



The illegal and unregulated fishery for toothfish in the Southern Ocean, and the CCAMLR catch documentation scheme

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Abstract

Fishing for toothfish in Antarctic waters started in the 1980s. Large amounts of illegal and unregulated fishing were observed in the mid-1990s, reaching 4 times the regulated catch in 1997. The Commission for the Conservation of Antarctic Marine Living Resources has adopted a number of Conservation Measures to control this illegal fishing. The Catch Document Scheme, adopted in 1999, which aims to reduce unregulated fishing through trade-related measures, is described in detail. © 2000 Elsevier Science Ltd. All rights reserved.

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1. Introduction

Dissostichus eleginoides (Patagonian toothfish) is a long-lived, slow-growing fish, which matures typically at ages greater than 10 years old, and may reach 2 m in length [1]. The species shows strong depth stratification, with larger animals occurring at deeper depths [2], and is typically found between 200 and 2000 m depth on continental shelf slopes around South America and the sub-Antarctic Islands. *Dissostichus mawsoni* (Antarctic toothfish) occurs further south than *D. eleginoides*, being generally restricted to Antarctic waters south of 65°S, but is similarly large and is likely to have an even slower growth rate than *D. eleginoides* [3,4]. Both species are vulnerable to overfishing because of their slow growth rates.

Longline and trawl fisheries, predominantly for *D. eleginoides*, have developed around South America and in the Southern Ocean¹ since the mid-1980s. At the same time, the Commission for the Conservation of Antarctic

Marine Living Resources (CCAMLR) has been developing assessments and management of stocks of *D. eleginoides* around a number of sub-Antarctic Islands for which there are good data. In addition to catching fish, longline fisheries also run the risk of accidentally killing seabirds which are attracted to the bait on longline hooks, are dragged underwater as longlines are being set and drowned. CCAMLR recognised this problem soon after the start of the longline fishery in its waters and put mitigation measures in place to reduce seabird bycatch. However, the rapid growth of the market for toothfish, which is a highly valuable fish, led to the development of unregulated fishing in the Convention Area. The subsequently much publicised “IUU fishery” which is composed of Illegal,² Unregulated and Unreported fishing, puts in jeopardy the measures developed by CCAMLR both to manage toothfish stocks and to reduce the incidental mortality of seabirds in Southern Ocean longline fisheries. This paper describes the history of this illegal

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¹ Here taken to be the Southern Atlantic, Indian and Pacific Ocean waters contained within, and adjacent to, the CCAMLR Convention Area: see Fig. 1.

² Illegal fishing can be of two types; fishing by CCAMLR-flagged vessels contrary to the Conservation Measures, for instance out of season; and fishing by either CCAMLR or non-CCAMLR flagged vessels in waters subject to coastal state jurisdiction within the Convention Area without that state's permission. Unregulated fishing is fishing by non-CCAMLR flagged vessels in CCAMLR waters outside coastal state jurisdiction.

fishing and assesses the measures put in place by CCAMLR to combat it. The most recent development, a Catch Documentation Scheme (CDS), is described and discussed in detail.

2. Commercial fishing for toothfish

2.1. The development of commercial exploitation

Patagonian toothfish (*Dissostichus eleginoides*) was first investigated as a fisheries resource by Chile, with exploratory fishing starting as early as 1955 [5]. Development of longline gear able to operate at depths greater than 1000 m allowed the establishment of a commercial fishery in Chilean waters, which since the mid-1980s has taken between 5000 and 10 000 t per year (Table 1). In Argentine and Falkland Island waters toothfish were taken by trawlers until the early 1990s, since when both trawlers and longliners have been active [6,7].

In the Southern Ocean, toothfish have been the subject of a directed trawl fishery around Kerguelen Island since the mid-1980s [8] and were also caught in the general trawl fishery around South Georgia from the late 1970s [9]. However, it was not until the development of a longline fishery around South Georgia, by the Soviet Union in 1988/1989 followed by Chile in 1991/1992, that large-scale commercial harvesting developed in sub-antarctic waters.

2.2. The development of IUU fishing

The first indications of unreported or illegal removals of toothfish from the Convention Area were apparent at the Commission's meeting of 1993³ when a number of infringements of CCAMLR Conservation Measures were reported by CCAMLR inspectors (Table 2). Information was made available to CCAMLR of catches by Chilean vessels from two banks immediately to the north and west of Subarea 48.3 (Fig. 1). The presence of toothfish on these banks is likely, but they are very deep (1500–3000 m) compared with the shelf waters around South Georgia. Although some doubt was expressed as to whether these were mis-reported catches actually made within 48.3 (especially on the north bank which lies on the northern limit of the Convention Area), the major concern at the time was that the stocks on which these catches were made were unlikely to be separate from the main stock in Subarea 48.3.

In 1995, the presence of a considerable number of fishing vessels around South Georgia in Subarea 48.3

in months outside the CCAMLR season was reported [10,11] and CCAMLR was able to compile details of unreported catches for the early 1990s (Table 1). Unfortunately, no information was available on IUU fishing in 1996 [12].

2.3. Eastwards expansion

In late 1996, large-scale unregulated fishing was reported to be moving eastwards into the Indian Ocean sector, particularly around Prince Edward and Marion Islands (both within and outside the South Africa EEZ), Crozet and Kerguelen Islands, and Heard and Macdonald Islands (Fig. 1), and increasing considerably. The unreported catch derived from landings at southern African and Mauritius ports in 1997 was estimated to be 74 000–82 200 t [13], and seems mostly to have been landed between September 1996 and March 1997. The marked increase in IUU catch was linked to the reductions of toothfish catches around South America in 1995 and 1996 which forced many of the vessels in these fisheries to seek new fishing areas (Table 1). There was also increased interest from Northern Hemisphere fishing companies in toothfish. The large areas of remote waters in the southern Indian Ocean must have appeared attractive to these vessels, especially given the increased enforcement around South Georgia (see Section 4.2). However, there was also an increasing interest from within CCAMLR. In October 1995, a CCAMLR workshop had been held to examine toothfish assessment methods, and had also identified a number of areas in CCAMLR waters where toothfish were likely to be present and in which there was currently no fishing [7]. In 1996, a large number of new and exploratory fishing applications were made by CCAMLR members [14], for fishing in seven new CCAMLR areas. The juxtaposition of these events may be entirely coincidental, but there remains the possibility that the actions of CCAMLR itself could have unwittingly triggered the rush of IUU fishing seen in late 1996 and 1997. Once the virgin grounds around the Prince Edward Islands were discovered, the higher CPUEs in these areas (over 10 t/day (see below) compared to less than 3 t/day around South Georgia) and the greater enforcement around South Georgia would have made these grounds far more attractive for IUU fishing than Subarea 48.3.

