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LEGAL REGULATION OF BOTTOM TRAWLING ON THE HIGH SEAS

LLB(HONS) RESEARCH PAPER

LAWS 489

LAW FACULTY
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Word count: 14, 277

I INTRODUCTION

The ocean is one of the world's largest and most important resources. Its recycling, cleansing and resource producing abilities have sustained mankind for millennia. These functions are coming under increasing pressure from modern practices and usages enabled through the evolution of technology. An example of this is the relatively recent emergence of the deep-sea or bottom trawling industry. This industry has been made possible through advances in technology. This allows fishers to trawl the sea floor at depths of up to 2000 metres, although bottom trawling is generally defined as trawling below 400-500 metres. It involves dragging heavy nets, rollers, and dredges across the seafloor, herding the fish between the top of the net and the bottom of the trawl. This means that the trawl gear rolling across the seabed can and does destroy formations, such as coral reefs, in its path. This fishing practice has become highly controversial, and consequently a prominent marine issue. Although this practice affects both national and international waters the principal concern is the high seas. Here there is little regulation and no body solely responsible for implementing and enforcing any controls.[1] There is urgent need for regulation, as this industry is showing signs of expansion, with increasing amounts of exploratory fishing in many areas.[2] This need is supported by scientific evidence concerning this topic. Four issues that raise this need for regulation on an ecological basis are; the unsustainable nature of bottom trawling; the issue of by-catch; the damage to the habitat; and, biodiversity loss.[3] In addition to these scientific issues, I will briefly consider some ethical problems that also suggest the need for regulation.

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[1] UNCLOS (10 December 1982) 1836 UNTS 3, art 87 (e). The default position is freedom of fishing on the high seas. Contrary to this is the exclusive economic zone (EEZ), which sets up state jurisdiction over the sea and its resources within 200 miles from the coast.

[2] M. Gianni "High Seas Bottom Trawl Fisheries and their Impact on the Biodiversity of Vulnerable Deep-Sea Ecosystems" (IUCN, WWF, Natural resources Defence Council (NRDC), Conservation International (CI) (2004) pp 52. He notes that Spanish, Norwegian, Russian, New Zealand, Australian and Chilean fleets have engaged in exploratory fishing.

[3] Lee A Kimball "Deep-Sea Fisheries of the High Seas: The Management Impasse" (2000) 19 IJMCL 259, 261-2.

In order to create and implement regulations, there must be a legal basis from which management procedures can be formed. The current legal status of bottom trawled areas gives rise to several possible bases for protection and regulation of threatened areas. These include the United Nations Convention on Law of the Sea (UNCLOS), the United Nations Conference on Straddling Fish Stocks and Highly Migratory Fish Stocks (UNFSA), the Convention on Biological Diversity (CBD), and the non-binding Food and Agricultural Organisation's Code of Conduct for responsible fisheries (the FAO Code of Conduct). Some Regional Fisheries Management Organisations (RFMOs) are also of relevance.

RFMOs have the potential to play a significant role in establishing bottom trawling regulation. Firstly, it is evident that some RFMOs have the ability to regulate bottom trawling. Because of their role in regulating many of the current fisheries on the high seas, they are the best vehicles through to expand the regulation of bottom trawling. Secondly, while some RFMOs have begun to regulate bottom trawling, more needs to be done to achieve effective regulation of this industry. For example, along with pursuing better regulation by RFMOs, there should be a longer term move to develop RFMOs with competency over this area. This latter aim is an extremely long-term option for regulation. As such, improvement in a shorter period could be achieved if present RFMOs adopted existing management tools, such as the Commission for Conservation of the Antarctic Marine Living Resources (CCAMLR) system, as guidelines. Thirdly, RFMOs remain flawed in some aspects. Many problems suffered by RFMOs are parallel with those of many international organizations. For example, domestic concerns tend to dominate the aims of states, rather than what may be best internationally. These problems do not mean that RFMOs cannot or will not produce effective results. Even if only some RFMOs achieve regulations that have a limited level of compliance, we will be better off ecologically than if nothing is done. Fourthly, acknowledgement that RFMO action alone has limitations supports the need for parallel development of international principles or guidelines to cover this area. These principles could act to provide a unification of objectives. Such objectives could be achieved through existing agreements, or through development of a new hard or soft law agreement. While these two processes have different benefits and drawbacks, I conclude that a soft law

instrument would be the most acceptable and practical compromise between use and protection of these threatened marine resources.

II THE NEED FOR REGULATION OF DEEP SEA TRAWLING

Bottom trawling has been recognized as an unsustainable fishing practice in many cases, due both to the nature of the fish it targets and the nature of their habitat. While it makes up less than 'one percent of both the production and value of global marine capture fisheries'[4] its environmental impact is proportionately higher. This supports the conclusion that the 'potential adverse effect on the marine environment of high seas bottom trawling outweighs any potential benefit from increased fish catches'.[5] It is unlikely that any expansion of this industry would justify the larger amounts of damage caused.

High seas bottom trawlers tend to target seamounts. Seamounts are defined as underwater structures rising 1000m or more above the surrounding terrain, although this term is used to describe include smaller features as well. These seamounts are targeted as many deep-water species congregate on these.[6] One concern raised by bottom trawling is that scientists believe that the interaction of fish within these habitats may affect behavior, reproduction and life cycles of some fish species. Damage to seamount habitat may therefore have a direct effect on the sustainability of fish populations.[7] For these reasons, any regulation of bottom trawling needs to take into consideration both its effects on the fish stocks and on their habitat.

A The Unsustainable Nature of Bottom Trawling

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[4] Michael W Lodge "Improving International Governance in the Deep Sea" (2000) IJMCL 299, 300.
[5] Lodge above n 4, 300.
[6] P Keith Probert, Don G McKnight, Simon L Grove "Benthic Invertebrate by-catch from a deep water trawl fishery, Chatham Rise, New Zealand" (1997) 7 Marine and Freshwater Ecosystems 27, 36; J A Koslow, G W Boehlert, J D M Gordon, R L Haedrich, P Lorance, N Parin "Continental slope and Deep-sea fisheries: implications for a fragile ecosystem" (2000) 57 ICES Journal of Marine Science 548, 549.
[7] Probert above n 6, 36.

Bottom dwelling stocks have several characteristics that make them particularly susceptible to over fishing. Vis-à-vis other commercial fish species, they tend to be long lived and have a slow life cycle, are slow to come to sexual maturity and do not always reproduce every year.[8] Consequently, when seamounts are heavily fished, the associated stock can be depleted beyond commercial use within five to ten years as stocks cannot replace themselves quickly enough. A pattern known as 'serial depletion' has occurred, where seamounts are rapidly fished beyond commercial viability, then fishers move on to a new ground and repeat the process.[9] This is what has happened to orange roughy fisheries in the Southwest Indian Ocean, where seamounts have been fished beyond commercial viability and then deserted as a new target area was identified. This occurred very rapidly (with in 3-5 years) and the damage was done before any regulation could be negotiated. Bottom trawling is responsible for about 80 per cent of the catch of bottom dwelling species on the high seas.[10]

Studies indicate that bottom trawling is likely to produce the most extreme and destructive effects in the deep sea, where a trawled area may take decades to recover.[11] In some existing trawled areas, it is not clear whether the stocks will ever recover. For example it is unknown whether the stocks of roundnose grenadier in the Northwest Atlantic will ever reach levels of commercial sustainability.[12] Generally little is known for sure about the effects of intensive bottom trawling on the high seas, or what it may mean for sustainable management of deep-sea fisheries.[13] The unsustainable nature of many fisheries is not a new problem and regulatory techniques to manage this in other situations exist. This means potential systems can be modeled on existing systems surrounding other high seas fisheries. The existing

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[8] Koslow above n 6, 549 tells us, for example that the life cycle of the orange roughy is estimated to be over 100 years long. Additionally they may not come to sexual maturity until they about 20 years old. Also see M W Clarke, C J Kelly, P L Connolly, J P Molloy "A life History Approach to the Assessment and Management of Deepwater Fisheries in the Northeast Atlantic"(2003) 31 J Northw Atl Fish Sci 401 for studies of specific species.

[9] Gianni above n 2, 54.

[10] Kimball above n 3, 261. The remainder is taken primarily by bottom long line fishing, principally in the Southern Ocean around Antarctica.

[11] Probert above n 6, 28.

[12] Clarke above n 8, 402.

[13] Probert above n 6, 28.

situation must be remedied, where some of the most vulnerable and unsustainable fisheries remain one of the least regulated areas of the high seas.

B By-catch Problems

By catch problems in bottom fisheries are not limited to fish, where 'investigations [show] bottom fisheries increase the mortality of both target and non-target species but also of benthic species'.[14] The affected seafloor species are mainly invertebrates like corals and sponges found on the continental slopes, seamounts and mid-ocean ridges.[15] The amount of coral bought up by this process is estimated to be huge, but is decreasing as deep-sea coral, like deep sea fish, is slow growing and long-lived, and is not replenishing itself.[16] For example, in the 1997-1998 period, observers of the orange roughy bottom trawl fisheries on the South Tasman Rise off the coast of Australia reported that there was approximately 1.6 tonnes of coral for every hour of towing a trawl net compared to the 2000-2001 period where coral by-catch had reduced to 0.7 tonnes per hour.[17] This figure did not include the coral that would have been damaged but was not bought to the surface. The extent of the by-catch of coral can be seen when viewing the photographic surveys carried out on nearby seamounts on the Northwest Chatham Rise, off the coast of New Zealand. Comparing those which had not been trawled where there showed almost 100 per cent cover of coral weighed against those that had been which had been trawled, which had about 3 percent coral cover.[18]

There is also the problem of by-catch of juveniles and other deep-sea species. A further problematic characteristic of bottom dwelling fish is that they tend to have:[19]

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[14] Catharina J M Phillipart "Long-term impact of bottom fisheries on several by-catch species of demersal fish and benthic invertebrates in the south-eastern North Sea" (1998) 55 ICES Journal of Marine Science 342, 342.
[15] Kimball above n 3, 262.
[16] Koslow above n 6, 554-555.
[17] O F Anderson, M R Clark "Analysis of the by-catch in the fishery for orange roughy, hoplostethus atlanticus, on the South Tasman Rise" (2003) 54 Marine and Freshwater Research 643, 649 table 5.
[18] M Clark, R O'Driscoll "Deep water fisheries and Aspects of their Impact on seamount habitat in New Zealand" (2003) 31 J Northw Atl Fish Sci 151, 152.
[19] J D M Gordon "The Rockall Trough, Northeast Atlantic: the cradle of Deep-sea Biological Oceanography that is Now Being Subjected to Unsustainable Fishing Activity" (2003) 31 J Northw Atl Fish Sci 57, 69.

> large scales and are not well endowed with mucus so most immature fish or fish of small adult size that enter the trawl and subsequently escape through the meshes will likely be badly damaged and will probably not survive.

This type of by-catch problem is described as 'no catch discards' and means that the biomass of the fish stock with such physical features will decline even faster, leading more quickly to an unsustainable fishery than would be the case for many other stocks.[20] Bottom trawling is one of the worst culprits with regards to the by-catch issue, it is said to be: [21]

> particularly unselective in terms of species caught and has led to high levels of discards in commercial fisheries, with an estimated 27 million tonnes of material discarded annually in the 1980s and early 1990s, compared with the 100 million tonnes or so that are actually landed.

