The Ross Sea fishery - Frequently Asked Questions (FAQ)

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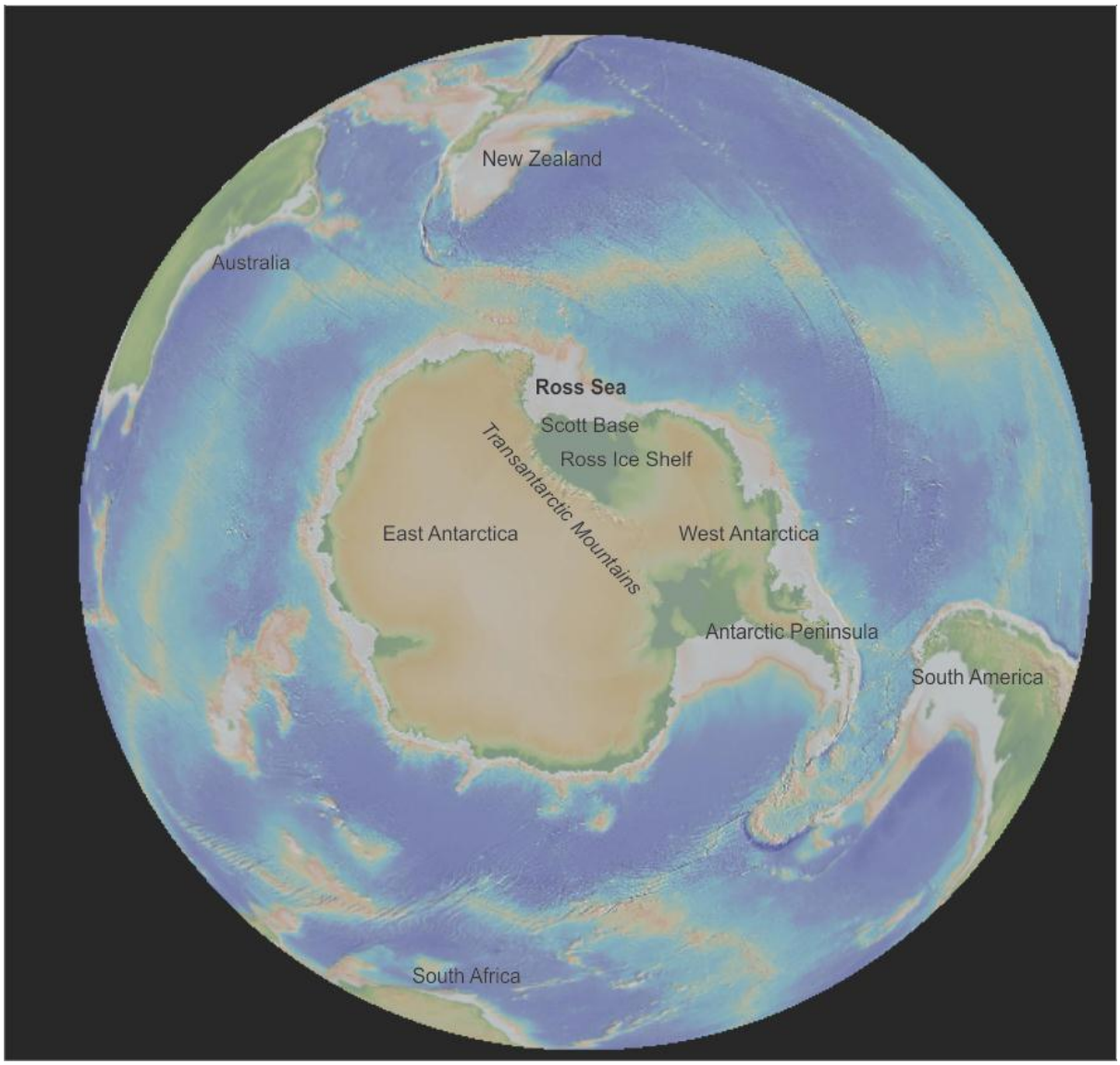
Where is the Ross Sea?

The Ross Sea is a deep indentation on the coast of Antarctica. New Zealand's Scott Base is on its eastern side.



There are a number of definitions of the Ross Sea, ranging from the shelf area adjacent to the Ross Ice Shelf and Ross Island, to the area defined as the Ross Dependency.

For fishing and Marine Protected Areas there is some agreement that the area extending from west to east between 150 E. and 150 W and reaching south from 60° S to the Ross Ice Shelf and the continent is appropriate, See figure 1.

