



**Policy framework for improving management of
the deep-water net fishery of the West and
North of Great Britain and Ireland**

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1 Introduction

The recent ‘DEEPNET’ report (Hareide et al, 2005) brought to light a number of management issues, including both illegal and wasteful fishing practices, in the deepwater fixed net fishery prosecuted to the West and North of Great Britain and Ireland, around Rockall and Hatton Bank.

Since the release of the report, the Commission has begun consulting Member States with a view to developing an emergency response, which may include a complete closure of the fishery (Borg 2005). Any Commission emergency measure would need to be adopted under the basic CFP Regulation (2371/2002, Article 7). It could last for up to six months in duration and would be renewable thereafter for a further six months.

It is therefore now opportune to consider the type of longer term measures, as identified in the DEEPNET report, that are needed for managing this fishery sustainably, and the policy framework under which these would be developed.

This paper¹ extracts the DEEPNET recommendations and uses them to develop options for improved management of the deep water fishery. It refers to the international and European policy context, including both existing policies that are not being fully enforced and gaps in policies. Section 2 begins by summarising the management issues and recommendations in the DEEPNET report. Section 3 provides an analysis of the existing policy and associated weaknesses as regards the deepwater fishery. Section 4 concludes with a summary of the main types of interventions that could be made to strengthen the management framework, policy options corresponding to the DEEPNET recommendations, and upcoming developments that could be exploited in order to support such options.

2 The DEEPNET report: findings and recommendations

2.1 Fishery overview

The DEEPNET report was published in spring 2005. It was the outcome of an international project to collect and review information on the deepwater set net fisheries in the north east Atlantic². The fisheries covered by the report are conducted on the continental slopes between 150 and 1200 meters from south of Porcupine Bank (49 ° N) to Tampen (61°N) and the Rockall and Hatton Banks (see Figure 1).

¹ This report was commissioned by Oceana from the Institute for European Environmental Policy (www.ieep.org.uk). IEEP is an independent institute with its own research programmes. Based in London and Brussels, the Institute’s major focus is the development, implementation and evaluation of EU policies of environmental significance, including agriculture, fisheries, regional development and transport policies. The authors wish to acknowledge comments provided by Clare Coffey (IEEP).

² Contributing authors were from: Hareide Fishery Consultants, Norway; Bord Iascaigh Mhara, Ireland; Marine Institute, Ireland; Norwegian Directorate of Fisheries; Sea Fish Industry Authority, UK; Marine Institute, Norway; North East Atlantic Fisheries Commission; and Joint Nature Conservation Committee, UK.

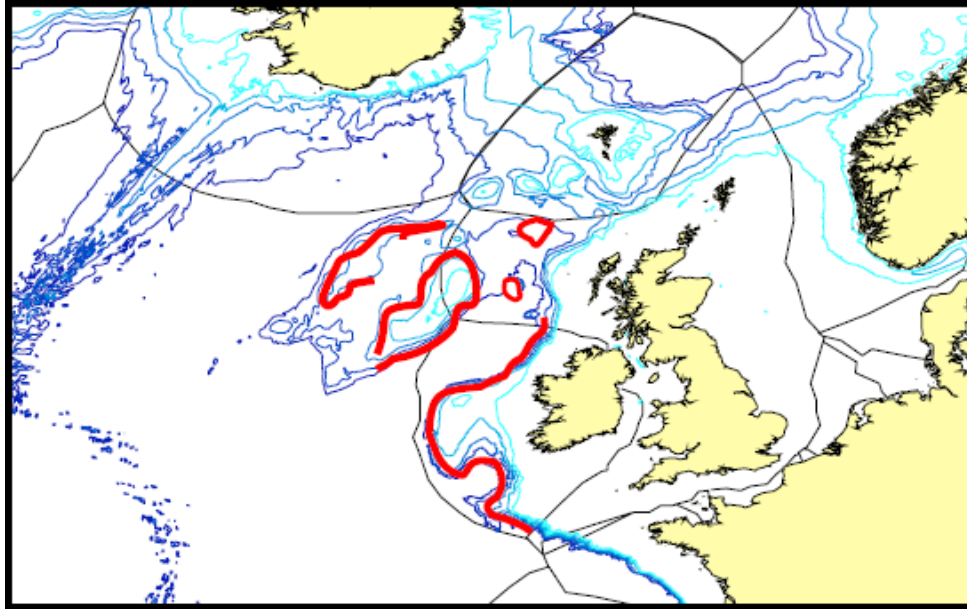


Figure 1 North East Atlantic waters with EEZs, (Depth contours 200, 500, 1000, 1500 and 2000 m)

The set net fisheries can be divided into a deepwater fishery and an upper slope fishery. The deepwater fishery (800-1200 m) targets the Leafscale gulper shark or false 'siki' shark (*Centrophorus squamosus*) and Portuguese dogfish or 'siki' shark (*Centroscyllium coelolepis*). The upper slope fishery (200-600m) targets monkfish (*Lophiidae*) (Figure 2). By-catch in both fisheries include Forkbeard (*Phycis blennoides*), Blue Ling (*Molva dyptergia*), Ling (*Molva molva*), Rays (*Raja spp.*) and Deepwater red crab (*Chaceon affinis*).

Relating this to geographical areas, in the Faeroes, Shetland Channel and the Rockall Trough and Bank the target species are monkfish and ling in depths between 200 and 450 meters. In depths between 600 and 1200 meters deepwater sharks and deepwater crabs are the main target species. At Hatton Bank the main target species is monkfish between 500 and 900 meters. Deeper than 800 meters the 'siki' sharks are the main target species.

