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Marine Protected Areas and Fisheries

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Marine Protected Areas and Fisheries

Proceedings of the International Expert Workshop held at the International Academy for Nature Conservation, Isle of Vilm, Germany 28 June – 2 July, 2004

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WELCOME TO THE WORKSHOP

HENNING VON NORDHEIM welcomed participants to the Island of Vilm and thanked them for their interest in taking part in the workshop. The workshop was made possible through the support of the German Federal Ministry for the Environment and has been organised by the Federal Agency for Nature Conservation (BfN). The attendance of people from 10 countries and from a range of types of organisations (governmental, non-governmental and private practice) was welcomed as it brought a good range of expertise to the meeting.

The idea for the workshop developed from a growing need to address the question of fisheries management in Marine Protected Area at international, European and national levels. This includes considerable interest in the subject in Germany which has recently proposed 10 offshore sites for the *Natura 2000* network, and therefore a desire to hear how other countries in Europe are tackling this issue or planning to do so in the future.

At the end of the workshop it is hoped to provide some pointers on options and the next steps for the management of harmful fishing practices in *Natura 2000* sites.

THOMAS BORCHERS welcomed the participants on behalf of the German Federal Ministry for the Environment, Nature Conservation & Nuclear Safety. (BMU) and thanked the BfN for organising the meeting.

The protection of marine biodiversity is an important issue and the workshop will have a valuable role in contributing to the debate on how this might be achieved in the coming decades, particularly in relation to Marine Protected Areas and fisheries.

The need for Marine Protected Areas (MPAs), including "No-Take Zones" (NTZs) has been recognised in many fora including the Convention on Biological Diversity, the IUCN Durban conference, OSPAR and HELCOM. All these bodies have been working on MPAs for many years but, in Europe, the major impetus for action has come through the requirements of the EU Habitats & Species Directive, and the EU Birds Directive which include the establishment of a network of protected areas (including marine areas) to form the *Natura 2000* network.

There are a variety of activities which are having an impact on marine ecosystems, and, while fishing is not the only one, it is considered by many to be the main activity which needs to be tackled.

For the ten offshore marine areas recently been identified by Germany as *Natura 2000* sites the next step is to consider the management needs of such areas, including fisheries. Dialogue and the exchange of information between all stakeholders is an essential part of this process and the workshop is the first opportunity to do so.

1 INTRODUCTION AND OVERVIEW OF THE NATIONAL AND INTERNATIONAL BACKGROUND

Jürgen Ritterhoff, Federal Agency for Nature Conservation (BfN), Insel Vilm, Germany.

At a global level only a small area (some 0.5%) of the oceans fall within MPAs. The World Summit on Sustainable Development (WSSD) has set a target for the establishment of networks of MPAs by 2012, including time/area closures. In spring 2004, Parties to the Convention on Biological Diversity (CBD) restated the commitment and reiterated the fact the MPAs have been proven to protect biodiversity as well as making a contribution to sustainable use and managing conflict.

At a regional level the 5th North Sea Conference set a target for the designation of a network of MPAs by 2010 and reiterated the commitment made at the 1997 Intermediate Ministerial Meeting on the North Sea (IMM) to carry out research on the potential and role of undisturbed areas. The joint OSPAR/HELCOM meeting in Bremen also committed to the establishment of "a network of well managed MPAs" and a programme to achieve this by 2010. For Member States of the EU, *Natura 2000* sites will undoubtedly contribute towards reaching these targets.

Within Germany, the amendment to the German Federal Nature Conservation Act (Bundesnaturschutzgesetz) in April 2002 created the statutory basis for implementing *Natura 2000* in the marine areas of the EEZ. The German Federal Environment Ministry (BMU) and the German Federal Agency for Nature Conservation (BfN) are now responsible for site selection and designation in these areas.

In Spring 2004, the German Advisory Council on the Environment (SRU) published a special report on Marine Environmental Protection in North and Baltic Seas. In § 26 the following statement was made:
"To ensure region-specific protection of particularly valuable and/or sensitive habitats and species, the German Advisory Council on the Environment recommends that the German Government implement as soon as possible the integrated protected area network aimed for under the Habitats directive and the Birds directive and also under the HELCOM System of coastal and marine Baltic Sea Protection Areas (BSPA) and the OSPAR Marine Protected Area Programme."

The term "marine protected area," or MPA, has a different meaning to different people, covering a wide spectrum of possibilities from "no-take areas" to "multiple use" areas.

The most generally accepted definition of a marine protected area is that originally developed in 1987 at the Fourth World Wilderness Congress in Denver, Colorado,

and subsequently adopted by the World Conservation Union (IUCN) in 1988 at its 17th General Assembly (IUCN 1988; Kelleher and Kenchington 1992). According to this definition, a marine protected area is:

Any area of intertidal or subtidal terrain, together with its overlying water and associated flora, fauna, historical and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment.

This broad definition implies that a wide variety of protected area types are considered MPAs. Such areas have been described as marine reserves, preserves, parks, sanctuaries, refuges, wilderness areas, protected areas and many other titles, and are equally varied in purpose. However, regardless of varieties in name, size, design, purpose or other elements, all MPAs have in common the setting aside of a marine area from otherwise unrestricted human activities.

For the purposes of the workshop the discussions should focus on areas set aside for the protection of marine biodiversity i.e. not areas where access is restricted for reasons other than conservation (such as security zones, sewage discharge areas, and pipeline and cable corridors), or unprotected areas that are logistically inaccessible due to weather, sea state, etc.

Fishing is one of the most significant ecological impacts on the marine environment. This view is recognised at international level, through OSPAR QSR and ICES.

There are a number of human activities in the marine area which have an impact on marine ecosystems. One of the most significant is considered to be fishing as stated by OSPAR, ICES, & HELCOM amongst others

(OSPAR QSR 2000, Fourth Periodic Assessment Report, HELCOM 2002; German Advisory Council on the Environment, 2004 Special Report on Marine Environment Protection in the North and Baltic Sea; ICES 2003, Environmental Status of the European Seas, Bremen).

The main impacts from fisheries are:

- removal of target species,
- mortality of non target species (fishes, invertebrates, birds and mammals) high discard (e.g. cod and haddock fisheries up to 50 % in numbers)
- discarding of fishery waste
- physical disturbance of the sea bed
- removal of food for predators
- shifts in community structure (benthic invertebrates, birds)
- shifts in the energy flow in the ecosystem

Against this background and because MPAs are considered to be an effective tool in the conservation and sustainable use of marine biodiversity and resources it seems

necessary to reach a common approach to both, preserving biodiversity as well as forming a component in a concept for sustainable fisheries. The open question is how to realise a possible win-win situation of more fish, better economics and less damage to the environment.

To reach this goal within the adopted timeframe for successful implementation of the EU *Natura 2000* network, close cooperation and better communication and exchange of experience between managers, scientists, stakeholders and political advisers of the countries of EU Member States and on a national level is necessary.

Given this background, the aims of the workshop are to seek possible "win-win" situation for biodiversity conservation and fisheries. To get a common understanding of this, three elements will be considered:

- the legal background of managing MPAs in relation to fisheries (who is competent for which concerns in the respective sea areas)

- what is needed (e.g. what kind of data, improvement of fishing practices) to bring harmful fishing activities in line with the objectives of MPAs (e.g. marine Natura 2000 sites) and
- how to organise such a process.

Existing experiences of EU member states with emphasis on the Exclusive Economic Zone/200 nautical mile zone will also be evaluated and discussed using case-studies presented to the meeting.

The overall aim of the workshop is the enhancement of the communication and exchange of information and views of the experts involved in fisheries and Marine Protected Areas. Furthermore, the workshop is a further step to support the implementation of the ecosystem approach to the management of human activities and to further develop an effective integrated management approach for MPAs.

2 THE ROLE OF MARINE PROTECTED AREAS IN FISHERIES AND THE CONSERVATION OF BIODIVERSITY

2.1 The role of Marine Protected Areas in the protection of biodiversity in the North-East Atlantic

Charlotte Johnston, Marine Strategy and Sites Co-ordinator, Joint Nature Conservation Committee, UK.

What is a Marine Protected Area?
The most commonly used definition of a Marine Protected Area (MPA) is that used by the IUCN.

"an area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means" (IUCN 1994)

There are three main types of MPAs in the North East Atlantic specifically for conservation of marine biological diversity:

- OSPAR MPAs
- *Natura 2000* (SACs and SPAs under the Habitats and Birds Directives)
- National level MPAs eg Marine Nature Reserve

OSPAR MPAs
Bremen Ministerial commitment made at the 1st Joint Ministerial Meeting of the Oslo-Paris- and the Helsinki-Commission was 'to establish the OSPAR Network of Marine Protected Areas and to ensure that by 2010 it is an ecologically coherent network of well-managed marine protected areas which will:

- protect, conserve and restore species, habitats and ecological processes which have been adversely affected by human activities;
- prevent degradation of, and damage to, species, habitats and ecological processes, following the precautionary principle;
- protect and conserve areas that best represent the range of species, habitats and ecological processes in the maritime area.

These MPAs are to be established throughout the NE Atlantic Maritime Area (including High Seas) based on criteria for site selection agreed by OSPAR Ministers, and using management guidance which has been prepared by the Biodiversity Committee of OSPAR. Legal or other mechanisms for protection and management of sites are to be determined by the individual Contracting Parties. The first set of MPAs (by 2005) is likely to consist of *Natura 2000* sites and the remaining MPAs to complete the network are to be established by 2010.

Management of OSPAR MPAs

The management measures which might be introduced in OSPAR MPAs will depend on the different competences which apply to the area. For example, OSPAR has no competence for management of fisheries or shipping but may draw fisheries management issues to the attention of the relevant authority. Within 200nm the relevant authority for fisheries management would be the European Commission for EU Member States, or the National Government. On the High Seas (i.e. areas outside national jurisdiction) in the North East Atlantic the North East Atlantic Fisheries Commission (NEAFC) is the only existing body for the management of fisheries, although it currently has a remit only for the management and conservation of fish stocks, rather than for marine conservation more generally. NEAFC consists of the European Commission (representing EU Member States) plus National Governments for other Contracting Parties. NEAFC takes scientific advice (concerning fish stocks) from the International Council for the Exploration of the Sea (ICES).

Marine Natura 2000

The Habitats Directive (92/43/EEC) makes it a legal requirement for Member States to identify Special Areas of Conservation (SACs) for those habitats & species on Annexes I and II to the Directive; approximately eight Annex I marine habitats (excluding coastal terrestrial) and approximately nine Annex II marine species. Of these, four habitats are coastal/inshore (estuaries, lagoons, mudflats/sandflats and large shallow inlets and bays) and four occur in inshore and offshore areas (submerged or partially submerged sea caves, sandbanks which are slightly covered by seawater all the time, reefs and submarine structures made by leaking gases). Four of the Annex II marine species in the North East Atlantic are freshwater/estuarine/inshore [Lamprey (*Petromyzon marinus*), Sturgeon (*Acipenser sturio*), Shad (*Alosa* spp.), Otter (*Lutra lutra*)] and five occur in both inshore and offshore areas [Grey seal *(Halichoerus grypus*), Common seal *(Phoca vitulina*), Bottlenose dolphin *(Tursiops truncatus*), Harbour porpoise *(Phocoena phocoena*), Loggerhead turtle (*Caretta caretta*)]. In UK waters, as of May 2004, there are 65 candidate marine SACs.

Natura 2000 in offshore waters

SACs will be designated in UK offshore waters (12-200 nautical miles)for the following three Annex I habitats:

1. reefs, consisting of bedrock reefs, stony reefs, and biogenic reefs (cold water corals, ross worm, horse mussels);
2. shallow sandbanks, consisting of tidal generated ribbon banks and sandy mounds;
3. submarine structures made by leaking gases, consisting of carbonate structures within some 'pockmarks'

Areas of possible reef (excluding biogenic reef) and areas of sandy sediments in less than 20m water depth in UK offshore waters have been identified principally from British Geological Survey seabed maps.

SACs for Annex II species

Coastal cSACs exist for the main breeding colonies and haul-out areas, and adjacent waters for common and grey seals. No areas 'essential to the life and reproduction' for seals have been identified in UK offshore waters although scientific study (tracking) of seals at sea is continuing. cSACs for bottlenose dolphin cover main areas of distribution in UK (Moray Firth, West Wales). The UK currently has no SACs for harbour porpoise. JNCC has re-analysed data for harbour porpoise to identify areas in UK waters (inshore and offshore) with continuous or regular presence, elevated population density, good adult:young ratio.

SPAs for birds

The Birds Directive (79/409/EC) makes it a legal requirement for Member States to identify the most suitable sites as Special Protection Areas (SPAs) for all bird species. There are16 marine Annex I species in UK waters and 40 regularly occurring migratory bird species in UK waters. The UK has 142 classified SPAs with a marine component in UK, all but one are coastal (not extending beyond low water).

Thee types of fully marine SPA are being developed in the UK:

- Marine extensions to existing breeding colony SPAs out to 1-2km from the coast;
- Inshore aggregations of non-breeding birds (seaduck, divers & grebes);
- Inshore and/or offshore aggregations, probably for feeding.

Natura 2000 sites: management

Sites must be managed to ensure the favourable conservation status of the habitats and species for which they have been designated. In UK territorial waters, once sites are submitted to Europe they are treated as if they are designated, 'appropriate assessment' of development projects applies, and management schemes are developed. UK nature conservation agencies prepare Conservation Objectives and advice on activities likely to require management for each site. A Management Scheme is developed where necessary by the authorities who regulate activities which may potentially affect the site. Management Schemes were developed for 12 UK European marine sites (SACs/SPAs) in inshore waters under the ECLife funded UK Marine SACs project, and will be developed for other sites, e.g. Lundy Island, off western England in the future.

Management of marine MPAs in the NE Atlantic

It is the management of activities affecting a site which achieves conservation of biodiversity, not the designation itself. For *Natura 2000* sites, management is only required to achieve favourable conservation status for the features for which the site is designated. Management of MPAs in territorial waters is (almost) entirely up to the Member State or National government. Management of fisheries affecting MPAs outside territorial waters (12nm) is entirely through the CFP for EU Member States. Management measures currently need to be based on scientific justification of threat or evidence of damage.

Principal activities likely to require management in offshore MPAs
Oil & gas exploration and development – Member State competence, in UK by prior licensing by UK Government (DTI), subject to Strategic Environmental Assessment (SEA), and EIA, also in UK specific Regulations requiring appropriate assessment for likely Annex I habitat areas;

- Aggregate extraction – Member State competence, in UK by prior licensing, subject to SEA and EIA;
- Renewable energy (windfarms) - Member State competence, in UK by prior licensing, subject to SEA and EIA;
- Fisheries – regulated through EU Common Fisheries Policy (closed areas, technical measures, quotas, etc.);
- Shipping – regulated by International Maritime Organisation (IMO).

Management of *Natura 2000* sites in offshore waters
The EU 'marine expert group' is developing European Commission guidance on management of *Natura 2000* sites. General guidance is being led by Netherlands, with input from other Member State and is due early 2005. Management is likely to be developed on a site by site basis through management schemes, based on conservation objectives for the features of the site. If certain types of fisheries are damaging sensitive habitats or species, 'closed areas' or other technical measures may be requested, for parts of sites or for whole sites.

Under the EU Common Fisheries Policy, a Member State may request emergency measures, but permanent measures will be determined by European Council. The EC may request scientific advice from ICES on proposed measures, however ICES at present does not always have sufficient expertise in biodiversity conservation to provide such advice effectively.