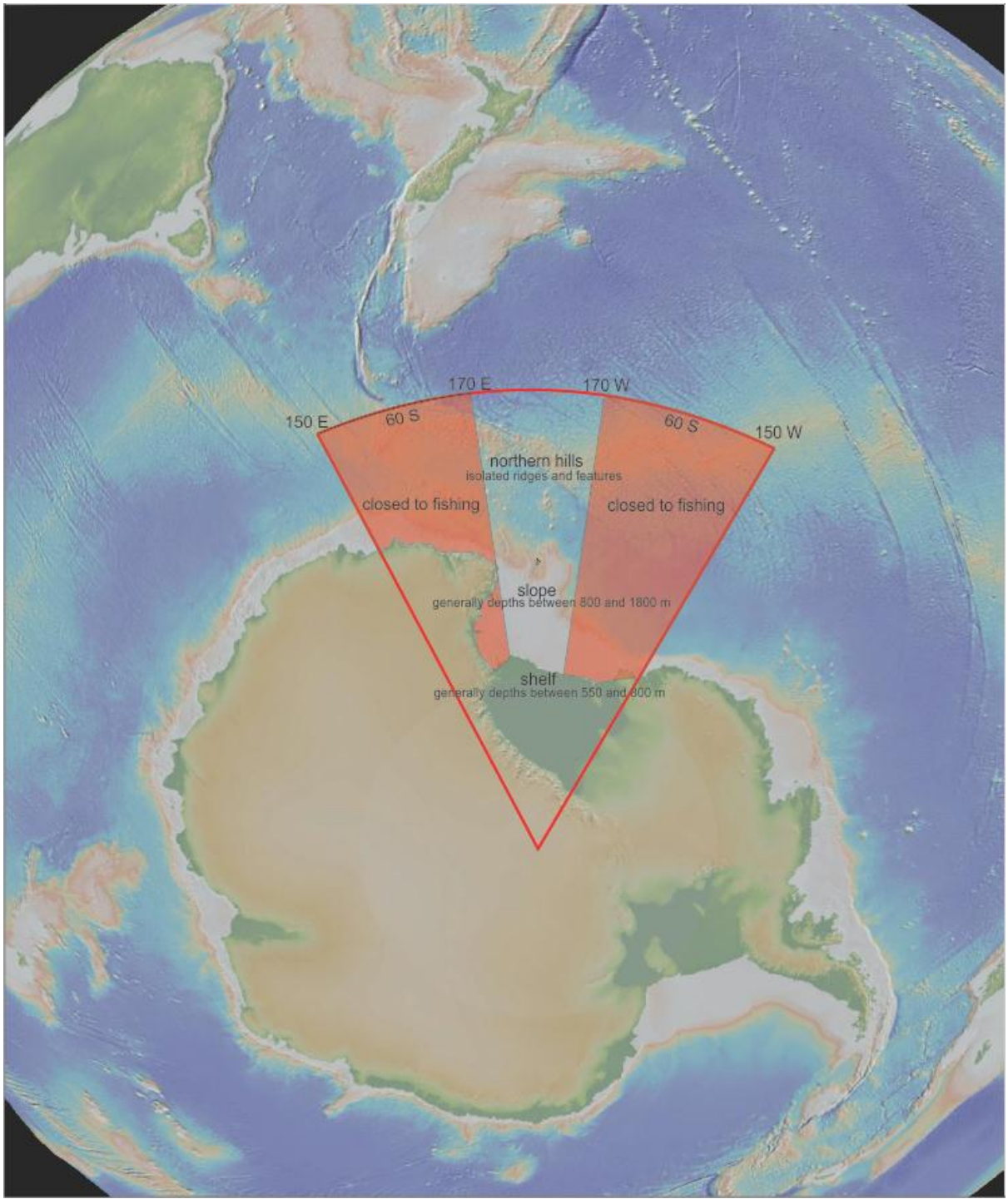


Figure 1. The Ross Sea as generally defined for the purposes of management of fisheries and marine protection. Areas shaded in red are already closed to all fishing as are depths shallower than 550 m. The total actually fished is about 3% of the defined area from 60° and then south to the ice shelf and continent.

Based on a NIWA report to CCAMLR, updating bathymetry in the region[i] and a 2012 analyses, which updated the 550 m contour and exclude permanent ice shelves from some calculations, it is possible to state the following.

All areas shown in figure 1 in red (grey in figure 2) are closed to fishing. This is about 63.3% of the total area of the Ross Sea. In addition, vessels are prohibited from fishing in depths shallower than 550 m. That closes another 10.7% of that area not permanently closed by CCAMLR. Thus, about 67.5% of the entire area is already closed to fishing. Toothfish are almost entirely found between 550 and 1800 m depth, although very little fishing shallower than 600 m takes place (3 sets in 2009/10 and none in 2010/11). In 2010, as a proportion of the total area (over 4.3 million km^2) used for the Ross Sea assessments by CCAMLR, only about 3.8% was open for fishing and lay within the range of suitable depths for fishing. Of this potential fishing ground very little fishing is carried out in the shallow shelf region to the south, reducing this figure yet again. The actual fishing footprint depending on annual fluctuations is about 3% or less. During many seasons sea ice presents an additional natural obstacle to fishing, in some past seasons having closed more than two-thirds of the available area for an entire season.

Table 1. By numbers, as things stand

3%, where nearly all fishing takes place as a proportion of the whole Ross Sea Region.
63.3% the proportion of the Ross Sea region now in closed management units.
10.7% also closed to fishing in the remaining management units due to the prohibition on fishing shallower than 550 m.
67.5%, total Ross Sea region already closed to fishing.

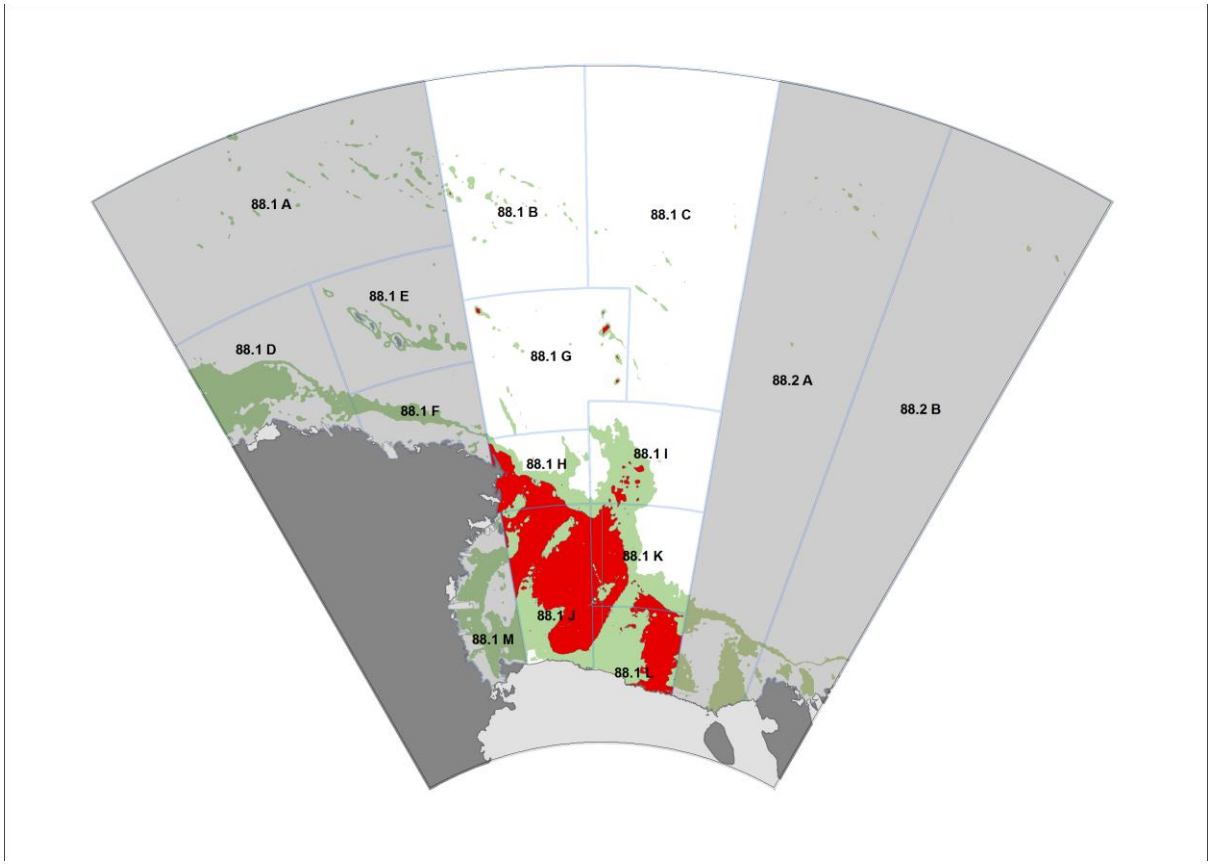


Figure 2. The Ross Sea region as currently managed with green showing potentially open areas to fishing. Shaded grey areas show the permanently closed region and the red area is closed due to CCAMLR's prohibition on fishing with 550 m. Updated figure courtesy of Steve Parker, NIWA.