The DEEPNET report provides a more exhaustive description of the fishery in terms of catch levels, vessels numbers, gear type and history

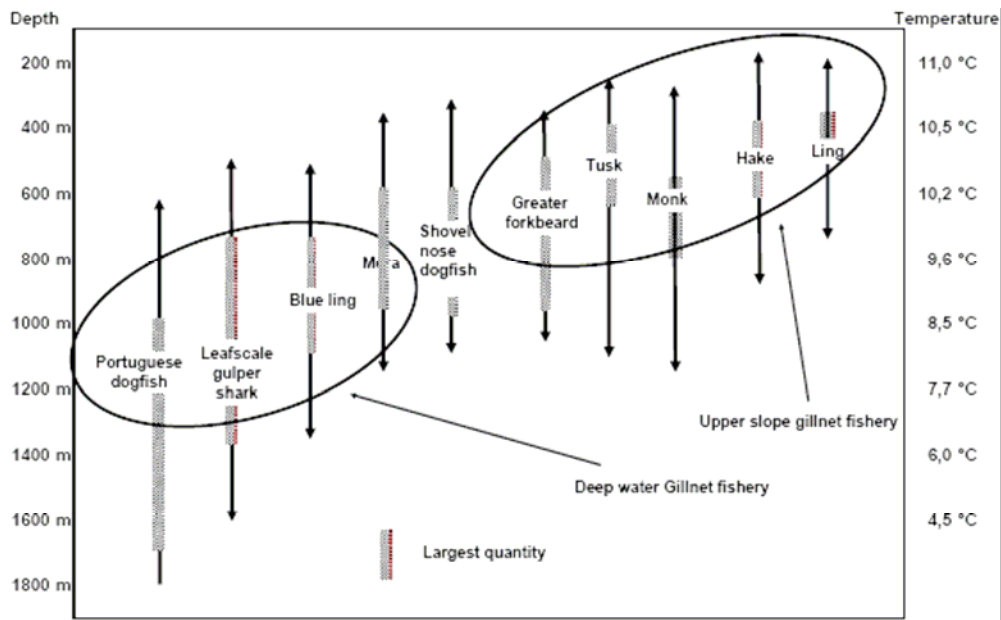


Figure 2 Distribution of fish species and gillnet fisheries by depth and temperature in the continental slopes to the west of the British Isles

2.2 Management issues

The key management issues raised in the DEEPNET report are grouped together here under common headings. Unless stated otherwise, the issues reported here are all as detailed in the DEEPNET report.

2.2.1 Over-exploitation of deepwater sharks

It is believed that the biomass of some of the shark species impacted by these fisheries has fallen to around 20 per cent of original levels in less than ten years. These sensitive deepwater shark species are recognised by the International Council for the Exploration of the Sea (ICES) to be among the most vulnerable fish species known in the North Atlantic. Landings of deepwater shark have increased corresponding to the expansion in the deepwater gillnet fleet. However, knowledge of the basic biological parameters such as the location of spawning grounds, breeding behaviour, seasonal trends in condition and maturation is particularly limited for deepwater sharks, as with most sensitive deepwater species. The landings of many shark species are also unrestricted and TAC levels are not set by species (see section 3.1.3)

2.2.2 Net mesh sizes

There is evidence that the nets used in the deepwater shark fishery contravene EU legislation. According to one of the net suppliers in the deepwater shark fishery, the average mesh size used is 160mm. Annex VI of Regulation 850/98 however stipulates that the minimum mesh size permitted for use in targeting deepwater species (included in 'All other marine organisms') is 220mm. Data from Irish inspection authorities is very limited but showed an average measured mesh size of 220mm.

2.2.3 Gear dumping

There is some evidence of dumping of sheet netting which is illegal under MARPOL (see section 3.4.1). The fishing vessels involved in the deepwater fisheries are not capable of carrying all their nets back to port. Fish have been observed being cut out of the nets by knife, and the headline and footropes of the nets being stripped after hauling. Only the headline and footropes are brought ashore while the net sheets are either discarded, bagged on board, burnt or dumped at sea. Scottish and Irish trawlers also report retrieving nets that have been tied up in large bails, indicating that they have been dumped intentionally.

It is crudely estimated that gear dumping may amount to around 1,254km of sheet netting per year. Little is known about the impacts of such abandoned sheet netting on fish stocks or the wider environment.

There are a number of reasons that skippers dump nets, including: it may not be easy, or even safe, to get netting aboard; the sheer volumes of netting could present a hazard or make normal fishing operations difficult; and there may be a port or local authority charge for waste disposal, especially in the case of large quantities of netting.

2.2.4 Gear loss

Based on experience in other fisheries and the characteristics of these deepwater net fisheries, accidental gear loss is believed to be a potential problem. In decreasing order of relative importance, gear loss is caused by (after MacMullen *et al* 2004, in DEEPNET):

- conflict with other fleet sectors, principally towed gear operators;
- increasing water depth;
- working in poor weather conditions and/or on very hard ground;
- working very long fleets; and
- working more gear than can be hauled regularly.

The gillnetting vessels compete for the same fishing grounds with Scottish, Irish, French and Spanish demersal trawlers and also Norwegian and Faroese longliners, resulting in conflict. Drawing on experience from the Norwegian gillnet fishery for Greenland halibut in depths between 550 and 700m, loss rates are estimated to be approximately 15 nets (750 m) per day.

The fishery and ecosystem effects of lost gillnets are not well understood, although research suggests that gillnets lost in deepwater (>400m) can fish for several years after they are lost because there is very little bio-fouling or water movement in depths below 400m (after MacMullen *et al* 2004, in DEEPNET).

2.2.5 Excessive soak times and discards

There is evidence of excessive net soak times, which gives rise to gear loss and wastage/discards. Furthermore, soak time is an important factor in determining fishing effort (see section 2.2.7) and catch quality.

Average soak times were deduced to be in the order of 5-10 days (120-240 hours). However, because of steaming times and bad weather, it was believed that nets may be left at sea between trips for anything between 1-3 weeks, and as a worst case scenario for up to 5 weeks.

These long soak times result in a high proportion of the catches being unfit for human consumption. Experience in Norwegian waters demonstrate discarded rates of between 54 and 71 per cent with an average 65 per cent of monkfish being discarded. This is based on nets that had been deployed with soak times of between 4-10 days (96-240 hours). Data on other species is lacking but reportedly suspected to be similarly high.