An example of this approach is for cold water coral biogenic reef *(Lophelia pertusa)* at the Darwin Mounds, UK (see Figure).UK Regulations for offshore waters are due Autumn 2004, so the Darwin Mounds area has been proposed to UK Government, but is not yet a cSAC under UK Regulations. Because of the sensitivity of cold water corals to damage by bottom trawling, UK requested measures under the CFP. The Commission introduced emergency measures, meanwhile a permanent ban on bottom trawling was agreed in EC Council to come into effect August 2004. In reaching this decision, the EC sought advice from ICES and justification from UK in determining the permanent ban on bottom trawling.
Enforcement currently operates using satellite tracking (VMS) of vessels every two hours however this timeframe is not adequate to ensure the coral reefs do not get damaged.

Habitats sensitive or vulnerable to fisheries impacts in the NE Atlantic
Biogenic reefs such as those formed by the cold water coral *Lophelia pertusa*, and reefs formed by the ross worm *Sabellaria spinulosa* are sensitive to physical damage. Fishing activities which are likely to cause physical damage include bottom trawling &

dredging. Some more stable parts of shallow sandbanks may be sensitive depending on species or communities present (eg. *Arctica islandica* or other long-lived species are likely to be sensitive to trawling/dredging damage).

Conclusions

Existing types of MPAs with suitable management measures can be effective for protection of listed habitats and sedentary species.

Mechanisms for management of non-Natura 2000 OSPAR MPAs need to be developed by Contracting Parties.

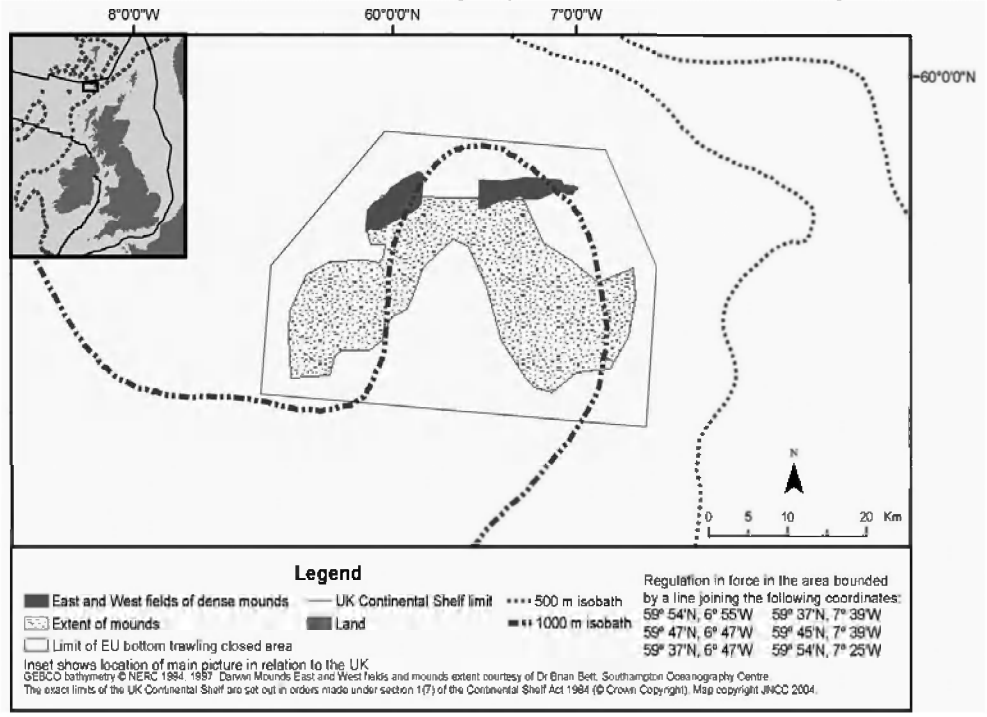
Mechanisms for selection and management of OSPAR MPAs on the High Seas need to be developed in International fora (including management of fisheries through NEAFC).

Management includes enforcement of Regulations which, for fisheries in offshore areas, is not currently adequate.

MPAs in offshore waters are much less effective for mobile or widely dispersed species including birds – specific management measures wider than MPAs are required.

Illustration:

Darwin Mounds area where trawling is prohibited under CFP Reg 602/2004



2.2 Fisheries effects of marine reserves and fisheries closures

Fiona Gell (Port Erin Marine Laboratory, University of Liverpool, Port Erin, Isle of Man) & Callum Roberts (Environment Department, University of York, Heslington, York, UK.).

Protecting an area from fishing has widely studied conservation benefits (reviewed in Gell & Roberts; 2003a&b). These include the recovery of populations of target species, recolonisation of areas by previously scarce organisms, increase in size and age of individuals, and recovery of habitat leading to increased structural complexity. It is accepted that closing an area to all fishing or to some of the more destructive methods can have significant conservation benefits within the area protected. Now, much research is focussing on how the build up of individuals of larger sizes and the improvement of habitat can also benefit areas outside the protected area. Marine reserves are thought to benefit outside areas by two main mechanisms, the export of pelagic eggs and larvae and the spill over of adults and juveniles across borders.

The has been a widespread perception that marine reserves may have a role as a fisheries management tool, but that this use is limited to small scale tropical fisheries, where they have already been extensively used to combine fisheries management and conservation goals. However, the evidence for their wider importance for fisheries management is growing and this evidence is reviewed in detail in Gell & Roberts 2003a&b. Studies from temperate waters have demonstrated the build up of numbers of sizes of commercial species within protected areas, and increases in numbers in adjacent areas, not only for sedentary species like scallops and reef fish, but also for species with high levels of movement including lobsters and large mobile fish species. Much of this evidence currently comes from the large numbers of studies carried out in temperate southern hemisphere reserves, but a growing number of studies are emerging from the Atlantic Ocean and European waters.

Fisheries benefits from marine reserves protected from some form of fishing typically develop quickly, often within three to five years of protection. One of the most persuasive evidence of fishery benefits of reserves comes from changing fishing patterns. Where effective reserves exist, fishers tend to move their activities closer to the boundaries and “fish-the-line”. Spill over of adults and juveniles has now been well-documented from more than a dozen countries for a wide range of species. It is harder to investigate the extent and mechanism of larval export. Existing reserves are mainly small, so it is very difficult to detect increased recruitment to fisheries on a large scale, but there are now several cases in which export of eggs and larvae have been confirmed, including the dramatic enhancement of scallop fisheries on Georges Bank and clam fisheries in Fiji. The increased age, size and reproductive capacity of fish and invertebrates within protected areas has been clearly demonstrated from sites around the world.

Small reserves have worked well and have produced important local benefits. For wider-scale benefits we need to look at networks of reserves. Some of the clearest fisheries benefits have come from places where between 10 and 35% of fishing grounds have been protected from fishing. In several cases there is evidence that yields with reserves have risen to higher levels than prior to protection, despite a reduction in the area of fishing grounds. In other cases, smaller reserves have stabilised catches from intensively exploited fisheries or slowed existing rates of decline. Fishery benefits have been demonstrated from reserves established in warm and cold temperate waters and in many habitats including rocky reefs, kelp forests, seagrass beds, estuaries, soft sediments, continental shelves and the deep sea. Protecting areas from fishing has also brought benefits to a wide variety of fisheries including artesianal fishing, recreational fishing, nearshore fisheries for species like lobster through to industrial-scale fisheries for animals like flatfish and scallops. Areas protected from fishing have also been effective over a broad spectrum of management sophistication from self-policing by fishers themselves, through to warden patrols and satellite monitoring of distant fishing activities.

The combination of dramatic conservation benefits of protecting an area from fishing and the benefits to the fisheries themselves, indicate the importance of incorporating a high level of fisheries protection into the management of *Natura 2000* sites in Europe. Protecting the wider ecosystem rather than selected species or habitats within small sites can have broad, long-term advantages far exceeding those expected from selective partial protection. Fishing must be acknowledged as the human activity currently posing the greatest threat to marine biodiversity. For real active protection of marine ecosystems, carefully selected areas must be completely protected from fishing, and in particular some of the most damaging activities like trawling and dredging.

Protected areas will have limited potential for conservation or fisheries benefits if they do not incorporate a significant component of protection from fishing. On the other hand, protecting significant proportions of marine ecosystems from fishing is predicted to have far-reaching conservation **and** fisheries benefits.

References

The paper given at this workshop was based on two literature review publications which are both available online. Please see these references for full details of the references used.

Gell, F.R. & C.M. Roberts (2003a) The fishery effects of marine reserves. WWF-US Washington, USA. http://www.worldwildlife.org/oceans/pubs.cfm

Gell, F.R. & C.M. Roberts (2003b) Benefits beyond boundaries: the fishery effects of marine reserves. Trends in Ecology and Evolution 18(9): 448-455.
http://www.panda.org/downloads/marine/benefitsbeyondbound2003.pdf

2.3 Nature protection in the marine environment. Views on the relationship between fisheries and the "Birds" and "Habitats" Directives

Placido Hernandez-Aguilar, DG Environment, Nature and Biodiversity, European Commission, Brussels, Belgium.

This paper is elaborated as a contribution to a better comprehension of the existing links between Community Fisheries Policy (CFP) and the "Birds" and "Habitats" Directives. The views expressed in it are merely those of the writer and may not in any circumstances be regarded as stating an official position of the European Commission.

The following information is of a general nature and is not intended to address the specific circumstances of any particular case, for which specific technical and legal advice would be required.

Context

Several tools exist in Community waters to improve the protection of nature in the marine environment:

- EC Directives for nature protection purposes: Habitats Directive[1] and Birds Directive[2]
- EC Regulations for conservation and sustainable exploitation of fisheries resources. The most important legal framework is the Common Fisheries Policy (CFP[3]).

Other relevant instruments of the environmental policy for the amelioration of the marine environment are the Water Framework Directive, EIA etc.

The implementation of the provisions of these instruments will be a significant contribution for the achievement of European Marine Strategy objectives. The Marine Strategy overall policy is to promote the sustainable use of the seas and conservation

[1] Council Directive 92/43/EEC of 21/5/92 on Conservation of Natural Habitats and of Wild Fauna and Flora. http://europa.eu.int/comm/environment/ture/hair.htm

[2] Council Directive 79/409/EEC of 05/04/79 on Conservation of Wild Birds http://europa.eu.int/eur-lex/en/consleg/pdf/1979/en_1979L0409_d0_001.pdf

[3] CFP: Council Regulation (EC) No 2371/2002 of 20/12/2002 on the Conservation and Sustainable Exploitation of Fisheries Resources under the Common Fisheries Policy http://europa.eu.int/smartapi/cgi/sga_doc?smartapi!celexapi!od!CELEXnumdocg=en&numdoc=32002R2371&model=guichett

of marine ecosystems, including sea beds, estuarine and coastal areas, paying special attention to sites holding a high biodiversity value.

The Common Fisheries Policy

Since 1 January 2003, the European Union has a new common fisheries policy. The new major text is Council Regulation (EC) No 2371/2002 of 20/12/2002 on the conservation and sustainable exploitation of fisheries resources under the Common Fisheries Policy.

The reform of the Common Fisheries Policy offers better prospects of securing the future of the European fisheries sector for the benefit of all, including the fishing sector and also the marine environment.

The new CFP establishes the protection of the marine environment as one of its major targets. In relation to the environment, the CFP shall provide for coherent measures concerning conservation, management, and exploitation of living aquatic resources and limitation of the environmental impact of fishing.

The first objective of the CFP is to ensure exploitation of living aquatic resources that provides sustainable economic, environmental and social conditions. For this purposes, the Community shall apply the precautionary approach in taking measures designed to protect and conserve living aquatic resources, to provide for their sustainable exploitation and to minimise the impact of fishing activities on marine ecosystems. It shall aim at a progressive implementation of an ecosystem based approach to fisheries management.

In compliance with the improvement of the legal framework, a number of individual measures have been taken to improve conservation status of habitats and species in the marine environment during the last few years, such as:

- Reduction of by-catch impact on cetaceans following the recent ban of driftnets and regulation related to the mandatory use of acoustic deterrent devices;
- Restriction of bottom trawling activities for protection of valuable habitat types like *Posidonia* beds in the Mediterranean and deep coral reefs in the Atlantic (Darwin Mounds).

These are examples that show how the CFP could play an important role for marine nature protection. It is intended to fully implement the CFP addressing other pressures created by fisheries activities to the marine environment.

At Community level, Member States have decided to share their national responsibilities in fisheries at community level establishing the CFP as an exclusive Community competency. That represents a significant advantage to solve some important conservation problems in the marine environment. Identified pressures

coming from fisheries at EU level may be addressed by a single EU level decision ("one shot" approach).

Implementation of the *Natura 2000* network in the marine environment

Implementation of both the Habitats and Birds Directives is a legal obligation that represents a major element for the protection of the marine environment, in line with the proposals of the Marine Strategy.

From identification to designation of *Natura 2000* sites

The Birds and Habitats Directives apply with no distinction between the marine environment and the terrestrial. The same obligations and proceedings have to be applied.

The site designation process is exclusively based on scientific criteria. Future management challenges should not be a determining element in this process.

Birds Directive

Special Protection Areas (SPA) are identified and designated by Member States in accordance with provisions of the Birds Directive. In its Article 4, it is established that they shall classify in particular the most suitable territories in number and size as special protection areas for the conservation of these species, taking into account their protection requirements in the geographical sea and land areas where this Directive applies. Identification and designation of SPAs is a Member State responsibility.

Habitats Directive

First step: elaboration of a list of Sites of Community Importance. The criteria for selecting sites eligible for identification as sites of community importance (SCI) will be in accordance with Annex III of the Habitats Directive and relevant scientific information. Member States will identify and carry out an assessment at national level of the relative importance of sites for each natural habitat type in Annex I and each species contained in Annex II (Including priority natural habitat types and priority species). On that basis, each Member State shall propose a list of SCI. The list including appropriate information for each sites, shall be transmitted to the European Commission[4].

Second step: adoption of the list of pSCI. The list of proposed SCI is to be adopted by the Commission in accordance with a procedure laid down in article 21 of the Habitats Directive.

Third step: designation of special areas of conservation (SAC). Once a site of Community importance has been adopted the Member State concerned shall

[4] A map, its name, location, extent and the data resulting from application of the criteria specified in Annex III provided in a standard format (c.f. Commission Decision of 18 December 1996 concerning a sites information format for proposed Natura 2000 sites *Official Journal L 107, 24/04/1997*).

designate that sites as a SAC as soon as possible and within six years at most, establishing priorities in the light of the importance of the sites for the maintenance or restoration, at a favourable conservation status, of a natural habitat type in Annex I or a species in Annex II and for the coherence of *Natura 2000*, and in light of the threats of degradation or destruction to which those sites are exposed.

In the marine environment obligations of Member States are the same as in terrestrial. Therefore, provisions of the Habitats Directive related to the site designation process are the same: the site designation process is exclusively based on scientific criteria. Future management challenges (related with any future activity as fisheries, energy etc.) should not be a determining element in this process.

Monitoring of *Natura 2000* sites

Once the site has been designated, Member States are obliged to ensure the restoration or maintenance of natural habitats and species for which the sites has been designated at a favourable conservation status (Birds Directive art.1 & 4: Habitats Directives, arts 1 & 2).