How is the Ross Sea managed?

Fishing in the Ross Sea is managed under the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR) with the objective of conserving Antarctic marine living resources, where 'conservation' is defined to include rational use.

The Ross Sea is managed under the Convention on the Conservation of Antarctic Marine Living Resources abbreviated as CCAMLR or sometimes in context – 'the Convention' - pronounced 'kammelar'.

Established in 1980, with the first meeting held in 1982, the Convention arose in response to concerns about the potential for a krill fishery to significantly harm the Antarctic ecosystem (which is largely dependent on krill) and a desire to avoid the overexploitation and other problems that had occurred in fisheries in many regions, including the Antarctic, for two fin-fish species – marbled rock cod and ice-fish.

The objective of the Convention is the conservation of Antarctic marine living resources, where 'conservation' is defined to include rational use. This does not include whales or seals which are managed under other agreements.

The Convention was the first international regional agreement to stipulate an ecosystem-based management approach. This approach requires that management consider the effects of any harvesting on dependent and associated species, not just the target species, and that those ecological relationships are maintained. Guiding principles are that stocks shall be kept at levels close to those which permit their maximum net recruitment and that ecological relationships between the various species shall be maintained.

There are now 25 Signatories to the Convention and 9 States are party to the Convention but not Members of the Commission. New Zealand was one of the initial signatories to the Convention.

Article 2 of the Convention specifically specifies that the term "conservation" includes rational use or the harvesting of marine resources under strict guidelines.

The Convention is implemented by a Commission with annual meetings in Hobart, Tasmania. Advice to the Commission by the Scientific Committee, and consequent decisions and the implementation of various management measures by the Commission, is by consensus, meaning that all CCAMLR Members must agree and conversely that any one member can block consensus.

In broad terms, CCAMLR manages the area south of the position of the Antarctic Convergence. This is the place where colder polar waters meet more temperate waters to the north forming an effective biological barrier to most Southern Ocean species.

The Scientific Committee of CCAMLR assesses information from a number of subgroups before reporting to the Commission for consideration and implementation. The CCAMLR Working Group on Fish Stock Assessment or WG-FSA is the body responsible for assessing the stock size of harvested marine species and making other recommendations to the Scientific Committee of CCAMLR for fisheries management. These other recommendations include such items as; season length, harvest levels, management of associated non-target species (part of the ecosystem management

framework) in each area and so forth. There are also other subgroups which deal with items such as; seabirds, the methods used to evaluate stocks, and reviewing information on ecosystem management. All these groups then advise the Scientific Committee who in turn advise the Commission to make management decisions.

The Ross Sea area effectively covered by the covered by CCAMLR Management area 88.1 is defined as an exploratory fishery. This is a specific term and is defined by CCAMLR as a fishery that will not be allowed to expand any faster than governed by the acquisition of such information from the fishery necessary for management under the CCAMLR conservation principles set out in Article 2.