2.2.6 Reflagging and international movements

The vessels prosecuting the fishery are international in nature, complicating monitoring and enforcement in the fishery. Of the 29 vessels reported to be active in the fishery in 2003, 23 were registered in the UK, 6 in Germany and two in Panama. It is also noted that vessels were flagged in France in 2002/2003. In response to profit changes, some of the vessels move between the northeast Atlantic fishery and Brazil under private agreements between the Spanish owners and the Brazilian Government. Many of the vessels have changed their names on numerous occasions – no less than seven in one case – over recent years, making them difficult to track.

2.2.7 Fishing effort and TAC shortcomings

Fishing effort is unknown and largely unregulated. Based on what information could be collated, the DEEPNET report estimated an effort level of 1,881 days, although this was considered to be a poor estimate of real effort. In terms of nets being fished, it is estimated that on average 3,500- 4,000 nets (175-250km of net) are used per vessel. A conservative estimate was put at between 5,800 and 8,700 km (3,600 – 5,400 miles) of nets constantly fishing.

The current Total Allowable Catch (TAC) system is deemed inappropriate by the DEEPNET authors on several levels. TAC levels are not considered to be in line with ICES and STECF advice. Shark TACs are not set at a species level but for all sharks combined (see section 3.1.3), reducing their effectiveness and undermining monitoring. Furthermore, the high grading and misreporting noted in the DEEPNET report would further undermine the TAC system.

2.2.8 Damage to protected habitats

Within the recommendations section of the DEEPNET report, it is suggested that the deepwater net fishery is impacting on ecologically sensitive habitats, such as hydrothermal vents, deepwater corals or other characteristic habitats eg seamounts (see Table 1). No evidence is provided in the report however. Some of these habitats are afforded protection under the EU's habitats Directive (see Section 3.2).

2.2.9 Data gaps

There is generally very limited scientific data available for the fisheries. The numerous data gaps concern the following:

1. **no observer data** are available to the public or scientists and there is limited data on catch and effort or catch composition. One institute has sent out an

- observer on one trip, but due to confidentiality this data was not available to be used for the DEEPNET project;
2. the practice of landing catch either as frozen monkfish ‘tails’ and shark ‘backs’ makes **port sampling and monitoring virtually impossible**;
 3. because of the fishery straddles international and national boundaries, being in EU and NEAFC waters, **information on fishing effort is very poor**. This problem is further compounded by the practice of setting very high net numbers and leaving them to soak for long periods;
 4. there is **limited discard data** throughout the fishery;
 5. there is **very little information on the relationship between discard rates and soak time** in gillnet fisheries; and
 6. the **amount and impact of lost and discarded nets** is not known.

As noted in the DEEPNET report, such data gaps significantly undermine stock assessments and subsequent monitoring and management.

2.3 DEEPNET recommendations

DEEPNET made a number of recommendations in order to improve the management of deep-sea fisheries. As they were made both within the main report body as well as within the recommendations section they are drawn together here for clarity. Again, this section presents only what was set out in the DEEPNET report.

It was recommended that long-term stock management measures need to be tailored to the characteristics of these fisheries and the species being exploited with the objective of preventing local stock depletions. Suggested measures were:

- restrictive licensing;
- effort limitation; and
- an effective observer programme.

It was noted that kilowatt-days may not necessarily be the most appropriate unit of effort in gillnet fisheries given that engine power of such vessels has a poor relationship to fishing mortality. A measurement of ‘net surface area * days’ was considered more appropriate.

Other recommendations made within the text include:

- soak time limits;
- confirmation of mesh sizes in the shark fishery;
- retrieval surveys and mitigation measures to reduce the effects of ghost fishing; and
- development of a standard method for measuring effort in gillnet fisheries.

The advantages and problems with a number of more detailed recommendations were also explored, as reproduced in Table 1.

In closing, the DEEPNET report recommends that there is an urgent need to find a resolution to the management challenges and that remedial actions should be considered to better manage these fisheries in the context of a longer term management plan.

Table 1 Possible management measures identified in the DEEPNET report

Recommendation	Positives	Negatives
The introduction of restrictions on the length of gear deployed at a given time either by overall length or per fleet of nets. Such restrictions were introduced in the northeast Atlantic drift net fisheries for Albacore tuna	Reduce fishing effort	Difficult to enforce and hard to monitor, although VMS does provide a level of control
The certification of fishing gear through labelling	Provide better information of fishing effort	Legal responsibility, problems with damaged or repaired gear and potentially easy to circumvent
A requirement that vessels cannot leave gear at sea whilst landing	Reduces discarding through extended soak times	Difficult to enforce and hard to monitor, although a combination of VMS and adequate marking of gear will provide a level of control
Mesh sizes for fixed gears in Region 3 to be harmonised with Region 1 and 2, in particular for hake and monkfish	Stop the use of small mesh sizes in Region 1 and 2	None
All gears to be marked clearly at either end	Reduce the amount of lost gear and also reduce hazard to other fishing vessels	Difficult to enforce and original EU proposals were too complex to be enforceable
The introduction of measures, which stop the practice of stripping the headline and leadline of nets and dumping of used netting at sea	Reduce the dumping of nets at sea	Difficult to enforce and potentially could have the opposite effect
The spatial management of effort by gear sector, separating towed and static fishing gears	A proven method of reducing the amount of gear conflict and net loss	Probably difficult to administer and enforce in offshore areas and international waters.
Closed areas to protect ecologically sensitive habitats, such as hydrothermal vents, deepwater corals or other characteristic habitats eg seamounts	Reduce the amount of lost gear and protect sensitive habitats	Difficult to monitor and enforce if areas are too small but VMS will allow monitoring of bigger areas. Widespread objection from other sectors of the industry

3 The policy framework

This section goes beyond what is reported in the DEEPNET report. It identifies the international and European policies that are relevant to the issues and recommendations raised in the DEEPNET report, exploring measures that could be taken and on what basis. Relevant time lines and policy or political processes are also identified.