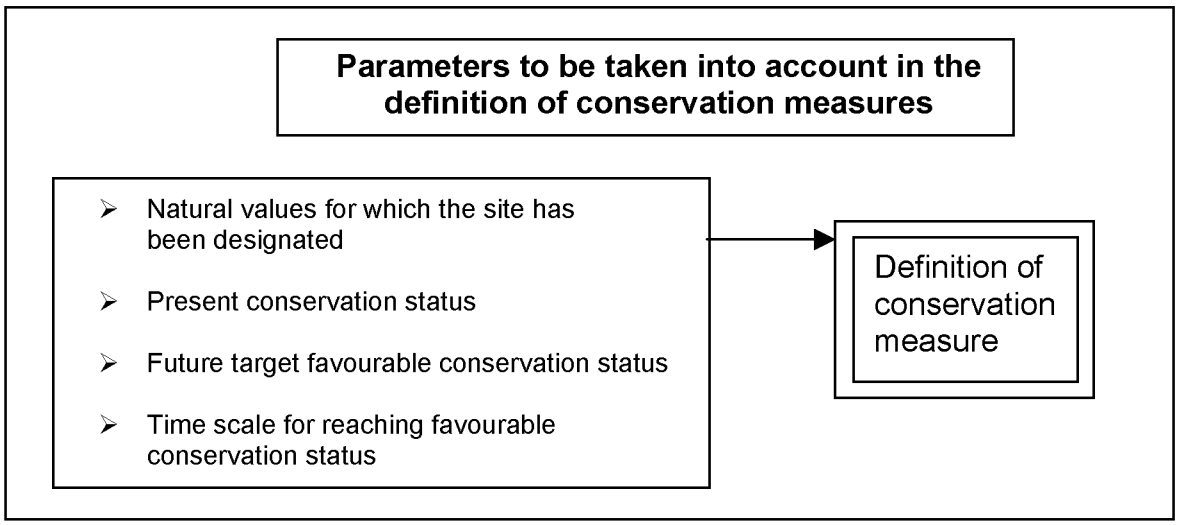
For that purpose a monitoring programme is necessary to assess the present state of the site and to design appropriate maintenance and/or restoration measures. National Authorities[5] are responsible for monitoring of sites (Habitats Directive art.11).

Management measures in *Natura 2000* sites

First step: identification of measures to be taken
Available data obtained from monitoring programmes will allow Member States to identify the conservation status of species and habitats present in the site. Member States will also proceed to the identification of potential pressures. Thereafter, they will define appropriate maintenance and/or conservation measures for delivering favourable conservation status. In accordance with Art 6.1 of the Habitat Directive, Member States shall establish the necessary conservation measures involving, if need be, appropriate management plans specifically designed for the sites.

Different values such as the object of protection, present conservation status, target status and time scale to reach it, are the driving element for the definition of conservation measures to be taken.

[5] National Authority responsible for the management of the *Natura 2000* site, as defined in the 97/266/EC Commission Decision of 18 December 1996 concerning a site information format for proposed *Natura 2000* sites *Official Journal L 107, 24/04/1997*.



Marine sites of the *Natura 2000* network will provide protection to some of the following natural values:

1. Habitats listed in Annex I of the Habitats Directive: including all habitat types classified under code 11* (Open seas and tidal areas) and 12* (Sea cliffs and shingle or stony beaches) of the interpretation manual[6] and habitat type 8330 "submerged or partially submerged caves. Four habitat types are listed in Annex I and present in offshore waters: 1110 sandbanks covered by shallow waters, 1170 reefs, 1180 structures made by leaking gases and 8330 submerged caves.

2. Species listed in Annex II (18 marine species, including fish, reptile, cetacean, and seal species).

3. Marine Birds.

4. Marine species listed in Annex IV of the Habitats Directive (Sites are not designated in Annex IV species presence basis but, if they are present in the site they will also have to be protected).

Application of measures

Measures have to be applied by competent authorities. The identification of the competent authority is based on the legal basis of the measures that will be applied. It will depend on two parameters:

(i) location of the measure to be taken – territorial waters or offshore

[6] Interpretation Manual of European Union Habitats. Eur-25. April 2003. European Commission DG Environment. http://europa.eu.int/comm/environment/nature/nature_conservation/eu_enlargement/2004/pdf/habitats_im_en.pdf

(ii) the nature of the measure itself – related with transport, geological exploitation, fisheries tourism, national defence etc.

Natural protected values subject to similar pressures would likely need similar protection. Nevertheless, depending on the site location and the type of action, the responsibility for the implementation of those measures can be different. These responsible actors could be founded at Federal, National, European Community or international levels.

Therefore, the National Authority has to identify the necessary conservation measures and the subsequent actors responsible for its implementation and enforcement. This Authority will have to implement all measures of its own competencies and ask other responsible bodies to take action on their own competencies.

Measures to be taken related to fisheries

Up to now we have developed the process of construction, monitoring and conservation status assessment of *Natura 2000* sites. According to Article 6.2 of the Habitats Directive, Member States have to take appropriate steps to avoid the deterioration of the sites. The assessment of monitoring data may show, in some cases, the necessity of regulation of some fishing activities. In such a case, as fisheries is an exclusive Community competency (c.f. point (ii) above), actions are to be taken in accordance with regulations established in the framework of the CFP {the basic regulation is Council Regulation (EC) N° 2371/2002 of 20/12/2002 on the conservation and sustainable exploitation of fisheries resources under the Common Fisheries Policy. OJ L 358, 31.12.2002].

As seen in precedent chapters, definition of possible measures is driven by the combination of a number of different parameters as the number and the nature of the values to be protected, conservation status gap, time scales, situation of the marine site etc. By combination of these parameters, it is possible to find a huge number of different nature conservation cases needing some regulation on fisheries activities. For this reason, it is not possible to develop in this paper an exhaustive catalogue of all the possible actions to be taken under the CPF provisions to address each of these cases. The information contained here is of a general nature and is not intended to address the specific circumstances of any particular case, for which specific technical and legal advice would be required.

In most usual cases, it is up to the Member States to ask the Commission to take the necessary measures to regulate fishing activities in order to protect a *Natura 2000* site from potentially damaging fishing activities. Then, it is up to the Council to adopt necessary measures following a Commission proposal. Member States can also apply measures to their own fishing vessels in waters under their sovereignty or jurisdiction.

In general terms it is also to be borne in mind that:

1. Decisions taken recalling emergency circumstances are limited in time. Therefore, they should be exceptionally considered in the framework of the establishment of management plans.

2. According to CFP C Regulation (EC) N° 2371/2002, Member States have residual jurisdiction in relation to non-discriminatory measures to minimise the effect of fishing on the conservation of marine ecosyst3ms within 12 nautical miles (Art.9), and to fishing vessels flying their own flag (Art.10).

Some legal questions related to the link between Community policy on fishing and the "Habitats" and "Birds" Directives were notified by the Commission to the members of the Habitats Committee on 10th May, 2004.

Measures taken in the framework of the CFP are decided in a co-ordinated manner at Community level. This decision scheme enhances the coherence of the measures taken, but, on the other hand, it needs more co-ordination of effort at Community level than measures related to other activities where national competency applies.

According to Art.6.3 of the Habitats Directive, any plan or project for a new fisheries activity (as any other activity) likely to have a significant effect in the site shall be subject to appropriate assessment of its implications for the sites in view of the site's conservation objectives.

An ongoing court case will provide further clarification of the modalities of application of Article 6.3 provision of the Habitats Directive in relation to fishing and shellfish extraction activities based on annual exploitation licences.

2.4 Fishing in European Marine Sites in Welsh Waters – science underpinning regulation

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European Marine Sites (Special Areas of Conservation and Special Protection areas under the Habitats and Birds Directives) cover the majority of Welsh coastal waters. While the details outlining the conservation importance of the sites are nearing completion, the full implications to users, and particularly to fishing, are still to be worked out. The potential interactions and spatial overlap between fisheries and the 'features' of each site (the habitats and species for which they are designated) are being examined. Furthermore, there are several positive examples, underpinned by sound science, of moves to manage fisheries in order to conserve nature conservation interests. The scallop dredging exclusion zone which protects a horse mussel reef on the north coast of the Llyn peninsular, which was introduced by the North Western and North Wales Sea Fisheries Committee, is one such example. The zone lies within the Pen a'r Sarnau candidate Special Area of Conservation and its maintenance is one of the action points within the site Action plan. This is a helpful fisheries byelaw which protects an important feature of the site. Other examples are the monitoring studies which are examining the feeding requirements of oystercatchers within three Special Protection Areas in Wales, the results of which have allowed the development of population models. On the basis of predictions from these models, decisions on fisheries management for cockles and mussels, including removal of mussel seed, can be informed to allow for the requirements of the oystercatcher populations.

Interpretation of the Habitats and Birds Directives and the regulations transposing them into UK law, particularly in relation to fishing, has led to some problems regarding assessment of fishing activities likely to significantly affect the conservation integrity of a site. A case study involving the prospecting for a new fishery – hydraulic dredging of razor clams - illustrates this point. In this instance regulatory measures were introduced to avoid potential legal action. This has precipitated a recent policy decision in Wales that fishing is a 'plan or project' under the Habitats Directive, and therefore opens up many questions regarding potential 'appropriate assessment' of 'new' and 'changes to existing' fishing activities.

Moves to estimate the sensitivity of the 'generic' features to specific fishing gear types can be made using information from the literature, such as those reviewed and collated by Gubbay & Knapman (1999). They are nonetheless hampered by a lack of information and the broad nature of some habitats (e.g. large shallow inlets and bays) which may differ depending upon the site in question and contain a variety of biotopes (or sub-features) of potentially differing sensitivity. However, site specific sensitivities of habitat and species 'features' to different fishing gears can be estimated for example for SACs, using the matrix headings below and four levels of the 'MarLin'

Biotope Sensitivity scale (u - no known effect, L- unlikely to degrade habitat, M - potentially some habitat degradation, H - habitat likely to be destroyed; and equivalent for species sensitivity) [http://www.marlin.ac.uk]. Details of such information can then be mapped, but must be viewed as purely indicative.

Illustrative matrix headings

Habitats & Species
Sandbanks covered all the time
Estuaries
Mudflats & sandbanks not covered at low water
Large shallow inlets and bays
Reefs
Submerged/partly submerged sea caves
Salicornia beds
Twaite shad
Allis shad
Sea lamprey
River lamprey
Otter
Grey seal
Bottlenose dolphin
Harbour porpoise

Benthic Trawls
Beam trawl
Light otter trawl
Rock-hopper trawl
Shrimp push net
Shrimp trawl
Cockle tractor dredging
Mussel seed dredging
Oyster dredging
Suction (Hydraulic) dredging
Cockle suction dredging
Razor clam dredging
Netting
Gill net
Tangle & trammel nets
Potting
Crab/lobster pots (F, L)
Prawn pots Whelk pots
Collecting
Mussel hand-working
Cockle hand-working
Aquaculture
Mussel dredge production
Oyster trestles
Clam ground cultivation

Estimation of the sensitivity of features to fishing gears at different levels of fishing intensity would also help determine levels of fishing effort compatible with maintaining the conservation integrity of the site. Application of sensitivity ratings may lead to the development of thresholds triggering site specific appropriate assessments. In some situations sufficient information may exist to make such predictions, and in others it may require collection of further information particularly relating to the actual level of fishing intensity within MPAs. Extension of such proposals to estimate the sensitivity of larger scale 'marine landscape' maps, as used in the Irish Sea pilot, and hence to provide advice on developing an ecosystem- based approach to fisheries management is a potential subject of debate. It would nonetheless provide invaluable to emerging Regional Advisory Councils, the potential geographical subunits within RACs, or to smaller scale regional fisheries managers.

2.5 DISCUSSION AFTER PAPERS ON THE ROLE OF MPAs IN FISHERIES AND THE CONSERVATON OF BIODIVERSITY

The discussion following these papers raised issues about fisheries benefits from MPAs in general as well as matters specifically linked to *Natura 2000* sites.

MPAs may bring some benefits to fisheries however this needs to be examined in the context of the bigger picture of the effects of fishing and environmental changes. The implication of changing the age distribution of fish stocks is one such issue. In some circumstances it may be that the population structure of a particular fish stock has changed so much that it is no longer able to respond to climate change. For example if plaice cannot reproduce successfully for 10 years, the background conditions may have altered so much, they may not be able to respond and recover a decade later.

One example of a large scale background change is the recent observed shift in the distribution of some marine mammals in the North Sea. In recent years large numbers of porpoises have been recorded off the Dutch coast and have been washed up on the beaches (strandings). In the UK work on the resident population of bottlenose dolphins in the Cardigan Bay SACs suggests a more northerly pattern to their activity in recent years. These species movements illustrate the difficulty in using MPAs to benefit shifting populations and highly mobile species.

Questions of enforcement and consultation over measures in MPAs were also discussed. Satellite tracking of vessels had been mentioned in several of the presentations. In the Netherlands fishing vessels carry a black box which tracks and records location data however the time frequency (2 hours) means that the information is not as useful as it could be in determining activity as well as location. The complexities in carrying out consultations over site selection and management in offshore areas was discussed. In the case of the Darwin Mounds, an offshore *Natura 2000* site on the UK continental shelf, the UK government carried out a consultation on the designation.

A number of issues specific to *Natura 2000* sites were also discussed.

Fisheries management within *Natura 2000* sites was a particular concern as Member States were moving on from the stage of site identification to the management of activities that may affect the favourable conservation status of the habitats and species within the designated sites. The view of the European Commission was that Member States should make proposals to the Commission regarding any fisheries management requirements for offshore sites. These may be on an individual basis or from a number of countries working together. Once the likely pressures had been identified fisheries regulations may be introduced generally or on a site-by-site basis, depending on the matters to be addressed. There is no difference between SACs and SPAs regarding the management of fisheries as the provision of Article 6 of the

Habitats Directive (which also applies to the Birds Directive) allows activities to continue if they do not have an impact on the reason for designation.

The question of the application of the EIA Directive to fishing activity within *Natura 2000* was also raised. In general, existing fishing activities in these sites probably do not need EIA however new activities will need assessment. The question of what constitutes as "new activity" (for example would it include change in gear, or change in effort) is under consideration within the Commission and subject to a Court Case, which will provide some guidance in due course. The Commission has not taken an official position on this at the present time.

The idea of using sensitivity matrix to guide the assessment process was discussed. One possibility was to determine the sensitivity of an individual feature/species (e.g. high, medium, low, zero), and link this to different levels of fishing activity in a particular area. With this information it may be possible to identify triggers for appropriate assessment. Difficulties which need to be tackled with this approach include the gaps in knowledge and therefore limitations with the data on which to base the assessment.

Another issue which is coming to the fore in discussions about *Natura 2000* sites is what makes a group of MPAs a network. Work is being undertaken on this question in a number of fora, including OSPAR. The UK is preparing a discussion paper on this question for the September meeting of the MASH Committee of OSPAR.

The EU Marine Experts Group is helping to develop a common understanding of various issues concerned with the implementation of the Directive in the marine environment. The group is working on the definition of habitats (led by Germany), site selection (led by the UK) and management (led by the Netherlands). This work should be completed by the end of 2004. . It is intended that this Working Group will provide guidance on the transposition of the Directives in offshore waters by the end of 2004.

3 ECONOMIC ISSUES IN RELATION TO FISHERIES AND MARINE PROTECTED AREAS

3.1 Economic research on marine reserves - an overview

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Introduction

Marine reserves have become one of the hot topics in marine management with proponents in most camps. Biological research on the topic has exploded since it re-emerged in the late 80s (Conover *et.al.* 2000), after Beverton and Holt (1957) put closed areas on the back burner, and instead focussed attention upon gear restrictions and fishing intensity as the principle tools of fisheries managers.

Regarding fisheries management we can see an evolutionary path leading from input controls such as gear and time restrictions, to output controls such as Total Allowable Catch (TAC) and more disaggregated quota limitations. Economists have for years (starting with Gordon, 1954) pointed to the fact that management focusing purely on the biological and technological side of fisheries will result in inefficient fisheries, where the potential economic rent is eaten up by increased fishing capacity. Economists have traditionally espoused economic incentive systems for management, such as output taxation, or more commonly individual transferable quotas. However, experience shows that such management options have not eliminated stock decline (see Iceland's cod stock decline a few years back, and the recent experiences with New Zealand's Hoki as well as other species), as the setting of TACs as well as enforcement still remains problematic. The next evolutionary step seems to be a return to input control, but this time in a more perfect form; permanent area closures, or marine reserves.