C Ecosystem and Habitat Destruction

It has been recognised that trawling has significant impacts on deep-sea ecosystems as well as on targeted fish stocks. Both of these destructive outcomes were a focus of the fifth meeting of the 2002 United Nations Informal Consultative Process on Oceans and Law of the Sea (UNICPOLOS).[22] Direct effects of trawling include crushing, burying and exposing sensitive ecosystems.[23] Bottom trawling has been identified as a specific hazard to the reduction of structural diversity of these habitats[24] and likened to using a bulldozer to weed a garden.[25] A central problem is

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[20] Gordon above n 19, 69.
[21] Kai Yin Kwok, Cynthia Yau and I-Hsun Ni "Conservation Aspects of Commercial Fishing" (2002 IUCN/WCPA-EA-4 Taipei Conference, Taipei, 18-23 March 2002) <http://www.cnps.org.tw> (last accessed 02 August 2005).
[22] Delegation of Norway "Deep-water Habitats Vulnerable to Fishing activities: Closing of Areas for Trawling in the Regulatory Area" (2004 NEAFC's 23rd Annual Meeting, London, 8-12 November 2004) <http://www.neafc.org> ; Lodge above n 4, 299.
[23] Daniel E Duplisea, Simon Jennings, Karema J Warr, Tracey A Dinmore "A size-based model of the impacts of bottom trawling on benthic community structure" (2002) 59 Canadian Journal of Fisheries and Aquatic Sciences 1785, 1786.
[24] Ocean Studies Board *Effects of Trawling and Dredging on Seafloor Habitat* National Research Council (Washington, 2002) <http://www.nap.edu> (last accessed 20 June 2005).

that it is unknown what effects this habitat modification will have on the target fish stocks. It is noted that 'habitat alteration by the fishing activities themselves is perhaps the least understood of the important environmental effects of fishing'.[26] Presently there is limited understanding between the interactions and ecology of target and non-target species, but studies conducted imply that there is an important correlation between deep-sea species and their habitat, in aspects such as lifespan and mortality rates.[27] Despite the lack of research, marine and environmental scientists recognise that there is need for concern and precautionary action, particularly where concentrated bottom trawling is occurring. It is necessary to control and limit the effects of bottom trawling on deep-sea ecosystems because we do not know what potentially significant alterations to the deep-sea habitat, environment and associated communities could occur.[28]

D Biodiversity Loss

Biodiversity loss is a critical issue of bottom trawling due to the highly endemic nature of the species that live on these seamounts. Their isolation from disturbance has made them extremely vulnerable to extinction, as has their tendency towards 'extreme longevity'.[29] The Scientists Statement on Protecting the World's Deep-sea Coral and Sponge Ecosystems, presented to the 2004 annual meeting of the American Association for the Advancement of Science (AAAS) describes the damage being done to deep-sea species and those of the benthos as 'unprecedented'.[30] Biodiversity lost to deep-sea trawling is not just important for the sake of being 'diverse'; it can provide important information about other aspects of concern. For example, some

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[25] Catherine Masters; Michael Richardson "Nets leave a trail of death in the sea" (9 October 2004) *New Zealand Herald* Auckland <http://www.nzherald.co.nz> (last accessed April 6th 2005).
[26] Ocean Studies Board above n 24, Chap 3.
[27] Ocean Studies Board above n 24. Chap 3. For example juveniles will interact and use the habitat for protection from other species.
[28] Probert above n 6, 28, 36.
[29] Bertrand Richer de Forges "Diversity and endemism of the benthic seamount fauna in the southwest Pacific" (2000) 405 Nature 944, 946.
[30] The Scientists Statement on Protecting the World's Deep-sea Coral and Sponge Ecosystems, presented to the 2004 annual meeting of the American Association for the Advancement of Science (AAAS statement), and the United Nations Convention of Biological Diversity (CBD) signed at the 10th Deep Sea Biology Symposium at the Institute of Marine Biology, University of Oregon, in Coos Bay, 25-29 August 2003.

deep-sea corals can serve as archives on past climate conditions[31] and species development, where sampling on a Tasmanian seamount found a group thought to have died out in the Mesozoic era.[32] A further potential use is the medicinal properties that these species may hold. Some corals have been found to be sources of antibiotics, whilst others have pain killing properties and asthma and heart disease treatments.[33] There may be yet unknown uses given that 36 percent of species discovered on seamounts off the coast of Tasmania were new to science.[34] The AAAS, in harmony with the views of many scientists has noted this, and recognized that endemism makes seamounts highly vulnerable to fishing activities, and that bottom trawling represents 'the greatest human threat' to this deep sea biodiversity.[35] An issue that complicates regulation of deep-sea trawling is that not all seamounts are going to be biologically important and worthy of protection. Because of this, it is not viable to aim for a blanket ban on trawling of all seamounts, yet the value of others means that they do need protection. Unfortunately we do not know which of these will prove valuable until more research has been done thus emphasizing the urgent need for more scientific studies of the deep-sea ecosystem.

E Equity Issues

In addition to the scientific reasons for regulation of the bottom trawling industry, there are also equity considerations. These arise due to the relatively small number of states that are engaged in and therefore profiting from this practice and causing the associated destruction.[36] At the moment 95 percent of this catch is taken by just 11 countries, the damage caused to global resources is, however, suffered by all states. As pointed out above, we do not know what we are destroying. Eleven states are

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[31] AAAS Statement above n 36.
[32] Richer de Forges above n 29, 946.
[33] National Marine Sanctuaries, National Oceanic and Atmospheric Administration "Joint Management Plan Review, Proposed Action Plans. A Report to the Monterey Bay National Marine Sanctuary Advisory Council" June 2003 <http://www.sanctuaries.nos.noaa.gov> (last accessed 02 August 2005).
[34] Richer de Forges above n 29, 944.
[35] AAAS statement above n 30; Richer de Forges above n 29, 944.
[36] These states are Spain, Portugal, Russia, Lithuania, Latvia, Estonia, Norway, Iceland, Denmark (in respect of the Faroe Islands), New Zealand and Japan. <http://www.neafc.org> (last accessed 20th July 2005).

currently eliminating an estimated 500,000 to 100 million species[37] before such knowledge can be acquired, used and shared for the benefit of all.[38] There are several possible ways that this equity argument can affect the international regulation of bottom trawling. Firstly, it could encourage regulation or imposition of a moratorium so that fish stocks remain, and other states do not lose out before they can participate. Secondly, it could be cited in support for imposing a moratorium on bottom trawling as an inequitable practice. Lastly, it could be invoked to lobby that any international regulation around deep-sea trawling has provisions specifying the equitable sharing of benefits on similar terms to s 19 of the 1992 Convention on Biological Diversity.[39]

III LEGAL BASES ON WHICH REGULATIONS COULD BE FORMULATED

Implementation of regulations around bottom trawling needs to have a legal basis from which to develop. There are a number of instruments, both treaties and voluntary agreements, which could provide a framework for addressing the regulation of bottom trawling at an international level. These include the United Nations Convention on Law of the Sea (UNCLOS), the United Nations Conference on Straddling Fish Stocks and Highly Migratory Fish Stocks (UNFSA), the Convention on Biological Diversity (CBD) and the FAO Code of Conduct for Responsible Fisheries (the FAO Code).[40]

The need for regulation of bottom trawling is recognised by the international community including states, politicians, scientists and environmentalists. It has also been recognised by the United Nations General Assembly (UNGA) in its Resolution on Oceans and Law of the Sea, adopted in November 2003. This repeats its call for 'Urgent consideration...to...improve...the management of risks to the marine

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[37] Kristine M Gjerde, David Freestone "Unfinished business: Deep-Sea Fisheries and the Conservation of Marine Biodiversity Beyond National Jurisdiction, Editors' Introduction" (2004) 19 IJMCL 209, 214.
[38] Kimball above n 3, 273, 283-284.
[39] Lodge above n 4, 309.
[40] UNCLOS above n 1; UNFSA (04 December 1995) 34 ILM 1542; CBD (5 June 1992) 31 ILM 822, FAO Code of Conduct for Responsible Fisheries, adopted by the FAO Conference on 31 October 1995 <http://www.fao.org>

biodiversity of seamounts…the threats and risks to vulnerable and threatened marine ecosystems and biodiversity in areas beyond national jurisdiction'.[41] However this statement is weak in that it does not make any hard commitments as to how this should be done. As such, the following instruments may all contribute to development of bottom trawling regulation.

A United Nations Convention on Law of the Sea 1982

UNCLOS is the basis for all discussion of legal regulation of the marine environment as it provides the elementary framework of laws that surround this area today. The freedom of fishing granted in article 87 (e) represents the default position within UNCLOS. While this freedom is amended in some places, bottom trawling on the high seas is not one of those areas. It remains almost completely disregarded within UNLCLOS and there is no explicit mention for conservation of high seas bottom dwelling species. This is inconsistent with the attention that UNCLOS pays to straddling and highly migratory stocks, which are provided for in articles 63 and 64.[42]

Indirectly, the conservation provisions in part VII, section two of UNCLOS can be read to apply to bottom trawling. This section covers the conservation and management of the living resources of the high seas, and places some limits on the provision of article 87 (e). Article 116, of section two, reiterates the right for freedom of fishing on the high seas, but makes this subject to section two provisions.[43] This means that the freedom to fish on the high seas is limited by reference to articles 116-121; however, for the purposes of bottom trawling, the important provisions of section two are articles 117-119. The influence of articles 63 and 64 is also important for the development of bottom trawling regulation, but as these are expanded and further implemented under the UNFSA, their possible impacts are dealt with in that paragraph.

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[41] UNGA Resolution 58/240 (23 December 2003) A/RES/58/240 paras 51, 52.
[42] UNCLOS above n 1, arts 63, 64. These articles deal with straddling stocks and highly migratory stocks respectively. The former requires that 'States shall seek…to agree upon…measures necessary to ensure…conservation' whilst art 64 requires State to 'co-operate…with a view to ensuring conservation'. Thus, the latter is clearly a weaker obligation upon states.
[43] UNCLOS above n 1, part VII. Note art 116 (a) to treaty obligations; and, (b) the interests of coastal states (including their interrelation with arts 63, and 64).

Article 117 requires states to take national measures or co-operate with other states to take measures necessary to achieve conservation of living resources of the high seas.[44] Article 118 is focused on the duty of states to co-operate towards conservation as regards living resources of the high seas. It specifies that states shall enter into regional or sub-regional organisations to this end. These provisions form the basis for the existence of RFMOs to further the conservation objectives of UNCLOS. These provisions therefore oblige states to work nationally and internationally towards conservatory measures. Article 119 expands on this duty by taking a more comprehensive look at what states should do as regards conservation goals. For example, it covers objectives such as keeping or restoring stocks to maximum sustainable yield levels. It also sets out conservation measures that states should consider when making decisions such as acting on the best scientific information available, and taking into account biological, ecological, environmental, and economic considerations.[45] For bottom trawling this would mean that states should at least be attempting to come to agreements either between themselves or through RFMOs to apply such measures.

Article 119 does not require explicitly that states exercise these duties in accordance with the precautionary approach. However, a precautionary approach is not ruled out either, as article 119 does not say that scientific proof is needed before states should apply such conservation techniques. This means that states *can* act to achieve conservation goals even when 'proof' of problems is not available.[46] That states *should* act in this way would be an interpretation consistent with later treaties that do include the precautionary principle such as the UNFSA. It would also be consistent with the status of the precautionary approach as an emerging norm of customary international law. This interpretation is helpful as it could encourage states to enact regulation despite not having comprehensive data on, and disagreement over, the effects of bottom trawling.

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[44] *United Nations Convention on the Law of the Sea 1982, A Commentary (The Virginia Commentaries)* (Martinus Nijhoff Publishers, The Netherlands, 1995) Vol 3 Section 2: Conservation and Management of the Living Resources of the High Seas, 219 para 117.1.
[45] *The Virginia Commentaries* above n 44, 305 para 119.1.
[46] *The Virginia Commentaries* above n 44, 310 para 119.7 (c).