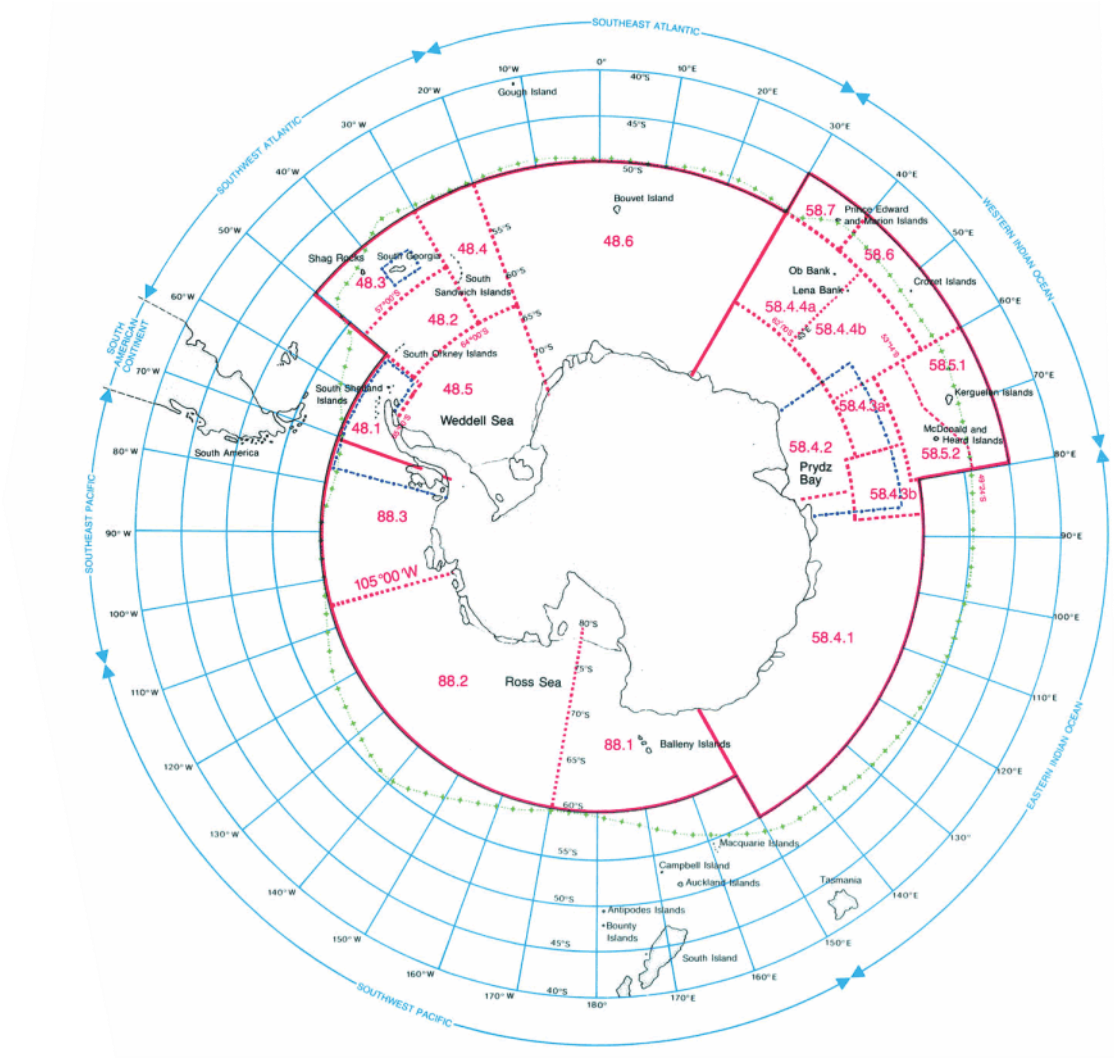


Figure 3. CCAMLR management areas

For further information check out NIWA's video at: http://www.niwa.co.nz/video/the-antarctic-toothfish-fishery and http://www.niwa.co.nz/video/ecosystem-effects-and-mitigation-of-the-toothfish-fishery

What is New Zealand's position on marine protection in the Ross Sea?

New Zealand has been promoting the implementation of a representative Marine Protected Area in the Ross Sea since 2009.

As early as 2008 New Zealand, with the full agreement of the New Zealand fishing industry, successfully proposed to close fishing in the area to the west of 170ºE in the western Ross Sea including Terra Nova Bay and McMurdo Sound. This closure was discussed and agreed to by CCAMLR.

New Zealand and the United States are the two main CCAMLR members most actively working on and promoting the creation of representative Marine Protected Areas within the Ross Sea. Although there are differences in approach and implementation, the countries have been collaborating with a view to agree on a joint approach.

CCAMLR requires consensus decisions and full agreement from all 25 members. A transparent and science-based approach will be crucial in getting a full agreement by CCAMLR members.

How many vessels from how many countries fish in the Ross Sea and what is New Zealand's share?

Four New Zealand vessels operated in the Ross Sea in the 2011/12 season (in total 15 vessels from all CCAMLR States fished there during the 2011/12 season). New Zealand has participated in the fishery with no more than four vessels since the 2003/04 season.

Last year New Zealand's toothfish catch was 26 per cent of the total catch limit set by CCAMLR, and for the past six years only once has it topped 40 per cent of this catch limit.

12 CCAMLR members have had vessels operating since the start of the Ross sea toothfish fishery in 1997.

There has always been a difference between the numbers of vessels for which CCAMLR members apply to fish in the Ross Sea and the number of vessels that actually go fishing. These 'optimistic' applications have reduced markedly since CCAMLR initiated a "pay for application" system. The two tables below show the number of vessels, number of New Zealand vessels, and in table 2 the proportion of New Zealand catch for each season for the entire history of the fishery.

Table 2. Summary of TAC, reported catch, and NZ participation in the Ross Sea fishery 1996 to 2012 (assessment area being CCAMLR Subarea 88.1 and SSRUs A and B of 88.2). Information from the publicly accessible area of the CCAMLR website.

Season	Total Toothfish TAC (tonnes)	Total Toothfish Reported Catch (tonnes)	New Zealand Catch (GWT)	Total Vessels Approved to Fish	Total Vessels Actually Participating	New Zealand	
						Vessel Numbers Approved	Actual Number participating
1996-97	1980	0.128	0.128	no limit set	1	no limit set	1
1997-98	1510	41	41	no limit set	1	no limit set	1
1998-99	2281	296	296	2	2	2	2
1999-00	1915	745	751	no limit set	3	no limit set	3
2000-01	2063	658	582	6	7	3	3
2001-02	2508	1333	1333	10	2	4	2
2002-03	3760	1792	985	13	9	6	6
2003-04	3250	2166	784	26	21	6	4
2004-05	3250	3079	1773	21	10	5	3
2005-06	2964	2938	1406	21	13	5	4
2006-07	3032	3096	1167	21	15	4	4
2007-08	2700	2259	772	21	16	4	4
2008-09	2700	2435	730	21	13	4	4
2009-10	2850	2870	1316	15	12	4	4
2010-11	2850	2882	888	19	16	4	4
2011-12	3282	3186	820	18	15	4	4

Table 3. New Zealand proportion of effort and catch from the Ross Sea. Information from the publicly accessible area of the CCAMLR website

Season	Total Dissostichus Reported Catch (MT)	New Zealand Catch (MT)	NZ proportion of reported catch	Total Vessels Participating	Proportion of NZ vessels participating
1996-97	0.128	0.128	100%	1	100%
1997-98	41	41	100%	1	100%
1998-99	296	296	100%	2	100%
1999-00	751	751	100%	3	100%
2000-01	658	582	88.40%	7	42.90%
2001-02	1333	1333	100%	2	100%
2002-03	1792	985	55.00%	9	66.70%
2003-04	2166	784	36.20%	21	19.00%
2004-05	3079	1773	57.60%	10	30.00%
2005-06	2938	1406	47.90%	13	30.80%
2006-07	3096	1167	37.69%	15	26.70%
2007-08	2259	772	34.17%	15	26.70%
2008-09	2435	730	29.98%	13	30.80%
2009-10	2870	1316	45.87%	12	33.30%
2010-11	2882	888	30.81%	16	25%
2011-12	3186	820	25.73%	15	26.60%