Economic research in the area of marine reserves is more recent and of a much more limited quantity than that found on the biological side, but it is clear that research in the topic is increasing rapidly. The work can roughly be divided in three fields; 1) management implementation and cost benefit analysis, 2) valuation and 3) bioeconomic modelling. This paper concentrates on the two latter fields, mainly discussing bioeconomic modelling, as this is where most economic research on marine reserves is found. However, as regards 1) management implementation, the main method used is multi-criteria analysis; taking into account stakeholders weighted preferences over a range of criteria (see Brown *et. al* 2001) or cost-benefit analysis (see Hoagland *et. al.* 1995). The second area, valuation, is a very research intensive part of environmental economics, and as regards protected areas, most of the research to date has been directed towards terrestrial rather than marine protection (see however Dixon *et. al.* 1993, Hall *et. al* 2002 and Mathieu *et. al.* 2003). The valuation of terrestrial natural parks have been extensively carried out on the basis of

two approaches; i) the travel cost method and ii) the contingent valuation method (CVM). The former method assigns values to national parks dependent upon the travel costs of the visitors to these parks. This is so-called use-value, i.e. a value dependent upon a form of consumption of the national parks.

Contingent valuation is a more widely encompassing measure of valuation in that people are asked what they are willing to pay for the existence of these parks, or what compensation they would require for the loss of these parks, irregardless of whether or not they plan to visit the park in question. In this measure non-use values may hence be included. The travel cost method may clearly be relevant for many marine reserves, such as tropical coral reef habitats, or other coastal reserves. For deep-water coral reefs such as those found in more temperate areas, as well as commercial fish stock management motivated marine reserves in oceans, the travel cost method is clearly not an acceptable approach. CVM is however an area where one may expect future studies with regard to marine reserves. This method is discussed in the next section.

Valuation of marine reserves

Economists usually define the value of environmental goods by so called *use* and *non-use values*. *Use values* are valuation of the use of an environmental good. This is however not always as straight forward as it sounds, as how do you calculate the value of a habitat? It is clear that habitats have value in the sense that they affect the well-being and thereby the growth of commercially valuable species, as well as species that impact upon these commercial species. These are however complex interactions both biologically and economically.

When it comes to *non-use* values economists usually divide them into three different valuations:

1) option value,
2) existence value and
3) quasi-option value

Option value measures the willingness to pay in order to guarantee the availability for the individual of a future environmental good.; existence value measures the individual's valuation of the existence of some environmental good, irrespective of whether or not the individual will actually use it; and quasi-option value relates to the willingness to pay in order to avoid an irreversible loss of some possible future valuation. So far valuation work (on the very few studies on marine reserves) has been concerned with use values, for instance what marine park tourists are willing to pay for access (Dixon *et.al*. 1993 and Mathieu *et. al.* 2003) or indirectly option values by asking the tourists their willingness to pay for increased protection and monitoring of a coastal habitat that they use (Hall *et. al*. 2002). There do not appear to be any studies of pure existence values, in the sense that the marine area in question is not accessible to the individual. This presumably would be relevant for oceanic reserves, where use values can be modelled (see later section), but existence values remain unknown.

An example that requires this form of CVM analysis is temperate/polar deep water coral reefs, which are only accessible by submarine as they are mainly found at depths of 200-1000 m. The dominant coral, *Lophelia*, grows at a rate of approximately 1 mm per year, and the highest known reef, on the Sula Ridge off the Norwegian coast, is 35 m tall. Specimens taken from these reefs have been dated as 8500 years old (Fosså, 2004). Knowledge of the ecosystem functions of the reefs is limited, but the reefs have been shown to provide shelter for a vast number of marine species (Fosså *et. al.* 2002). This is something fishers had long been aware of, and it was they who alerted Norwegian biologists of possible damage to these reefs as a result of bottom trawling. Fishers using mostly passive gear set off the alarm after bottom trawling activities in the area resulted in reduced catches by their chosen gear types. Biologists, in close cooperation with oil companies with vested interest in the areas, analysed the bottom with ROVs (remotely operated vehicle), and for the first time captured on film the devastation of bottom trawl on the coral reefs. This resulted in large public and political interest in Norway, rapidly resulting in three protected areas. The protected areas only exclude bottom trawling, while passive gear such as long-lining is still allowed. However, with increasing visual mapping of the ocean floor, more and more *Lophelia* reefs are being found, and the question has now emerged; how much should we protect? Areas that were seen as unique and sensitive were easily closed with minimal reaction of a negative kind. However, as biologists press to close more and more areas, fishers are beginning to question the policy, and asking for consideration of the costs involved. It seems clear that a study of valuation is required here. How does the public value these resources? Does the increased availability eliminate the irreversibility issues and quasi-option values?

CVM is costly; interviews and other data collection is time consuming and expensive. However, there may be some possibilities for transferral of benefit measures from one area to another depending on ecological homogeneity measures (Ruijgrok, 2001).

It seems clear that a lot of research remains to be done on the valuation of marine reserves, and specifically on the issue of existence values.

The third field of economic research on marine reserves, bioeconomic modelling, is the area where we currently see the greatest activity. This aspect is discussed below in some detail.

Bioeconomic modelling and marine reserves

Economists working in the field of bioeconomics accept criticism from biologists for their use of simplistic models. Their defence is however that with the additional complexity of economics on top of for instance cohort models, the creation of a "big black box" is imminent, rendering constructive analysis minimal. Hence most theoretic work on bioeconomic models apply so-called Gordon-Schaefer biomass models (with some exceptions such as Holland and Brazee 1996 and Sumaila 1998) and also most often one-species models (here Boncoeur *et.al.* 2002 is the only exception), and are

usually designed to analyse specific issues. In the following the economists' response to hypotheses of marine reserves as a solve-all are presented.

One of the earliest problems that economists have pointed to as regards marine reserves is the issue of time. Biologists have also underlined the trade-off between short term profits from fisheries versus possible long term gains from risk reduction of marine reserves (Dayton *et. al.* 2000). This is clearly underlined in Holland and Brazee's (1996) dynamic bioeconomic analysis where the discount rate of those affected by a reserve implementation, and their minimum production requirements, are critical with regards to policy decisions on marine reserves. If society discounts the future to a large degree, possible gains from marine reserves a long time ahead will not pay for the losses of economic activity today. The consequences for policy-making are well known from the global warming debate around the Kyoto Protocol. Hence the "bounce-back" propensity of chosen marine reserve areas compared to society's rate of discount, will determine whether marine reserve policy as a fisheries management option will succeed in winning through.

This naturally brings us to the issue of uncertainty, which is also of interest from an economic viewpoint. It has been hypothesised that marine reserves could insure against environmental shocks, or function as a "hedge against inevitable management limitations" (Lauck *et. al.* 1998). Sumaila (2002) applied a Beverton-Holt simulation model and found that the implementation of a reserve may indeed protect discounted economic rent. This model assumes, however, that the shock only occurs in the fishable area. Conrad (1999) using a Gordon-Schaefer model assumes a more general shock to the system, and finds that marine reserves give less variation in the biomass, but reduce harvests and thereby economic rents as compared to a private property management.

Economists have traditionally been interested in the sustainability of fisheries management both from a biological as well as an economic viewpoint. Biological models underlie the economic analysis, and hence focus is on long run optimally sustainable resource utilisation. From this follows economists' critique of open access management, as the effect of profits to attract fishers in unmanaged fisheries leads to excessive effort investment, which decimates the profit. Hence many economists have pointed to this fact (Holland and Brazee, 1996), and also shown that perfectly applied private property management without reserves will better take care of both stocks and harvests, unless marine reserves are exceedingly large (Hannesson, 1998). It is clearly problematic to assume that in fisheries with a high degree of sophisticated management, the implementation of marine reserves will eradicate all other management except perhaps access (see references to limited-entry management and marine reserves below). Much work still remains, therefore, with regards to the analysis of different management options than just open and limited access outside marine reserves.

It has been claimed that marine reserves in industrialised fisheries may be cheaply monitored via satellite systems, thereby reducing management costs. Bioeconomic

analysis including management costs (Armstrong and Reithe 2001) has indeed shown that the introduction of marine reserves has the potential to reduce the reserve size that will give equal stock and harvest results as that of private property management without a reserve. There are however very few reserves in such industrialised fisheries, as reserves are much more prevalent in tropical waters with larger degree of subsistence fisheries, where unless there is community acceptance, the monitoring costs can be prohibitive.

It has been claimed that marine reserve implementation will somehow reduce conflicts at sea (Bohnsack 1993), presumably by zoning, and separating different interest groups in the ocean. The many conflicting opinions that have arisen *prior* to reserve implementation in for instance California may not be an indication of the climate *after* a reserve implementation, but it definitely begs the question of how a shrunken area of use will reduce conflict among a given group of agents. Sumaila and Armstrong (2003) using a one-species cohort model with two harvesting groups, fishing on each their section of the species in question, show how there may be clear disagreement between the two groups as regards marine reserve size and fisheries management implementation. This result is underlined in Holland's (2000) applied model of multi-species and multi-agent fisheries on Georges Bank. Via simulations it is shown that some groups of fishers obtain increased yields from permanent marine reserves, while others obtain reduced yields.

So far we have mainly discussed work that focuses on simple two-patch models. Sanchirico and Wilen (1999, 2001) introduce greater degree of spatiality into bioeconomic models of marine reserves. They show that economic results are highly dependent upon the type of interaction between different patches, and which patch is closed. This is due to complex spatial and intertemporal effort redistribution effects. Hence both economic and biological factors affect the results of reserve implementation. The authors (op. cit.) identify circumstances which would afford what they call a "double payoff", namely increased aggregate biomass *and* aggregate harvest by closing one or more areas to exploitation. They find that, given open access, biological benefits may be forthcoming from reserve implementation, but few combinations of biological and economic parameters give *both* increased aggregate harvests and aggregate biomass.

A central critique made by economists of biologists' work is how the latter include human behaviour. In most biological models of marine reserves, effort is assumed exogenously given and constant. Economists see this as a strong assumption and underline the incentive effects that fishers react to. Using an applied, spatially and behaviourally explicit, dynamic bioeconomic model of a specific fishery, the sea urchin fishery in northern California, Smith and Wilen (2003) compare to a pure biological model with standard simplifying assumptions regarding human behaviour (read: ignoring economic behaviour). They demonstrate that the optimistic conclusions regarding reserves may well be a result of the simplified assumptions ignoring economic behaviour. Furthermore, the preferred areas to close vary greatly for the two models analysed.

What does the economic research say about which fisheries and areas to close in the case of reserve implementation? Holland and Brazee (1996) show that only fisheries with a high degree of effort already present will gain from reserves. This is also a result found in Holland's (2000) applied work. Hence fisheries that manage to control effort by other means are best left alone. Sanchirico and Wilen (2001) find that given open access conditions, closing the most profitable high productivity patch provides the greatest chance of increased aggregate harvests. This is due to the fact that under open access, the most profitable area is overexploited, and hence fits into Holland and Brazee's (1996) definition of high effort levels. Introducing limited-entry management changes these results. In this case Sanchirico and Wilen (2002) show that the closure of lower productivity areas gives higher values in the fishery, as the high productivity areas under limited-entry already without reserves give large returns. The opportunity cost of closing such areas is thus high. Hence closing low productivity and high cost areas may lead to increased profitability in a limited-entry fishery. This underlines the importance of the status quo in a fishery prior to reserve implementation, and also points a finger at one of the usual determinants for reserve area choice, namely natural productivity. Once the economics of a managed fishery is taken into account, areas less attractive are more advantageously closed.

Bycatch fisheries are by many economists seen as the type of fishery that will best gain from marine reserve implementation. This is however a topic that has not been sufficiently studied, though there is much work in progress. Ecosystem modelling is not prevalent in bioeconomic research as of yet, but marine reserves as a fisheries management tool seems like a natural place for such research to emerge. Bonceour *et.al.* (2002) apply a two-species, two-area model of marine reserve implementation. One stock is a commercially interesting prey species while the other stock is a non-commercial predator. They show that interactions between species may reduce benefits to the fishing industry of reserve implementation, but on the positive side create opportunities for eco-tourism development.

So far, however, almost all modelling of marine reserves in economics rests upon the driving force of density dependent migration. Density dependent migration is highly probable, but nonetheless not demonstrated (Gell & Roberts 2003). This begs the question of alternative advantages of marine reserves, such as how habitat improvement as a result of closed areas will affect the harvests and profits. Issues such as the "shifting baseline syndrome" (Pauly 1995), and the question of whether applied carrying capacities are large enough, or should be revised for marine reserves is clearly an issue that would affect some model results. This is also a relevant issue with regard to deep-water coral, and begs the question of economic costs involved with preserving versus not preserving such habitat. However, transferring effort from reserves to the outside area may naturally increase the negative habitat pressures there. The sum total effect is yet to be studied.

Applied bioeconomic modelling is scarce and far between, but one of the few examples that does exist, Holland's (2000) multi-species, multi-fishery bioeconomic model of Georges Bank brings out a critique of the perhaps most often supposed

positive result of marine reserve implementation, namely increased stock sizes (see however Parrish (1999) and Walters & Bonfil (1999) for a similar argument from biologists). In this work he shows that in a situation where fisher's react to area closures in an economically sound fashion, resulting fishing may actually increase the danger of depletion for some fish stocks. This is clearly a warning regarding how we design marine reserves.

Areas of future bioeconomic research on marine reserves

Summarising the economic research so far, economists in general underline the dangers of assuming marine reserves to be a panacea for fisheries management. Marine reserves must be seen as one of the many tools of fisheries management, and the how, where and for what fisheries, reserves are implemented is of great concern. Economists underline the political problems of reserve implementation, due to diverging economic interests in the relevant areas, and illustrate the sometimes conflicting economic and biological goals in the use of marine reserves in fisheries management. However, the economic analysis of marine reserves is still in its infancy, demanding much further study in a vast range of topics. Some important topics to apply economic analysis in are:

- Marine reserves and management options outside the reserve area.
- Marine reserves and habitat /ecosystem issues – other gains than purely from density dependent movement.
- Marine reserves and non-use values as well as non-harvesting values – existence values of ecosystems, and tourism values
- Marine reserves and applied research – simulations of marine reserves implemented on actual fisheries, hereunder reserve networks.

There is a danger of marine reserves faring as poorly as individual transferable quotas. Not because either management option necessarily is detrimental, but that knowledge, control and degree of implementation is imperfect, hence leading to poor results which colour perceptions of the management option negatively (Dayton *et. al.* 2000). Hence there is a great need for increased knowledge within a broad range of academic disciplines in order to better understand the many consequences of marine reserves.

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3.2 Economic relevance and impacts of MPAs

Ralf Döring, University of Greifswald, Germany.

Introduction

This paper provides a short summary of a project funded over the last two years by the German Federal Agency for Nature Conservation entitled "The Baltic Sea as an example for environmentally sound fisheries"[7]. The main goal of the project was to combine ecological data on habitats, with data on fish stocks and fisheries management issues in order to clarify where there may be conflicts between fisheries and nature conservation goals in the southern Baltic Sea. Parts of the research area are proposed protected areas under the *Natura-2000* network.

The first section describes the economic background relating to the decision to set aside an area for nature conservation. Problems of today's fisheries management from an economic perspective are then outlined and the question of whether Marine Protected Areas (MPAs) are useful from the perspective of stock management is addressed. Finally the instrument of protected areas from a nature conservation perspective and what this means for fisheries is discussed.

Opportunity costs and Marine Protected Areas

The main reason for setting aside an area for nature conservation is usually clear and commonly concerns the protection of habitats and species facing the threat of destruction or extinction. The same applies for Marine Protected Areas.