At the time it was thought that about 130 000 t of toothfish were available on the world market in 1997 [13]. Up to 90 vessels were implicated in this unregulated fishery, half of them flagged with CCAMLR Members (Table 2), principally from South America. Subsequent calculations based on the number of vessels thought to be fishing in the area and average catch rates have reduced this estimate of IUU catches in 1996/1997 (Table 1). To put this catch in context, the Scientific Committee of CCAMLR has recently calculated that the long-term

³ The annual meetings of CCAMLR, which are frequently referred to in this paper, take place in the last week of October and first week of November each year.

Table 1
Estimated world catches of *Dissostichus* spp (mostly *D. eleginoides*) since 1984, reported from within and outside the Convention Area and estimated IUU fishing from the Convention Area^a

<i>Within the Convention Area</i>		1983/1984	1984/1985	1985/1986	1986/1987	1987/1988	1988/1989	1989/1990	1990/1991	1991/1992	1992/1993	1993/1994	1994/1995	1995/1996	1996/1997	1997/1998	1998/1999
Reported catch																	
Area 48	109	294	564	1199	1809	4138	8311	3640	3747	3088	509	3262	3821	2389	3258	4291	
Area 58	145	6685	467	3178	1046	1687	1070	1973	8750	2700	5139	5649	4919	7981	7910	12970	
Area 88															41	297	
Unreported catch																	
Area 48							345	565	3470	2500	6145	2870	0	0	0	640	
Area 58														42 800	33 583	10 093	
Total	254	6979	1031	4377	2855	5825	9726	6178	15967	8288	11 793	11 781	8740	53 170	44 792	28 291	
<i>Outside the Convention Area</i>																	
Chilean waters	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1996/1997	1997/1998	1998/1999	
Argentine waters	2480	5032	6985	4337	4300	6889	9387	10 969	26 918	20 997	20 902	15 694	6993	6796	8692	9172	
Falkland Island waters	27	107	144	825	53	105	135	132	525	3651	10 840	19 180	14 811	9395	5651	8297	
Other SW Atlantic	43	88	13	484	756	1209	2037	978	909	394	2963	2068	686	1195	1539	2189	
Other																	
South American														4000	156	1059	
Australia, New Zealand and South African waters														1000	575	175	
Total	2550	5227	7142	5672	5236	8439	11 767	13 203	28 352	25 042	34 705	36 942	22 490	22 386	16 613	20 892	
Estimated world catch	2804	12 206	8173	10 049	8091	14 264	21 493	19 381	44 319	33 330	46 498	48 723	31 230	75 556	61 405	49 183	

^aFAO Fisheries Statistics, CCAMLR Statistical Bulletins and Scientific Committee reports, Falkland Island Statistical Bulletins [6]. Area 48, 58 and 88 are the Southern Atlantic, Indian and Pacific oceans respectively (Fig. 1). Until 1992 there were significant catches by foreign fleets in Argentine and/or Falkland Island waters. FAO and Falkland Island statistics are quoted by calendar year. CCAMLR statistics, including estimates of catches outside the Convention Area from 1996 to 1997 onwards, are quoted by split-year.

Table 2
Inspections of Contracting Party vessels under the CCAMLR Inspection System, and infringements of conservation measures relating to fishing for toothfish in the Convention Area^a

	Inspections	Infringement by Members	Infringement by other Contracting Parties	Fishing by Non-Contracting Parties ^b	CCAMLR meeting
1988/1989	0				VIII
1989/1990	0				IX
1990/1991	0 ^c				X
1991/1992	1 ^c				XI
1992/1993	0	4	1 ^d		XII
1993/1994	3	3 ^e		1	XIII
1994/1995	1	11 ^e		3 ^f	XIV
1995/1996	5	9		4 ^g	XV
1996/1997	4	46		44 ^h	XVI
1997/1998	3	9 ⁱ		45 ^j	XVII
1998/1999	3	5		15	XVIII

^aCCAMLR Standing Committee on Observation and Inspection (SCOI) reports for 1989–1999 (e.g. Refs. [11,22]). Inspections have not found infringements unless noted.

^bincludes sightings.

^cplus one attempted but hampered through poor weather.

^dBulgaria, which is an Acceding State, not a Member of CCAMLR.

^eIncludes an inspected vessel.

^fBelize, Panama.

^gBelize, Panama, Vanuatu, Portugal, including some re-flagged from Members. This was the first year in which IUU activity in the Southern Indian Ocean was noted, around Prince Edward Island.

^hPanama, Belize, Vanuatu, Portugal, Namibia. Most activity around Prince Edward, Crozet, Kerguelen, McDonal and Heard Islands.

ⁱderived from French data (see Table 3); CCAMLR reports do not provide this statistic.

^jPanama, Belize, Vanuatu, Seychelles, Faroe Islands, Namibia.