Additionally a rudimentary ecosystems approach is provided for in article 119 (1) (b). This article requires states to consider effects of conservation measures upon species associated with or dependent upon the targeted species. This has the effect of 'broaden[ing] the obligation of States...to conserve and manage the living resources of the high seas to encompass the conservation of associated and dependent species (regardless of their commercial exploitability)'.[47] This article can therefore provide a basis for looking at the wider effects of bottom trawling to include species other than the targeted stock. This is relevant for bottom trawling because, as pointed out above, there is evidence that dependence exists between habitat and bottom dwelling stocks. However, this 'ecosystem approach' does not impose a strong obligation for states to act on, as these interrelationships only have to be 'taken into consideration'.[48]

There may be scope for regulation under section XI, article 145 of UNCLOS, which covers the regime of the seabed. The conservation measures that could apply to bottom trawling can be seen in article 145 (a) and (b). Article 145 (a) states that the International Seabed Authority (ISA) should adopt appropriate regulations for the 'prevention, reduction and control of...hazards to the marine environment...including the ecological balance'. Further to this, article 145 (b) provides for 'the protection and conservation of natural resources...and the prevention of damage to the flora and fauna of the marine environment'. This could be seen as acting as a clear mandate for the ISA to take a leading role in developing bottom trawling regulations. Additionally, these articles would mean that ISA sponsored regulations would have a wider approach to conservation than just protecting fisheries, as they would be focused on the conservation of the marine environment. However, the ISA has not taken any steps towards this, and states that the principal function of the Authority is to regulate deep seabed mining.[49]

B United Nations Conference on Straddling Fish Stocks and Highly Migratory Fish Stocks 1995

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[47] *The Virginia Commentaries* above n 44, 311 para 119.7 (d).
[48] UNFSA above n 40, art 119.
[49] International Seabed Authority <http://www.isa.org> (last accessed 21/07/05)

This instrument was designed to cover some of the weaknesses that had become increasingly evident with the UNCLOS approach to certain high seas stocks, namely those of articles 63, and 64 of UNCLOS.[50] It is clear from the long title of the UNFSA[51] that it is designed as an extension to the provisions of UNCLOS as regards conservation of these stocks coming under serious threat from unsustainable fishing practice. As with the bottom trawl issue today, there was a UNCLOS basis for conservation for these stocks, but there needed to be a further agreement to implement actual conservation measures.[52] The UNFSA could aid development of bottom trawling in two ways. Gianni suggests that it can be argued that the UNFSA already covers some of the bottom trawled stocks, and can currently impose conservation measures, however this is not uncontroversial. Alternatively, the UNFSA could indirectly influence bottom trawl regulation by acting as a framework for developing a similar agreement for this area.

The basis for Gianni's argument is that some of the bottom dwelling stocks can be considered to be straddling stocks.[53] This will occur when their habitat is spread across an EEZ and the high seas, so despite their discrete nature, they straddle the two jurisdictions. These 'straddling' stocks would therefore, arguably, be subject to the conservation provisions of the UNFSA. Gianni extends this by arguing further that if these stocks are covered, it could potentially provide coverage for all deep-sea fisheries. This is because even though not all bottom trawling and seamount targets would fall into this category of straddling stocks, it would be unjustifiable to treat

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[50] Lodge above n 4, 303-304.

[51] United Nations Conference on Straddling Fish Stocks and Highly Migratory Fish Stocks: Agreement for the implementation of the provisions of the United Nations Convention on the Law of the Sea of 10 December 1982, relating to the conservation and management of straddling fish stocks and highly migratory fish stocks.

[52] Lodge above n 4, 303-304. It was noted by the Conference on Fisheries (COFI) meeting that 'despite perceptions to the contrary, the 1982 Convention together with UNFSA does cover discrete high seas stocks as well as straddling and highly migratory stocks' but 'real problems persist in relation to discrete high seas fish stocks'. COFI "Moving from Words to Actions" (2005 Conference on the Governance of High Seas Fisheries and the UN Fish Agreement, St. John's, Newfoundland and Labrador, 1-5 May 2005) 13 <http://www.dfo-mpo.gc.ca/fgc-cgp/conf_report_e.pdf> (last accessed 30 August 2005).

[53] Gianni above n 2, 67-8. In the Northeast Atlantic, the Hatton Bank and the Rockall Plateau, both associated with deep sea trawling, straddle EEZ and high seas boundaries. The orange roughy fishing grounds on the South Tasman Rise and the Northwest Challenger Plateau could be said to target straddling stock as both areas straddle the EEZ's of Australia and New Zealand respectively.

those that did better and differently to those which were not covered by the UNFSA.[54] The implication of Gianni's line of thought is that states party to the UNFSA should apply the same measures to species taken by bottom trawling as those applied to 'normal' straddling stocks.

Whilst this argument would provide a very convenient means to assert that conservation measures of the UNFSA do apply to bottom trawling, any attempt to apply this approach is not as easy in practice as Gianni makes it sound in theory. Gianni points out that most of the 11 countries currently dominating the bottom trawling industry are parties to the UNFSA.[55] However, this does not really improve the situation as these countries do not necessarily accept the relevance of the UNFSA here. Additionally, even if it were to be agreed that some stocks and habitats fall within this category and are entitled to UNFSA measures, it is unlikely that this would be extended to all straddling habitats. Gianni says that protecting the stock and habitats of some seamounts would make it unjustifiable to not do the same to all. However, this implies that there are comparable levels of biota and associated stock on all seamounts, which, as pointed out earlier, is not so. As such, there are strong arguments to support the idea that some seamounts may be trawled, for example, for those with fewer or no endemic species, and of low biological importance, it may be entirely justifiable to trawl these whilst not trawling other, more diverse seamounts. This point has been picked up by the Russian Federation, at NEAFC's 23rd Annual Meeting, where they argued the uncertainty of the effect of closures, and said that 'in some areas bottom trawling does not affect the bottom fauna adversely, in other areas closures have had an adverse effect on the bottom fauna.[56]

This illustrates that even if these countries are prepared to first agree that the UNFSA principles do apply, they are still unlikely to extend this unreservedly to all seamounts. A further problem, even if this did occur, would be the flag state jurisdiction that the UNFSA sets up. This form of enforcement means that any

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[54] Gianni above n 2, 67-8.
[55] Gianni above n 2, 68. The countries which are party to the UNFSA take approximately 90 percent of the catch, and include the EU, Australia, New Zealand, Russia, Norway, Iceland and the Ukraine.
[56] NEAFC "Report of the 23rd Annual Meeting of the North-East Atlantic Fisheries Commission" (NEAFC Annual Report) (London, 8–12 November 2004).

management procedures would add to the already huge task of trying to prevent and deter IUU fishing.

Despite this probable lack of direct application to bottom trawling management, the UNFSA regulatory regime could still be of be of indirect value. It is more likely that the UNFSA can be helpful to bottom trawling regulation by acting as a model for a similar convention as regards discrete high seas stocks. Another possibility that has been proposed is amendment of provisions of the UNFSA to include management of discrete stocks as well as straddling and highly migratory stocks. This latter approach is also an unlikely prospect, but these two ideas are discussed further under the paragraph titled 'development of international regulatory guidelines'.

C Convention on Biological Diversity 1992

The CBD, while not placing any restrictive obligations on state's behavior can be useful as a guiding document. A main drawback of the CBD is in article 22, which makes its provisions subordinate to other treaties. While this is often invoked to avoid its provisions, the CBD can be of value in other ways. For example, its main principle in article 1 aims for 'the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of ...benefits'.[57] This article can be utilized as a tool from which to develop similar principles to guide development towards regulations covering bottom trawling. This principle, as stated in the CBD, is also useful in that it applies to activities within and beyond control of national jurisdiction.[58]

Direct involvement of the CBD in the issue of bottom trawling took place at the seventh Conference of the Parties (COP-7). It was urged by the UNGA to look at the threats posed by bottom trawling. It responded by producing a decision which *inter alia* recognised the serious threat to biological diversity posed by bottom trawling and called upon the United Nations and other relevant organisations to urgently take

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[57] CBD above n 40, art 1.
[58] CBD above n 40, arts 3-5.

short, medium and long term measures.[59] Parties to the CBD have recognised since its inception the need for on going scientific research in order to better understand the complicated interrelationships that make up ecosystems. Without better understanding of ecosystems, we do not know how to better protect them. The importance of this is reflected by the fact that the need to acquire, and obligation to share information, is one of the few binding obligations that the CBD creates.[60] The need for knowledge as regards bottom trawling led the CBD, in February 2004, to 'ask international bodies to co-operate in compiling and synthesizing information on...the seabed...in areas beyond national jurisdiction, including identifying threats...and technical options for their protection'.[61] Thus the CBD is acting in its capacity of a conveyer of information about bottom trawling and effects on stocks, biodiversity and habitat.

The CBD does set out important conservation provisions, for example identification of biodiversity components, and guidelines for in-situ conservation.[62] Whilst these do not place obligations on states to act in accordance with them, they can be guiding tools for development of new regulations. Broad ratification of the principles means that the CBD is an effective international instrument from which to draw concepts to help further regulation, which like the UNFSA, could incorporate some of its provisions into a more binding regime.

D FAO Code of Conduct for Responsible Fisheries 1995

Unlike the other three international bases for actions which have been discussed above, the FAO Code of Conduct is not a treaty but a voluntary code. However it can still be of benefit to the development of bottom trawl regulations for several reasons. Firstly it contains conservation principles very similar to the UNFSA, recommending

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[59] Decision VII/5 of the Seventh Conference of the parties to the Convention on Biological Diversity on marine and Coastal Biological Diversity <http://www.biodiv.org/decision/default.aspx> (last accessed 27 July 2005)

[60] CBD above n 40, arts 7, 12 and 17.

[61] Lodge above n 4, 311.

[62] For example CBD above n 40, article 8 (d) 'promotes the protection of ecosystems, natural habitats and maintenance of viable populations of species in natural surroundings'. Also see generally arts 6 to 10.

the ecosystem approach to fisheries and application of the precautionary principle. Strong similarities can be seen in comparison of the language between the two instruments. The FAO Code goes further than the UNFSA to extend requirements of conservatory measures to provide a more thorough approach. This can be seen in the FAO code's treatment of the precautionary approach. In the UNFSA it is set out in article 6, the FAO Code adopts the same language in its article 6.5 but also extends the concept in later sections to cover how and by whom this approach should be implemented.[63]

The FAO code also has the advantage of having been endorsed by all members of the FAO and thus has a much wider scope of coverage than the UNFSA. Its ambit is also broader in scope meaning that these principles apply to fisheries that the UNFSA does not reach, these include deep sea fisheries, this is shown by article 1 of the Code, which provides that it's 'principles and standards [apply] to the conservation, management and development of *all* fisheries'.[64] A further beneficial aspect is that article 4 provides that the application and implementation of this code will be monitored by the FAO who will report to COFI. This provides third party monitoring by an objective organisation. Whilst the Code is not binding and therefore no action can be taken against non-compliers, it can still be useful in that it can report without bias about which states are and are not acting consistently with the Code's conservation principles. This could act to increase public pressure domestically and by the international community to act in a more responsible manner for those who are not applying the Code.

Some of the Code's strengths arise out of its weaknesses. The very fact that the Code has had such wide sign up is because of its status of soft law and its consequent lack of ability to compel action to achieve its stated goals. Conversely, this also means that its thorough formulations of important management principles do not impose any obligation on states to implement these. As long as a state is getting benefits from bottom trawling, without breaching obligations, it is likely that it will

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[63] Compare the UNFSA above n 40, art 6, which lays down the basis for the precautionary approach, with the FAO Code of Conduct above n 40, arts 6.5, 7.5.1 and 7.5.2. The language of the ecosystem approach in art 5 of the UNFSA is also duplicated and extended by the FAO code in articles 6.6, 7.2.2 (g), 7.6.9 and 8.5, which provide more detail.