3.1 The EU Common Fisheries Policy

European fisheries management policy is – to a large extent – an area of exclusive competence of the EU, meaning that management decisions are taken at the EU level unless explicitly delegated otherwise. The Common Fisheries Policy (CFP) provides the framework for European and national fisheries management activities.

Measures may be taken under the CFP that apply to activities practiced on the territory of Member States or in EU waters or by EU fishing vessels or nationals of Member States. EU management measures such as those recommended in DEEPNET (eg net soak times) may therefore be applied to EU vessels in international waters.

Furthermore, there is a clear commitment in the CFP framework Regulation (2371/2002, Article 2) to the protection of the marine environment and to the application of an ecosystem approach. Application of the precautionary approach is laid down in the objectives, together with sustainable exploitation, minimising the impacts of fishing on the marine ecosystem, and a progressive implementation of an ecosystem-based approach to management. This provides a legal basis for measures intended to reduce negative impacts of fishing on the environment, overall as well as within recovery and management plans. Under specified circumstances the Commission and Member States may also take six and three-month emergency measures, respectively.

3.1.1 General technical measures

Council Regulation 850/98 is the main Regulation setting out technical measures for EU fisheries. These include minimum mesh sizes, minimum landing sizes, regulations for the use of nets and selectivity devices. Restrictions may be gear or species specific. As noted in section 2.2.2, technical regulations for gillnets are largely restricted to mesh size limits (the ban on large drift nets being a notable exception), and there is a case for harmonise these.

There are no restrictions within this Regulation, or otherwise, on the length of gear, soak times or gear materials for the deepwater net fisheries. Regulation 850/98 would be a suitable, although not the only, Regulation through which to set such controls.

Technical measures are sometimes included in other Regulations. The annual TAC Regulation is important in this respect as it increasingly contains technical measures in its annexes. Some are introduced on a temporary basis while some are renewed year on year subject to review. It can be quicker to adopt technical measures through the annual TAC Regulation than through developing stand alone proposals and Regulations, which may require amendments to the technical Regulation.

3.1.2 *Cetacean Regulation*

Regulation 812/2004 lays down a number of requirements designed to reduce the bycatch of cetaceans in key European fisheries. Some of the requirements have implications for the deepwater net fisheries. This includes the requirement for Member States to deploy observers on board bottom-set gillnet and entangling net vessels in several areas, and most notably for this fishery ICES Area VIa and VIIb from 1 January 2005 (west and northwest Ireland). Vessels with these gears in ICES areas VIIh and VIIj (southwest Ireland and southwest England) are also required to fit acoustic deterrent devices ('pingers') to their nets. The Commission is due to present an assessment and review of the Regulation by 1 June 2007.

3.1.3 *Deepwater effort management and TAC Regulation*

Regulation 2347/2002 establishes access requirements and reporting conditions for deepwater fisheries and stocks. These requirements apply to vessels targeting a broader range of species than those covered by the deepwater TAC Regulation (see below). Requirements include:

- Member States issue Fishing Permits for vessels catching more than 10 tonnes of deepwater species;
- Member States cap effort at the aggregated power and volume of deepwater vessels for any one of the years 1998, 1999, 2000;
- vessels using fixed nets record in the EU logbook, the mesh size, average length and height of nets, fishing depth, as well as soak time;
- vessels landing quantities of deepwater species in excess of 100kg, do so only into designated ports; and
- Member States to submit Sampling Plans covering the deployment of scientific observers on licensed vessels and sampling at ports

The Commission is required to report on the deep-water species management scheme before 30 June 2005. On the basis of this report, the Commission is required to propose to the Council any necessary amendments to this scheme.

Regulation 2270/2004 fixes TACs for certain deepsea fish stocks for 2005 and 2006 for EU fishing vessels fishing. It applies to deepsea stocks inhabiting deep waters beyond the main fishing grounds of continental shelves, including those reported on by DEEPNET. Species covered include deepsea sharks, black scabbardfish, alfonsinos, tusk, roundnose grenadier, orange roughy, blue ling, forkbeards and Red seabream. As noted in sections 2.2.1 and 2.2.7, TACs for deepsea sharks are not specified at the species level, but rather cover eleven different species³.

The Regulation is not limited purely to TACs but includes protection areas for orange roughy, demonstrating that its scope is broader than catch limits alone, in the same manner as the annual TAC. Member States are further required to ensure fishing

³ 'deep sea shark' TACs apply to: Portuguese dogfish (*Centroscymnus coelolepis*), Leafscale gulper shark (*Centrophorus squamosus*), Birdbeak dogfish (*Deania calceus*), Kitefin shark (*Dalatias licha*), Greater lanternshark (*Etmopterus princeps*), Velvet belly (*Etmopterus spinax*), Black dogfish (*Centroscyllium fabricii*), Gulper shark (*Centrophorus granulosus*), Blackmouth dogfish (*Galeus melastomus*), Mouse catshark (*Galeus murinus*), Iceland catshark (*Apristurus spp.*).

effort in 2005 (in kilowatt days) does not exceed 90 per cent of that in 2003. As the Regulation only applies to 2005 and 2006, it will be reviewed before the end of 2006 and so likely be agreed in December 2006.

3.1.4 Shark finning Regulation

The removal of fins on board, the keeping of removed fins on board, and the transshipping or landing of shark fins removed from the fish body by EU vessels is essentially prohibited by Regulation 1185/2003. It applies to all Community vessels, whether in EU or other national or international waters, and all other vessels in waters under the jurisdiction of EU Member States. While there is presumption against finning, vessels that can demonstrate a capacity to use all parts of sharks and justify the need for separate processing on board are eligible for a special fishing permit that allows finning.

While the sharks in the deepwater net fishery are not targeted for their fins, and hence do not require a permit, the Regulation may present an opportunity for the Commission to investigate the deepwater shark, and so raise the public and political profile of the fishery. The Commission is due to report on the shark finning Regulation, including any 'international developments in this field', by 1 January 2006.