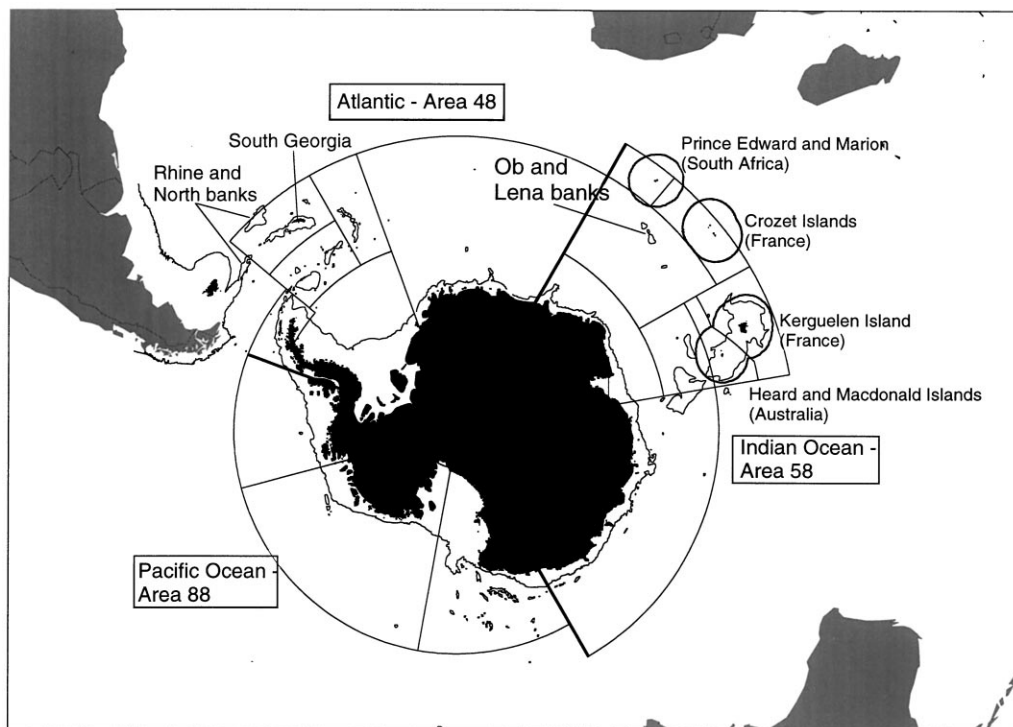


Fig. 1. Map of the Convention Area. The EEZs around the Indian Ocean Islands (Prince Edward and Marion, Crozet, Kerguelen and Heard and Macdonald) are marked, as is the 2000 m isobath (the general lower limit of fishable toothfish distribution) around South America and within the CCAMLR area, and subdivisions of the area used by CCAMLR for statistical purposes. Longlining for toothfish started around South America in the early 1980s and in the Convention Area in the late 1980s. The first IUU fishing was seen around South Georgia in 1994. It increased rapidly and spread to Prince Edward, Marion and Crozet Islands in 1996/1997 and then to Kerguelen and Heard and Macdonald Islands. Catches were landed in southern African ports (Namibia, Mozambique, Mauritius).

Table 3
Sightings and arrests of vessels engaged in IUU fishing around South Georgia, Crozet and Kerguelen Islands, and Heard and MacDonald Islands^a

	South Georgia Crozet (France) (UK)			Kerguelen (France)			Heard Island (Australia)
	<i>Arrests</i>	<i>Total sightings</i>	<i>NCP sightings</i>	<i>Arrests</i>	<i>Total sightings</i>	<i>NCP sightings</i>	<i>Arrests</i>
1994/1995	1						
1995/1996	2 (1 NCP)						
1996/1997		36	13	2 (Both NCP)	6	2	1
1997/1998		4	3	0	26	18	7 (6 NCP)
1998/1999		3	1	0	15	11	5 (1 NCP)
							3 (All NCP)

^aThe number of sightings and arrests of vessels with flags from Non-Contracting Parties is also given. UK data provided by Mr. G. Liddle, French data provided by Prof. G. Duhamel and taken from [20], and Australian data provided by Mr. I. Hay.

sustainable annual yield for toothfish in Subarea 48.3, one of the most productive areas for toothfish in the Antarctic, is only 3 500 t [4]. The high catches taken from the Prince Edward, Marion and Crozet areas in 1996/1997 was therefore far above sustainable levels and had the effect of “mining” the stock; that is, removing most of the biomass in an unsustainable way.

Unregulated catches declined somewhat from the peak in 1996/1997 and continued to move eastwards in 1997/1998 and 1998/1999 to Kerguelen and Heard and Macdonald Islands (Fig. 1). One of the reasons for departing the Prince Edward Island area was the significant reduction in catch rates resulting from the unregulated fishery, from 1.4 kg/hook in 1996 (for vessels setting an average of 8000 hooks per day this would equate to 11.2 t/day) to 0.5 kg/hook in 1997 and 0.1 kg/hook in 1998 (equivalent to 0.8 t/day) [13]. This last catch rate is generally regarded as being uneconomic for vessels operating in the Southern Ocean. However, there has also been increasing pressure on IUU vessels, both from the tightening of regulations for Contracting Party vessels and an increasing number of arrests and punitive fines (see next section). As a consequence, IUU fishing has declined considerably, and is now mostly restricted to Non-Contracting Party (NCP) vessels (Tables 2 and 3). In many cases, these NCP vessels are known to have reflagged from CCAMLR members. The IUU “fleet” of about 90 vessels seen in 1996/1997 appears to have been composed of about 66% “opportunistic” vessels, which have since been dissuaded from fishing by declining catch rates and high penalties (i.e. the probability of arrest and the level of fines). The rest form a “hard core” of IUU fishers, which remain problematic. Examination of ownership aspects has revealed that many are controlled and financed by Northern Hemisphere interests and their operations often involve a hierarchy of several companies registered in different countries and the use of open (shipping) register countries and tax havens (I. Hay, pers. comm.). There is concern that these remaining IUU vessels will turn their attention to as-yet unexploited

toothfish resources (especially *D. mawsoni* along the Antarctic coast) and to those areas (such as South Georgia) where successful management has resulted in a productive and sustainable fishery.

Up until 1998 the only target of the toothfish fishery had been *D. eleginoides* in the sub-Antarctic. In 1998 Chile conducted an exploratory fishery for toothfish in Subareas 48.1, 48.2 and 88.1 in a cruise that fished from 90 to 40°W along the Antarctic continental shelf. Very low catch rates of both *D. eleginoides* and *D. mawsoni* were recorded (less than 0.02 kg/hook), well below the rates required for a commercial fishery [15]. In the same year, New Zealand started a new fishery in Subarea 88.1 (the Ross sea), and took a total of 41 t which was mostly *D. mawsoni* [16]. Catches in this fishery by New Zealand continued in 1999 with 296 t of *D. mawsoni* and 1 t of *D. eleginoides* being taken [4]. It has not proved possible to derive separate estimates of the IUU catches of these species.

3. Regulatory responses of CCAMLR

3.1. Catch limits

In 1989, following the first year of a major longline fishery around South Georgia for toothfish, the Commission had insufficient information from which to agree a scientific catch limit. Instead, it agreed a Resolution in which the Soviet Union stated its intention not to increase the level of catches, and in which Members were urged to investigate methods of reducing the incidental mortality of seabirds on longlines.

A number of years of development of scientific assessment methods then followed, culminating in the development of a method which combined survey-derived estimates of recruitment with long-term stochastic yield projections to arrive at an estimate of long-term sustainable yield [17,18]. Catch limits and other fishing regulations have been in place for all areas, including

those which are the target of new and exploratory fisheries, since 1990. Following concern about the level of incidental mortality of seabirds arising from reports of the early longline fishery, CCAMLR adopted Conservation Measure 29/X in 1991 [19], which set out methods to be used to minimise seabird bycatch in longline fisheries. As a result, the bycatch of birds in the legitimate fishery is now two orders of magnitude lower than in IUU fisheries which do not use these mitigation methods (approximately 0.01 birds/thousand hooks in the legitimate fishery compared with an estimated 0.5–2 birds/thousand hooks in IUU fisheries; [4]).

