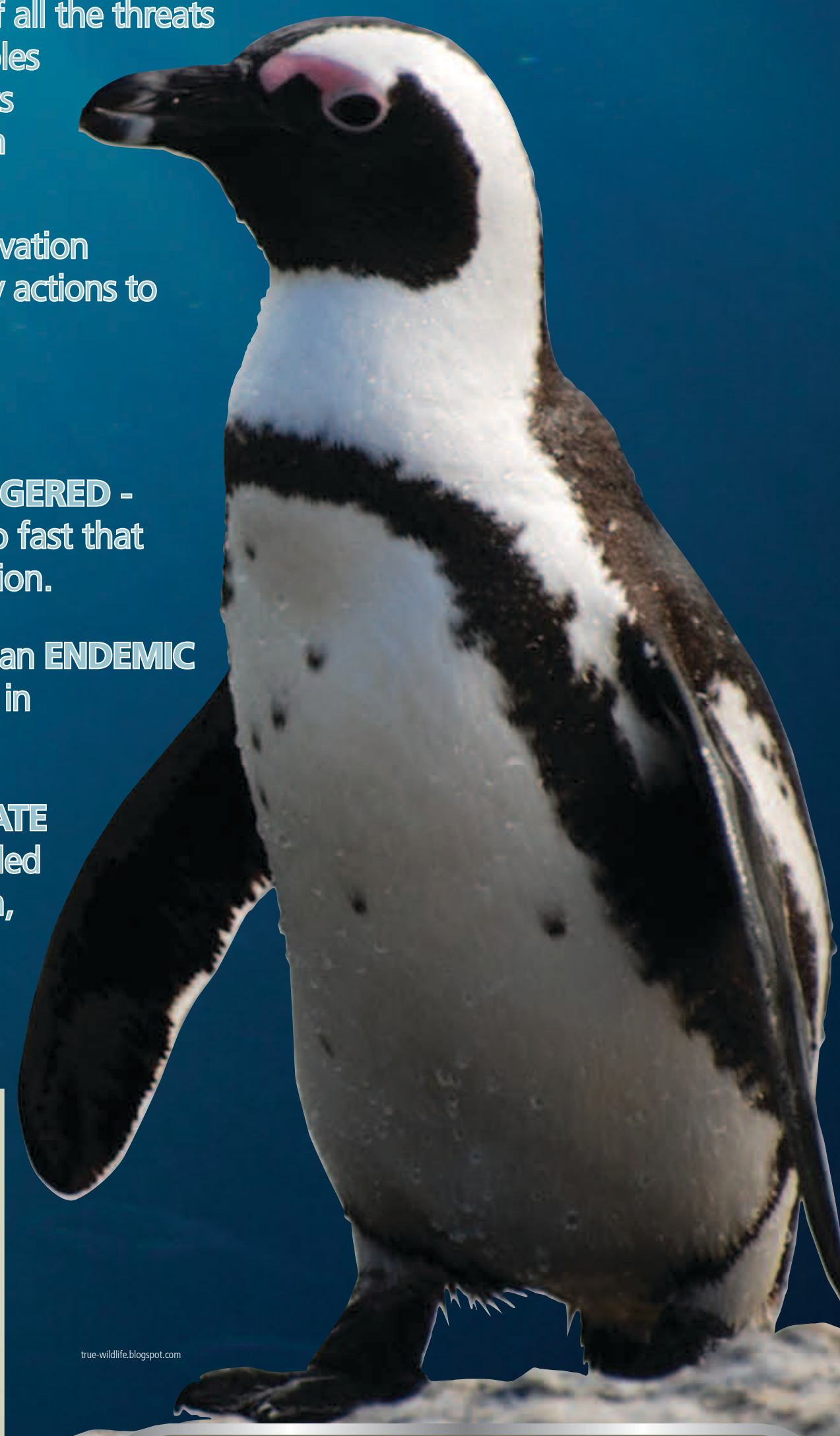
African Penguins are an **ENDEMIC** species i.e. they are found only in Southern Africa.

African penguins **MATE FOR LIFE!** If one of a pair is oiled and is caught for rehabilitation, when it is released, it will look for its mate!

We need a **SYSTEMS APPROACH** to marine ecosystems and fishing. Fishing needs to be considered in the broader context of :

- how fish species live in an ever-changing ecosystem
- how we as humans impact on the marine ecosystems by fishing, as well as
- how we are affected by changes in our marine ecosystems.

For people to continue harvesting fish (and income) from the marine realm, we have to ensure that food webs and marine habitats are protected.



The African Penguin