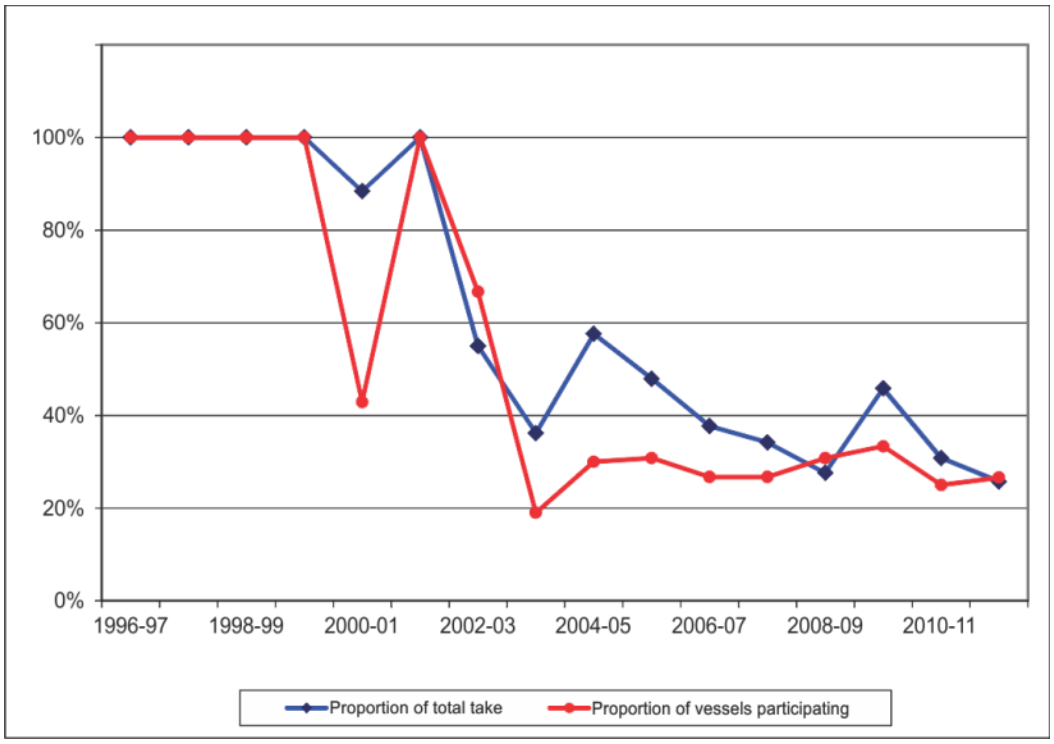


Figure 4. New Zealand proportion of total toothfish take and as a ratio of participating vessels in the Ross Sea fishery 1997 to 2012.

From figure 3 it is evident that on only one occasion over the past six years of the fishery has the New Zealand proportion of the total catch been above 40%. It is also evident that as a proportion of participating vessels New Zealand has comprised between 25% and 30% of the fleet from the 2003/04 season.

Who fishes there? CCAMLR members that have participated in the Ross Sea fishery to date include:

- Argentina, Chile, New Zealand, Norway, Russia, South Africa, South Korea, Spain, Ukraine, United Kingdom, United States, and Uruguay

Is illegal (illegal, unregulated, unreported) fishing significant?

There have been few 'illegal' vessels in the Ross Sea. This is the most southern fishery in the world and its high latitude location, distance from all ports, and the fact that ice covers the region for up to nine months of the year provides natural protection. In addition, legitimate and licensed vessels from member states with a vested interest in protecting their own access and allocation gives a second tier of detection and reporting.

CCAMLR estimates that IUU vessels took 632 tonnes of toothfish from the Ross Sea between 1996 and 1997. As a proportion[ii] the Ross Sea has contributed 0.45% of the total estimated IUU removals from the CCAMLR Convention Area. No IUU catch was reported for 2010/11, the last year of published records.

It is important to note that 'illegal' refers to fishing by vessels which would be truly illegal under sovereign jurisdiction if carried out in any country's territorial waters. The Ross Sea is effectively international waters for vessels not flagged to CCAMLR signatories.

General history of 'pirate' fishing: IUU catches of toothfish started around South Georgia but in 1996 spread seriously to the Indian Ocean, which led to a substantial catch above the recommended aggregate global limit for the Convention Area. There was also a rapid decline of the stock around Crozet Island in 1997. IUU catches have reduced in recent years. Strict controls on the imports of toothfish (*Dissostichus species*) by the United States and the enforcement of catch documentation and port control/ inspection measures by CCAMLR have assisted this.

But the threat of IUU fishing to stock sustainability remains considerable IUU activity may be again increasing. Recent reports are that IUU vessels are using set-nets rather than longlines. Set netting is very unselective and catches a wide range of fish and non-fish bycatch. The advantage for pirate operators is that it does not require them to carry bait. Much of this IUU fishing is carried out in CCAMLR statistical area 58 in the Indian Ocean sector.

IUU in the In the Ross Sea Region.

CCAMLR's estimates for IUU fishing in the Ross Sea are precautionary and are based not only on vessel sightings but on sightings of unmarked and drifting fishing floats.

New Zealand carries out regular surveillance flights over the Ross Sea and has more recently used its new offshore patrol boats to carry out fishing vessel boardings and inspection.

Photo 1. New Zealand Navy carrying out a vessel inspection in the Ross Sea region.

Has CCAMLR-approved fishing in the Ross Sea caused a decline in toothfish numbers from McMurdo Sound?

The reported decline in toothfish catches from the McMurdo Sound sampling programme is restricted to McMurdo and has not occurred in the wider Ross Sea fishery and in other research programmes carried out during the past 13 seasons.

According to a number of scientists primarily based near McMurdo Sound there has been a decrease in toothfish in the 39 years between 1972 and2011. Several papers, the most recently published in March 2012, attribute this decline to the Ross Sea fishery which began in the 1996/97 season. They maintain that the fishery appears to be dramatically altering the trophic structure of the Ross Sea.

Although the CCAMLR working group on fish stock assessment uses tagging to assess the size of the spawning stock of Antarctic toothfish in the Ross Sea, the group also uses other data to verify these findings. There are independent analyses of catch per unit effort (CPUE) information - that is how much fish is caught using a set number of hooks.

In addition, the size and age distribution of the catch is monitored from observer derived biological information. Every vessel fishing in the Ross Sea must carry two scientific observers who collect biological records from fish species including lengths, otoliths for ageing, and weight. Stock assessments are carried out by CCAMLR biennially but monitored annually. No information collected over the past 16 years, including the independent CPUE and size/age data, show evidence of declining trends in abundance, catch rate, or fish size.

Photo 2. New Zealand and other CCAMLR Member vessels collect biological and other scientific data for scientific observers.

There are likely explanations for fewer fish being caught through holes in the ice near McMurdo. Research shows a change in the bottom water and hydrology. Fast ice in the area had not cleared for a 15 year period. The largest piece of Iceberg B-15, which calved in 2000, restricted surface circulation, cooled and freshened the upper water column, and reduced melting near the ice shelf front for four years. Iceberg C-19 in 2002 interrupted the operation of the Ross Sea polynya, from which McMurdo Sound took three to four years to recover, and was responsible for a geographic shift in the dense water formation region for the south-western Ross Sea.

These changes in local hydrology may well have depleted the food sources for toothfish.