3.1.5 Gear marking Regulation

In April 2005 the European Commission adopted a Regulation (Commission Regulation 356/2005) requiring passive gear (longlines, entangling nets, trammel nets and drifting gillnets) to be marked with the vessel registration numbers. The Regulation will come into force in October 2005 and the Commission hopes that similar measures will be applied in international waters through Regional Fisheries Organisations such as NEAFC (see section 3.4.5).

The requirements should improve the enforcement of technical regulations such as mesh size, hook numbers and effort limitations. It should also discourage the dumping of gear.

The marking requirements are limited to identifying the vessel to which it belongs. Soak times, setting dates or mesh sizes are not included, all of which would improve further the monitoring of these fisheries. The requirements apply both to gear that is actively fishing as well as gear being carried on board vessels.

An unfortunate implication of the marking requirements applying to gear being carried on board vessels is that it may create an incentive for skippers to dump back at sea any abandoned gear that they may themselves retrieve in the course of fishing, rather than returning it to port for disposal.

3.2 EU Environmental legislation – the habitats Directive

The EU habitats Directive (92/43/EEC) requires Member States to designate Special Areas of Conservation (SACs) to protect some of the most threatened habitats and species across Europe, and to restore and maintain them at a 'favourable conservation status'. The listed habitats include reefs, which are identified in the DEEPNET report as being damaged by the deepwater net fishery (section 2.2.8). While there is some ambiguity about who should lead on the protection of habitats in offshore waters of

the EU (see Owen 2004), there is a requirement on Member States to protect habitats in their 'territory'. Measures may also be taken at the EU level under the CFP, to support delivery of the habitats Directive. An example includes the cetacean Regulation and a bottom trawling ban in the area known as the 'Darwin Mounds', an area 180 kilometres north west of Scotland that holds some of the best examples of deep-water coral.

3.3 Future EU developments

3.3.1 Ghost fishing measures

The Commission Communication on Promoting more Environmentally-friendly Fishing Methods (COM(2004)438), tabled in June 2004, identifies the need to address ghost fishing as part of the drive to tackle unwanted catches more broadly. It was noted that there is a need to take measures to identify ghost fishing gear, encourage the reporting of lost gear and to recover it from the seabed. To this end, the Commission committed itself to developing a set of pilot projects in 2004 covering a wide range of species, fisheries and areas within the Community, in cooperation with Member States, the fishing industry and NGOs. The June 2004 Council welcomed the Communication and invited the Commission 'to develop a pilot project to address the problem of ghost fishing in Community waters which will include a retrieval system to remove lost gears, gear adjustments that lessen the impact of lost gears and methods to reduce the losses of gears'.

Under the 2005 EC-Norway agreement the Head of Community Delegation informed the Norwegian Delegation that the Community intends to develop gear retrieval schemes in Community waters. Ireland and the UK are due to conduct retrieval surveys in the area. The Irish Survey will cover Rockall bank while the UK survey will cover Porcupine Bank and some of the smaller banks to the West of Hebrides (Hareide pers. com).

The Commission has also commissioned a six month study report into the issue of ghost fishing in European waters. It is due to report by July 2005 and is expected to include recommendations on management and research actions as well as an evaluation of the feasibility of gear retrieval programmes.

3.3.2 Communication on the management of fishing capacity and licences

The Fisheries and Maritime Affairs Commissioner, Dr Jo Borg, noted in a written response to a European Parliament question, that the Communication on the management of fishing capacity and licences would be a potential avenue through which to develop long term management measures in the deepwater net fishery (Borg, 2005). The Commission is currently developing this Communication, which will reportedly consider parameters that could be used to limit the capacity of vessels using passive gears, where tonnage and power may not be sufficiently indicative of fishing effort. Such long-term measures may take the form of net per vessel or maximum soak time limits, and be combined with an obligation to mark each net with the identity of the owner and the time of deployment. The document is not to be in the form of a proposal but rather a Communication developed for the purpose of initiating debate. It is expected before the end of 2005.

3.3.3 *Discarding action plan*

In November 2002 the European Commission adopted an Action Plan to tackle discarding (COM(2002)656). The plan presents a number of possibilities for reducing discarding in the future, together with a three-year timetable for implementation.

As a Commission Action Plan, it contains no firm commitments to new EU measures; it does, however, list a number of areas where modifications to the CFP might be sought, eg by revising technical measures, as well as other initiatives that can be taken forward by the Commission itself, including studies.

The Action Plan proposes the following technical measures to improve selectivity and minimise catches of unwanted species and undersized fish:

- the structure of nets - a range of selectivity measures is foreseen which, in many cases, will build on existing technical measures. The Commission also proposes more research into gear selectivity, as well as consultation with the industry, scientists and national authorities;
- minimum landing sizes - minimum landing sizes will be reviewed, and to avoid catches and discards of undersized fish, will be considered together with gear changes to increase selectivity in order to ensure consistency;
- catch composition rules - the rules on catch composition, which currently lead to compulsory discarding, will be reviewed in relation to defined mesh sizes; and
- closed areas and real-time closures - the Commission will consider extending existing closed areas as well as establishing new ones.

A Commission working paper on discarding is reportedly under production and is due at the end of 2005 or early 2006. While it is too early to foresee the content and form this will take, it may present an opportunity to address the high discard rates in the deepwater net fisheries.

3.4 International level

3.4.1 *MARPOL and its national transposing regulations*

The International Maritime Organisation (IMO) Convention for the Prevention of the Pollution from Ships (commonly referred to as MARPOL 73/78) specifically prohibits the abandonment/dumping of fishing gear (Annex V, Regulation 3). The accidental loss of fishing gear is however recognised under Annex V, Regulation 6., All ships of 400 gross tonnage and above, or certified to carry 15 persons or more, must provide a Garbage Record Book to record all disposal and incineration operations (Annex V, Regulation 9). The date, time, position of the ship, description of the garbage and the estimated amount incinerated or discharged must be logged and signed. The books must be kept for a period of two years after the date of last entry.

MARPOL applies to all ships in national and international waters, which are entitled to fly the flag of a party or operate under the authority of a party, except warships or other state-owned ships operated by a state and used only on governmental non-commercial service (Article 3 (1) and (3)).

