

# Practical management of Southern Ocean fisheries

Scientific information provided by the Australian Antarctic Division is instrumental in the development of Australia's well-founded policies on managing fisheries in the Southern Ocean.

Large scale fishing in the Southern Ocean began in the 1960s and was largely unregulated, as much of the Southern Ocean is beyond the jurisdiction of any nation. As stocks were discovered, many, such as the marbled rock cod (*Notothenia rossii*), were rapidly fished to near extinction and in many instances are still rare, despite having been effectively unfished for decades.

As a result of this experience and international concern that krill – important in the diet of many species in the Southern Ocean – may also be overfished, CCAMLR (the Convention on the Conservation of Antarctic Marine Living Resources) was established in 1982, with Australia as an original signatory.

Australia did not begin to fish in the Southern Ocean until 1997. Following research surveys conducted in the early 1990s by the Australian Antarctic Division, in the 200 nautical mile Exclusive Economic Zone around the Heard and McDonald islands, the Australian Fisheries Management Authority (AFMA) issued permits to fish in the area for mackerel icefish (*Chamsocephalus gunnari*) and Patagonian toothfish (*Dissostichus eleginoides*). A fishery for Patagonian toothfish also commenced around Macquarie Island. All these fisheries continue today.

To ensure that targeted fish stocks and the ecosystems within which they live are not permanently affected, Australia uses a system of rigorous management controls. These include limiting the number of vessels allowed to fish, restricting the amount of fish that can be caught, and requiring the use of techniques that avoid seabird and marine mammal bycatch. Both Macquarie Island and the Heard and McDonald islands also have some of the world's largest Marine Reserves adjacent to them, to protect the marine environment from the direct impacts of human activities.



JASON HAMILL, AFMA

Researcher, Robbie Kilpatrick, attaches the deep sea camera to the trawl net on board the Southern Champion.

Vessels are also required to implement research programmes developed by Australian Antarctic Division scientists; such as tagging and releasing fish and conducting a large annual survey to estimate the abundance of icefish and juvenile toothfish, around the Heard and McDonald islands. The tagging programme has revealed that toothfish can move very large distances, with fish tagged at Heard Island being recaptured by French vessels near Crozet Island, over 2000 km away. These results indicate that there are links between widely separated toothfish stocks. French scientists are currently collaborating with the Antarctic Division to develop a more complete picture of stocks throughout the Indian Ocean sector of the Southern Ocean.

As a further management measure, all vessels fishing in the Southern Ocean must carry two scientific observers. Australia's observer programme is administered by AFMA, with technical and data management support from the Antarctic Division. The Antarctic Division also uses the research and observer data collected each year to model the toothfish and icefish stocks and recommend catch limits for future fishing seasons. The observers are tasked with collecting large amounts of data on where vessels fish, what species they catch and how much, and any interactions with seabirds or marine mammals. All this occurs while sailing in some of the roughest conditions on the planet.

## New technology for future management

The Australian Antarctic Division, with the assistance of AFMA, the Fisheries Research and Development Corporation and the fishing industry, is currently developing sophisticated underwater camera systems that can be deployed on fishing gear by observers. These cameras are designed to record digitised video and still photos while

attached to trawl, longline and pot gear. This footage will then be analysed to identify the types of habitats where fishing occurs, and the vulnerability of these habitats to damage from fishing gear.

The cameras were successfully trialled recently by Antarctic Division staff aboard a trawler fishing for toothfish around the Heard and McDonald islands. The footage captured so far provides a tantalising glimpse of the undersea world hundreds of metres below the surface, and has attracted interest from other fisheries in Australia and overseas, as a method of assessing the effects of fishing on the deep sea environment.

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## More information

Heard Island and McDonald Islands:

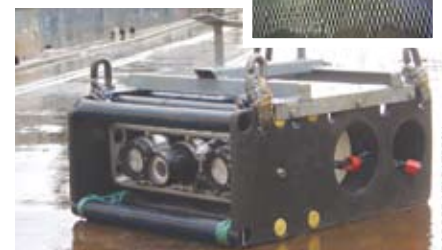
[www.heardisland.aq/index.html](http://www.heardisland.aq/index.html)

Fisheries research and management:

[www.aad.gov.au/default.asp?casid=29303](http://www.aad.gov.au/default.asp?casid=29303);

[www.afma.gov.au/](http://www.afma.gov.au/); and [www.frdc.com.au/](http://www.frdc.com.au/)

A large Patagonian toothfish, *Dissostichus eleginoides*, captured on camera entering a trawl net deployed at 700 m.



ROBBIE KILPATRICK

The deep sea camera system developed by the Australian Antarctic Division, which is being trialled to assess the effects of fishing on the deep sea environment.