In February 2012 a CCAMLR requested survey on smaller toothfish on the shallower slope area to the south of the Ross Sea was carried out. Its standardised results showed no significant change in catch rates in the southern Ross Sea over the past decade[iii].

http://www.niwa.co.nz/news/survey-reveals-plenty-of-fish-in-the-ross-sea

Why isn't CCAMLR listening to the scientists at McMurdo Sound?

There has been considerable public commentary that CCAMLR is ignoring information on the apparent decline of toothfish in the southern reaches of the Ross Sea provided by American and other scientists at McMurdo Station and Scott Base.

On the contrary, a number of the CCAMLR working groups have seriously considered papers from this group as early as 2008. Due to inconsistencies and a lack of supporting data for some of the findings CCAMLR requested the authors to supply further information. The McMurdo scientists published a further paper in March 2012. .

A paper[iv] by scientists at McMurdo was submitted in July 2008 to the Working Group on Ecosystem Monitoring and Management (EMM) in St Petersburg, Russia. The Meeting was attended by 35 scientists from 11 countries.

The Working Group questioned the McMurdo scientists' assertions, including;

- If the McMurdo scientists had caught 4,500 fish over a 30-year period (1971–2001), this is an average catch of 150 fish per year. This is inconsistent with the claim that total captures once numbered 200–500 fish per year before exploitation started.
- (ii) The authors also claimed that they chose 1987 as a 'typical year in catch results' for the pre-exploitation period. However, the catch in that year was 412 fish – this is not a typical year if the average was only 150 fish.
- The apparent decline in toothfish catches coincided with a change in the scientific fishing location. Commercial catch rates are very dependent on fishing location, therefore it would be surprising if this was not the same for a research fishing site.

Due these and other inconsistencies and lack of information the international scientists were unable to adequately assess the conclusions of the paper and requested that the authors provide specific information.

Are toothfish long-lived and slow growing?

The maximum age for a Ross Sea toothfish is 35 years (compared with snapper at 60 years, hapuku (groper) 46 years and tarakihi 46 years). They grow more than a metre in their first ten years and by 35 they are generally about 1.7 m.

A good measure of the maximum age of a fish species is the age by which 99% of the population has died.

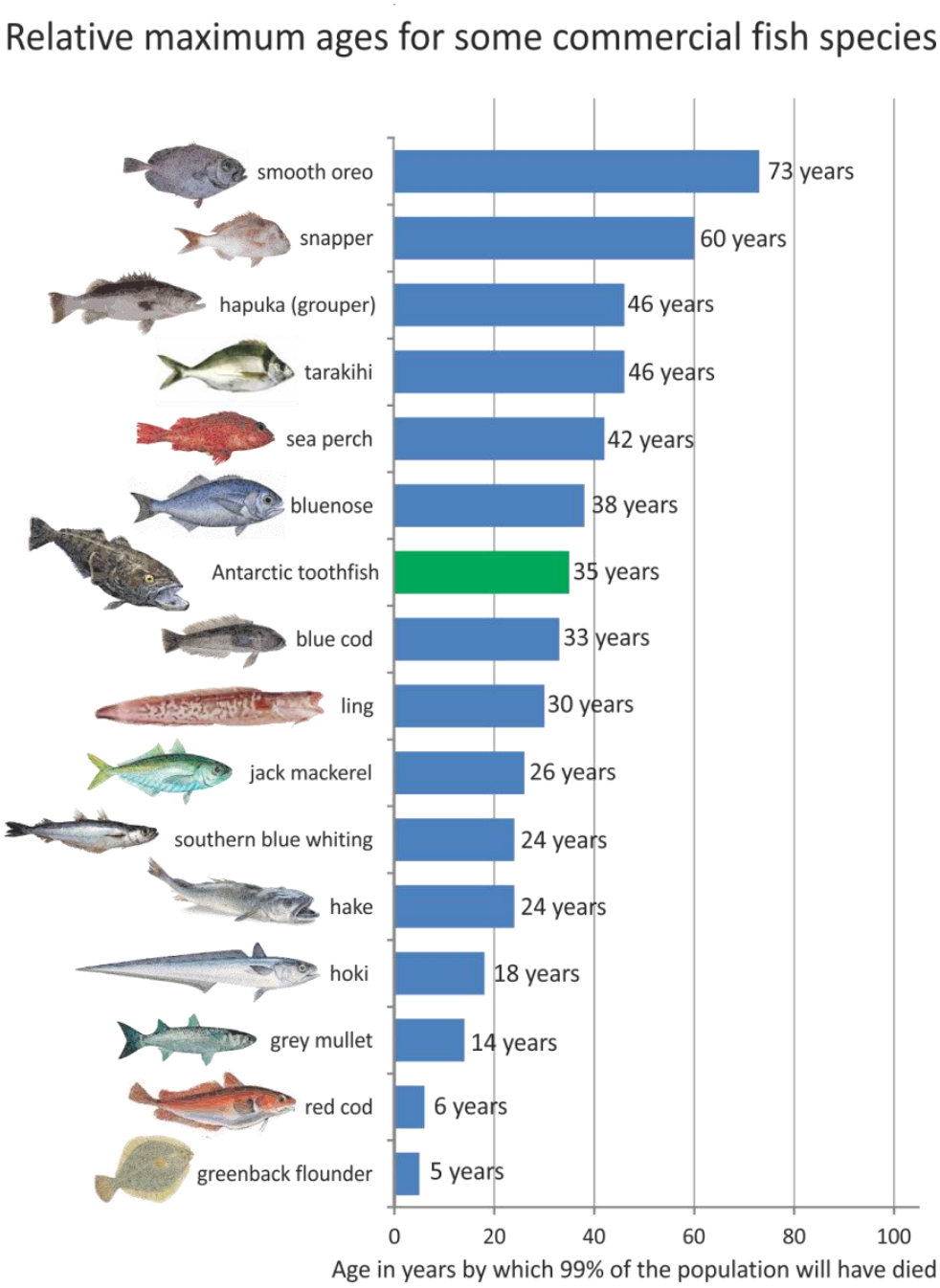


Figure 5. Relative ages for some well-known fish species.

Antarctic toothfish lie very much in the middle of the range - close in fact to blue cod to which they are distantly related. They are not long-lived in comparison to many other temperate species.

Scientists measure growth rate using the von Bertalanffy growth function. For toothfish we are lucky in that the species is suitable for a mark and recapture programme (or tagging). The fish lack a swim-bladder and so can survive being taken out of the water, which lets us independently verify their age and length. .