Presently in the Baltic Sea only few areas are under protection with the goal of the protection of habitats and species apart from some areas dealing with fishing bans or bans of specific fishing practices (like the Odra bank above 10 m) The legal requirement to create a network of protected areas within the European *Natura 2000* network further offshore has resulted in considerable debate about MPAs in Germany with fishermen fearing that it means they will be excluded from the most productive areas which may lead to lower catches and higher costs.

From an economic perspective such costs are identified as opportunity costs associated with the declaration of a *Natura 2000* area. Normally, the holder of property rights for those areas can claim that their rights are restricted. On the mainland users with clear property rights on areas are in the position to request financial compensation if they are forced to reduce their activity or extensify their production. The same does not appear to apply to as fishermen do not have clear property rights on areas or stocks today. Nevertheless the question remains: do the setting aside of areas really lead to opportunity costs or are there unforeseen gains? The main problems for fishermen in the Baltic at the moment are low stocks of the

[7] The paper is based on the final project report which will be published at the end of 2004 (Döring 2004). More references to arguments, results of research projects etc. can be found there.

main target species. It seems that they need areas with the chance of good catches and low costs to earn a living. Figure 1 shows the intensity of fishing in the southern Baltic Sea by German fishermen with trawl nets (effort classified in hours fishing). This data can be combined with the maps of habitats in a small area (Figure 2)

The highest effort takes place in rectangles 38 G 3 + 4. With today's type of vessels and fishing gear the German fishermen are not able to fish on rocky grounds (the loss of nets is to be expected so there might not be any direct conflict between nature conservation and fisheries because fishermen fish in the less sensitive areas in between the rocky grounds (in 38 G 4). This is confirmed by the fact that research data suggest that much of the seabed in the southern Baltic Sea is in a 'nearly' natural status with no clear evidence of great damage from bottom trawling. However, further research is necessary to confirm this view and more data are needed on fisheries to have a real idea of the fishing effort in sensitive areas (with more detail within the fisheries rectangles). Nevertheless there is a clear need to protect sensitive habitats from certain damaging fishing methods because of the possibility of a change in use over time.

If a whole rectangle, e.g. 38 G 4 is set aside as a closed area, this may produce high opportunity costs or lead to higher efforts in other areas and therefore to more problems than there are today. If high costs for the fishermen can be avoided or if the problem of dependence on specific areas can be solved, it is probably that some closed or seasonally closed areas for nature conservation purposes will be accepted from fishermen's side.

Problems of fisheries management and protected areas as a fisheries management instrument

From an economic viewpoint the main problem of fisheries management is the lack of clear property rights in a very short-term management system. The following table illustrates the different types of property right systems.

Table 1: Property institutions (Stevenson 1991)

Property Institutions

	1	2	3	
			Open Access	
	Private Property	Common Property	Limited User	Unlimited User
Group Limitation	One Person	Members Only	Members Only	Open to Everyone
Extractions Limitation	Extraction Limited By individual Decision	Extractions Limited By Rules	Extraction Unlimited	Extraction Unlimited

There is no real difference between Common Property and Sole Ownership. In the past many scientists saw Common Property as to be equal to Open Access. But we know that clear rules within community-based-management systems avoid overexploitation and destruction of habitats. Additionally fishermen were forced to obey the rules within the social framework of the group.

Under the current fisheries management system within the EU, which is based on a one year quota system, fishermen are not able to calculate long-term revenues. After a decision by the Council of Ministers within the EU, they get fishing rights for the following year or they have a right to fish on an overall quota within a country. Forced by this system they have to fish as much as they can or have to press politicians to avoid lowering of individual quotas.

Another reason why fishermen are forced to work against strict recovery programs or closure of fishing grounds are high costs of these actions. At the moment catching costs are high because of low stocks and longer trips to avoid closed areas would also be cost intensive. If there is no opportunity to cover these costs, fishermen will disagree with every new programme. They will then see nature conservation measures as direct threat to their business and will fear bankruptcy.

One of the goals of the current project was to answer the question of how long-term fisheries management could work, and how fishermen can be given a perspective considering recovery programs and protected areas. The results show that if fishermen are able survive a period of lower catches due to stock recovery programmes (e.g. with public aid) expecting gains of higher catch opportunities after the stock recovery they may be in favour of recovery programs in the future.

An additional question addressed by the project concerned the advantages and disadvantages of closed areas from a fisheries management perspective and what the economic results of closure for nature conservation. Table 2 shows a few possible gains and costs of protected areas from a stock management perspective.

Table 2: Examples of possible gains and losses of MPAs

Possible gains	***Possible losses***
Protection of old, fertile females	In some cases great areas are necessary
Conservation of habitats for reproduction and areas for juveniles	Fishing effort increase outside the MPA
Spill over effect – individuals move out of the MPA which leads to higher catches outside	High costs for enforcement and control

These are only some of the arguments from the discussion (for more details see Bender *et al.* 2003). It seems clear regarding these different arguments that the creation of MPAs is not sufficient for the recovery of stocks. For the Baltic Sea project it could be concluded that it seems more helpful to use adaptive management with protection of spawning grounds and areas with a high density of juveniles. For cod these areas vary annually, which could mean that every year different areas have be

closed or protected. A small area in the Bornholm deep is protected during the spawning season, but presently this is not a successful measure to protect the cod stocks.

To solve the overuse of the cod stocks we need a different approach. The Federal Research Centre on Fisheries analysed the introduction of a more selective trawl net to avoid bycatch of juveniles. The outcome of these model calculation was that fishermen face five years of losses before they can land a lot higher catches than before the introduction of the selective net (for more details see Döring 2003). But fishermen will not be able to avoid bankruptcy during this five year period of losses. Therefore we need a recovery programme which covers these losses and a programme which leads to a fleet capacity in line with the available resources.

From this perspective protected areas can only be seen as an additional instrument. Some area closure may help to protect spawning grounds (like for some areas at the coast of Ruegen island), avoid bycatch of juveniles or protect old, big fertile females. But it is clear that MPAs cannot be seen as the only instrument to solve the problems of low stocks in the Baltic Sea, apart from closing the entire Baltic.

Protected areas from a nature conservation perspective

From a nature conservation perspective it is not sufficient to introduce a more selective trawl net to avoid negative effects on species and ecosystems. It is necessary to set aside some areas purely for nature conservation purposes. But the consequence fishermen will be losses because of closures of certain fisheries or bans of specific fishing methods (sometimes the most efficient fishing method) Nevertheless, in the long run it seems possible that

- a recovery programme may make more fish available to the fishery and
- the idea of labelling 'fresh fish from a Marine Protected Area' may also help get a higher price for fish.

From a stock management perspective clear property rights in particular areas for groups of fishermen can lead to a sustainable use system (so called community-based-management systems). Hence, one measure could be to give a defined group of fishermen clearer property rights on areas. They can develop rules for fishing effort and fishing techniques within the area in close negotiation with the authorities. In the long run this may lead to a system where fishermen control themselves and are able to limit fishing effort.

Recommendations and conclusions

Within the Baltic Sea project the following recommendations and conclusions have been drawn:

- The recovery of stocks (in the Baltic especially cod) is one of the most needed actions

- This means to switch from a short-term to a long-term management (clearer property rights as one precondition e.g. community development quota (see Holland 2000) and therefore recovery programs with an idea how to cover the losses for some years
- Protected areas cannot be the only management instrument
- Protection of habitats and species is needed
- in the Baltic Sea only few direct conflicts of trawl fishing in sensitive habitats exist
- But the bycatch of birds and marine mammals is in some areas very problematic
- This can be improved with a more adaptive management (e.g. season closures, flexible area closure)
- Labelling of certain fisheries may help to create a market with higher prices

The last point is an idea to help fishermen in areas with regulations for fishing gear to create a special market for their products. Because of the potentially higher costs for fishing methods which avoid high bycatch, fishermen are against the ban of the most efficient gear types. They will stay in direct competition with the other fishermen who are allowed to use the more efficient gear type. But this fear for high losses is quite understandable. Table 3 shows the present situation of German fishermen in the southern Baltic Sea region.

Table 3: Revenues and costs of German fishing vessels in the Baltic Sea (Döring 2004, translated)

Revenues and costs	**Vessels Mecklenburg-Vorpommern in €**	**Vessels Schleswig-Holstein in €**
Revenues	84.323	186.923
Total revenues	84.323	186.923
Variable costs (e.g. labour) includes: fuel costs	**29.610** 7.543	**88.577** 30.418
Fix costs includes: depreciation interest	**34.441** 9.915 1.240	**69.801** 19.486 7.992
Total costs	64.051	158.538
Profit	20.272	28.565

With a profit of a little more than €20.000, no real long-term perspective for any enterprise exists. The low costs for depreciation and interest show that there were no greater investments over the last decade. The average age of vessels is over 30 years. Without a clear economic perspective most of today's fishing companies will leave the business in 10 to 20 years. Table 4 illustrates the situation after a recovery of the cod stock.

Table 4: Revenues and costs in model calculation for investments in longlines after a recovery program (Döring 2004, translated)

Revenues and costs	**in €**
Revenues	168.600
Total revenues	168.600
Variable costs (e.g. labour) Includes: fuel costs	**29.610** 7.543
Fix costs Includes: depreciation and interest	**81.116** 57.830
Total costs	110.720
Profit	57.880

One idea in the ongoing discussion on sustainable fisheries is the change to a more selective fishing practice (to avoid bycatch of juveniles) which avoids damage to the seabed. Long lines fulfil both of these requirements but produce a high bycatch of some marine birds. Nevertheless, there is presently no chance for introduction because of low catches (because of low stocks) and higher costs (because of high labour costs). But if it is possible after a recovery program to realise higher catches (the table assumes a doubling) then a change in fishing practice seems an alternative. Under such a scenario the future could be one of sustainable use of fish stocks and the preservation of habitats.

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Figure 1: Fishing effort (hours) with trawl nets in 2002 (Döring, 2004)

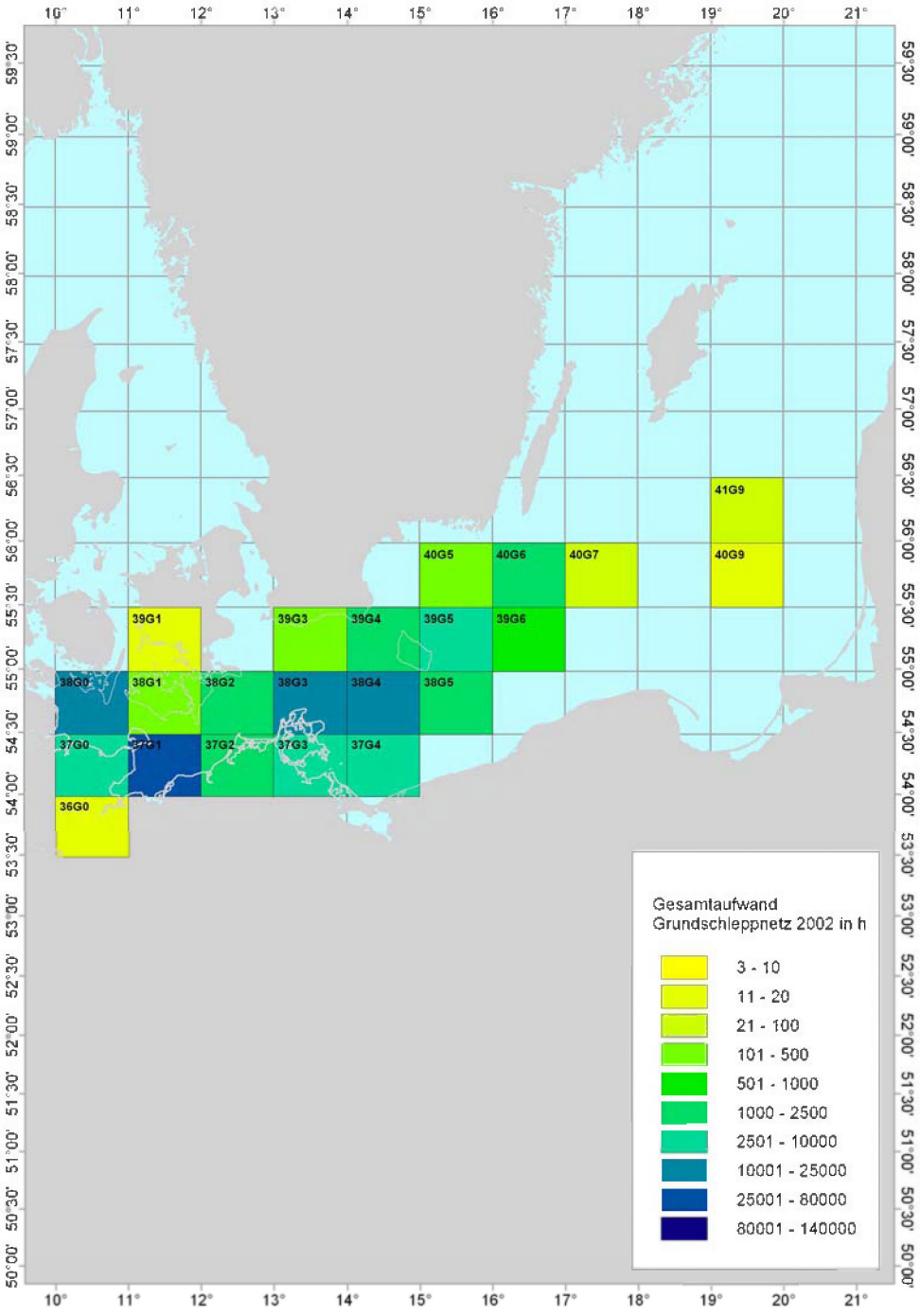
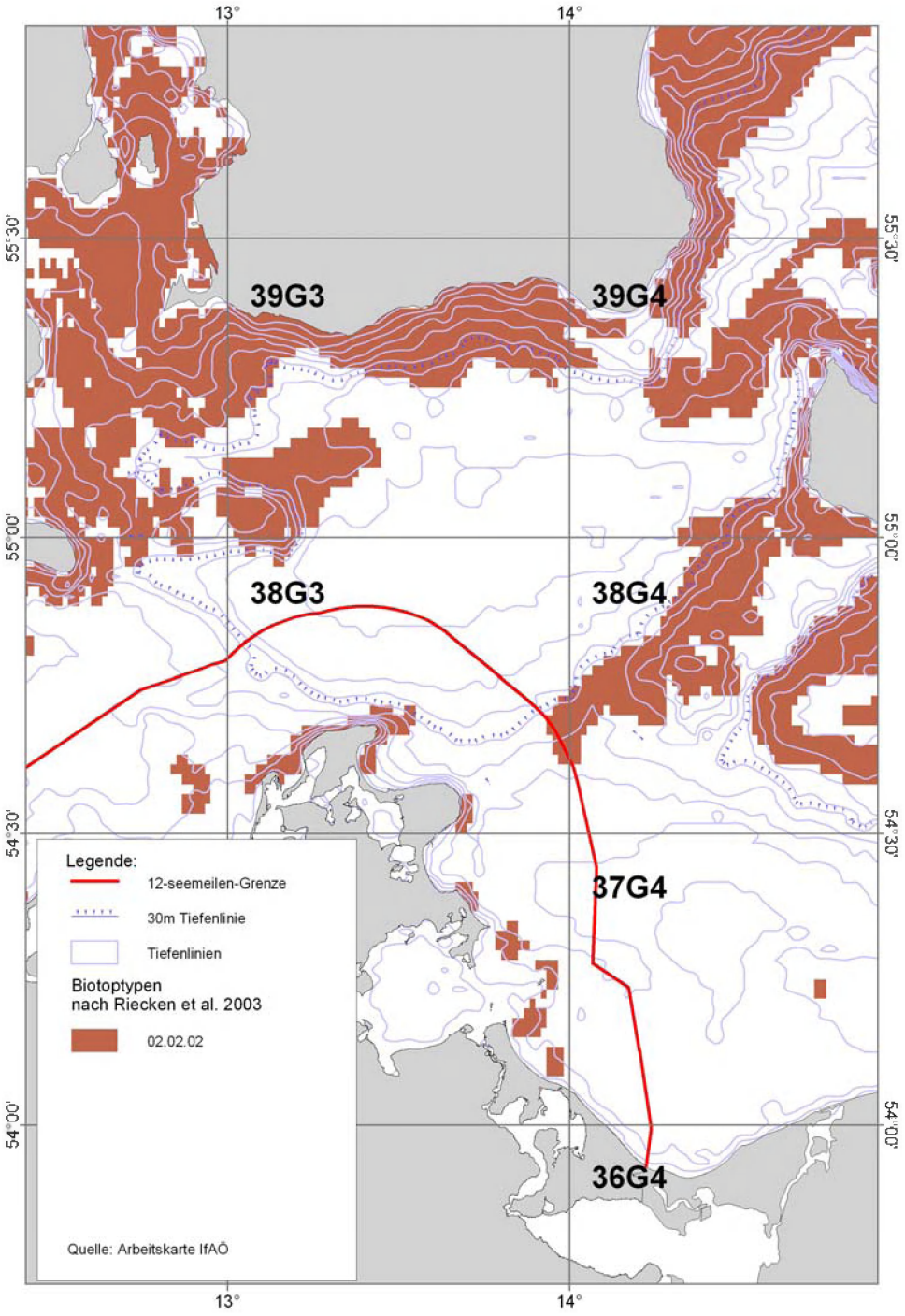


Figure 2: Sensitive habitats in the area north of the island of Ruegen and statistical areas with fishing data (Döring 2004)



3.3 ADDITIONAL CONTIRBUTIONS

3.3.1 The Offshore Toolbox. Implementing Marine Protected Areas in the North-East Atlantic Offshore: Seamounts – A Case Study

Stefanie Schmidt, WWF Germany & OASIS

Marine Protected Areas (MPAs) are widely recognised as valuable tools for the conservation and sustainable management of ecosystems and related human activities. There is however, very little experience of identifying, establishing and managing activities in offshore MPAs, and no supporting practical guidelines to assist with these tasks in the Northeast Atlantic. WWF are working on the development of a set of tools in order to address this gap and are carrying out the work using seamounts as a case study.