Any violation of MARPOL within the national waters of any party to the Convention is punishable either under the law of that party or under the law of the flag state. The party can either (a) cause proceedings to be taken in accordance within its law or (b) inform the flag state of the violation (Article 4 (2)). In the latter case, the flag state is obliged to promptly inform the party on the action taken (Article 4 (3)). Proceedings of violations, which occur in international waters, are to be taken in accordance to the law of the flag state, which also establishes sanctions (Article 4 (1)).

With regards to the detection of violations and the enforcement of the Convention the parties are obliged to co-operate using all appropriate measures of detection and environmental monitoring as well as adequate procedures for reporting and accumulation of evidence (Article 6 (1)).

Although the Community is not a party, all 25 EU Member States have ratified MARPOL. It has further been transposed to some extent into the national law of the EU countries in which the deepwater netting vessels are flagged (ie UK, Germany and France) as well as Ireland in whose waters the fishery is partly prosecuted⁴. Panama has also ratified MARPOL although the extent to which it has been transposed into national law and implemented these provisions also requires further investigation⁵.

3.4.2 UN Fish Stocks Agreement

Several of the fish stocks taken in the deep water net fishery straddle international and Community waters. In this respect, the United Nations Agreement on the conservation and management of straddling fish stocks and highly migratory fish stocks is relevant. Its aim is to ensure the conservation and sustainable use of straddling and highly migratory fish stocks, by elaborating certain provisions of the 1982 UN Convention on the Law of the Sea.

The Agreement entered into force at the end of 2001 and the EC and Member States ratified the Agreement in December 2003. Among other things, the Agreement requires the application of the precautionary approach, the protection of marine biodiversity, and measures to be taken to prevent or eliminate overfishing and excess fishing capacity and to keep levels of fishing effort within the limits of fisheries resources.

3.4.3 International and EU Shark Plan of Action

The voluntary international plans of action (IPOAs) stem from the Food and Agriculture Organisation (FAO) Code of Conduct for Responsible Fisheries. The Code sets out principles and international standards of behaviour for responsible

⁴ In the **UK** MARPOL 73/78 and Annex V is transposed through the 1995 Merchant Shipping Act and the Merchant Shipping (Prevention of Pollution by Garbage) Regulation, which entered into force on 1 July 1998. In **Germany** MARPOL 73/78 and Annex V have been transposed by the Gesetz zu dem internationalen Uebereinkommen von 1973 zur Verhuetung von Meeresverschmutzung durch Schiffe und zu dem Protokoll von 1978 zu diesem Gesetz (MARPOL Gesetz). **France** has integrated MARPOL 73/78 into their Environmental Code (Articles L.128-10 to L.128-31). In **Ireland** the Sea Pollution Act, 1991 was enacted to give effect to MARPOL 73/78 and also applies to garbage (Annex V). The disposal of garbage is also covered by the Sea Pollution (Prevention of Pollution by Garbage From Ships) (Amendment) Regulations, 1997.

⁵ **Panama** has 'approved' the MARPOL 73/78 Convention with Ley 17 de 1975 (UNEP, 1999), although it is not clear whether it has since transposed Annex V, which covers gear dumping.

practices to ensure the effective conservation, management and development of living aquatic resources, the ecosystem and biodiversity.

In 1999, in response to concern about the global state of shark stocks, the Committee on Fisheries (COFI) of the FAO adopted a voluntary International Plan of Action for the Conservation and Management of Sharks (IPOA-Sharks). IPOA-Sharks applies to FAO member countries that contribute to the fishing mortality of sharks, rays, skates and chimaeras, which are caught either as target or non-target species. It applies to States in the waters in which sharks are caught and those whose vessels catch sharks on the high seas. The overall aim is to develop management and conservation strategies to keep total fishing mortality for each stock within sustainable levels by applying a precautionary approach. States should adopt national shark plans of action by 2001. In addition, states should regularly assess the status of shark stocks subject to fishing in order to determine whether a new shark plan is needed. Implementation of shark plans should be reviewed at least every four years to identify cost-effective strategies for improving their effectiveness.

The EC has signed up to the IPOA-Sharks on behalf of Member States but has not developed a shark plan of action. Member States were consulted on a draft Plan in 2000 and circulated a preliminary draft to COFI in 2001 that was largely a review of shark fishery knowledge. This plan failed to meet most of the requirements of IPOA-Sharks and has since been withdrawn, meaning a formal plan remains to be conceived (Fowler *et al*, 2004). The overexploitation and absence of regulation highlighted in the deepwater shark fishery, together with the lack of strategic framework within which to address them, highlights both the absence and need for the EU to develop and implement a shark plan of action.

3.4.4 International and EU IUU Plan of Action

Many of the practices reported in the DEEPNET report can be classified as illegal, unreported or unregulated (IUU) fishing. Because of the threat IUU fishing poses to effective conservation and management of many fish stocks, the FAO Committee on Fisheries (COFI) adopted the IPOA-IUU in March 2001.

Under the plan, States are to develop and implement, as soon as possible but not later than 2004, national plans of action to further achieve the objectives of the IPOA. National plans should also include, as appropriate, actions to implement initiatives adopted by relevant regional fisheries management organizations to prevent, deter and eliminate IUU fishing. IPOA-IUU includes measures relating to flag States, coastal States and port States. It also encourages the use of internationally agreed market-related measures, research and regional fisheries management organizations.

The EU has signed up to the IPOA-IUU. A EU Action Plan (COM (2002)180), forwarded as part of the 2002 Common Fisheries Policy reforms, sets out the necessary measures for the EU to comply with the IPOA-IUU. It identifies 15 new measures or initiatives to be undertaken by the Community itself, or to be pursued through regional fisheries organizations and/or international organizations. These include the identification and monitoring of IUU vessels, the promotion of uniform action plans to curb illegal fishing, the development of framework plans for control and inspection within each regional fisheries organisation and the alerting of fishing

industry, consumers and the public in general to the need to control IUU fishing. These are further detailed in the Annex. Timeframes for delivery are not specified.