3.2. Measures to combat IUU fishing

Those CCAMLR members having territorial waters within the Convention Area have the possibility of patrolling and making arrests within these waters. Despite the high cost of deploying enforcement vessels in CCAMLR waters, a number of arrests have been made, especially by France, Australia and the UK⁴ (Table 3). The fines imposed by Members on these vessels have gradually increased, from under £100 000 (the UK fined the FV *Antonio Lorenzo* £74 000 in 1994, and early French fines were FF 500 000 at Port Réunion) to as high as £1.8M (the UK fine on the Belizian flagged FV *Thunnus* arrested in 1995) and FF 70M (£7M) in recent years at Port Réunion [20]. These fines have had a significant effect on the number of vessels engaged in IUU fishing, since many companies simply abandon their vessels in the face of such fines and many are now reluctant to run the risk of arrest. However, many of the areas where *Dissostichus* spp. are found are outside national jurisdiction, either because they are sea-mounts such as the Ob and Lena banks or they are south of 60°S and therefore within the Antarctic Treaty system.

CCAMLR has had a System of Inspection in operation from 1989 [21]. This allows inspectors of one member to board and inspect fishing vessels of other members within the Convention Area, any infringements being reported to the Flag State of the fishing vessel for action by that Flag State. Relatively, few inspections have been carried out each year (Table 2). Not all attempted inspections are successful — for instance, in 1996, 1999 and 2000 the UK reported that a vessel refused to stop and allow an inspection ([22]; M. Richardson, pers. comm.) — and there is no provision for members to inspect vessels of Non-Contracting Parties (NCPs). Since a con-

siderable amount of IUU fishing was attributable to NCPs it is clear that the Inspection System was not a suitable mechanism for combating a large portion of the increasing levels of IUU fishing.

Throughout the early 1990s, reports of sightings of vessels presumed to be IUU fishing in the Convention Area, many of which were from NCPs, were made to CCAMLR's Standing Committee on Observation and Inspection (Table 2). The increasing frequency of these reports raised the importance of the issue on CCAMLR's agenda so that by 1997 unregulated fishing was of major concern to the Commission. Various mechanisms were discussed to combat it, including bilateral approaches to NCPs; denial of landings or transshipments by NCP vessels engaged in IUU fishing; trade-related measures; licensing Contracting Party vessels to fish on the high seas; and monitoring vessels attempting to re-flag in accordance with responsibilities under the FAO Compliance Agreement.⁵

Arising out of these discussions the Commission agreed two important Conservation Measures (CM) in 1997. The first (CM 118/XVI) obliged Contracting Parties to prohibit landings of toothfish from Non-Contracting Party vessels which had been sighted fishing in the Convention Area unless it could be proved that the fish had either been caught within the Convention Area in compliance with CCAMLR Conservation Measures or had been caught outside the Convention Area. The second (CM 119/XVI) prohibited fishing by Contracting Party vessels in CCAMLR waters unless they had a Flag State licence setting out the time, and place and species for which they could fish. This measure was primarily directed at "illegal" catches by vessels flagged with Contracting Parties.

At its 1998 meeting CCAMLR discussed the possibility of monitoring trade flows and of making Vessel Monitoring Systems (VMS) mandatory on fishing vessels (this last item had first been discussed in 1993). A Conservation Measure requiring fishing vessels⁶ to have VMS was agreed, albeit with an implementation date of 31 December 2000 (CM 148/XVII). Since many IUU vessels cut their longlines and depart rapidly when approached by an inspection vessel, all licensed vessels are now required to mark their gear appropriately (CM 146/XVII). Finally, a measure was agreed to inspect all vessels licensed by Contracting Parties to fish for toothfish in CCAMLR waters, when they entered the port of that or another Contracting Party (CM 147/XVII).

Although the adoption of these conservation measures appeared to considerably strengthen the CCAMLR

⁴In 1993, the UK proclaimed a 200 mile maritime zone around South Georgia and the South Sandwich Islands, and a Fisheries (Conservation and Management) Ordinance was enacted by the Commissioner of the Territory. This provides for comprehensive regulation of fishing within the zone, including a more effective implementation of the relevant CCAMLR Conservation Measures.

⁵The FAO Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas.

⁶With the exception of those fishing for krill.

regulatory system, it is doubtful whether individually they were particularly successful in reducing the levels of IUU fishing. To date, no inspections have been undertaken under CM 118/XVII (the measure was amended in 1998 giving it the roman numeral XVII) and only one under CM 147/XVII (by the UK at Stanley, Falkland Islands, in 1999). Despite CM 119/XVI, some Contracting Party vessels continue to fish in the Convention's waters illegally. Because of the delayed implementation date, VMS has not yet been universally adopted, and in any case is not useful in tracking NCP and unlicensed Contracting Party vessels since they are most unlikely to have VMS on board. VMS has proved useful, however, for some Contracting Party vessels to demonstrate that catches of toothfish were taken legitimately out of season in high seas waters outside the Convention Area. VMS coverage is increasingly being sought by legitimate fishing companies for their own commercial and safety purposes. The conservation measure on marking of gear is similarly ineffective against NCP and unlicensed vessels since they are most unlikely to have marked gear (IUU vessels often eliminate vessel markings as well). There was clearly a need for additional measures to combat IUU fishing.

3.3. The catch document scheme

The major markets for toothfish are in the territories of Members of CCAMLR — the US, Japan and the EU. The possibility of trade-related measures to control IUU fishing had been explored in the 1997 meeting of CCAMLR's Standing Committee on Observation and Inspection (SCOI) [23]. At the 1998 meeting of the Commission the US presented a draft of a conservation measure for a certification scheme aimed at identifying the origin of all toothfish landed or imported into territories of Contracting Parties. An important additional measure proposed by the US was to deny access to Contracting Party markets of imports of toothfish unless it could be demonstrated through a certification scheme that the fish had been caught either outside the Convention Area, or within it in conformity with CCAMLR Conservation Measures. Australia also presented a draft Action Policy which proposed that a comprehensive approach be adopted for the elimination of IUU fishing for *Dissostichus* spp. within the Convention Area [24]. Australia's proposal also recommended the introduction of a statistical document scheme to trace international trade in toothfish, based on the ICCAT Bluefin Tuna Statistical Document.