The "Offshore Toolbox", is being developed in conjunction with the OASIS project (Oceanic Seamounts – An Integrated Study[8]), which has as one of its principle objectives, the description of seamount ecosystems, following interdisciplinary studies of two seamounts in European waters.

A second objective of the project is to integrate the scientific information and use it to help formulate management measures for the conservation of the natural features of these two seamounts. The Offshore Toolbox will provide the guidance necessary to carry out this second stage of the work.

The Offshore Toolbox has three main parts. There is a general introduction to MPAs with a particular focus on seamounts and offshore MPAs. This is followed by an overview of the existing legal framework, options and obligations under which offshore MPAs can be designated in the Northeast Atlantic. The final section covers the issues of site selection, planning and management, based on experiences with seamounts and existing or proposed offshore MPAs.

[8] The OASIS project is funded by the European Union under its 5th Framework Programme. Contract No. EVK3-CT-20 02-00073-OASIS

3.3.2 Marine Protected Areas in the Dutch sector of the North Sea

Meike Baretta, Seas At Risk, The North Sea Foundation, Utrecht, The Netherlands.

This presentation gave an overview of present situation regarding MPAs in the Netherlands, the potential for MPAs in the Dutch part of the North Sea, and changes needed in management regime.

There are two MPAs in the territorial sea of the Netherlands: the "Voordelta" and the "North Sea coastal zone", both of which have been designated EU Habitat and Bird Special Protection Area and Special Area of Conservation since 2000/2001. However, despite the designation there is no specific management in place. Instead activities are managed on a sectoral basis and without regard to cumulative effects. Shell extraction, beach nourishment, shrimp fisheries, shellfish fisheries, laying of cables and pipelines, and land reclamation continue much as before and, as a result, the natural value of these areas is deteriorating and, in some cases, may be lost forever.

In response to these issues, Seas at Risk has developed some proposals for MPAs in the North Sea. In deciding on the location of a potential Marine Protected Area, a number of questions were addressed.
Firstly, what types of habitat and species are protected under international and European law? Secondly, which of those habitat and species occur in the North Sea, or should be expected to be present, or have been present in the North Sea? Lastly, where can they be found in considerable numbers? (NB. Species such as turtles, humpback whales or other species which stray into the area were excluded).
We took into consideration that for the sake of enforcement, it is practical to draw straight lines in delimitation of these MPAs and along the coast, we followed the coastal zone (see Figures below). Contrary to the German situation, it should be noted that there has been no specific research to draw precise boundaries for these MPAs and that the scientific data gathered was sometimes scattered or less detailed than desirable.

A Special Sea reserve is planned in the Voordelta as compensation for the land reclamation for the Rotterdam Area. This has been approved by the European Commission, but the precise management regime has still to be decided.

Boundaries of a potential Dogger Bank MPA have been drawn to link up with the German part of it, which doesn't apply to the Borkumer rif. On the Dutch side the boulders that make it worthy of protection have all been removed by overzealous fishermen and therefore it is too late to safeguard that habitat.
Lastly, the Policy Paper on Spatial Planning is worth mentioning, because it includes these areas. In these areas the regime of the Habitat directive art 6 sub 2-4 applies

requiring appropriate assessment of new activities. This is a positive step, considering the preliminary status of these areas. On the other hand existing uses can continue so, for example, parts of a future MPA have already been designated for marine aggregate extraction. If a use is expanding or intensifying, it is considered to be a new use, thus falling under the stricter regime.

A number of questions arise. It seems that while Member States are designating MPAs, they are giving little consideration to the overarching goal of the *Natura 2000* network. Another issue is the fact that the economic costs and benefits are not being calculated. While this may not be essential to the designation process it will help the process if all stakeholders have a clear picture of the likely implications. This is particularly true when the final decision is likely to be politically motivated and therefore assisted by a cost-benefit analysis.

Last but not least, legislation to effectively protect MPAs is not available in all countries. This is the case in the Netherlands where the approach is to provide protection through policy guidance rather than specific legislation. A shift from sectoral approach towards the application of the ecosystem approach to the management of all human activities is also needed in the Netherlands. In order to determine the boundaries for safe harvesting from the ecosystem all functions need to be considered jointly and cumulative effects need to be taken into account, while working transparently. Management effectiveness of MPAs should therefore be high on the agenda of considerations by the European Commission and Member States.

Figure 1: Present situation with MPAs in the Netherlands

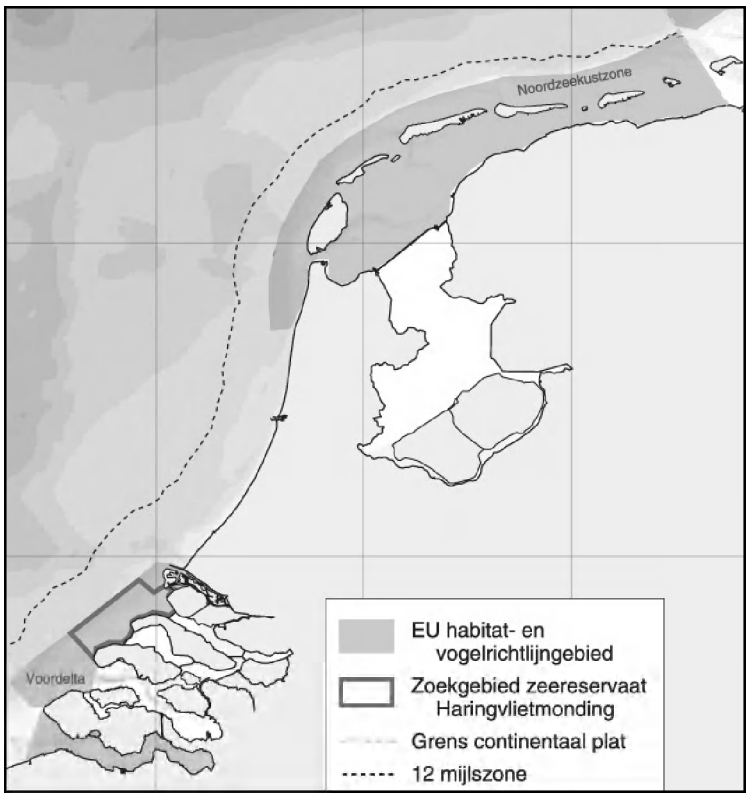
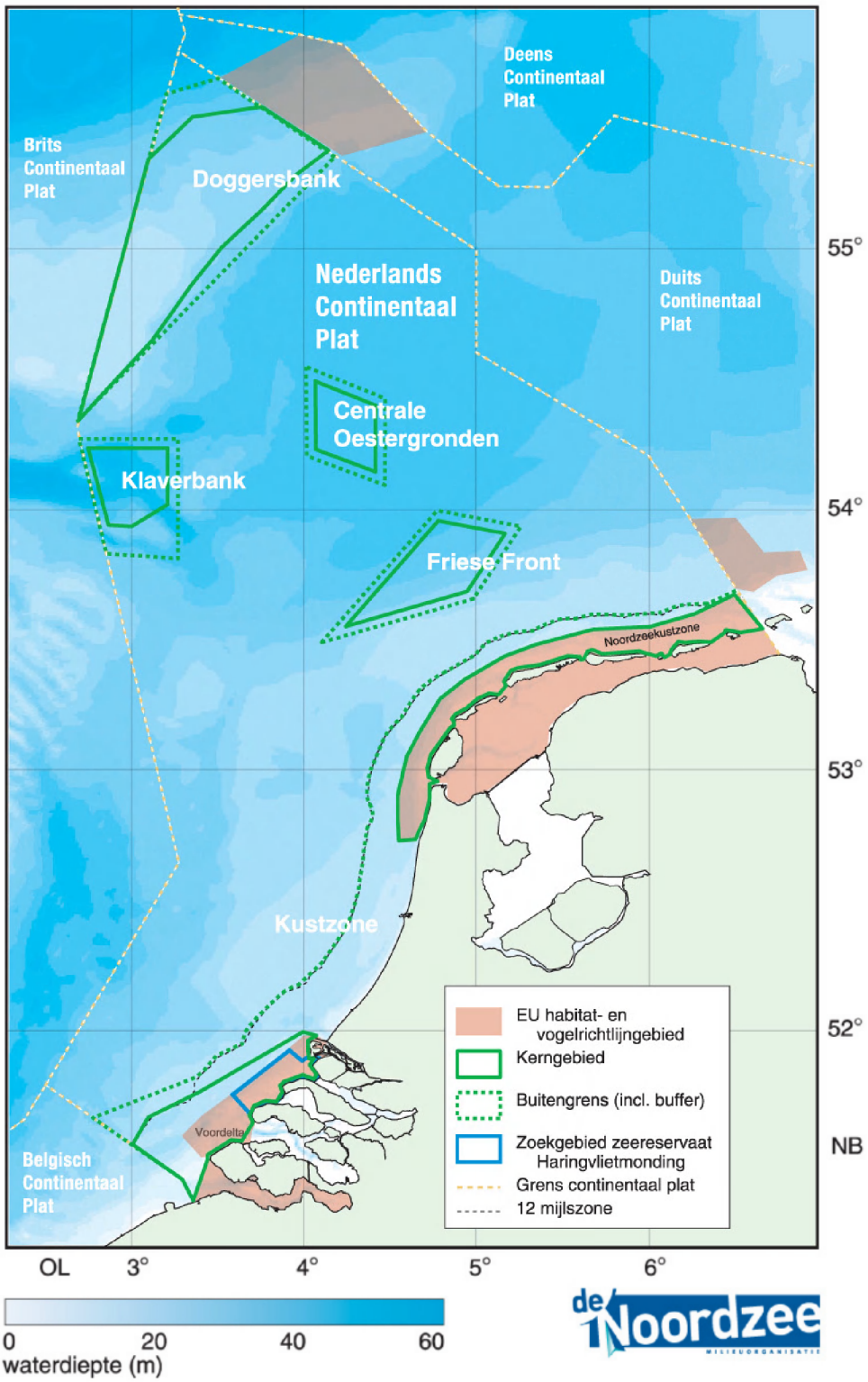


Figure 2: Potential MPAs in the Netherlands



3.4 DISCUSSION AFTER PAPERS ON ECONOMIC ISSUES IN RELATION TO FISHERIES AND MPAs

Economic assessments of the benefits to fisheries from MPAs are still in their infancy. Nevertheless such studies are recognised as being valuable as they are a way of including the some of the effects of human behaviour in benefit/cost analyses.

The following issues were raised during this discussion session

1. The need to look at the bigger picture rather than MPAs in isolation
2. The need to be clear about the role of the MPA and what it is being compared to in any benefit/cost analysis
3. The need to question the data on which the analysis is based e.g. from sites where restrictions are not properly enforced
4. The need to be aware of short and long-term issues
5. Financial support for fishermen whose activities may be restricted by MPAs

In considering the bigger picture it was clear that any assessment of benefits and costs needs to be set into the context of what is happening within and immediately outside the area, as well as at an international level. The economics of fisheries in Europe is not only linked to competition for resources between Member States within the European Fisheries Zone but also much further field, for example through third party agreements.

The economists approach is most often to examine costs and benefits relative to an ideal situation (e.g. perfect management). Given the current status of many fisheries it may be expedient to take a different approach and make comparisons with the existing situation. In such circumstances, MPAs which benefit fisheries are perhaps a logical step towards solving some of the problems of fisheries management. Another scenario was that if fisheries management was successful there may be less argument for setting up "no-take zones" to benefit fisheries (although such an option might be considered to be an integral part of the successful management regime).

When carrying out any assessment of the economic costs and benefits of MPAs and "no-take zones" it is essential to factor in how effectively the regulations are being enforced and the different patterns of management (e.g. seasonal closures, specific gear restrictions). The importance of this was illustrated with reference to fisheries restrictions in the southern Baltic. The data suggest that the MPA was not having a particularly beneficial effect (in this case for cod) however further discussions revealed that the area was not permanently closed to the fishery so fishermen concentrated their fishing around the boundary of the area and went into it in the autumn. The view expressed was that it was still worth protecting such area as it was the primary spawning area and would act as a refuge for cod which are concentrated in the region for much of the year.

With regard to the data on which assessments are based, it is clear that the advice of fisheries scientists is only one element that is considered when decisions are made about levels of fishing activity. Any economic models should therefore take account of the fact that the resulting management actions may not have a totally scientific basis.

In determining likely effects, costs and benefits associated with biological factors which are not associated with the fishing activity should also be considered. In the Baltic for example, the inflow of oxygen rich water from the North Sea is critical to the development of fish eggs and therefore likely to have a far more significant effect on fish stock recruitment that a MPA closed to fishing. The natural variation in fish stocks both in the short-term and the long-term are additional essential consideration in any discussion of economic costs and benefits.

The market could possible be used to guide the fishery and recovery of depleted stocks but this will not take into account effects on the structure of the fishery. For example, the herring fishery in the North Sea collapsed in the late 1970s, resulting in the closure of this fishery. Since then stocks have recovered, but because of changing consumer preferences, effort on this fishery is still low. Such "market" collapses may also result in small scale, community based fisheries closing as only larger operations, that could ride the fluctuations (say over a 10 year period) being able to operate as a viable business.

The opportunities for compensation or alternative income to tide fishermen over a period of restricted or closed fisheries also need to be considered in any economic modelling. Ideas discussed included the possibility of getting some financial support by developing something similar to the definition of 'Less Favoured Areas' by the EU, which are linked to financial support for activities in terrestrial areas. There may also be some possibilities for financial support through EC Structural Funds. However, at the moment, there are no plans within the EC for any broad or large-scale compensation package for fisheries. It is also the case that in a time of budget cuts and demands linked to the recent expansion of the EU, the scope and future of the Structural Fund is not clear. Other possibilities for financial support are loans and variable payback schemes.