[64] FAO Code of Conduct above n 40, art 1.3 [emphasis added].

continue. Although some soft law instruments have been successful in changing behavior, it is unlikely that states will voluntarily start now to restrict their actions based on this non-binding code.[65]

The FAO Code of Conduct does remain valuable, albeit more as a basis for further regulation to build upon. It complements and extends the UNFSA, in that it provides a more thorough plan of conservation measures and implementation guidelines. As a legal base for regulation of bottom trawling, the FAO Code of Conduct is a more appropriate base for a treaty than the UNFSA as it can provide a set of conservation standards that can be held to apply to bottom trawling as well as other forms of fishing, whilst still taking into account the ecosystem approach.

IV RFMOS: THE VEHICLES FOR FURTHER DEVELOPMENT

RFMOs are the primary vehicles for current management of high seas fisheries resources, however despite the range and diversity of these organisations very few have the competence to regulate bottom trawl fisheries.[66] Utilizing current RFMOs is a practical way forward. RFMOS that currently regulate this area have bases form which to develop consistent regulations. Those RFMOs that do not currently regulate this area can be developed and their competence expanded more easily than development of new organisations. Regulations instated by RFMOs can provide actual limits on state behavior. This is unlike the current situation, where little action can be taken, as high seas bottom trawling is not currently considered illegal purely because it is inconsistent with general international obligations.[67] RFMO regulations in place around bottom trawling means there can be actual enforcement of established management measures. RFMOs are arguably the best (albeit not ideal) agents for implementation of bottom trawl regulations for the short term. This is primarily because they already exist, thus there does not need to be lengthy establishment procedures towards new organisations, a process likely to take years. Problems with

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[65] See paragraph titled 'A hard or soft law approach?'.
[66] Gjerde above n 37, 209.
[67] Kimball above n 3, 274. Such as international obligations to protect biodiversity, consider ecosystem impacts and to co-operate to conserve high seas living resources.

that can be seen by looking at high seas bottom trawl fisheries that were seriously depleted or collapsed before a body could be negotiated to regulate them in spite of national measures taken.[68] This was the case in the Southwest Indian Ocean, where the orange roughy stocks were depleted in a mere three years.

A Existing Regulation of Bottom Trawling By RFMOs

Current regulation of bottom trawling by RFMOs has both advantages and disadvantages. On one hand, it shows that some action can and is being taken, despite a lack of guiding principles or even consensus over the matter. On the other hand, it shows flaws of RFMOs such as their tendency to favour weak regulatory measures.

A benefit of using RFMO as the tools to implement regulation is that existing RFMOs have established systems, processes and components that can be adapted to meet changing needs faster than development of new organisations. Some RFMOs have already started extending their regulatory powers to cover bottom trawling to combat the unsatisfactory situation of having unregulated fisheries on the high seas.

Full coverage of bottom trawling on the high seas will always be limited by the individual capacities of RFMOs. Current lack of regulation may exist because a potentially capable RFMO has not looked at bottom trawling or devised management procedures around that practice. Alternatively, an area of the high seas may be unregulated because the relevant RFMO is based on a species, such as tuna, which is not currently taken by bottom trawling.[69] Finally, some areas of the high seas will remain unregulated if there is simply no RFMO covering that area.[70]

A problem hampering current fisheries regulation through RFMOs, which will arise also around bottom trawl regulation, is that RFMO measures only apply to members and UNFSA parties operating in the area.[71] RFMO constituent states may

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[68] Kimball above n 3, 275; Gjerde above n 37, 213.

[69] Kimball above n 3, 274. Kimball gives examples of tuna and salmon as stocks covered by an RFMO which does not regulated bottom trawling as they are not caught via this method.

[70] For example Southwest Indian Ocean, Southwest Pacific Ocean, Southeast Pacific Ocean, North and Central Pacific, Central Atlantic and Southwest Atlantic Oceans. For further discussion of these, see: Deep-sea Conservation Coalition "A net with holes: the regional fisheries management system" 4 <http://www.greenpeace.org> (last accessed 04 August 2004).

[71] UNFSA above n 40, art 8; Are K Sydnes "Regional Fisheries Organizations: How and Why Organizational Diversity matters" 32 Ocean Development and International Law 349, 352.

avoid tough regulations if they can see that these will put them at a disadvantage vis-à-vis other 'free rider' states who are not bound by similar rules

Despite these drawbacks, RFMOs are still an important component for driving development of bottom trawling regulation. Some of the above areas can be remedied through internal development of RFMOs extending their capabilities. Any extension is only possible at the will of member states.[72] Such development could combat the situations where an RFMO could act to regulate bottom trawling, but has not.[73]

Currently there are only three RFMOs that are actively regulating bottom trawling on the high seas. These are: CCAMLR, the Northwest Atlantic Fisheries Organisation (NAFO), and the North East Atlantic Fisheries Commission (NEAFC). Later is discussed the need for concurrent development of international guidelines so as to produce consist regulations, however these RFMOs show that action can still be taken in the meantime if competence is utilised. Unfortunately, the regulations and actions taken have not gone far enough. Nevertheless, a survey of these RFMOs shows us the current state of regulation today.

1 Commission for Conservation of the Antarctic Marine Living Resources

CCAMLR's unique approach to fisheries management has prompted creation of rules to address both the target stocks and their environment. This ecosystem approach to conservation and management is revolutionary and is generally considered to be best practice within the high seas arena.[74] It recognizes that 'management of these resources must be expanded to actual biological boundaries as

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[72] Sydnes above n 71, 351 notes that although co-operation is being influenced increasingly by externalities such as political factors, 'states, as the members of RFO's are the main actors and driving forces behind regional fisheries cooperation.' He also observes later (pp 354) that within RFMOs there is 'ample room for common and conflicting interests among the members'.

[73] For example the South East Atlantic Fisheries Commission and the Western Pacific Commission both have the competence to regulate bottom trawling, but being recently established, have not yet done so.

[74] A J Constable; W K de la Mare; D J Agnew, I Everson, D Miller " Managing fisheries to conserve the Antarctic marine ecosystem: practical implementation of the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR)" (2000) 57 ICES Journal of Marine Science 778, 789.

opposed to arbitrary line not recognised by animal life'.[75] This is consistent with the definition of the regulatory area (RA), stating that it covers the 'Antarctic marine living resources...which form part of the Antarctic marine ecosystem'.[76] This defines the scope of the convention by reference to the scope of the ecology of the region.

CCAMLR's conservation objectives, rather than sustainability for the purposes of exploitation, mean that its position among RFMOs is unique. Article 2 (1) tells us their objective is 'the conservation of Antarctic marine living resources'. This includes prevention of decrease of populations, maintenance of ecological relationships and prevention or minimisation of risks of changes in the marine ecosystem.[77] CCAMLR's precautionary approach pre-dates general use of that term and has helped define and shape it.[78] Measures that CCAMLR has taken that are indicative of this ecological approach are rules to address by-catch and impact on the seafloor habitat.[79]

At the present time there are very few bottom trawl fisheries in international waters in the CCAMLR region.[80] However, such trawling is only likely to expand as a practice due to rapid growth in markets for fish that can be caught through this method. For example, bottom trawling may begin to target more heavily the patagonian toothfish found around South America and the sub-Antarctic islands.[81] At the moment these are taken mainly by long-line fishers. However, Argentine trawlers have taken them in their waters, and waters around the Falkland Islands, through bottom trawling since the mid-1980's.[82] During late the 1980's frustration expressed by the scientific commission of CCAMLR over catch limits signaled a move towards a stronger precautionary approach.[83] By the early 1990s, CCAMLR extended this precautionary view in recognizing the issue of potentially rapid growth in new and

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[75] S Chopra; C Hansen "Deep Ecology and the Antarctic Marine Living Resources: Lessons for Other Regimes" (1997) 3 Ocean and Coastal Law Journal 117, 138; also see G Parkes "Precautionary fisheries management: the CCAMLR approach" (2000) 24 Marine Policy 83, 83.
[76] CCAMLR (20 May 1980) 1329 UNTS, 47, art 1.
[77] CCAMLR above n 76, art 2 (1), (3) (a-c).
[78] Parkes above n 75, 83-84.
[79] Kimball above n 3, 275.
[80] Kimball above n 3, 275.
[81] D J Agnew "The illegal and unregulated fishery for toothfish in the Southern Ocean and the CCAMLR catch documentation scheme" (2000) 24 Marine Policy 361, 361-2.
[82] Agnew above n 81, 362; Constable above n 81, 782. He notes that the trawling method tends to take juvenile fish, while the long lining tends to take more mature fish.
[83] Constable above n 74, 782.

exploratory fisheries, such as bottom trawling. It came up with a system of controls surrounding these that represent current best practice.

The first was the adoption of the New Fisheries measure in 1991, which is a response to previous Antarctic fisheries being initiated without sufficient information to adequately regulate them.[84] Secondly, the Exploratory Fisheries measure that was adopted in 1993;[85] it is 'considerably more prescriptive than the New Fisheries measure [and] aims to prevent fisheries from expanding faster than the acquisition of information necessary for the development of management advice.'[86] These two measures are discussed in more detail under the heading increasing RFMO competence. The regulations contained in these two measures will ensure that bottom trawling develops in a controlled and observed manner. This regard for precaution and the ecology of the intended area means if bottom trawling looks as if is causing unacceptable effects, or leading towards unsustainability, CCAMLR has evolved processes to deal with it.

2 *Northwest Atlantic Fisheries Organisation*

The Convention on Future Multilateral Cooperation in the Northwest Atlantic Fisheries, (NAFO Convention) has initiated the most regulation around bottom trawling, unfortunately most is insufficient to combat its damaging effects. NAFO's RA comprises the Northwest Atlantic Ocean, reaching out from the upper eastern seaboard of the United States, bordering Canada, up to the coast of Greenland.[87] It has the dubious distinction of being said to have 'comparatively speaking, the best regulated deep water trawl fisheries on the high seas... [but these] are not without

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[84] CCAMLR above n 76, Conservation Measure 31/X, Notification that Members are Considering Initiating a New Fishery, preamble <http://www.ccamlr.org> (last accessed 04 August 2005).
[85] CCAMLR above n 76, Conservation Measure 65/XII, Exploratory Fisheries <http://www.ccamlr.org> (last accessed 04 August 2005).
[86] Parkes above n 75, 87.
[87] NAFO Convention (24 October 1978) <http://www.nafo.ca> (last accessed 04 August 2005). Article 1 specifies the area as: North of 35°00' north latitude and west of a line extending due north from 35°00' north latitude and 42°00' west longitude to 59°00' north latitude, thence due west to 44°00' west longitude, and thence due north to the coast of Greenland, and the waters of the Gulf of St Lawrence, Davis Strait and Baffin Bay south of 78°00' north latitude.

significant problems'.[88] Bottom trawling is an issue for NAFO, taking virtually all of the deep-water species caught in the high seas in this area. The majority of the bottom trawl catch consists of redfish, Greenland halibut, and skate. Regulatory measures that NAFO has adopted, which affect bottom trawling, include by-catch measures, fishing bans, total allowable catch (TAC) quotas. These are set out in a NAFO's document titled 'Conservation and Enforcement Measures' this also covers enforcement provisions such as vehicle monitoring systems (VMS), and gear markings.

Article 9 of the above document covers the rules surrounding by-catch, which basically act to limit the amount of non-target fish can be caught before being in breach of NAFO regulations. For example, paragraph 2 states that:[89]

> Vessels of a Contracting Party shall limit their by-catch to a maximum of 2 500 kg or 10%, whichever is the greater, for each species listed in Annex I for which no quota has been allocated in that division to that Contracting Party.