The issues raised by these drafts were too substantive to be concluded during the 1998 meeting. Instead, an intersessional meeting, chaired by the UK, was held in Brussels in April 1999 to take the issue further. New texts which elaborated on the various texts provided to the 1998 meeting of CCAMLR were provided by the US, the

EU and Australia. The meeting identified a number of important principles for any CCAMLR scheme. Namely, it should:

- effectively address illegal, unregulated and unreported fishing by Parties and Non-Parties;
- be non-discriminatory, fair and transparent;
- be practical, and capable of coming into operation easily and rapidly;
- address fishing in areas both inside and outside CCAMLR waters;
- be constructed so as to allow non-Contracting Parties the opportunity to participate;
- include sufficient validation and verification so as to create confidence in the documentation; and
- explicitly define the responsibilities of all participants.

Further progress was made at informal discussions held on the margins of the Antarctic Treaty Consultative Meeting in Lima, Peru in June 1999, in extensive discussions between June and September by the US and Australia, and in Washington in September 1999. The latter, which involved the US, Australia, the EU and Japan resulted in a revised draft scheme co-sponsored by the US, Australia and the EU. Following further drafting at the 1999 meeting, CCAMLR adopted three items: a Conservation Measure (see Appendix A), an Explanatory Memorandum and an Action Plan [25]. The Memorandum explains the need for the scheme and puts the details into layman's terms, and the Action Plan provides guidance on implementation, especially the engagement of NCPs.

All Contracting Party vessels, and vessels from NCPs which wish to operate the CDS, will be provided with individually numbered catch documents by their flag states. When they wish to land or tranship toothfish, they will obtain a Confirmation Number from their flag state, if the flag state confirms that the details of the landing are consistent with the vessel's authorisation to fish. When the fish are eventually landed, a port official will confirm that the landing agrees with the details on the document, and each recipient of the catch will confirm their receipt of a specified part of the landing. Copies of the catch document will remain with each part of the catch, through all export and import stages. Copies will also be held by the Flag State, and by the CCAMLR Secretariat. The intent of the CDS is clear in the Explanatory Memorandum [25]: "The [landing and] importation authorities (customs authorities or other appropriate officials) of Contracting Parties to CCAMLR will require that a *Dissostichus* Catch Document accompanies all [landings or] imports of toothfish. The relevant authorities may, if appropriate, contact the Flag State of the vessel to verify the authenticity of the content of the Catch Document. In the event that Contracting Parties importation authorities receive a shipment of toothfish that is not accompanied by a valid Catch

Document, the shipment will be detained. In the event that checks carried out by the importation authorities with the Flag State fail to verify the legitimacy of a Catch Document, importation of the shipment will not be authorised.”

A further development at CCAMLR-XVIII was the amendment of CM 147/XVIII in line with the CDS. This Conservation Measure now contains the requirement that all intended landings of toothfish into Contracting Party ports must be inspected to ensure that they have a valid catch document, and that all fish taken in the Convention Area have been caught in accordance with CCAMLR measures. This conservation measure has now become an integral part of the CDS.

4. Discussion

It is clear that the CCAMLR scheme provides mechanisms for both tracking trade in toothfish and excluding IUU caught fish from the major toothfish markets. The Conservation Measure, and the explanatory memorandum, allows for detention of a shipment while documentation is verified, and also for refusal if a document is not present or the legitimacy of a document is not confirmed. The CDS does not explicitly require Contracting Parties to refuse imports of fish caught in the Convention Area by Non-Contracting Parties if the fish are accompanied by correct documentation. However, the document itself includes a declaration of whether the toothfish were caught in the Convention Area “in a manner consistent with Conservation Measures”. It is generally considered that it would be very difficult for a NCP to comply with CCAMLR conservation measures (which include provisions for observers and regular reporting as well as seasonal and spatial closures and catch limits) without openly cooperating with CCAMLR as envisaged by paragraph 5 of the conservation measure.

As with all schemes of this nature, the CDS is attempting to force changes to fishing practices through imports to markets. The need for such a scheme is particularly highlighted by the international nature of much of the IUU fishing activities (evidenced by the comments about ownership in Section 2.3). Traditional lines of control (flag state controls and international law) can be too easily circumvented by organised IUU activities. The most likely impact of the CDS in the early stages of implementation will be to make it extremely difficult to trade in IUU product, since any product with suspect documentation is likely to be held at the point of import until its origin is resolved. This is likely to have the effect of increasing costs and decreasing profitability. Conversely, legitimately caught toothfish accompanied by correctly certified Catch Documents will have access to all the major markets which should increase profitability. The value of toothfish in Contracting Party ports has

already increased significantly from about \$5/kg headed and gutted in 1998 to over \$10/kg in 1999 [4]. This is thought to be partly in response to decreasing supply (following the peak in estimated catches in 1997) and partly to increasing insistence by importers that toothfish originate from legitimate catches. At the same time, the value of toothfish in NCP ports (principally, at the time of writing, Mauritius) is reported to be about half the value in Contracting Party ports.

4.1. Other international fisheries document schemes

CCAMLR's Catch Documentation Scheme is only the second international trade-related scheme to be introduced for marine fish by an international organisation. In 1992, ICCAT adopted the Bluefin Tuna Statistical Document (BSD) programme, which requires the use of an ICCAT-accepted reporting system to monitor trade in fresh and frozen bluefin tuna [26]. The BSD requires exporters of bluefin tuna to include documents identifying the location and flag of the vessel catching the fish. This information has been used to address the problem of harvests that are contrary to ICCAT rules, especially by NCPs. In 1994, a Bluefin Tuna Action Plan was adopted by the Commission that linked information gathered by the BSD Program with Contracting Party compliance and Non-Contracting Party cooperation with ICCAT's conservation regime. Having identified in 1995 that Belize, Honduras, and Panama had vessels which were fishing in a manner which diminished the effectiveness of ICCAT's conservation measures, in 1996 ICCAT prohibited imports by its members of bluefin tuna products from these three countries from 1997 (Belize, Honduras) and 1998 (Panama) [27].

The ICCAT approach was therefore to identify countries that were not complying with its management measures and then, after suitable warnings, prohibit imports from these states until they could demonstrate compliance. This approach was possible since all Atlantic bluefin tuna is caught only within the area of application of ICCAT. Such is not the case for toothfish, where there are high seas areas outside CCAMLR's zone which could be the source of legitimate catches by Non-Contracting Party vessels. CCAMLR's approach is therefore different from that of ICCAT, in that it targets individual shipments rather than all imports from a named state. A very similar system to that of ICCAT has recently been adopted by the Commission for the Conservation of Southern Bluefin Tuna (in December 1999).