Female Antarctic toothfish:

- Grow nearly 30 cm in the first two years of life.
- Grow 65 cm in the first five years.
- Reach 107 cm in length after 10 years.
- By age 35 they are over 1.7 m in length.
- The males reach are smaller than females.

How are the numbers of toothfish assessed in the Ross Sea to manage fishing?

Toothfish stocks in the Ross Sea are assessed by tagging a set proportion of live fish caught. By knowing the number of tagged fish already in the population and recording the numbers recaptured as a proportion of the total catches, the total population can be estimated.

The CCAMLR stock assessment for toothfish species in general and specifically in the Ross sea region is based on a mark and recapture programme (tagging). All fishing vessels approved by CCAMLR and operating in the Ross sea fishery must tag and release at least one toothfish per tonne of fish caught. CCAMLR annually audits tagging results from each vessel. Additionally two observers are on each vessel.

Photo 3. Tagging a toothfish.

The actual tagging and calculation process uses mathematical models, with parameters such as age and growth, the natural mortality rate, the number of tags that detach, and so forth.

Two plastic tags are inserted into each candidate fish and the fish is released back alive. Accurate records are kept of the location, the numbers on the tags and fish length.

CCAMLR's rules currently governing the long-term annual yield for Antarctic toothfish in the Ross Sea are that at each assessment the yield is set so that 50% of the initial spawning biomass of fish (that is the estimated weight of spawning fish before fishing commenced) will remain after the subsequent35 years. This process is reviewed every two years.

CCAMLR assessments work on a long-term annual yield, setting catch limits over a number of years, rather than attempting to revise catch limits each year.

The yield estimate is revised with new information or improved methodologies.

What is known about the egg and larval stages of toothfish?

The CCAMLR stock assessment for toothfish species in general and specifically in the Ross Sea is based on a mark and recapture programme (tagging). The assessment of stock size is specifically for spawning stock biomass, or adult fish. So only the larger fish are tagged, released, and recorded as they are recaptured. Any information on reproduction, eggs and larvae, and juvenile stages of toothfish would be of interest scientifically, but such information would not change the existing assessments, since its interest and use if for describing ecology and movement patterns.

There is research to answer some of these questions. For example the New Zealand vessel San Aotea II has been towing a continuous plankton sampling system to and from the Ross Sea for the past four years to collect eggs and larval fish.

There seem to be a number of incidents involving fishing vessels in the Ross Sea sinking, being holed by ice, and catching fire - why is this?

The New Zealand Government has always set very high standards under its own domestically issued AMLR permits for vessels working in the Convention area. Many of these measures have subsequently been adopted by CCAMLR for all Members, such as the requirement to carry two observers.

Crew experience, backup systems, and training are also vital components of safe ship management and New Zealand is highly regarded in this area. New Zealand vessels have operated safely in the Ross Sea for 16 years.

However while New Zealand sets and requires very high standards for the suitability of its vessels and crew to operate in the polar environment, measures such as a minimum classification for ice suitability are not currently a formal CCAMLR requirement and some Member states have lower expectations and standards.

This is unsatisfactory and hazardous to both vessel crews and the environment. One vessel sank in2010/11 with a loss of 21 lives and another the following year.

For more information on a typical New Zealand vessel operating in the Ross Sea see http://icescience.blogspot.co.nz/2012/02/our-fine-vessel.html

How much do we know about the interactions between toothfish and other species in the Ross sea ecosystem-prey/predator relationships?

There has been considerable research, in particular over the past four years, on the both the effect of the fishery, and toothfish themselves, on Antarctic food webs. Recent work strongly suggests that neither Weddell seals or killer whales rely on Antarctic toothfish for more than ten per cent of their diet. Studies on toothfish feeding report that toothfish are non-selective and voracious feeders.

Some of the work on trophic relationships in the Ross Sea includes:

> Trophic study of Ross Sea Antarctic toothfish (*Dissostichus mawsoni*) using carbon and nitrogen stable isotopes by S.J. Bury, M.H. Pinkerton, D.R. Thompson, S. Hanchet, J. Brown and I. Vorster (WG-EMM-08/27)
>
> A preliminary balanced trophic model of the ecosystem of the Ross Sea, Antarctica, with emphasis on apex predators by M.H. Pinkerton, J.M. Bradford-Grieve and S.M. Hanchet (WG-EMM-08/42)
>
> Trophic overlap of Weddell seals (*Leptonychotes weddelli*) and Antarctic toothfish (*Dissostichus mawsoni*) in the Ross Sea, Antarctica by M.H. Pinkerton, A. Dunn and S.M. Hanchet (WG-EMM-08/43)
>
> A balanced model of the food web of the Ross Sea, Antarctica by M.H. Pinkerton, J.M. Bradford-Grieve and S.M. Hanchet (WG-EMM-09/42)
>
> Bioregionalisation and Spatial Ecosystem Processes in the Ross Sea Region. Sharp, B.R., S.J. Parker, M.H. Pinkerton (lead authors); and others WG-EMM-10/30
>
> Towards a minimum realistic model for investigating trophic relationships between Antarctic toothfish and demersal fish in the Ross Sea, Antarctica. Pinkerton ,M.H., S. Mormede, and S. M. Hanchet. WG-SAM-10/21

Weddell seals can dive to 750m, which is deeper than where killer whales go, but still shallower than the standard toothfish depth, and generally neither the seals nor the killer whales inhabit the deep toothfish waters.

More information can be found at http://www.niwa.co.nz/oceans/research-projects/the-ross-sea-trophic-model

How did the Ross Sea toothfish fishery gain MSC Certification and who has the blue tick?

Certification of this fishery was contentious and resulted in much scientific debate, scrutiny and independent evaluation over several years. The outcome of this very rigorous process was that the final certification resulted in one of the highest scores ever awarded by the Marine Stewardship Council (MSC).

MSC certification for the Ross Sea is only valid for a subset group of companies that operate in the area. This group is called the Ross Sea Toothfish Client Group.

As of the 2011/12 fishing season this group comprised two companies from New Zealand, one British, one from Spain, and one from Norway. Collectively the client group has eight vessels in the fishery.

Figure 6. Vessels operating in the 2011/12 Ross Sea fishery - Ross Sea toothfish client group vessels are shown in blue.

Ross sea toothfish fishery certification timeline

21 November 2007: The Ross Sea toothfish fishery entered assessment. The initial client group comprised one New Zealand and two British fishing companies.