3.4.5 NEAFC

The North East Atlantic Fisheries Commission (NEAFC) is a Regional Fisheries Organisation (RFO) that recommends fisheries management measures for the international waters of the north east Atlantic ie beyond areas under national fisheries jurisdiction of Contracting Parties. NEAFC Recommendations should then be transposed into Contracting Parties domestic law. Contracting Parties include the EC, Denmark (in respect of the Faroe Islands and Greenland), Iceland, Norway and the Russian Federation. ICES provide NEAFC with scientific advice.

In its 23rd annual meeting in November 2004, NEAFC made a number of recommendations in relation to the conservation and management of deepsea species in the NEAFC regulatory area:

- each Contracting Party undertakes to limit the effort for 2005 put into the directed fishing for deep-sea species as set out in Annex 1B of the Scheme in the NEAFC Regulatory Area;
- the effort shall not exceed 70 per cent of the highest level put into deep-sea fishing in previous years for the relevant species; and
- the effort should be calculated as aggregate power, aggregate tonnage, fishing days at sea or number of vessels, which participated.

3.4.6 International fora

The vulnerability of deepsea fisheries is widely recognized and is attracting increasing attention through various international fora.

UN General Assembly⁶

In November 2004, the UN General Assembly adopted in its Oceans Resolution⁷, a call upon States and international organisations to urgently take action to address, in accordance with international law, destructive practices that have adverse impacts on marine biodiversity and ecosystems, including seamounts, hydrothermal vents and cold-water corals. It also created an Open-ended Informal Working Group to study issues related to the conservation and sustainable use of marine biological diversity beyond areas of national jurisdiction⁸.

In its Sustainable Fisheries resolution⁹, the General Assembly called upon States to take action urgently, and consider the interim prohibition of destructive fishing

⁶ This section draws on IUCN (2005) *Constraints to the Sustainability of Deep Sea Fisheries beyond National Jurisdiction* <http://www.iucn.org/themes/marine/Word/IUCN-BriefingPaper-DeepSeaFisheries.doc>.

⁷ UN General Assembly Resolution on Oceans and the Law of the Sea, 10 November 2004, A/59/L.22, Resolution 59/24, at http://www.un.org/Depts/los/general_assembly/general_assembly_resolutions.htm ('Oceans Resolution'), Paragraph 70.

⁸ Oceans Resolution, paragraphs 73-76.

⁹ UN General Assembly Resolution on Sustainable Fisheries, 10 November 2004, A/59/L.23, Resolution 59/25, at http://www.un.org/Depts/los/general_assembly/general_assembly_resolutions.htm, ('Sustainable Fisheries Resolution'), paragraph 66.

practices on a case-by-case basis until appropriate conservation and management measures have been adopted.

Other fora include the following:

- **FAO Committee for Fisheries (COFI) 26th Session, March 2005** - discussed deepsea fisheries¹⁰. COFI called on FAO to undertake specific activities related to deep-sea fisheries, including the following:
 - collection and collation of information concerning past and present deepwater fishing activities;
 - undertaking an inventory of deepwater stocks and an assessment of the effects of fishing on deepwater fish populations and their ecosystems;
 - convening technical meetings to develop a code of practice/technical guidelines; and
 - reviewing the legal framework needed to support governance of deepwater fisheries.
- **High Seas Task Force**¹¹ - the Task Force consists of a group of fisheries ministers and international NGOs working together to develop an action plan designed to combat illegal, unregulated and unreported fishing on the high seas. It was launched at DEEP SEA 2003 and is housed at the OECD;
- **DEEP SEA 2003 Conference**, December 2003¹² - addressed the themes of: (1) Environment, ecosystem biology, habitat and oceanography; (2) Population biology and resource assessment; (3) Harvesting and conservation strategies for resource management; (4) Technology Requirements; (5) Monitoring, compliance and control; (6) Existing policies and instruments; and (7) Governance and management. It also identified and documented the needs for future action;
- **Deepsea conservation coalition**¹³ - non-governmental organisations working together, calling on the United Nations General Assembly to secure a moratorium on high seas bottom trawling and protect deep seas ecosystems;
- **OECD Workshop on Illegal, Unreported and Unregulated (IUU) Fishing Activities**, April 2004¹⁴ - aimed at addressing IUU fisheries activities from a multi-disciplinary approach thus bringing to fore a broader range of possible actions.

4 Conclusions and future options

The DEEPNET report illustrates that there are a number of areas in which the deep water fishery demands specific management interventions, going beyond a short term emergency measure. In considering options to support longer-term management, it is perhaps helpful to consider the following categories of action:

¹⁰ <ftp://ftp.fao.org/docrep/fao/meeting/009/j3862e.pdf>

¹¹ <http://www.high-seas.org/>

¹² Held in Queenstown, New Zealand. Organized by the Ministry of Fisheries, New Zealand and the Department of Agriculture, Fisheries and Forestry of Australia, with the technical cooperation of the FAO <http://www.fish.govt.nz/current/deepsea/>

¹³ <http://www.savethehighseas.org/index.cfm>

¹⁴ http://www.oecd.org/document/5/0,2340,en_2649_33901_21007109_1_1_1_1.00.html

- Efforts to secure greater compliance with existing EU CFP and environmental legislation – this can include better monitoring and enforcement of existing rules, information and awareness raising, and adjusting other incentives – financial or otherwise – so that compliance of existing rules is promoted rather than undermined by these;
- Introducing new legal requirements under the EU CFP or environmental policy, including measures to implement both ‘hard’ and ‘soft’ international commitments outlined above, as well as options being explored within other international fora, and those set out in the various strategies and plans that the Commission has or is developing. In most of the cases, new measures can be based on CFP Regulation (2371/2002). This Regulation provides a legal basis for technical measures, close areas, and management and recovery plans. Furthermore, many of the recommendations could be integrated into the annual TAC Regulation that is agreed each December.
- Supporting voluntary management within the fishery – encouraging industry to apply more rigorous but voluntary standards, either on their own or by working in partnership with others. Partnerships can bring fishing operators or interests together with NGOs, government, agencies, processors and/or retailers.