The situation with toothfish was seen as so critical by CCAMLR that no “lead-time” could be entertained, other than the statutory 180 days required by the Convention. However, in order that the process is as transparent as possible the Action Plan provides for communication to all relevant parties. Non-Contracting Parties are explicitly invited to participate in the scheme

and are given clear instructions as to how this can be achieved (preamble to the Conservation Measure, see Appendix A).

CCAMLR has, in fact, always had a role in communicating with all Non-Contracting Parties identified in fishing for toothfish within the Convention Area. This communication is normally undertaken by the Executive Secretary, as for instance in 1994 when the Commission requested “that the Secretariat should write to the governments of the [NCP] states concerned with information about CCAMLR and request comments in respect of fishing in the Convention Area” in respect of a sighting of the Belize registered *Liberty* fishing in Subarea 48.3 in October 1994 [28]. However, in 1996, the Commission Chairman was directed to write to all NCPs whose vessels were implicated in IUU fishing, drawing their attention to the activities of their flag vessels, inviting them to “take steps to ensure that your flag vessels do not continue to act in a manner inconsistent with the Convention” and to consider acceding to the CCAMLR Convention [29]. This approach was extended in 1997 and Mauritius and Namibia, both states involved in receiving landings of suspected IUU caught toothfish, were invited to attend the 1998 meeting of the Commission which they duly did. Namibia has since indicated its intention to Accede to the Convention. The new Action Policy therefore extends the process of engagement of Non-Contracting Parties that has been ongoing throughout most of the 1990s, in the very specific context of inviting them to participate in the Catch Documentation Scheme.

4.2. *NGO contributions*

The negotiations of the CDS took place against a background of much public and political attention and considerable pressure from environmental groups. Interest in unregulated fishing for toothfish has always been high from the umbrella environmental NGO, ASOC (Antarctic and Southern Ocean Coalition). One member of ASOC, the Tasmanian Conservation Trust, even went so far as to set up a monitoring operation with financial assistance from licensed toothfish fishers and the Australian Government (ISO FISH, the “International Southern Oceans Longline Fisheries Information Clearing House”), following the widespread concern over illegal fishing at the 1997 CCAMLR meeting.

ASOC pressure at the 1999 meeting was for a moratorium on all catches of toothfish [30] and there was also consideration of a CITES Appendix B listing. Similar environmental pressure was evident when ICCAT’s BDS was being negotiated. The threat of a CITES Appendices A and B listing for Atlantic bluefin tuna, and intense discussion of the bluefin tuna problem at the March 1992 Kyoto meeting of CITES led indirectly to the adoption of the BDS in 1992 [31] and to later prohibition of imports

from Belize, Honduras and Panama. The NGO pressure on CCAMLR may have contributed to the impetus to agree a catch document scheme, but even without it there was a very high level of commitment by all Parties to CCAMLR in arriving at a workable solution to the high levels of IUU fishing that had been of concern to the Commission since 1995. ASOC welcomed the final adoption of the scheme, commenting “it is a momentous occasion when finally after two CCAMLR meetings, intersessional meetings and a great deal of intersessional activity and hard work by some very determined Members, consensus is finally reached and the CDS is agreed. ECO would like to congratulate the Commission. ... A CDS will assist in identifying those fishers that do it [IUU fishing] and those nations that support it. This will expose those who persist in finding ways to evade measures to curb illegal activity” [32].

4.3. *Considerations of World Trade Organisation requirements*

It is not the intention to provide here a detailed legal critique of the CCAMLR Catch Documentation Scheme in relation to World Trade Organisation (WTO) rules. However, considerable effort was made to create a scheme that would be consistent with these rules and it is worth describing the problem in some depth. In particular, lessons learnt during the tuna/dolphin [33] and more recently the shrimp/turtle disputes were taken into account so that any restrictions on imports of toothfish to Contracting Party territories would be legitimate exceptions to the principle of free trade.

The 1994 GATT Agreement, which since 1995 has been subsumed by the WTO, has as its core the principle of non-discrimination in trade (Articles 1, III and XI) from which there may be exceptions as detailed in Article XX. This latter article includes the “environmental” exception most likely to be applicable to the toothfish case:

Article XX

General Exceptions

Subject to the requirement that such measures are not applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between countries where the same conditions prevail, or a disguised restriction on international trade, nothing in this Agreement shall be construed to prevent the adoption or enforcement by any contracting party of measures:

...

(g) relating to the conservation of exhaustible natural resources if such measures are made effective in conjunction with restrictions on domestic production or consumption.

...

In very brief terms, in the tuna/dolphin dispute the US banned imports of tuna caught by Mexico, since it judged

that the Mexican tuna fleet did not meet its standards for dolphin protection during seine fishing operations. In the shrimp/turtle dispute the US banned imports from countries that did not require their vessels to use Turtle Exclusion Devices (TED) on their shrimp fishing gear.

The WTO panel ruled that both import bans were not consistent with GATT, and should be removed. Schoenbaum [33] states “WTO/GATT panels analyse Article XX(g) in terms of four requirements:

- (1) that the policy of the measures for which the provision is invoked falls within the range of policies relating to the conservation of exhaustible natural resources;
- (2) that the measures for which the exception is being invoked — that is, the particular trade measures inconsistent with the General Agreement — are related to the conservation of exhaustible natural resources;
- (3) that the measures for which the exception are being invoked are made effective in conjunction with restrictions on domestic production or consumption; and
- (4) that the measures are applied in conformity with the requirements of the introductory clause of Article XX”.

The reasons given by the panel in the tuna/dolphin case were that the US could not embargo imports of tuna products from Mexico simply because of the method of production, and that imported products must be treated in a manner no less favourable than domestic products. A further dissatisfaction of the panel was that the United States had not demonstrated that it had exhausted all other avenues for protection of dolphins, specifically international agreements [33]. In the shrimp/turtle case the US was requiring that countries wishing to export shrimp to it had adopted a regulatory scheme essentially the same as their own, using TEDs comparable in effectiveness to their own (used in the Gulf of Mexico), without considering whether individual vessels were using TEDs [34].