Consumers are another force for change and are being encouraged to be more environmentally conscious in their choices of fish. A number of organisations have produced "Good Fish Guides" to raise public awareness of the issues and help guide choice towards more environmentally friendly decisions when purchasing fish.

4 LEGAL ASPECTS OF MARINE PROTECTED AREAS AND FISHERIES

4.1 Fishing management in the Exclusive Economic Zone (EEZ) of the Federal Republic of Germany

Kyrill -A. Schwarz; Göttingen University, Germany

Introduction

The restrictions or management of commercial fishing required by Article 38, paragraph (1), No. 3 of the Federal Nature Conservation Act <BNatSchG> is a complex issue whose legal management – as rightly confirmed by recent literature[9] – not only poses a number of thorny legal issues, but also requires the consideration of various legal spheres, both under Community law and under national law. Leaving aside the requirements of international law (which must be taken into account but which will not be addressed here - particularly the Convention on the Law of the Sea and the Convention on Biological Diversity) an analysis of the relationship between provisions under Community law and national regulations is also of pivotal importance. This relationship is the central touchstone for the implementation of obligations under secondary law relating to environmental legislation, but which may also clash with the allocation of competencies under Community law, insofar as implementation by the national legislator or rule maker (in the case of § 38, paragraph 3 of the Federal Nature Conservation Act <BNatSchG>) affects an area of competence to which the Member States are denied access. The decisive legal question that must be answered concerns the relationship between the provisions under Article 174 ff of the EC Treaty relating to environmental protection, whereby the general view is that the Community has only alternative/competing competence[10], and the provisions of the Common Fisheries Policy within the meaning of Article 32 ff. of the EC Treaty, whereby the widely-held (though not compelling) view is that the Community has comprehensive, sole responsibility[11].

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* This manuscript was submitted at an Expert Workshop on Marine Protectes Areas an Fisheries, held at the International Academy für Nature Conservation, Isle of Vilm, Germany on June, 30th. Contact-Adress of the Author: kyrillschwarz@web.de

9 As such, cf. also: *Gellermann*, in Landmann/Rohmer, Umweltrecht IV (status: 40th supplement, 2003), § 38 BNatSchG, marginal no. 17; *Priebe*, in: Grabitz/Hilf, EUV/EGV (status: 21st supplement, 2003), Art. 32 EC Treaty, marginal no. 38 a.E.

10 In this respect, cf. in the literature: *Geiger*, EUV/EGV, 3rd edition, 2000, Art. 175 marginal no. 6 ff.; *Herrmann*, in: NVwZ 2002, page 1168, 1169; *Himmelmann*, EG-Umweltrecht und nationale Gestaltungsspielräume, 1997, page 83 ff.; *Kotulla*, in: EuR 2001, page 522, 528 f.; *Oppermann*, Europarecht, 2nd edition, 1999, marginal no. 2018; *Scherer/Heselhaus*, Umweltrecht, in: Dauses (editors), Handbuch des EU-Wirtschaftsrechts, (status: 12th supplement, 2003), O marginal no. 102.

11 Disputed, but as here: *Booß*, in Rengeling, Handbuch zum europäischen und deutschen Umweltrecht, EuDUR II, 2nd sub-volume, 2nd edition, 2003, § 85 marginal no. 15; *ditto*., in: Grabitz/Hilf, EUV/EGV (status: 21st supplement, 2003), Art. 32 EC Treaty, marginal no. 36; *Fischer*, in: Grabitz/Hilf, EUV/EGV old volume I, (status: 14th supplement, 1999), acc. to Art. 47 marginal no. 7, 9;

If restrictions or management of fisheries in protected marine areas are considered to be measures directly affecting the scope of the Common Fisheries Policy, then this *prima facie* poses the question as to whether the standardisation of partial or full usage restrictions by the national legislator and rule maker to meet obligations under secondary law - namely, implementing the Habitats Directive (Directive 92/43/EEC) and the Birds Directive (Directive 79/409/EEC) - may also constitute a violation of primary Community law when the subject of regulation is outside the competence of the Member States and, as such, the corresponding national provisions are in effect blocked. In any case, it would appear to be difficult to reconcile with the Community legal system if primary Community law were to prohibit the duties imposed upon the Member States due to an obligation under secondary law. In this respect, it is also worth bearing in mind that the notion of EU bodies being called upon to implement and execute a measure addressed to the Member States is incompatible with Article 249, paragraph (3) of the EU Treaty.

The following highlights just how problematic this issue is: Recent legal acts by the Community appear to suggest that the Commission is working on the assumption that measures relating to marine environmental protection fall under the definition of the Common Fisheries Policy, and are therefore evidently outside the competence of the Member States. Admittedly, the Commission – apart from placing certain deep-water corals in the North Sea and the Atlantic under protection – does not appear to be pursuing a clear line either: In particular, the strategy for incorporating environmental concerns into the Common Fisheries Policy[12] at the very least suggests certain doubts as to the Community's sole competence in this area, when on the subject of protecting natural habitats etc. it states: "By June 2004 at the latest, the Member States must designate special protection areas *and specify corresponding conservation measures* (…)."[13] As such, this coincides with an until today widely held view that the Member States are prevented from adopting the required fishing restrictions needed in order to ensure the effective protection of marine "Natura 200 areas"[14] by virtue of the Community's sole competence.

Hix, in: Schwarze, EU-Kommentar, 2000, Art. 37 EC Treaty, marginal no. 25; *Korte/van Rijn*, in: Groeben/Thiesing/Ehlermann, EUV/EGV, 5th edition, 1997, Art. 43 EC Treaty, marginal no. 36; an alternative view is expressed in: *Booß*, in: Grabitz/Hilf, EUV/EGV (status: 21st supplement, 2003), Art. 37 EC Treaty, marginal no. 37; *Kopp*, in: Streinz, EUV/EGV, 2003, Art. 37 EC Treaty, marginal no. 21 f.; *Mögele*, Agrarrecht, in: Dauses (editors), Handbuch des EU-Wirtschaftsrechts, (status: 12th supplement, 2003), G marginal no. 27; *Thiele*, in: Calliess/Ruffert, EUV/EGV, 2nd edition, 2002, Art. 37 EC Treaty, marginal no. 11. Cf. furthermore the case-law of the European Court of Justice (ECJ), Cases 3, 4 and 6/76, collection 1976, 1279 ff.; Case 804/79, collection 1981, 1045 ff. In this respect, cf. also the communication from the Commission to the Council and European Parliament dated 2 October 2002 ("*Towards a strategy to protect and to conserve the marine environment*"), COM (2002) 539

[12] Website http://europa.eu.int/scadplus/leg/de/lvb/120894.htm

[13] Emphasis added by the author.

[14] Also according to *Booß*, in Rengeling, Handbuch zum europäischen und deutschen Umweltrecht, EuDUR II, 2nd sub-volume, 2nd edition, 2003, § 85 marginal no. 15; *Hix*, in: Schwarze, EU-Kommentar, 2000, Art. 37 EC Treaty, marginal no. 25; *Korte/van Rijn*, in: Groeben/Thiesing/Ehlermann, EUV/EGV, 5th edition, 1997, Art. 43 EC Treaty, marginal no. 36.

Guidelines for restrictions of fishing under Community law

The answer to the previous question vis-à-vis the decisive legal regime therefore demands an in-depth analysis of those areas of the law primarily affected. Based on the – now undisputed – assumption[15], that both the Habitats Directive and the Birds Directive also apply in the Exclusive Economic Zone and that therefore, the Community legal regime must also be implemented in national law, one must consider which peculiarities must be taken into account regarding implementation in the fisheries sector, which is required under Community law but has not been adequately practised in the past[16] .

The Common Fisheries Policy

Content

The Common Fisheries Policy, as part of the Common Agricultural Policy under Article 32 ff. of the EC Treaty, has since evolved into an autonomous Community policy[17]. At the present time, the content of the Common Fisheries Policy (CFP) is primarily determined by Council Regulation (EC) No. 2371/2002 of 20 December 2002 on the conservation and sustainable exploitation of fisheries resources under the Common Fisheries Policy[18], which replaces Council Regulation (EEC) No. 3760/92 of 20 December 1992 establishing a Community system for fisheries and aquaculture[19].

There are also regulations restricting fishing effort and controlling fishing effort in certain regions, and also relating to certain fishery resources[20]. Particularly with regard to ecological considerations, expressed primarily in recitals 3[21], 4[22], 10[23], 23[24]

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15 Essentially in case law: High Court of Justice CO/1336/1999 (extracts translated into German in: NuR 2001, page 19 ff.); more on this also in: *Czybulka*, in: NuR 2001, page 19 (23 ff.); *ditto/Kersandt*, Rechtsvorschriften, rechtliche Instrumentarien und zuständige Körperschaften mit Relevanz für marine Schutzgebiete ("Marine Protected Areas"/MPAs) in der Ausschließlichen Wirtschaftszone (AWZ) und auf Hoher See des OSPAR-Konventionsgebietes, 2000, page 28; *Gellermann*, in Landmann/Rohmer, Umweltrecht IV (status: 40th supplement, 2003), § 38 BNatSchG, marginal no. 8; *Jarass*, (footnote 5), page 41 ff.; *Lagoni*, in: NuR 2002, page 121 (132); *Leising*, in: ZfU 2002, page 187 (214); *Weiß*, (footnote 6), page 23 f.

16 Cf. also only those rulings by the European Court of Justice affecting Germany on the inadequate implementation of the Birds Directive, Case 412/85, NuR 1987, page 53 f.; Case 345/92, NuR 1993, 505 f. on the one hand and Case C-83/97, collection 1997, -7191 ff.; Case C-71/99, NVwZ 2002, 461 ff. on the inadequate implementation of the Habitats Directive on the other.

17 *Fischer*, in: Grabitz/Hilf, EUV/EGV old volume I, (status: 14th supplement, 1999), acc. to Art. 47 marginal no. 1.

18 OJ L 358/59.

19 OJ L 389/1.

20 For further details cf. *Hix*, in: Schwarze, EU-Kommentar, 2000, Art. 34 EC Treaty, marginal no. 67.

21 *"Given that many fish stocks continue to decline, the Common Fisheries Policy should be improved to ensure the long-term viability of the fisheries sector through sustainable exploitation of living aquatic resources based on sound scientific advice and on the precautionary approach, which is based on the same consideration as the precautionary principle referred to in Article 174 of the Treaty".*

22 *"The objective of the Common Fisheries Policy should therefore be to provide for sustainable exploitation of living aquatic resources and of aquaculture in the context of sustainable development, taking account of the environmental, economic and social aspects in a balanced manner".*

and 29[25] of Council Regulation (EC) No. 2371/2002 of 20 December 2002, it becomes clear that the Common Fisheries Policy has a number of specific peculiarities compared with the Common Agricultural Policy, and that these must be considered individually. Viewed objectively[26], the Common Fisheries Policy encompasses both commercial[27] fishing and the trade in fishery products, whereby central importance is attributed to the definition of fishery. Responsibility not only extends to fish in a biological sense, but also to all living marine resources[28]. For this reason, other life forms such as corals and sponges also fall under the scope of marine resources meriting protection[29].

Delimitation of the Common Fisheries Policy from other competencies

The aforementioned inclusion of ecological aspects in the Common Fisheries Policy in turn poses the question as to the delimitation of environmental protection policy from fisheries policy. The relationship between the Common Fisheries Policy and other legal foundations cannot be definitively determined on the basis of general rules; instead, the respective regulatory content of the individual contractual provisions must be taken into account[30]. Generally speaking, the Community's authority over environmental policy is equal to its competencies under the Common Fisheries Policy[31]. Considering the Common Fisheries Policy and special legal acts

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23 *"Provision should be made for Member States or the Commission to adopt emergency measures in the event of a serious threat to the conservation of resources, or to the marine eco-system resulting from fishing activities, and requiring their immediate action".*

24 *"The Commission should be able to take immediate preventive measures if there is evidence of a risk that fishing activities could lead to a serious threat to conservation of living aquatic resources".*

25 *"It is necessary and appropriate for the achievement of the basic objective of the sustainable exploitation of living aquatic resources to lay down rules on the conservation and exploitation of those resources. In accordance with the principle of proportionality as set out in Article 5 of the Treaty, this Regulation does not go beyond what is necessary in order to achieve that objective".*

26 For further details on this and the following, cf. *Fischer*, in: Grabitz/Hilf, EUV/EGV old volume I, (status: 14th supplement, 1999), acc. to Art. 47 marginal no. 13.

27 This objective restriction is derived from a comparison between Council Regulation (EEC) No. 3760/92 of 20 December 1992 and Basic Regulation No. 2371/2002 dated 20 December 2002: Whereas Article 2, clause 2 of the former obligated Member States to ensure "that non-commercial activities do not jeopardize the conservation and management of resources covered by the common fisheries policy", Article 3, letter c) of the new Basic Regulation defines fishing vessels as any vessel equipped for commercial exploitation of living aquatic resources. As such, with a view to Article 38 I, no. 3 of the Federal Nature Conservation Act <BNatSchG>, there are no restrictions on regulatory authority in the field of non-commercial fishing. Where the literature (*Fischer*, in: Grabitz/Hilf, EUV/EGV old volume I, (status: 14th supplement, 1999), acc. to Art. 47 marginal no. 13) represents the view that even non-commercial fishing activities, such as sports fishing, could pose a threat to resources and should therefore fall under the scope of the Common Fisheries Policy as well, this explicitly refers to the legal status prior to 2002, and therefore can no longer be justified.

28 Cf. only: *Booß*, (footnote 3), § 85 marginal no. 16.

29 This was recently highlighted by Commission Regulation (EC) No. 1475/2003 dated 20 August 2003 on the protection of deep-water coral reefs from the effects of trawling in an area north-west of Scotland, Official Journal (OJ) L 211/14.

30 *Priebe*, in: Grabitz/Hilf, EUV/EGV (status: 21st supplement, 2003), Art. 32 EU Treaty marginal no. 19.

31 Cf. in this respect only *Kahl*, in: Streinz, EUV/EGV, 2003, Art. 175 EC Treaty, marginal no. 70 with further references

which, in effective, likewise pursue ecological objectives, within the framework of delimiting competencies between Article 32 ff. of the EU Treaty on the one hand and Article 174 ff of the EU Treaty on the other, this poses the question of dual competence, or the delimitation of existing and potentially alternative or cumulative competencies. As a general principle, however, it is inadmissible for a legal instrument to be founded on two competency standards in this way[32]. Instead, according to the jurisdiction of the European Court of Justice, the required decision on delimitation is more a question of objective and hence legally verifiable circumstances[33], so that the authorisation basis is not at the disposal of the Community legislator. On the other hand, if one measure is capable of pursuing several objectives, it is necessary to determine the authorisation basis required by the predominant purpose or component[34]. If a measure pursues the purposes of different Community policies, in order to determine the specific relevant legal basis, it is necessary to determine whether the measure in question refers primarily to one action area, or whether both aspects are equally essential[35]. According to the case law, this means that a Community act which pursues two purposes or contains two components, one of which is main or predominant, whilst the other is of subordinate importance only, the legal instrument should only be founded on the legal basis required by the main or predominant purpose or component[36]. Exceptionally, in cases where a legal instrument pursues several objectives simultaneously which are indissociably linked to one another without one being secondary and indirect in relation to the other, such a legal instrument may be founded on the various corresponding legal bases[37]. Particularly with a view to the case law outlined here, which considers the main focal points of the respective legal act, it becomes clear that this is essentially a matter of judgement, and is only justiciable to a limited extent.