There is an important opportunity to make progress across these areas, rather than focusing on just one of them. The use of financial instruments could in particular be explored as a means of encouraging compliance and the voluntary adoption of management measures, at the same time as new legal measures are developed.

A summary of the main management options corresponding to the DEEPNET recommendations is provided in Table 2. The coming months and years should present a number of specific opportunities for taking forward the DEEPNET recommendations and related management options; Table 3 lists some of these.

Table 2 DEEPNET recommendations and relevant policies and processes

DEEPNET Recommendation	Relevant Policy or Process
Technical measures: <ul style="list-style-type: none"> • Net or fleet length restrictions • Gear labelling • Prohibition on leaving gear at sea whilst landing • Mesh sizes harmonisation • Soak time limits • Restrictions on the length of gear deployed 	Opportunities include: <ul style="list-style-type: none"> • Technical Regulation • Annual TAC Regulation • EU gear marking Regulation • Voluntary measures relating to the above
Gear marking at either end	Basic requirements already in place for EU vessels from October 2005: <ul style="list-style-type: none"> • EU gear marking Regulation
Stop sheet net dumping at sea	Requires in particular effective EU/Member State implementation and enforcement of:

DEEPNET Recommendation	Relevant Policy or Process
	<ul style="list-style-type: none"> • MARPOL and national transposing regulations
The spatial management of effort by gear sector, separating towed and static fishing gears	<p>Opportunities include:</p> <ul style="list-style-type: none"> • Technical Regulation • Annual TAC Regulation • Deepsea effort Regulation
Closed areas to protect ecologically sensitive habitats, such as hydrothermal vents, deepwater corals or other characteristic habitats eg seamounts	<p>Opportunities include:</p> <ul style="list-style-type: none"> • Technical Regulation • Annual TAC Regulation • Deepsea TAC Regulation • Voluntary agreements
Observer programme	<p>Current requirements need implementing and building upon, including:</p> <ul style="list-style-type: none"> • Deep-sea effort Regulation • Cetacean Regulation • Voluntary measures
Restrictive licensing	<p>Existing requirements need implementing and building upon:</p> <ul style="list-style-type: none"> • Deep-sea effort Regulation
Effort limitation	<p>Existing requirements need implementing and building upon:</p> <ul style="list-style-type: none"> • Deepsea effort Regulation • Voluntary commitments
Lost gear retrieval surveys and mitigation measures	<p>Commitments are made under:</p> <ul style="list-style-type: none"> • 2005 EC-Norway agreement • UK and Ireland surveys planned • Commission Communication on Promoting more Environmentally-friendly Fishing Methods
Confirmation of mesh sizes in the shark fishery	<p>Enforcement of:</p> <ul style="list-style-type: none"> • Technical Regulation
Development of long term management plan.	<p>Development of plan under:</p> <ul style="list-style-type: none"> • The basic CFP Regulation, supported by funding or • Voluntary development of plan

Table 3 Selected opportunities to strengthen deepwater fishery management

Month/year	Lead actor(s)	Opportunity
June 2005	Commission	report on deep-water species management
July 2005	Commission	ghost fishing report to be completed
October 2005	Member States	EU gear marking requirements enter into force
December 2005	Council	annual TAC Regulation to be agreed
2005	Commission/Member States (UK & Ireland)	launch of ghost fishing related pilot projects
2005	Commission	Communication on the management of fishing capacity and licences
January 2006	Commission	report on the shark finning Regulation, including any 'international developments in this field'
End 2005/early 2006	Commission	expected working paper on discarding
December 2006	Commission/Council	new deepwater species TAC Regulation expected
June 2007	Commission	assessment and review of cetacean Regulation

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Annex: Community Action Plan to eradicate IUU

The Community action plan identifies 15 new measures or initiatives to be undertaken by the Community itself, or to be pursued through regional fisheries organisations and/or international organisations in order to implement the IPOA-IUU. The following key actions are promised, although without specifying a timeframe for delivery:

At Community level

- Controlling nationals – ensuring Member States take control over their nationals, discouraging them from flagging vessels under the jurisdiction of a state that is failing to meet its flag State responsibilities, and from committing infringements;
- Trade measures to implement international rules - adopting rules banning the trade in fishery products taken in breach of international fisheries agreements, and making business in IUU derived products illegal;
- Information and awareness raising – the public, consumers and the industry are to be alerted to the issue of IUU fishing and the EU action plan, based on a combination of printed, audiovisual and electronic media exercises;

Within regional fisheries organisations (RFOs)

- RFO plans for control and inspection – Initiate conservation and management measures to limit unregulated fishing, with priority to be placed on areas where Community rules are stricter;
- Regulation fishing activities – work towards establishing objective and transparent criteria for identifying IUU fishing activities, while supporting action of RFOs to invite flag States to take action against IUU fishing, and to exchange information on IUU vessels;
- Identifying and monitoring IUU vessels – call upon RFOs to adopt action plans, with a priority to be given for high value fish;
- Identifying and quantifying IUU catches – encourage RFOs to develop data collection procedures, covering quantities taken illegally and identifying the origin of these catches;
- Certification and documentation – encourage the reform of certification/documentation schemes and the preparation of a prototype document for discussion in the FAO;

At the international level

- Improved information – transmitting information on the Community fleet to the FAO;
- Strengthening international cooperation – participation in the network of monitoring agencies proposed by Chile and the USA;
- Defining ‘substantial link’ – a Community initiative will aim to convene an international conference to negotiate an international agreement to determine

the existence of a substantial link between a flag State and a vessel flying that flag;

- Defining port State rights and responsibilities – to convene an international conference to negotiate an agreement defining the rights and responsibilities of port States concerning access by fishing vessels to port facilities; and

In partnership with developing countries

- Assistance to control unlawful fishing – technical and financial assistance for monitoring, control and surveillance activities, to be put in place in partnership with developing countries.