These two cases indicate that in disputes of this kind the WTO is primarily concerned that trade measures should be non-discriminatory (applying equally to foreign and domestic situations), should have been approached transparently in the context of an attempted multilateral resolution and should be clearly directed at and connected to the policy of conservation of the resource in question [34]. The principles of the CCAMLR catch document scheme, as laid out at the Brussels meeting clearly take these points into account. Of particular importance is the emphasis on restricting imports of individual shipments whose documentation is incomplete, rather than shipments from named countries; the inclusion of Non-Contracting Parties

in the scheme; and non-discrimination, which arises from the requirement that all participants (Contracting and Non-Contracting party vessels) follow exactly the same procedures. The CDS is clearly directed at conservation of toothfish, the target species of the fishery, and also seabirds which are a bycatch in longline fisheries.

5. Conclusion

The CCAMLR Catch Documentation Scheme is unique in that it is a scheme developed and adopted by an international inter-governmental organisation with the aim of conserving stocks of fish occurring within its area of jurisdiction, but which has implications for harvesting of the species in areas outside its jurisdiction. Catch documents will be required for all toothfish imported into the territory of a Contracting Party irrespective of where they were caught. It includes both Parties and non-Parties to CCAMLR in the scheme, with the goal of making trade in toothfish caught in the Convention Area in an Illegal, Unregulated or Unreported fashion extremely difficult and uneconomic, and ultimately to eliminate all IUU fishing. It will be implemented in 2000. It, and the suite of other regulatory measures described above, will almost certainly evolve over the next few years in CCAMLR's continuing battle to reduce IUU fishing and impose sustainable management regimes on toothfish stocks in the Southern Ocean.

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Appendix A. Conservation measure 170/XVIII catch documentation scheme for *Dissostichus* spp.

The Commission,

Concerned that illegal, unregulated and unreported (IUU) fishing for *Dissostichus* spp. in the Convention Area threatens serious depletion of populations of *Dissostichus* spp.,

Aware that IUU fishing involves significant by-catch of some Antarctic species, including endangered albatross,

Noting that IUU fishing is inconsistent with the objective of the Convention and undermines the effectiveness of CCAMLR conservation measures,

Underlining the responsibilities of Flag States to ensure that their vessels conduct their fishing activities in a responsible manner,

Mindful of the rights and obligations of Port States to promote the effectiveness of regional fishery conservation measures,

Aware that IUU fishing reflects the high value of, and resulting expansion in markets for and international trade in, *Dissostichus* spp.,

Recalling that Contracting Parties have agreed to introduce classification codes for *Dissostichus* spp. at a national level,

Recognising that the implementation of a Catch Documentation Scheme for *Dissostichus* spp. will provide the Commission with essential information necessary to provide the precautionary management objectives of the Convention,

Committed to take steps, consistent with international law, to identify the origins of *Dissostichus* spp. entering the markets of Contracting Parties and to determine whether *Dissostichus* spp. harvested in the Convention Area that is imported into their territories was caught in a manner consistent with CCAMLR conservation measures.

Wishing to reinforce the conservation measures already adopted by the Commission with respect to *Dissostichus* spp.,

Inviting non-Contracting Parties whose vessels fish for *Dissostichus* spp. to participate in the Catch Documentation Scheme for *Dissostichus* spp.,

Hereby adopts the following conservation measure in accordance with Article IX of the Convention:

1. Each Contracting Party shall take steps to identify the origin of *Dissostichus* spp. imported into or exported from its territories and to determine whether *Dissostichus* spp. harvested in the Convention Area that is imported into or exported from its territories was caught in a manner consistent with CCAMLR conservation measures.
2. Each Contracting Party shall require that each of its flag vessels authorised to engage in harvesting of *Dissostichus eleginoides* and/or *Dissostichus mawsoni* complete a *Dissostichus* catch document for the catch landed or transhipped on each occasion that it lands or tranships *Dissostichus* spp.
3. Each Contracting Party shall require that each landing of *Dissostichus* spp. at its ports and each transshipment of *Dissostichus* spp. to its vessels be accompanied by a completed *Dissostichus* catch document.

4. Each Contracting Party shall provide *Dissostichus* catch document forms to each of its flag vessels authorised to harvest *Dissostichus* spp. and only to those vessels.
5. A non-Contracting Party seeking to cooperate with CCAMLR by participating in this Scheme may issue *Dissostichus* catch document forms to any of its flag vessels that intend to harvest *Dissostichus* spp.
6. The *Dissostichus* catch document shall include the following information:
 - (i) the name, address, telephone and fax numbers of the issuing authority;
 - (ii) the name, home port, national registry number, and call sign of the vessel and, if applicable, its Lloyd's registration number;
 - (iii) the number of the licence or permit issued to the vessel, as applicable;
 - (iv) the weight of each *Dissostichus* species landed or transhipped by product type, and
 - (a) by CCAMLR statistical subarea or division if caught in the Convention Area; and/or
 - (b) by FAO statistical area, subarea or division if caught outside the Convention Area;
 - (v) the dates within which the catch was taken;
 - (vi) the date and the port at which the catch was landed or the date and the vessel, its flag and national registry number, to which the catch was transhipped; and
 - (vii) the name, address, telephone and fax numbers of the receiver or receivers of the catch and the amount of each species and product type received.
7. Procedures for completing *Dissostichus* catch documents in respect of vessels are set forth in paragraphs A1 to A10 of Annex 170/A to this measure.
8. Each Contracting Party shall require that each shipment of *Dissostichus* spp. imported into its territory be accompanied by the export-validated *Dissostichus* catch document or documents that account for all the *Dissostichus* spp. contained in the shipment.
9. An export-validated *Dissostichus* catch document issued in respect of a vessel is one that:
 - (a) includes all relevant information and signatures provided in accordance with paragraphs A1 to A11 of Annex 170/A to this measure; and
 - (b) includes a signed and stamped certification by a responsible official of the exporting State of the accuracy of the information contained in the document.
10. Each Contracting Party shall ensure that its customs authorities or other appropriate officials request and examine the import documentation of each shipment of *Dissostichus* spp. imported into its territory to verify that it includes the export-validated *Dissostichus* catch document or documents that account for all the *Dissostichus* spp. contained in the shipment.

These officials may also examine the content of any shipment to verify the information contained in the catch document or documents.