Annex 1 species includes three species that bottom trawling takes. Despite this measure, NAFOs' Scientific Committee has expressed concern that by-catch remains high, and in same cases is increasing. Additionally, while by-catch regulation could provide a means to regulate the effects of bottom trawling on other species, it has been used in few areas and primarily 'with respect to other depleted target species.'[90] Finally, by-catch regulations are only focused on other fish stocks and 'there are no regulations in place to protect corals or other deep-water habitats from the impact of bottom trawling.'[91]

Other regulatory measures that NAFO has taken include a fishing bans and imposition of TACs on some species in certain areas. TACs are more widely used as a tool for regulation, but there is a fishing ban on redfish in the '3LN' area. The more TAC limits used by NAFO include the intensive 15-year rebuilding plan for Greenland halibut. This heavily reduces the TAC over the next few years and is not

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[88] Gianni above n 2, 58.
[89] NAFO Convention above n 87, art 9(2).
[90] Kimball above n 3, 275.
[91] Gianni above n 2, 59.

subject to increase until 2008 and with the advice of the scientific council.[92] NAFO has also implemented a TAC as regards some areas of redfish at its latest Annual Meeting. Although the Fisheries Commission Working Group looked at options such as closures and depth limits, as well as TACs, the latter was decided upon and the stock regulated by setting a TAC of 20,000 metric tonnes.[93] Although this, prima facie, may be regulation of bottom trawl activity, this quota was actually set in spite of the advice of the Scientific Council. Their report noted that 13,000 tonnes had been the historic take of redfish since the 1960, and while this level seemed sustainable, catches that were above 20,000 tonnes 'would be detrimental to the stock'.[94] This shows that NAFO's approach is not precautionary. Internal commitment problems to such an approach are highlighted when seeing that setting any quota was opposed by some members, including the EU and Ukraine, who felt that there was no need for it at that time.[95]

This analysis shows that NAFO has developed good options for regulation but hasn't implemented any of these in a manner specifically aimed at managing bottom trawling or its target species. For example, while NAFO has the ability to use tools like gear restrictions it has not done so in a manner relevant to bottom trawling by regulating use of deep-sea trawl gear. Another example is that while NAFO has developed by-catch regulations, these only apply to other fish, and not the relationship between by-catch of non-fish species, such as coral and trawling. For NAFO's measures to effectively regulate bottom trawling, they must be more specifically directed at that end.

3 *North East Atlantic Fisheries Commission*

The North East Atlantic Fisheries Commission's (NEAFC) has taken some regulatory measures directed at bottom trawling, but like NAFOs', these have tended

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[92] NAFO/FC Doc. 05/1 <http://www.nafo.ca> (last accessed 25 July 2005)
[93] NAFO Annual Report 2004, Fisheries commission, <http://www.nafo.ca> (last accessed 20 July 2005)
[94] Report of the Working Group on the Management of 3O Redfish (Redfish Working Group) 30-31 March 2004 St. John's, NL, Canada, NAFO/FC Doc. 04/2. <http://www.nafo.ca> (last accessed 25 July 2005)
[95] Redfish Working Group above n 94.

to be insufficient. Comprised of the EU, Russia, Norway and Iceland, NEAFC's RA is roughly 35 degrees north latitude to the Arctic Circle; it is.[96] It is an area which has exploited deep water bottom trawl fisheries since the 1960's with many states, including Russia, Germany, France, Denmark and more recently both Scotland and Ireland, participating in this practice.[97] The primary focus of the NEAFC convention is protection of the fisheries resources, where it 'desir[es] to promote the conservation and optimum utilisation of the fishery resources'[98] rather than an ecosystem approach, this is consistent with the period in which is was signed.

NEAFC has taken some regulatory measures around bottom trawling in an attempt to limit its impact, and some parties, primarily Norway have been lobbying heavily for stronger future regulation, which should also incorporate ecosystem considerations.[99] Current regulations include limited area closures of significant underwater environments, for example the western slopes of the Rockall Bank, where the importance of this feature is evident in its description as 'the cradle of deep-sea biology'.[100] However the impetus to do so was not driven by the need to protect the ecology, including corals, of the bank, a move recommended by OSPAR, but was closed to bottom trawling in an effort to protect the seriously decimated Haddock population.[101] Area closures have also been used even though it is said that 'the justification for establishing area closures in NEAFC, with the present Convention, can be based on fishery considerations alone'[102] thus seeming to preclude area closures for the purposes protection of ecosystems. Despite this, NEAFC implemented at its 23rd Annual meeting a measure on Vulnerable Deep-water Habitats by Denmark (in Respect of the Faroe Islands and Greenland), Estonia, the European Community, Iceland, Norway and Poland, where NEAFC:[103]

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[96] NEAFC (18 November 1980) 1285 UNTS 129, art 1.
[97] Gordon above n 19, 67.
[98] NEAFC Convention above n 98, preamble.
[99] Delegation of Norway above n 22.
[100] Gordon above n 19, 57.
[101] NEAFC Annual Report above n 56, agenda item 13. Also note the 1992 OSPAR Convention is the current instrument guiding international cooperation on the protection of the marine environment of the North-East Atlantic <http://www.OSPAR.org> (last accessed 25 July 2005)
[102] NEAFC Annual Report above n 56, agenda item 14.
[103] NEAFC "Vulnerable Deep-water Habitats by Denmark (in Respect of the Faroe Islands and Greenland), Estonia, the European Community, Iceland, Norway and Poland" <http://www.neafc.org/measures> (last accessed 27 June 2005)

[R]ecommend[ed] the following interim measure for the protection of vulnerable deep-water habitats;

1. Bottom trawling and fishing with static gear shall be prohibited in the following areas:
   a) The Hecate and Faraday seamounts, and a section of the Reykjanes Ridge.
   b) The Altair seamounts.
   c) The Antialtair seamounts.
2. This measure shall be in force for the period 1 January 2005 – 31 December 2007.

This acts as a short-term moratorium and by prohibiting the use of 'static gear' (that used for bottom trawling) this regulation has the advantage of conserving the marine environment. This latter approach is preferable to that of closing areas for fisheries purposes alone, as NEAFC has done in the past. Although the effect might be the same in that the habitat remains protected, it is not protected for its own sake. Thus the intrinsic value of the ecosystem is not recognized, and the protection of the habitat remains dependent on the status of the fish stock. Protection of habitat for its own sake is a principle reason why regulation of bottom trawling is being advocated for so strongly, and deserves consideration in its own right.

Other regulatory measures that NEAFC has implemented include limits on fleet capacity, size, and days at sea, and catch limits on main commercial species. This means that bottom trawling simply cannot be done as much, and for as long a period, this will limit the number of trawls vessels can do and thus reduce both decimation of the target stock and their habitats.

NEAFC has also set up 'Appendix A', which identifies deep-sea species that are to be scientifically monitored, with many of the regulations referring back to this. For example the EU limits fleet capacity in the convention area for 'full appendix A list of species'.[104] This list of species includes species that were previously unregulated such as roundnose grenadier, orange roughy, blue ling and deep-sea sharks.[105] The TAC regulations around deep-sea species tend to focus on the main commercial species of appendix A, and limit the catch level of these deep-water species taken

[104] NEAFC Annual Report above n 56, agenda item 7(f).
[105] Gianni above n 2, 56.

from the high seas through bottom trawling within NEAFC's area of jurisdiction.[106] NEAFC has also instituted an effort cap as regards some species. Named 'the NEAFC recommendation for Conservation and Management Measures for Deep Sea Species in the NEAFC Regulatory area in 2005', it states that:[107]

> Each contracting party undertakes to limit the effort for 2005 put into the directed fishing for deep-sea species as set out in Annex 1 B of the scheme in the NEAFC Regulatory Area
>
> The Effort shall not exceed 70 percent of the highest level put into deep-sea fishing in previous years for the relevant species.
>
> The effort should be calculated as aggregate power, aggregate tonnage, fishing days at sea or number of vessels, which participated.

An effort cap reduces the amount of fishing being done, and will reduce the damage to stocks and their environment by reducing the amount of 'effort' put into fishing. Overall these regulatory measures look to be fairly comprehensive, but have in fact not been particular successful. For example, on closer consideration of this measure, the effort cap stipulates that the fishing effort was not to exceed the 'highest level put into deep-sea fishing in previous years'. These stocks had been exploited for these previous years at a much higher level than they could biologically sustain and are so depleted that the cap establishes a limit far higher than the catch levels in recent years, meaning that fishing effort could potentially actually expand up to seven times what is now and still remain within the limit.[108] Additionally states have entered reservations to many of these regulations as regards some species. For example Russia, whilst limiting days at sea and fleet size, makes an exception for this in the

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[106] NEAFC Annual Report above n 56; Gordon above n 19, 62 notes that out of the seven species identified as commercially or potentially commercially important, the specified four were capped. Remaining unregulated were greater argentine, black scabbardfish, and blue whiting.

[107] NEAFC "Recommendation III: Recommendation for Conservation and management Measures for Deep Sea species in the NEAFC Regulatory area in 2005" <http://www.neafc.org/measures> (last accessed 27 June 2005)

[108] Deep-sea Conservation Coalition "A net with holes: the regional fisheries management system" above n 70, 3.

case of highly affected species such of ling, argentine and Greenland halibut.[109] NEAFC has not yet instituted any overall gear restrictions or limits on the number of trawls, which would aid protection of the marine environment as well as the commercially valuable fish stocks.[110] This could be a better method due to NEAFC's inability, as stated above, to regulate for effects on habitat and biodiversity.

Whilst NEAFC has recognised bottom trawling as an area to be dealt with, and made some progress towards regulations, they have not yet implanted a truly effective regime. This has been recognised within NEAFC and Norway is running a strong campaign to get thorough regulations, and establish marine protected areas (MPAs) as part of a concentrated effort to regulate bottom trawling. However, this doesn't have consistent internal support, with members such as the EU and Iceland backing the proposal, and Denmark and Russia stalling such development by 'agreeing in principle', but advocating a delay of any action until more information is gathered.[111] For NEAFC to have adequate regulation, current measures have to be extended or expanded upon. The Norwegian delegation at NEAFC's latest Annual Meeting identified this need for provision of a more coordinated approach, which can cover both sustainability of the stocks and habitat and biodiversity protection. [112]

V SHORT-TERM ACTION

While there is consensus among many environmentalists, scientists and specialist academics that some form of action as regards bottom trawling, this is not echoed by consensus towards what for this action should take. For example, proposals range from an immediate ban on all trawling, to limited closures of sensitive areas, to simply aiming for increased research and information about bottom trawling. Clearly such varying approaches for longer-term regulation mean that there is likely to be little progress made towards anything. This delay is the basis for a concerted

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[109] NEAFC Annual Report above n 56, agenda item 7 (f).
[110] Deep-sea Conservation Coalition "A net with holes: the regional fisheries management system" above n 70, 3.
[111] NEAFC Annual Report above n 56, agenda item 13.
[112] NEAFC Annual Report above n 56, agenda item 14.

international effort by conservation groups and scientists to take short-term action until movement can be made towards permanent regulation.

A Proposal for an Interim Moratorium:

An interim moratorium has been proposed as the logical first step towards comprehensive regulation of bottom trawling. For example, the American Association for the Advancement of Science has collectively drafted and presented a statement on the urgent need for a moratorium to the United Nations, which supports a UNGA resolution declaring such a moratorium. A moratorium as a short term measure is also supported by environmental academics who have concluded that '[o]ver the short term, the best option for international action is a UN General Assembly declared moratorium or interim prohibition on deep-sea bottom trawling on the high seas.'[113] Proposals to the UNGA so far have been fairly weak, for example, in its July 2004 Report to the Secretary General, UNICPOLOS proposed that the UNGA should:[114]

> (a) Urge States, either by themselves or through regional fisheries management organisations, where these are competent to do so, to consider on a case by- case basis and where justified on a scientific basis, including the application of precaution, the interim prohibition of destructive practices by vessels under their jurisdiction that have an adverse impact on vulnerable marine ecosystems, including seamounts, hydrothermal vents and cold-water corals located beyond national jurisdiction;
>
> (b) Encourage regional fisheries management organisations with a mandate to regulate bottom fisheries to urgently address the impact of deep-sea bottom trawling on vulnerable marine ecosystems in accordance with international law;
>
> (c) Urge members of regional fisheries management organisations without the competence to regulate bottom fisheries to expand the mandate, where appropriate, of their organisations to cover such activities in accordance with international law.

