

SCIENCE
by Rebecca Priestley

Something fishy

A fall in antarctic toothfish numbers would seem to have an obvious cause.

The antarctic toothfish (*Dissostichus mawsoni*) is not a pretty creature. These large ancient-looking fish have enormous heads and a mouth full of teeth – useful when you’re the top fish predator in the Southern Ocean. Toothfish feed on many smaller species of fish and squid. Above them in the food chain are colossal squid and marine mammals like weddell seals and sperm whales.

And now humans, too. For almost two decades, trawlers have been catching antarctic toothfish in the Southern Ocean, including in the Ross Sea directly south of New Zealand. Headless, gutted slabs of fish are frozen and shipped around the world, where they are served up to markets and restaurants as “Chilean sea bass”, a name invented to appeal to the palate.

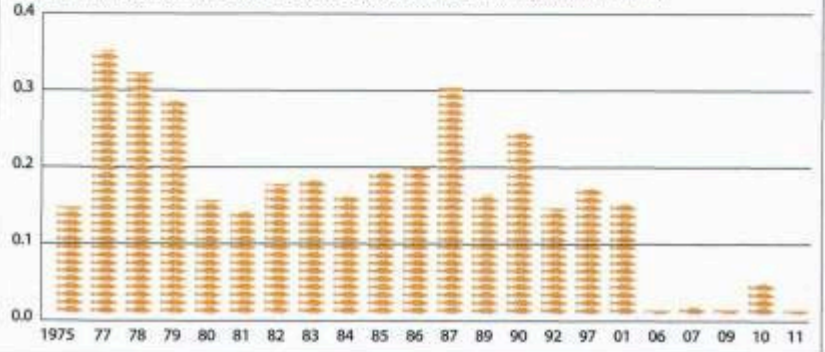
The Antarctic toothfishery is now worth about \$20 million a year to New Zealand – not a lot for a \$1.5-billion-a-year fishing industry. The Government says the fishery is sustainable and has given permission for the toothfish stock to be reduced to half the original levels. But the development of the fishery has coincided with a precipitous decline in toothfish in the McMurdo Sound, according to a team of scientists who have been studying the species for more than five decades.



Weighty issue: Clive Evans thinks commercial fishing is to blame.

GOING DOWN: ANTARCTIC TOOTHFISH CATCH

Catch per unit effort from McMurdo Sound (data from Art DeVries, Gretchen Hofmann and others)



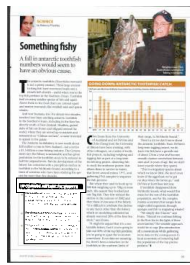
Clive Evans from the University of Auckland and Art DeVries and Chris Cheng from the University of Illinois have been working, with other colleagues, on a series of toothfish projects, including weighing and tagging fish as part of a long-term monitoring project, dissecting fish to study the antifreeze protein that allows them to survive in waters that hover around minus 1.9°C, and gathering DNA samples to sequence the fish genome.

But where they used to hook up to 500 fish weighing up to 70kg or more each, this season they hooked just

one 5kg fish. They first noticed the decline in the summer of 2002 and they think it’s because of the fishery. “It is difficult to attribute this decline to any factor other than the fishery, which on modelling estimates has already removed 20% of the Ross Sea stock,” says Evans.

“It might be argued that it is a sustainable fishery, but if you’re going to take out 50% of the top fish predator, you’re going to upset the ecosystem somewhere. If our data are meaningful, there’s been a reduction in the toothfish in the southern limits of





their range, in McMurdo Sound.”

There’s a lot we don’t know about the antarctic toothfish. From DeVries’s long-term tagging project, we do know the fish have a growth rate of about 2.5cm a year and become sexually mature somewhere between nine and 16 years of age. But we don’t know exactly where they spawn.

“This is a migratory species about which we know little. We don’t even know if the eggs float; we’ve got no idea where the larvae go,” said DeVries at Scott Base last year.

If toothfish disappeared from McMurdo Sound, what would this mean for the rest of the toothfish population, and for the complex marine ecosystem that ranges from single-celled organisms through sponges and fish to migrating whales?

“We simply don’t know,” says Evans. “Should we continue fishing in the Ross Sea in the light of these uncertainties? The sensible approach would be to urge [the introduction of] a moratorium while gathering more data on the consequences to local ecosystems of removing half the population of the top piscine predator.” ■

UPCOMING ANTARCTIC EVENTS

The Last Ocean, a documentary about the race to stop commercial fishing in the Ross Sea, plays at the New Zealand International Film Festival, nationwide, August, www.lastocean.org

The Christchurch Writer’s Festival has several events with an Antarctic theme. Christchurch, August 30-September 2, chchwritersfest.co.nz

This year’s Antarctic season is launched with the first **New Zealand IceFest**, a celebration of New Zealand’s relationship with Antarctica. Christchurch, September 14-October 14, nzicefest.co.nz