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NZ scientists' plea to preserve 'The Last Ocean'

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The Ross Sea is one of the last healthy ecosystems of its kind left on earth. Recently the New Zealand Government rejected a proposal from the United States for a marine reserve in the Ross Sea that might have offered greater protection for the Antarctic toothfish than it wanted. In doing so it is sacrificing this unique ecosystem in favour of short-term gain from the fishery.

As scientists we have spent numerous seasons conducting research in the Ross Sea and Southern Ocean. Our work, and that of colleagues, includes long-term tag and release studies of Antarctic toothfish and ecological studies in the McMurdo Sound region of the Ross Sea, the results of which show the impact of the fishery on both the toothfish population and the Ross Sea ecosystem.

The protection of marine species in Antarctic waters comes under the umbrella of the Antarctic Treaty and its agreed measures, specifically the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR).

Despite its apparent focus on safe-guarding marine species, the convention defined "conservation" to include "rational use", providing an avenue for New Zealand to initiate a fishery for Antarctic toothfish in the Ross Sea, beginning in 1996/97. This was achieved despite opposition from some countries owing to a lack of understanding of the distribution, abundance, productivity and life history of this species. New Zealand fished alone for four seasons, after which this "exploratory fishery" (a CCAMLR classification) was opened to other countries, with the catch quickly approaching the maximum allowed (more than 3000 tonnes).

It soon became apparent that the fishery itself was to be the source of data by which the large gaps in our understanding of toothfish biology were to be filled. To this day, little in the way of research has been undertaken to address the data gaps that fishery statistics cannot provide. Indeed, much of the information for the stock model is taken from other fish species, none of which exists in the sub-zero temperatures in which Antarctic toothfish live.

Our toothfish catch in McMurdo Sound, part of a scientific programme initiated 40 years ago, has shown a precipitous decline in recent years in both the numbers and size of this species, coincident with the growth of the toothfish industry. Over the past 10 years, our catch returns have decreased to about 6 per cent of what they were before the fishery was established. This suggests a contraction northward towards the breeding and prime foraging grounds by large fish, a process that cannot be observed by fish statistics derived from vessels that concentrate their fishing in those waters.

Also coincident with this loss of large toothfish in the southern Ross Sea is an increase in penguin numbers (competitors of toothfish for prey), a decrease in toothfish-eating killer whales, and an increase in the foraging effort of Weddell seals (another toothfish predator).

But it doesn't stop here. Although observations of seals (which bring their catch to their breathing holes) indicate that small toothfish still remain in McMurdo Sound, it is the disappearance of the larger fish that is of concern. Large fish are generally the most fecund in the stock, the ones that are responding successfully to climate change, and also unfortunately among the ones targeted by the industry.

The connectivity between organisms within an ecosystem is well established. The impacts on dependent species of removing the toothfish, the top piscine predator and a key prey species, from the Ross Sea that we are observing are thus not unexpected based on experience in other oceans.

It does not matter that this fishery is "tightly regulated" as some offer as justification. What matters is that one of the last healthy continental shelf ecosystems on earth is being sacrificed for short-term gain. There can be no more compelling reason for wanting to protect this unique and still relatively pristine environment, which has come to be known justifiably as "The Last Ocean".

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Large Antarctic toothfish are becoming increasingly rare in the Ross Sea.