18 November 2009: Following stakeholder notifications, meetings, site visits, a final report and determination was made by the certification body that the Ross Sea Toothfish Longline Fishery should be certified according to the MSC principles and criteria.

16 December 2009: A Notice of Objection to the determination was lodged by The Antarctic and Southern Ocean Coalition (ASOC), an umbrella organisation representing more than 30 environmental and conservation organisations.

12 February 2010: The matter proceeds to adjudication under an MSC independent adjudicator..

8 October 2010: the independent adjudicator releases a third decision requiring the certification body to adjustment the final report reflecting the adjudicator's findings. These findings are available at http://www.msc.org/track-a-fishery/certified/southern-ocean/ross-sea-toothfish-longline/assessment-downloads-1/Public_Certification_Report_Ross_Sea_Toothfish_Fishery_v5.pdf .This report dismissed most of the objections made but questioned the scoring of four performance indicators.

15 November 2010: The certification body releases a revised public certification report for the Ross Sea Toothfish Longline Fishery. The final score was: MSC Principle 1: Sustainability of Exploited Stock - 88.5, MSC Principle 2: Maintenance of Ecosystem – 89.4, MSC Principle 3: Effective Management System – 91.4.

As a guide, in order for the fishery to achieve certification, an overall weighted average score of 80 is necessary for each of the three Principles and no Indicator should score less than 60. Accordingly, 100 represents a theoretically ideal level of performance and 60 a measurable shortfall.

18 November 2010: The Ross Sea Toothfish Longline Fishery is certified and a public certification report produced. The MSC scores awarded were among the highest ever awarded to a certified fishery.

8 December 2010: Certificate of Compliance issued to the Ross Sea Client Group for the Ross Sea Toothfish longline fishery.

22 December 2011: The first surveillance audit report indicates that of the eight conditions set for the Ross Sea Toothfish longline four were on or ahead of target for completion,, three were closed for the original client group members, but would be reopened for new client group members, and one condition was completely closed.

All documentation for the process above can be found online at http://www.msc.org/track-a-fishery/certified/southern-ocean/ross-sea-toothfish-longline/assessment-downloads

How can we be sure about our knowledge of Antarctic toothfish and the assessment?

CCAMLR stock assessments work on the basis of a long-term annual yield. This does not imply that a catch limit of a fixed amount will be retained for the total period over which the yield is calculated. CCMLR revises its estimate of yield as new information or improved methodologies become available. This is subject to annual review by a number of the CCAMLR working groups.

Additionally, a risk analysis evaluating the accuracy of the information is included in the assessment. Given that the fishery is managed conservatively, with catch levels set at a very low level, there is confidence that the stock assessment provides information to effectively manage the fishery.

Much of the base information used for science in the Ross Sea fishery is collected aboard fishing vessels by the scientific observers. The provision of accurate data is critical to the whole process. New Zealand vessels are credited with very high standards in this regard.

What other fish and non-fish species are caught in the Ross Sea fishery and what happens to it?

During the 2010/11 season, the last season for which verified data are available, Antarctic toothfish comprised over 93% of the weight of the total catch. Yearly fluctuations are minimal. All species caught must be recorded.

Photo 4. Whitson's rattail (Macrorus whitsoni) the most common fish by-catch species in the Ross Sea. CCAMLR has a number of measures including a move-on rule to reduce catches of non-target species.

The two main species other than toothfish taken in the Ross Sea fishery are skates of various species and several grenadiers (or rattail) species. Skates, like toothfish, lack a swim-bladder and are therefore also good candidates for live release.

CCAMLR requires vessels to return all live skates caught either with or without tags. Where possible vessels remove the hooks as well..

Photo 5. The hook is removed from the mouth of a skate before release.

Other than grenadiers and skates, all other species in the 2010/11 season were less than 0 .8% of the total catch.

There are strict controls prohibiting the discard of any fish species unlikely to survive after capture. Thus any fish caught must be retained aboard until the vessel leaves the Convention Area. Two of the New Zealand vessels operate fishmeal plants to deal with bycatch species or, in some cases where the fish are edible, they are processed for sale.

Only one seabird (a giant petrel) has been killed as a result of fishing in the entire 16 year history of the fishery.

The New Zealand fleet has pioneered many of the measures to protect seabirds. Many of these have been adopted by CCAMLR and set out in a number of Conservation Measures. There are very strict reporting requirements for catches of both seabirds and marine mammals.

Further information can be found at: http://icescience.blogspot.co.nz/2012/02/seabirds-and-fishing-solutions.html

What is the fishing method for catching Ross Sea toothfish?

Trawling is not allowed in CCAMLR exploratory fisheries. Demersal long lining is the only method used. It is passive rather than active and thus has a much lower impact on the sea bottom. Estimates[v] of total cumulative impact by New Zealand fishing vessels in the Ross Sea fishery on benthic organisms remain low, on the order of 0.01% to 0.03% mortality for the most fragile VME taxa in the most heavily fished bioregions (i.e., on the Ross Sea shelf edge and continental slope).

When combined with suitable seabird and bycatch mitigation measures, long lining is the most suitable low impact way of fishing in this region.

For more information:

- the autoline system used in the Ross Sea http://www.ccamlr.org/en/document/publications/wg-fsa-08/60
- Bottom impacts of longline gear: http://www.ccamlr.org/en/document/publications/ccamlr-xxvii/19-annex-i

References

[i] Parker, Steven J., Brent Wood, Stuart M. Hanchet, and Alistair Dunn. 2010. A Bathymetric Data Framework for Conservation in the Ross Sea Region. WG-SAM-10/18

[ii] Source - Table 10, Estimation of IUU Catches of Toothfish Inside the Convention Area during The 2009/10 Fishing Season. WG-FSA-10/6 Rev.1. WG-FSA-11/10.

[iii] Hanchet, S.M., S. Mormede, A. Dunn, Hyun-Su Jo 2012. Results of a research survey to monitor abundance of pre-recruit Antarctic toothfish in the southern Ross Sea, February 2012. WG-SAM-12/29

[iv] DeVries, A.L., D.G. Ainley and G. Ballard (USA)Decline of the Antarctic toothfish and its predators in McMurdo Sound and the southern Ross Sea and recommendations for restoration 2008. WG-EMM-08/21.

[v] Sharp, B.R. 2010. Updated impact assessment framework to estimate the cumulative footprint and impact on VME taxa of bottom longline fisheries in the CCAMLR area. WG-FSA-10/31