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[113] Gianni above n 2, 78.

[114] Report of the Work on the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea at its fifth meeting. A/59/122, paragraphs 6a-c. Full text is available at <http://www.un.org> (last accessed 02 August 2005)

This falls far short of forming a text to set out the modalities of a moratorium. However, the UNGA has supported a more comprehensive approach in principle, than that text, in its resolution on Oceans and the Law of the Sea.[115]

Support for a moratorium is not comprehensive, with endorsement of a moratorium being blocked by states due to domestic politics. For example consider states' actions at the most recent meeting of UNICPOLOS, where, despite having produced a fairly weak text, the organisation 'again failed to recommend a moratorium on bottom trawling...Despite support from several countries, the move to recommend a global moratorium was blocked by the EU and Iceland.'[116] This shows the reluctance of states to make such a bold move, as NEAFC's annual report shows us that both these states were in favour of more regulation within that region.[117] This may be an indication that states are more willing to regulate through RFMOs, where they retain more control over outcomes that will directly impact them. Yet this reluctance to take international action echoes the reluctance of states to make strong precautionary regulations through RFMOs. In both situations states espouse support for ecosystems and precaution in principle, yet produce regulations that are weak or ineffective in achieving these outcomes.[118]

A moratorium does not yet have enough support, even as an interim measure to become a United Nations General Assembly resolution (UNGAR), it does, however, remain an important step towards short term control of bottom trawling.

B Advantages and Disadvantages of a Moratorium

Supporters argue that a UNGAR declaring a moratorium would act as a temporary stopgap until more knowledge and data about the effects of bottom trawling can be accumulated. As a short term measure, environmental groups hope that it will offer

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[115] UNGA Resolution 59/24 (17 November 2004) A/RES/59/24 paras 73-76.
[116] UNICPOLOS "Sixth meeting of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea" (6-10 June, New York, 2005) <http://www.fishsec.org> (last accessed 05 August 2005).
[117] NEAFC Annual Report above n 56, agenda item 14.
[118] For example, NEAFC's effort cap which allows an increase in fishing, and NAFO's TAC limits which are set at the outer bounds of sustainability.

temporary but earlier protection for threatened ecosystems[119]. It is hoped that a moratorium over bottom trawling would create breathing room in which development of a more rational and coherent regulatory framework could be established. This would avoid current issues such as inconsistent regional approaches taken by RFMOs and states as they create their own regulations in a lacuna of uniform international standards or principles. Advocates believe that a moratorium will also have important longer term benefits in that it would galvanize action at national, regional and international levels towards further development.[120]

Proponents of this approach recognize that a UNGAR can be highly effective in changing behavior, despite their non-binding nature.[121] The oft-cited example of this is the successful UNGAR imposed moratorium on large-scale pelagic drift-net fishing on the high seas,[122] (hereinafter "high seas drift net fishing") which has 'been as effective as any treaty in changing fishing behavior'.[123] This resolution recommends the international community institute a moratorium on high seas driftnet fishing by 1992. The operative parts also state that this moratorium will not be imposed or will be lifted 'if effective conservation and management measures could be taken'.[124] Analogously, it is suggested that the UNGAR based moratorium model may be successful for deep sea trawling as well.

However, while the pelagic drift-net fishing moratorium has been successful, it is worth remembering that 'the international community adopts numerous non-binding instruments on fisheries every year that seem to have little effect in improving the management of fisheries'[125] The pelagic drift-net fishing resolution is considered highly successful but it had the advantage of being firmly supported by the USA, who

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[119] Deep-sea Conservation Coalition "The way forward: making a moratorium work" 2 <http://www.savethehighseas.org> (last accessed 18 August 2004)

[120] Deep-sea Conservation Coalition "The way forward: making a moratorium work" above n 119, 2. Although it is accepted that UNGARs do not have a purely legally binding nature *per se* Johnson points out that they they do have moral, political and in some case impose 'quasi legal' duties. D H N Johnson "The Effect of Resolutions of the General Assembly of the United Nations" (1955-56) 32 BYIL 97, 101.

[121] See generally B Sloane "The Binding Force of a 'Recommendation' of the General Assembly of the United Nations" (1948) 25 BYIL 1; and Johnson above n 120, 97-122.

[122] UNGA Resolution 46/215 (20 December 1991) A/RES/46/215.

[123] David A Balton, Dorothy C Zbicz "Managing Deep-Sea Fisheries: Some Threshold Questions" (2004) 19 IJMCL 247, 253.

[124] G J Hewison "The legally Binding Nature of the Moratorium on Large-Scale High Seas Driftnet fishing" (1994) 25 J Mar L & Com 557, 570.

[125] Balton above n 123, 253.

had supported calls for a moratorium since 1989.[126] The USA also implemented national limits, and has retained an active role in eliminating usage. A consequence of this support has been that many major fishing nations, such as Japan and Taiwan, followed suit.[127] Furthermore this resolution took a long time to come into effect, it was not rapidly accepted and applied by all. It cannot be expected that a UNGA declared moratorium will halt bottom trawling in the short term and provide immediate relief. For a UNGA moratorium to have fairly rapid effect there must be widespread political will, and preferably support from the stakeholder states.[128] As discussed above, it is unlikely that there is the requisite support about this issue yet. Because there are important stakeholder states that do not support a moratorium, even if such a resolution was passed, these states are unlikely to abide by it. New Zealand, while being an industry player does support some form of moratorium but recognizes that not all involved states feel the same way. In a September 2004 cabinet announcement, New Zealand Ministers Jim Sutton (Acting Foreign Affairs and Trade Minister) David Benson Pope (Fisheries Minister) and Chris Carter (Conservation Minister) said that whilst they would:[129]

> be looking to advance discussions at the United Nations General Assembly…to get a strong resolution for interim targeted bans on bottom trawling in vulnerable areas…there did not appear to be broad support for an interim global moratorium on high seas bottom trawling, and this was unlikely to form the basis of a proposal at the UNGA.

This suggests that while UNGARs *can* be highly effective there is not yet requisite support within the UNGA to produce a global moratorium analogous to that

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[126] Christopher J. Carr; Harry N. Scheiber "Dealing with a Resource Crisis: Regulatory Regimes for Managing the World's Marine Fisheries" in UCIAS *Dynamics of Regulatory Change: How Globalization Affects National Regulatory Policies* (University of California International and Area Studies Digital Collection, California, 2002) 18, 19.

[127] Carr above n 126, 18-19.

[128] Sloane above n 121, 32 explains that the influence exerted by recommendations come from the fact that they reflect the will of the 'majority of nations and [are] an expression of world opinion'. Therefore, to have influence, there must be the requisite international support for the resolution.

[129] Jim Sutton, Acting Foreign Affairs and Trade Minister; David Benson-Pope Fisheries Minister; Chris Carter, Conservation Minister "Cabinet decisions on deepwater biodiversity" (24 September 2004) Press Release <http://www.biodiversity.govt.nz > (last accessed 04 August 2005)

on large scale pelagic drift-net fishing on the high seas.[130] A resolution passed without the necessary commitment and support will lack the authority that leads to effective implementation.[131] Further to this is the view that a non-binding resolution would not be enough to prevent these activities and attention should be focused on stronger actions instead of a moratorium.

C Effectiveness of a Moratorium

These arguments do highlight the reality of problems that a non-binding resolution would face. However this does not necessarily mean that the drive for such a moratorium is futile. It has been suggested that a UNGAR may still be the best step forward in international regulation of deep-seas trawling because 'even a UNGA resolution that lacks universal support can make a contribution to enhancing awareness and to creating stimulus and legitimacy for further action'.[132] Further to this, even if there is not universal support for action to be taken now, 'urgency means that a strong resolution with less than universal support may be preferable above a weak resolution that enjoys universal support.'[133] These are good arguments in favour of continuing to push for a moratorium in spite of a lack of uniform support. However it does ignore the point that a strongly worded resolution for a moratorium will still not be 'strong' in effect unless it enjoys at least the support of several main participants within the industry, and it is unclear whether this is present. The value of a UNGAR doesn't necessarily lie in practical effects. As a parallel measure, along with development of a more formal regulatory document, such a resolution would emphasize the importance of this issue, and the need for further consideration. In this way a UNGA declared moratorium would still fulfill an important role as a short term measure, even if does not provide immediate protection.

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[130] E J Molenaar "Global, Regional and Unilateral Approaches to Unregulated Deep-Sea Fisheries" Deep Sea 2003 Conference, 1-5 December 2003, Queenstown, New Zealand, 11.
[131] Molenaar "Global, Regional and Unilateral Approaches to Unregulated Deep-Sea Fisheries" above n 131, 11.
[132] E J Molenaar "Unregulated Deep-sea fisheries: a Need for a Multi-Level Approach" (2004) 19 IJMCL 223, 236.
[133] Molenaar "Unregulated Deep-Sea Fisheries: A Need for a Multi-Level Approach" above n 132, 236.

VI PRACTICAL IMPLEMENTATION OF LONG TERM MANAGEMENT AND REGULATORY GOALS

In order to get a comprehensive regime covering bottom trawling, there needs to be concurrent improvement in RFMO action and development of longer term goals. The first aspect of this two-pronged approach requires increased consistency and quality of regulations covering bottom trawling; this section will cover this aspect. RFMOs are currently in the best position to implement regulations so it is important that they take a strong role in increasing regulation of bottom trawl fisheries. It is recognised that 'improving both the coverage of RFMOs where there are gaps, and the technical competence and performance...[are] ...critical issues'[134] and must be worked upon if these bodies are to become effective vehicles for regulation. To help achieve this, there needs to be parallel development of international principles of some kind upon which RFMOs can build effective regulations. Options for ways to develop such principles are discussed in the paragraph entitled 'development of international regulatory guidelines'.

A The Need for Better Regulation by Existing RFMOs

Being at the forefront of fisheries control makes RFMOs the best bodies through which to develop bottom trawling regulation. For RFMOs to move regulation forward they need to begin to adopt real and effective management measures. This is most important for those RFMOs that have already adopted some measures, as they will be able to make progress more quickly. Development of new RFMOs remains important, but '[e]stablishing RFMOs which could regulate bottom fisheries...then ensuring that all countries involved in deep-water fishing abide by the RFMO's regulations is a long term process.'[135] As such the utilisation of existing powers can produce more of an RFMO contribution to regulation of deep-sea trawling in the foreseeable future.

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[134] Ministry of Fisheries "Report of the FAO Workshop on the Assessment and Management of Deepwater Fisheries" (27 – 29 November 2003 Dunedin, New Zealand (Revised 5 December < http://www.fish.govt.nz> (last accessed 29 June 2005)

[135] Deep-sea Conservation Coalition "A net with holes: the regional fisheries management system" above n 70, 2.

The question then becomes; how can RFMOs improve regulation of deep-sea trawling within their jurisdiction? Ideally, development of measures should be in line with international principles, however these have not yet been established. Other regulatory guidelines can be looked at for guidance. We currently have some regulatory devices that are representative of sustainable fisheries management, reflecting the ecosystem and precautionary principles. These can act as an immediate guide, to be adapted and followed by other RFMOs in the dearth of any specific international principles. The most sophisticated of such regimes is the CCAMLR convention. This regime regulates its fisheries in line with evolving norms of management such as the ecosystem and precautionary approaches.[136] This regime is a useful tool from which other organisations can draw upon to guide practical implementation of these principles.

B The CCMALR Approach: A Basis for Others?