11. If, as a result of an examination referred to in paragraph 10 above, a question arises regarding the information contained in a *Dissostichus* catch document, the exporting State whose national authority validated the document and, as appropriate, the Flag State whose vessel completed the document are called on to cooperate with the importing State with a view to resolving such question.
12. Each Contracting Party shall provide copies quarterly to the CCAMLR Secretariat of all export-validated *Dissostichus* catch documents that it issued from and received into its territory and shall report annually to the Secretariat data, drawn from *Dissostichus* catch documents, on the origin and amount of *Dissostichus* spp. exported from and imported into its territory.
13. Each Contracting Party, and any non-Contracting Party that issues *Dissostichus* catch documents in respect of its flag vessels in accordance with paragraph 5, shall inform the CCAMLR Secretariat of the national authority or authorities (including names, addresses, fax numbers and email addresses) responsible for issuing and validating *Dissostichus* catch documents.
14. Notwithstanding the above, any Contracting Party may require additional verification of catch documents, including inter alia the use of VMS, in respect of catches by its flag vessels outside the Convention Area, when landed at and exported from its territory.

Appendix B. ANNEX 170/A

- A1. Each Flag State shall ensure that each *Dissostichus* catch document form that it issues includes a specific identification number consisting of:
 - (i) a four-digit number, consisting of the two-digit International Standards Organization (ISO) country code plus the last two digits of the year for which the form is issued; and
 - (ii) a three-digit sequence number (beginning with 001) to denote the order in which catch document forms are issued.
 It shall also enter on each *Dissostichus* catch document form the number as appropriate of the licence or permit issued to the vessel.
- A2. The master of a vessel which has been issued a *Dissostichus* catch document form or forms shall adhere to the following procedures prior to each landing or transshipment of *Dissostichus* spp.:
 - (i) the master shall ensure that the information specified in paragraph 6 of this conservation

measure is accurately recorded on the *Dissostichus* catch document form;

- (ii) if a landing or transshipment includes catch of both *Dissostichus* spp., the master shall record on the *Dissostichus* catch document form the total amount of the catch landed or transhipped by weight of each species;
 - (iii) if a landing or transshipment includes catch of *Dissostichus* spp. taken from different statistical subareas and/or divisions, the master shall record on the *Dissostichus* catch document form the amount of the catch by weight of each species taken from each statistical subarea and/or division;
 - (iv) the master shall convey to the Flag State of the vessel by the most rapid electronic means available, the *Dissostichus* catch document number, the trip start date, the species, processing type or types, the net landed weight and the area or areas of the catch, the date of landing or transshipment and the port and country of landing or vessel of transshipment and shall request from the Flag State, a Flag State confirmation number;
- A3. If the Flag State determines that the catch landed or transhipped as reported by the vessel is consistent with its authorisation to fish, it shall convey a unique Flag State confirmation number to the master by the most rapid electronic means available.
 - A4. The master shall enter the Flag State confirmation number on the *Dissostichus* catch document form.
 - A5. The master of a vessel that has been issued a *Dissostichus* catch document form or forms shall adhere to the following procedures immediately after each landing or transshipment of *Dissostichus* spp.:
 - (i) in the case of a transshipment, the master shall confirm the transshipment by obtaining the signature on the *Dissostichus* catch document of the master of the vessel to which the catch is transferred;
 - (ii) in the case of a landing, the master shall confirm the landing by obtaining the signature on the *Dissostichus* catch document of a responsible official at the port of landing;
 - (iii) in the case of a landing, the master shall also obtain the signature on the *Dissostichus* catch document of the individual that receives the catch at the port of landing; and
 - (iv) in the event that the catch is divided upon landing, the master shall present a copy of the *Dissostichus* catch document to each individual that receives a part of the catch at the port of landing, record on that copy of the catch document the amount and origin of the catch received by that individual and obtain the signature of that individual.

- A6. In respect of each landing or transshipment, the master shall sign and convey by the most rapid electronic means available a copy, or, if the catch landed was divided, copies, of the signed *Dissostichus* catch document to the Flag State of the vessel and shall provide a copy of the relevant document to each recipient of the catch.
- A7. The Flag State of the vessel shall immediately convey by the most rapid electronic means available a copy or, if the catch was divided, copies, of the signed *Dissostichus* catch document to the CCAMLR Secretariat to be made available by the next working day to all Contracting Parties.
- A8. The master shall retain the original copies of the signed *Dissostichus* catch document or documents and return them to the Flag State no later than one month after the end of the fishing season.
- A9. The master of a vessel to which catch has been transhipped (receiving vessel) shall adhere to the following procedures immediately after landing of such catch in order to complete each *Dissostichus* catch document received from transshipping vessels:
- (i) the master of the receiving vessel shall confirm the landing by obtaining the signature on the *Dissostichus* catch document of a responsible official at the port of landing;
 - (ii) the master of the receiving vessel shall also obtain the signature on the *Dissostichus* catch document of the individual that receives the catch at the port of landing; and
 - (iii) in the event that the catch is divided upon landing, the master of the receiving vessel shall present a copy of the *Dissostichus* catch document to each individual that receives a part of the catch at the port of landing, record on that copy of the catch document the amount and origin of the catch received by that individual and obtain the signature of that individual.
- A10. In respect of each landing of transhipped catch, the master of the receiving vessel shall sign and convey by the most rapid electronic means available a copy of all the *Dissostichus* catch documents, or if the catch was divided, copies, of all the *Dissostichus* catch documents, to the Flag State(s) that issued the *Dissostichus* catch document, and shall provide a copy of the relevant document to each recipient of the catch. The Flag State of the vessel shall immediately convey by the most rapid electronic means available a copy of the document to the CCAMLR Secretariat to be made available by the next working day to all Contracting Parties.
- A11. For each shipment of *Dissostichus* spp. to be exported from the country of landing, the exporter shall adhere to the following procedures to obtain the necessary export validation of the *Dissostichus* catch document or documents that account for all the *Dissostichus* spp. contained in the shipment:
- (i) the exporter shall enter on each *Dissostichus* catch document the amount of each *Dissostichus* spp. reported on the document that is contained in the shipment;
 - (ii) the exporter shall enter on each *Dissostichus* catch document the name and address of the importer of the shipment and the point of import;
 - (iii) the exporter shall enter on each *Dissostichus* catch document the exporter's name and address, and shall sign the document; and
 - (iv) the exporter shall obtain validation of *Dissostichus* catch document by the responsible authority of the exporting State.
- A12. In the case of re-export, the re-exporter shall adhere to the following procedures to obtain the necessary re-export validation of the *Dissostichus* catch document or documents that account for all the *Dissostichus* spp. contained in the shipment:
- (i) the re-exporter shall supply details of the net weight of product of all species to be re-exported, together with the *Dissostichus* catch document number to which each species and product relates;
 - (ii) the re-exporter shall supply the name and address of the importer of the shipment, the point of import and the name and address of the exporter;
 - (iii) the re-exporter shall obtain validation of the above details by the responsible authority of the exporting State.

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