The CCAMLR approach represents the most sophisticated conservatory approach to sustainable fisheries management.[137] This can benefit RFMOs in two ways. Firstly it can act as a guide in the development of new bodies, and secondly it can guide development of new regulations by existing RFMOs. As discussed above, this latter option is likely to produce tangible effects first.

Some of CCAMLR's regulatory measures are already common to RFMOs such as VMS, inspection and observer programmes, and marking of gear and vehicles. CCAMLR has gone further than these and adopted more potent regulations to govern all fisheries in their RA. Innovative measures that CCAMLR employs include the catch documentation scheme (CDS), which acts as a trade measure to ensure legitimacy of catches of endangered fish.[138] CDS requires specific documentation validating that they have been caught in accordance with CCAMLR rules before the

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[136] Chopra above n 75, 136.
[137] Chopra above n 75, 136-137. For example catch allocation provision are not specified in the Convention because the drafter believed this would be contrary to the conservatory nature of CCAMLR and change the 'agreement to a pro-fisheries regime'.
[138] Agnew above n 81, 366.

port state will allow them to pass.[139] This ensures that the fish are caught with regard to CCAMLR's conservation components, as set out in article 2.[140] Applied to bottom trawling, such a tool would allow an RFMO to regulate fishing in accordance with its conservation principles. If these principles included ecosystem considerations, CDS could act to limit damage to both target stock and habitat.

Two further control measures, adopted under article IX, regulate development of fisheries in their jurisdiction; these are the New Fisheries Measure and the Exploratory Fisheries Measure. These are particularly relevant to the expanding practice of bottom trawling. These measures grant CCAMLR control of present fisheries, but also control of the development of future fisheries, of which bottom trawl fisheries will be a component. These regulations will regulate bottom trawl fisheries in accordance with CCAMLR's principles.

The 1991 New Fisheries measure specifies that 'no fishing activity on a species in a management area, using a particular gear type, which has not been fished before, can proceed without prior notification to the Commission'.[141] The commission must also be notified at least 3 months in advance of its next meeting of any such proposal. This means that if the commission objected to the fishing measure, whilst not having any formal rejection criteria, could theoretically adopt a specific conservation measure that could have the effect of shutting down the proposed fishery. Although this is deemed as 'unlikely to happen' due to the requirement of consensus around such a decision, it does provide advance notification of any action to members.[142] Any proposal must also include data such as the nature of the proposed fishery on which the council can then comment. Required data includes; information about the target species; region of fishing; minimum level of catch required to develop a viable fishery; comprehensive biological data (such as abundance of stock); details of dependent and associated species and the likelihood of affects on these if the proposed fishery goes ahead.[143]

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[139] See Agnew above n 81, 365-368 for a more detailed description of the modalities of this system.
[140] CCAMLR above n 76, art 2. Also see Parkes above n 75, 85 for general format that CCAMLR has applied for conservation measures.
[141] Parkes above n 75, 86.
[142] Parkes above n 75, 86.
[143] CCAMLR above n 76, "Notification that Members are Considering Initiating a New Fishery" Conservation Measure 31/X, art 3 (i-iii).

Further to the instigation of new and exploratory fisheries, CCAMLR realized that they would also have to regulate the development of these once they got underway. This resulted in production and adoption of the comprehensive Exploratory Fisheries measure in 1993.[144] This measure aims to ensure that new fisheries do not develop faster than the accumulation of scientific information about their effects.[145] In the case of bottom trawling this is highly relevant as it could prevent destruction of vulnerable areas where their importance is still unknown.

The 1997 meeting of the parties produced further fisheries regulation, and additional conservation measures for new fisheries were agreed upon. These included precautionary catch limits, season length and effort limitations, the requirement to carry CCAMLR designated scientific observers and satellite monitoring systems, and finally the requirement of comprehensive data collection schemes to monitor progress.[146]

C Problems Still Faced by RFMOs

The CCAMLR approach is not a panacea to all problems faced by RFMOs. While the adoption of similar regulations would go a long way towards improvement of bottom trawling on the high seas, it does not deal with other issues. For example, there is the issue of whether CCAMLR's approach can be successfully applied within other RFMO RAs. Secondly, even if the CCAMLR approach is broadly applicable, RFMOs must still combat institutional problems such as IUU fishing, non-contracting parties, and enforcement of regulations.

1 Is CCAMLR's approach broadly applicable?

Development of CCAMLR's distinctive regulatory system has been influenced by both political and geographical factors. The issue is whether these factors are preventative of it's regulations being used elsewhere. While these factors have

[144] CCAMLR above n 76, "Exploratory Fisheries" Conservation Measure 65/XII.
[145] Constable above n 74, 785.
[146] Parkes above n 75, 87.

contributed to development of unique regulation, their presence is not vital to successful implementation.

Politically, CCAMLR was negotiated with different ends in mind than other RFMOs, with its principles founded in 'rational use of marine species while ensuring principles of conservation'.[147] Its conservation principles (found in article 3) are wide ranging and form a basis of complete ecosystem management. By comparison, the original aims of NEAFC and NAFO are based solely on the optimum utilisation of their fisheries resources.

CCAMLR was also adopted under article IX of the Antarctic Treaty, and so forms part of the Antarctic Treaty System (ATS).[148] This group of conventions and treaties either have, or have been interpreted as having, a strong conversationalist approach to the Antarctic area. As such it would be inconsistent for CCAMLR's approach to be any different if it is to contribute to the same system. For example, other treaties that make up the ATS include treaties governing protection of marine mammals such as whales and fur seals.[149]

CCAMLR's geographical position has also influenced the development of regulations. CCAMLR's RA has the benefit of being 'clearly delimited by the Antarctic Convergence [which] acts as an effective biological barrier...the Southern Ocean is therefore substantially a closed ecosystem.'[150] Other RFMO regulatory areas do not have the benefits of such a closed ecosystem, and have to struggle with issues such as straddling stocks. In that situation, half the stock may be within their RA, but the other outside of their jurisdiction. This may provide less incentive to initiate conservatory regulations around the stock, as states do not want to deny themselves access to stocks if another is going to come and fish it anyway.

While these factors have undoubtedly facilitated CCAMLR's ability to create these regulations, they are not necessarily vital to their effectiveness. Although

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[147] Constable above n 74, 779.
[148] Constable above n 74, 779.
[149] Constable above n 74, 779. The ATS was designed to manage the use of Antarctic marine living resources whose populations had been taken to the point of extinction. To this end it focused on the key prey species of krill. This focus was necessary as there needed to be management of krill fisheries 'to ensure that exploitation of krill did not inhibit the recovery of whale and seal populations' which rely heavily on it as a food source.
[150] General Introduction <http://www.ccamlr.org> (last accessed 28 July 05).

CCAMLR adopted the ecosystem approach first, it has now been recognised by other RFMOs. It is up to them whether they chose to implement a similar approach or not. Successful adaptation and introduction of CCAMLR-type regulation is more likely to be dependant on the commitment of the RFMO to making them work, rather than the historical development of the regulatory measure itself. As such, while CCAMLR's unique position was vital to developing such regulations, it is not likely to be a bar to their effective transfer to another area.

2 *Institutional problems faced by RFMOs*

RFMOs including CCMLR still have to battle other, more general problems to ensure effective operation. These include problems of funding, non-contracting parties (NCPs), state control over enforcement, and consensus dominated decision making often leading to weak regulations.[151]

Lack of adequate funding means that regulations cannot be monitored or enforced, either against their party states or NCPs. CCAMLR is an example of an RFMO that has a thorough management system,[152] but insufficient funds to ensure enforcement. The result is that this region continues to be plagued by IUU fishing, undermining the effective operation of regulations. As with all fisheries, bottom trawling regulations will not be effective unless they are enforced. Without sufficient funding for monitoring and enforcement, a regulated area could potentially could end up as damaged as an unregulated one.

NCPs present a problem for all RFMOs, being beyond the scope of either general UNFSA, or specific RFMO measures. They have 'posed some of the major constraints for effective fisheries management' as regulations made by an RFMO cannot affect the behavior of NCPs.[153] NCPs are free to apply the customary law of UNCLOS, which grants freedom of fishing on the high seas. Despite RFMOs being

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[151] Ronald Barston "The Law of the Sea and Regional Fisheries Organisations" (1999)14 IJMCL 333, 347.
[152] As outlined by Parkes above n 75, 83-84.
[153] Barston above n 151, 351.

able to impose limited trade bans over NCPs,[154] it is considered that 'the lack of control over non-member state fleets is an enormous loophole in the regional fisheries management scheme.'[155] NCPs may also influence the adoption of regulations by an RFMO. For example, a member may lobby against adoption of precautionary bottom trawling regulations as they foresee that ship-owners will switch registration to an 'open-registry' state. In doing this, that vessel becomes free of any conservatory measures put in place by the RFMO.[156]

Finally there is the problem of the dominant sovereign power of the state vis-à-vis the RFMO as a body. Barston points out that a state may 'prefer to remain outside ...institutions for the fear of loss of access to...resources and quota limitations imposed on them.'[157] However, even if a state does become a member, it retains the power to make reservations to any regulation of that RFMO. This ability is frequently exercised, for example, both Demark and Russia have entered reservations as regards NEAFC bottom trawl regulation. Additionally enforcement of regulations is left to member countries, and so the effectiveness of the RFMO measure is 'entirely dependent on the good faith efforts of their member states'.[158] If a state does not wish to take a hard-line against its ships fishing in contravention of a measure, little can be done to effect compliance.

D Overview of the Role of RFMOs in Bottom Trawling Regulation

This discussion and overview of RFMOs sets out four steps of the argument towards bottom trawling regulation. Firstly, some RFMOs can and are regulating bottom trawling albeit to with differing levels of success. Their current position

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[154] Barston above n 151, 352. Trade measures such as refusing port access and trade sanctions to dissuade NCPs have been applied by the United States. Other states such as Brazil, Japan and France have raised doubts about their legitimacy under the World Trade Organisation.

[155] Deep-sea Conservation Coalition "A net with holes: the regional fisheries management system" above n 70, 3.

[156] Barston above n 151, 339 notes that the FAO Code of Compliance attempts to limit this with article VI provisions. These envision a comprehensive vessel monitoring system monitored by means national databases which hold information about all fishing vessels. This information, such as a vessel having its license revoked should then be circulated among members.

[157] Barston above n 151, 349.

[158] Deep-sea Conservation Coalition "A net with holes: the regional fisheries management system" above n 70, 3.

within fisheries management means that developing these abilities is a logical way to achieve timely regulation of bottom trawling, both as it exists and as it expands. Although development of new RFMOs which can regulate this area is important, it is an extremely long term goal and cannot be relied upon to resolve issues as they are happening now. Secondly, regulation being produced needs to be more effective it is to produce tangible results. The CCAMLR approach is illustrative of how the precautionary and ecosystem approaches can be incorporated into RFMO regulations. Other RFMOs could adapt CCAMLR's tools in order to achieve stronger regulation of bottom trawling in their area. It is recognised that even if stronger regulations are developed, they cannot address all of the problems faced by RFMOs, such as funding issues. This does not mean that RFMOs cannot still be effective and highly useful bodies through which to develop controls around bottom trawling. However, these limitations do support the need for additional development of regulation. A suggestion here is that RFMO action should be supported by international action, for example the production of a set of guidelines to cover acceptable bottom trawling practices.

The debate around this issue is what form these guidelines should take, for example would a soft or hard law method be better? Should there be use of existing agreements or development of a new one? There is no clear consensus as to the right answer, with each presenting its own advantages and disadvantages.

VII DEVELOPMENT OF INTERNATIONAL REGULATORY GUIDELINES

A A Hard or Soft Law Approach?

Guidelines supplemental to RFMO action could be pursued through means of hard or soft law. The debate around which would be more effective was an issue faced during the negotiation of the UNFSA, where both methodologies presented pros and cons.[159] Arguments advanced were typical of the generic debate that surrounds the use of these. For example, the minority (comprised mainly of the distant water

[159] Balton above n 123, 252.

fishing nations (DWFNs)) pointed out that soft law can be highly effective in changing behavior, whilst not requiring the intense drawn out negotiations that would inevitably come from drafting a binding treaty.[160] The majority however felt that 'only a binding instrument would command the respect and induce changes in fishing practices'.[161]

A basic matrix can show the main trade-offs between the two approaches:[162]

	Hard law	**Soft law**
Advantages	Creates legally binding obligations on parties, modern treaties usually also include compliance and enforcement measures to encourage achievement of its aims. As treaties require express consent, they reflect true willingness to proceed. Treaties are seen as the most important source of international law.	Can contain more detail about what is to be done, and be less reflective of the weakest, least controversial views. Can be negotiated faster than hard law as states are less worried about signing a non-binding agreement. Success will reflect the political will. Can signal development of an issue which later becomes hard law.
Disadvantages	Can constitute the lowest common denominator. Can take long time to negotiate. There may be a significant lag time between conclusion of negotiation and entry into force. It will still only bind parties who sign it.	As it is not legally binding it will be ignored if there is not the political will at the international and national level to mobilize it. Compliance relies on whether parties intended to create binding rules and relationships.

[160] Balton above n 123, 252.
[161] Balton above n 123, 252.
[162] See generally: A E Boyle "Some Reflections on the Relationship of Treaties and Soft Law" (1999) 48 ICLQ 901, particularly 902-903; C M Chinkin "The Challenge of Soft Law: Development and Change in International Law" (1989) 38 ICLQ 850; Shaw, *International Law* (5ed, Cambridge University Press, 2003) Chapter 3; Cassese *International Law* (2ed Oxford University Press, 2005) Part III.

Development of regulatory guidelines to cover bottom trawling is likely cause similar dissent and produce similar arguments among stakeholders.[163] Neither can be said to be a better approach in all circumstances than the other, as there are examples of both that have affected fishing practices. For example hard law measures that have changed fisheries management include the UNFSA in 1995, and the FAO Code of Compliance adopted in 1993, and of course the RFMO establishing conventions.[164] On the other hand, soft law instruments that have also contributed to charges are: the UNGAR instituting a moratorium on the use of large-scale pelagic driftnets, the FAO Code of Conduct, and the four international points of action (IPOAs) adopted by the FAO.[165]

B Amendment vs. *Development*

1 Amendment

There is further debate about whether guidelines, either hard or soft, should be created anew or extrapolated from existing agreements. There is academic support for both sides of this debate, for example, there is the argument that: [166]

> The inescapable conclusion is that we already have to tools to deal with these problems in the 1995 Agreement and the FAO code of conduct and the various [International Plans Of Action] adopted by FAO. What is needed now is for words to be translated into action. This requires political commitment and action at national, regional and global levels.

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[163] Chinkin above n 162, 851-852 notes that there is the additional factor that treaties and soft law instruments are highly variable and not easy to classify as one or the other. For example there can be soft law obligations included in treaties, and codes of conduct that have been accepted as binding by the international community, thus blurring the lines between what is hard law and what is soft law.
[164] Balton above n 123, 248-249. Also note that although the FAO Code of Compliance is binding it is considered to be part of the non-binding FAO Code of Conduct.
[165] Balton above n 123, 249. These deal with IUU fishing, by-catch of seabirds, fishing capacity and sharks.
[166] Lodge above n 4, 304.

On the other hand, it is posited that 'despite great advances in the global regime on fisheries...existing legal instruments are not adequate in dealing effectively with current challenges to the management of deep-sea fisheries.'[167]

Both these options have been debated at an international level. New Zealand's Ministry of Fisheries reported that options debated at an international level included the amendment of existing multi-lateral agreements, for example the UNFSA and FAO compliance agreement, and the need for an additional agreement, to complement a moratorium.[168] There is not yet any firm agreement on what path should be taken, or indeed if either will be taken. However, both options present valid reasons why it could be more effective than the other.

None of the above options present a clearly superior means through which to pursue development of international principles. It has been suggested that amendment of the UNFSA would perhaps form the best basis, as it potentially already does cover some deep-sea stocks (as discussed above). However this ignores some critical problems that will have to be overcome before it could have the desired effects. For example, there would still need to be amendment of the UNFSA to ensure that all relevant stocks are covered. Such significant changes are not common to international treaties, in fact they are highly unlikely. Even if there were enough support to make these changes within the UNFSA, those members who engaged in bottom trawling would still have to agree to be bound by the amendments. It is basic treaty law that these states will not be without their consent. They could therefore reserve their positions as to any amendment and keep applying the UNFSA in its current form. Additionally, although ratifications to the UNFSA are slowly increasing, it is still not widely ratified. Any amendment to it may jeopardize further ratification to the original agreement and prevent that from becoming implemented more widely. As such, the UNFSA may not be the best document through which to try to produce generally applicable international principles.

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[167] Moritaka Hiyashi "Global Governance of Deep-Sea Fisheries" (2004) 19 IJMCL 289, 289.
[168] Ministry of Fisheries "Report of the FAO Workshop on the Assessment and Management of Deepwater Fisheries" above n 134.

There is some support for the negotiation and development of a new international agreement. For example, at the 2005 meeting of the FAO Conference on Fisheries (COFI) it was suggested that the:[169]

> FAO should urgently develop technical guidelines under the Code of Conduct relating specifically to conservation and management measures for deep sea fish stocks, and that existing RFMOs be used to regulate deep sea fisheries on the high seas.

The UNFSA could provide guiding principles directed at bottom trawling. Although the conference noted that 'states *should* apply the fundamental management principles of UNFA to fish stocks found exclusively in the high seas (i.e., discrete high seas stocks)' that this should be achieved through 'developing a legal instrument based on this commitment.'[170]

Like the UNFSA, the purpose of guidelines would be to elaborate on UNCLOS conservation concepts, but would specifically cover existing and potentially exploitable discrete high seas stocks.[171] To aim to develop regulation through this means is a huge undertaking likely to take many years, even if there is enough support to launch negotiations. And, finally, if there is enough support, and if a treaty is produced, the end result is still not one of guaranteed effectiveness. Obstacles such as enforcement, compliance, funding and non-participation would have to be faced if the treaty were to provide useful guidelines. Further to the last point, Hiyashi believes that for an enforcement regime to be effective it would have to cover states which have not joined RFMOs. Also '[m]ore specifically, there is a need to provide sufficient legal basis to compel unwilling fishing states to join in specific collaborative efforts or to enforce conservation measures of existing RFMOs.'[172]

At the moment such a development is more an academic ideal rather than a likely prospect. Currently there is not even enough support for a non-binding UNGA

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[169] COFI above n 52, 13.
[170] COFI above n 52, 19. [my emphasis].
[171] Hiyashi above n 167, 296.
[172] Gjerde above n 37, 220; Hiyashi above n 167, 296.

instated moratorium on bottom trawling, or agreement on how, if at all, regulation should proceed. It is highly improbable that the international community would be able to negotiate an entire agreement on bottom trawling in the present atmosphere.

C The Way Forward

There are significant problems faced in attempting to amend an existing agreement, and negotiating hard law. As such, the best approach for bottom trawling regulation may be to aim for a soft law declaration, which has a better chance of materializing, even if this means compromising on other aspects. Along with the drive for an interim moratorium, support for regulation around bottom trawling can be used to sponsor negotiations towards a soft law declaration setting out the guiding principles. Despite a soft law document suffering from the weaknesses outlined above, its benefits would be considerable. A soft law declaration will benefit from increased participation in the negotiation process and ability to produce provisions that are more detailed and thorough than provision of a hard law declaration.[173]

Although a soft law document may not be able to legally enforce changes in behavior, it is hoped that it would act to lead to such changes. Firstly, a soft law declaration of principles 'can help generate widespread and consistent state practice' by marshalling a 'consistent general response on the part of states'.[174] In doing this it becomes evidence of an emerging customary rule, which would then be binding in its own right. A soft law instrument could also be used as the first step in achieving a later treaty.[175] This treaty, being based on previously decided terms, could contain a more comprehensive regime than if such an agreement had been attempted as the first step. However, even standing alone, many environmental declarations have achieved some effectiveness as soft law documents.[176] Their success lying more in the political commitment to achieving principles than whether states are legally bound by it.[177] In the latter case it is unlikely that states would choose to be bound unless the political

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[173] Boyle above n 162, 903.
[174] Boyle above n 162, 903-904.
[175] Boyle above n 162, 904.
[176] Shaw above n 162, 111; Boyle above n 162, 904.
[177] Shaw above n 162, 111.

commitment was already present, in which case soft law would offer more advantages as it can produce stronger regulations.

The final point that remains is what bottom trawling guidelines should cover. This will of course be a compromise between comprehensive protection, and what states would actually agree on (even in soft law form). At a minimum, a declaration of international principles to guide bottom trawling would have to cover extensive information gathering and sharing requirements, so as to obtain better knowledge about actual sizes and sustainable harvesting levels of stocks. Management should be instituted on a precautionary, CCAMLR style basis, which covers existing and potential fisheries. It is vital that these guidelines cover protection of the marine environment, and deal with the broader challenge of deep-sea biodiversity and interrelationships of fish stocks and their habitat. Further issues that could be included are guidelines around bio-discovery and prospecting and equitable benefit sharing of deep-sea resources, both fishery and otherwise.[178]

VIII CONCLUSION

Bottom trawling is an example of how the advent of new technology can change the balance between utilisation and conservation of fisheries resources. A major issue with this practice is that due to its recent emergence its effects are still relatively unknown. While there is evidence that it affects target stocks and their habitats, it is unclear what the result of this could be. However, many scientists believe that these newly discovered habitats are intrinsically valuable. As such, their protection alone should be reason enough to impose stronger regulations on bottom trawling. Industry players deny the need for this, arguing that not all targeted areas are so worthy of protection that it can justify prohibiting their actions. Additionally, it is not accepted by everyone that bottom trawling even causes damage *per se*.

This is the contentious climate in which advocates of regulation are attempting to make the progress they see as necessary. Analysis of current regulation by RFMOs is considered to be generally insufficient to achieve real conservatory effects. The

[178] Kimball above n 3, 284.

Exception is the is CCAMLR regime, which if applied as intended has the ability to impact on how bottom trawling is carried out. As such, it is recommended as a basis for further regulation by other RFMOs. RFMOs remain the best bodies through which to implement regulation. This is because they have the ability to act immediately, as opposed to the long term option of developing new bodies through which to drive regulation. Faults are recognised with RFMOs that can inhibit truly effective implementation of regulations. However, these faults are common to all areas of fisheries that RFMOs manage, and lack of perfection is not considered a valid reason for inertia. Success, even in a limited way, of RFMO instated regulation to cover bottom trawling will rely heavily on the political commitment of their member states. This will require a sentiment in favour of regulation within the international community. At the moment the impetus to generate such a sentiment is being focused on achieving a UNGA declared moratorium. It is hoped this would provide some temporary relief while longer-term options for regulation are discussed. While a moratorium will not lead to an immediate or absolute cessation of bottom trawling, it is hoped that over time it will take effect, as has been the case for other similar measures. However, a moratorium is by definition only temporary. For this reason it is suggested that alongside a push for an interim moratorium, there should be moves made towards development of international guidelines or principles that regulate and govern bottom trawling. Although this could be pursued through hard or soft law, the latter offers a more practical and probable means through which to achieve the guidelines.

There is no paradigm for how effective management of fisheries should be developed or applied in the shifting kaleidoscope of international marine governance. What is certain is that some action must be taken, and soon, if yet another fishery is to be prevented from over exploitation.

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