The growing significance of ecological aspects in the Common Fisheries Policy

As already indicated, ecological considerations play an increasingly significant role in the formulation of the Common Fisheries Policy. In a fundamental manner, both the Sixth Environment Action Programme of the European Community of 22 July 2002[38]

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32 As such, cf. also: *Herrmann*, in: NVwZ 2002, page 1168, 1170; *Scherer/Heselhaus*, (footnote 2), O marginal no. 80, *Schwarz*, in: ZEuS 2003, 51, 67.

33 ECJ, Case C-62/88, collection 1990, 1527 (1549 f.); Case C-155/91, collection 1993, 939 (966); Case C-84/94, collection 1996, 5755 (5802 f.); Case C-269/97, collection 2000, 2257 (2290); Case C-36/98, collection 2001, 779 (829 f.); most recently also: expert report 2/00 dated 6 December 2001, collection 2001, I-9717 (9757).

34 ECJ, Case C-62/88, collection 1990, 1527 (1549 f.); Case C-36/98, collection 2001, 779 (829 f.); expert report 2/00 dated 6 December 2001, collection 2001, I-9717 (9757 f.); most recently also: ECJ, Case C-336/00, collection 2002, I-7699, marginal no. 30.

35 *Kahl*, in: Streinz, EUV/EGV, 2003, Art. 175 EC Treaty, marginal no. 73 with further references; *Priebe*, in: Grabitz/Hilf, EUV/EGV (status: 21st supplement, 2003), Art. 32 EC Treaty, marginal no. 18.

36 ECJ, Case C-155/91, collection 1993, I-939, marginal no. 19 and 21; Case C-42/97, collection 1999, I-869, marginal no. 39 f.; Case C-36/98, collection 2001, I-779, marginal no. 59; Case C-336/00, collection 2002, I-7699, marginal no. 31.

37 ECJ, Case C-300/89, collection 1991, I-2867, marginal nos. 13 and 17; most recently confirmed by ECJ, Case C-336/00, collection 2002, I-7699, marginal no. 31.

38 Resolution No. 1600/2002/EEC by the European Parliament and the Council, OJ L 242/1.

and the Communication from the Commission to the Council and the European Parliament of 2 October 2002 ("*Towards a strategy to protect and to conserve the marine environment*")[39] emphasise the complete incorporation of environmental concerns into all areas of Community policy as a contribution towards sustainable development. However, the inclusion of ecological considerations is demonstrated even more clearly by two more recent Community acts and a draft by the Commission for a Council Regulation:

Firstly, based on the standardised application of the precautionary principle in Article 2, paragraph (2) of Basic Regulation No. 2371/2002 dated 20 December 2002 to minimise the impacts of fishing on the marine ecosystems, a Commission Regulation dated 20 August 2003 banned the use of bottom-trawling in a specific area[40] in order to protect coral reefs there, as natural habitats of Community interest, from irreversible damage. This Regulation, founded on the provisions of the Common Fisheries Policy, is therefore an example of the interaction between secondary law obligations under the Birds and Habitats Directives on the one hand, and the Common Fisheries Policy standardised as primary law on the other. On closer examination, the Regulation evidently assumes "shared competence" between the EU and the Member States for this scenario. As indicated by the 4th recital[41] , the latter are responsible for the designation of habitat areas, whilst the Council is responsible for the corresponding protection measures *in concreto*[42]. In the case in question, the Commission utilised the powers granted to it under Article 7 of the Basic Regulation No. 2371/2002 of 20 December 2002 to adopt emergency measures. In effect, this means that the Member States may only be responsible for designation, whilst any measure that actually restricts or prohibits fishing would appear to fall under the sole competence of the Community. In this respect, it is also worth considering that the Commission is intending to make the provisional regulations adopted to protect the "Darwin Mounds"[43] permanent, by amending Regulation (EC) No. 850/98 for the conservation of fishery resources through technical measures for the protection of juveniles of marine organisms[44]. As this has yet to occur, the Commission has extended the validity of Regulation (EC) No. 1475/2003 until 22 August 2004 with Regulation (EC) No. 263/2004 dated 16 February 2004[45] .

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39 COM (2002) 539 final.

40 Commission Regulation (EC) No. 1475/2003 dated 20 August 2003 on the protection of deep-water coral reefs from the effects of trawling in an area north-west of Scotland, Official Journal (OJ) L 211/14.

41 *"In response to its obligations under the aforementioned Directive* (namely, the Habitats Directive), *the United Kingdom has formally expressed its intention to designate the "Darwin Mounds" as a special area of conservation and thereby grant them special protection".*

42 This is derived from the 7th recital: *" … Significant fishing activities using bottom-trawls would continue in the area concerned over the coming months, before any measures could be adopted by the Council ..."*

43 OJ L 125 dated 27 April 1998, page 1

44 Proposal for a Council Regulation amending Regulation (EC) No. 850/98 regarding the protection of deep-water coral reefs from the effects of trawling in an area north west of Scotland, COM (2003) 519.

45 OJ L 46/11 dated 17 February 2004.

Similar in terms of its regulatory system is the proposal by the Commission for a Council Regulation laying down measures concerning incidental catches of cetaceans in fisheries dated 24 July 2003[46]. The cetaceans to be protected under the Habitats Directive are protected by a variety of measures based on the precautionary principle, designed to minimise the impacts of fishery on marine ecosystems. Although no protective measures have been adopted in protected marine areas in the Exclusive Economic Zone in this respect, this nevertheless represents a conflict situation between the Common Fisheries Policy and environmental protection policy, which is characterised by the fact that according to the preamble, the Community has taken the explicit view that the national measures adopted to date have proven inadequate and believes that for this reason, measures must be taken at Community level. Incidentally, this opportunity of enforcing obligations under secondary law by way of "executive fiat" could well undermine the legal system of the EC Treaty which – as illustrated by various proceedings in the past – assumes that the inadequate implementation of secondary law by a Member State may justify contractual violation proceedings. The assumption of a power of "executive fiat" in fact evades the special proceedings under Article 226 of the EC Treaty, designed to give Member States the opportunity of meeting their obligations under Community law[47] by way of an out-of-court preliminary procedure.

The most recent example of this is the Commission Proposal of 3 February 2004[48] to prohibit the use of bottom trawling in the waters around the Azores, Madeira and the Canaries, aimed at averting the risk of permanent and irreparable damage to deep-sea habitats. Unlike the Regulation to protect the "Darwin Mounds", in these areas, bottom-trawling is already prohibited by earlier Community acts; the provision is merely intended to perpetuate the limit-period ban, whilst at the same time serving the purpose of maritime environmental protection. Here too, permanent protection is to be achieved via an amendment to Regulation (EC) No. 850/98 for the conservation of fishery resources through technical measures for the protection of juveniles of marine organisms[49] .

Overall, against this background, it appears questionable that the concept of the Common Fisheries Policy in fact only encompasses measures with a fishing industry-related purpose. Rather, the above explanations suggest that a modified interpretation is acceptable, insofar as environmentally protective measures that impact the scope of the Common Fisheries Policy should also be subsumed under this title. With the recognisable intention of implementing habitat protection in the Common Fisheries Policy, it can be assumed that regulations regarding possible territorial restrictions and certain fishing techniques in particular can only be adopted at Community law level.

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46 COM (2003) 451 final.

47 Regarding this central protective function of the preliminary procedure for protecting the rights of the affected State, cf. only: *Schwarze*, in: Schwarze, EU-Kommentar, 2000, Art. 226 EC Treaty, marginal no. 14 with further references.

48 COM (2004) 58 final.

49 OJ L 125 dated 27 April 1998, page 1.

Blocking effect of Community law versus national regulations

In particular, the aforementioned growing significance of environmental protection-related considerations associated with the Common Fisheries Policy compel us to analyse the extent to which these environmental considerations, which according to Article 175 of the EC Treaty are themselves subject to competing competence between the Community and Member States, may have a blocking effect on Member State regulations as a result of "upzoning" in the Common Fisheries Policy. The same is also true of the question as to whether application of the cross-sectional clause on environmental policy in Article 6 of the EC Treaty results in the exclusion of Member State regulations in the interpretation of the Common Fisheries Policy pursuant to Article 3, letter e in conjunction with Article 32 ff. of the EC Treaty[50].

The issue here revolves around the problem of whether the Common Fisheries Policy's demand for "indivisibility" – also and in particular with regard to recent jurisdiction by the European Court of Justice[51] – can actually be upheld in future. This appears doubtful at best[52], because in its verdict on a nullity suit by the European Parliament concerning a Regulation on the protection of the Community's forests against atmospheric pollution[53] and a Regulation on the protection of the Community's forests against fire[54], the European Court of Justice ruled that Article 175 of the EC Treaty was the applicable legal basis, explaining: "*…In this Case, although the measures referred to in the regulations may have certain positive repercussions on the functioning of agriculture, those indirect consequences are incidental to the primary aim of the Community schemes for the protection of forests, which are intended to ensure that the natural heritage represented by forest ecosystems is conserved and turned to account and does not merely consider their utility to agriculture…*"[55] However, since according to the case-law of the ECJ there is no fundamental precedence of one policy over another for the Common Agricultural Policy – and this is equally applicable to the Common Fisheries Policy – in relation to Community environmental policy , the provisions of Article 174 ff. of the EC Treaty do not in fact affect the Community's competencies afforded to it by other provisions in the Treaty. Regarding the provisions of Article 174 ff. of the EC Treaty, these are more concerned with legal foundations for specific measures in the environmental sector[56].

Against this background, regarding the relationship between the Community's sole competence in the field of the Common Fisheries Policy and competing competence in the field of environmental protection, the following assumptions are initially

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50 For general information on the problem of unilateral action relating to Article 6 of the EC Treaty, cf. also *Kahl*, in: Streinz, EUV/EGV, 2003, Art. 6 EC Treaty, marginal no. 30 ff.

51 ECJ, joined Cases C-164/97 and C-165/97, collection 1999, I-1139 ff.

52 As found in the literature: *Jans/von der Heide*, Europäisches Umweltrecht, 2003, page 68 f.

53 Regulation 307/97 of 17 February 1997, OJ L 51/9.

54 Regulation 308/97 of 17 February 1997, OJ L 51/11.

55 ECJ, joined Cases C-164/97 and C-165/97, collection 1999, I-1139 marginal no. 16.

56 Regarding the above cf. also ECJ, joined Cases C-164/97 and C-165/97, collection 1999, I-1139 marginal no. 15 with reference to ECJ, Case C-405/92, collection 1993, I-6166 (6175).

decisive: Whilst the general view is that Article 37 of the EC Treaty is the decisive legal foundation[57] for agro-environmental measures, recourse should be made to Article 175 of the EC Treaty for legal acts designed to tackle general environmental problems and nature conservation in general, even if they essentially concern the policy-making area outlined in Article 32 ff. of the EC Treaty. Consequently, even measures aimed solely at ecological objectives, detached from economic purposes, must not be founded on Article 37 of the EC Treaty but should instead be founded on the provisions of Article 175 of the EC Treaty as their legal basis[58].

The possibility of residual interpretational scope at national level

Residual interpretational scope in the case of sole competence

Although the above account – whilst not undisputed – suggests that the Community has sole competence on the Common Fisheries Policy, this does not necessarily mean that the Community can adopt every nature conservation-related legal provision under the "mantle" of the fisheries policy, so to speak. Even if one concedes to the Community the (undisputable) power to environmentalise its policies – an obligation also derived from the cross-sectional clause in Article 6 of the EC Treaty – this does not necessarily mean that all measures actually of an environmental nature but which are integrated into an area of sole competence as a sub-topic, should themselves become part of said sole competence and the associated legal impacts.

The aforementioned environmentalisation of the fisheries policy is not disputed; rather, one must ask whether ultimately, a definitive blocking effect occurs at the implementation level of this environmentalisation. The decisive question, then, is whether the Community, influenced by Article 6 of the EC Treaty, also has the option of regulating fishery-related matters by virtue of considerations relating primarily to nature conservation. Although recourse may be made to the jurisdiction of the European Court of Justice in this respect – at least the expert report on the Cartagena Protocol[59] – more recently, there seems to have been a tendency to interpret the matter of sole competencies of the Community (specifically, sole competence pursuant to Article 133 of the EC Treaty) rather restrictively, so as to avoid stripping the provisions of the EC Treaty on environmental protection of their material content; in this way, however, a consideration of the relevant secondary law may also offer an opportunity for unilateral action:

Although Regulation (EC) No. 2371/2002 of 20 December 2002 on the conservation and sustainable exploitation of fisheries resources under the Common Fisheries Policy reportedly founds its justification on Article 37 of the EC Treaty in particular, thereby creating the impression of sole competence, we have to face the fact that, as

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57 ECJ, Case C-336/00, collection 2002, I-7699, marginal no. 35 f.; consensus in the literature: *Priebe*, in: Grabitz/Hilf, EUV/EGV (status: 21st supplement, 2003), Art. 32 EC Treaty, marginal no. 37.

58 Cf. also in this respect *Priebe*, in: Grabitz/Hilf, EUV/EGV (status: 21st supplement, 2003), Art. 32 EC Treaty, marginal no. 38.

59 Expert report 2/00 dated 6 December 2001, collection 2001, I-9717 ff.

secondary Community law, the Regulation itself in Articles 8, 9 and 10 affords Member States the option of adopting measures to minimise the effects of fishing on marine ecosystems under certain conditions and within the context of a special consultation procedure. As such, the secondary law standardises explicit powers for unilateral measures within the framework of the Common Fisheries Policy. As such – disregarding the presupposed sole competence of the Community for fisheries policy – we can, in effect, assume a shared competence between the Community and the Member States for nature conservation measures in the field of fisheries policy.

If this finding is transferred to the relationship between the Common Fisheries Policy and implementation of the Habitats Directive, a similar system becomes apparent: Here too, it can be assumed that the obligation to implement the Habitats Directive in the Exclusive Economic Zone contains an explicit order to take action in the field of marine environmental protection with direct impacts on fisheries policy. As such, this makes allowance for the protection of Member State competencies in the field of environmental protection, but it also means that although recourse to the cross-sectional clause in Article 6 of the EC Treaty may have the effect of broadening the Community's competencies[60], nevertheless, the Member States are not prevented from adopting provisions in the field of marine environmental protection which may also impact the area of fishing, due to the absence of a blocking effect in the field of environmental protection.

Residual interpretational scope in the case of competing competence

Finally, a completely different approach may be derived by adopting an alternative interpretation of the Common Fisheries Policy, which does not view this as the sole competence of the Community[61], but instead assumes a restricted competing competence[62].

Whereas with sole competence, all responsibilities must be transferred to the Community and the Member States are no longer authorised to exercise their own jurisdiction, thereby leading to the complete loss of competence by the Member States[63], even if and insofar as the Community bodies have yet to adopt any corresponding secondary law, the situation is somewhat different in the case of

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60 On this problem cf. also: *Callies*, in: Calliess/Ruffert, EUV/EGV, 2nd edition, 2002, Art. 6 EC Treaty, marginal no. 18; *Kahl*, in: Streinz, EUV/EGV, 2003, Art. 6 EC Treaty, marginal no. 23.

61 Accordingly, only the conservation of fish stocks pursuant to Article 102 of the 1972 Act of Accession is classed under the sole competence of the Community; in this respect, cf. also ECJ, Cases 3, 4 and 6/76, collection 1976, 1279 ff.; Case 804/79, collection 1981, 1045 ff.

62 In the more recent literature for example: *Booß*, in: Grabitz/Hilf, EUV/EGV (status: 21st supplement, 2003), Art. 37 EC Treaty, marginal no. 37; *Kopp*, in: Streinz, EUV/EGV, 2003, Art. 37 EC Treaty, marginal no. 21 f.; *Mögele*, Agrarrecht, in: Dauses (editors), Handbuch des EU-Wirtschaftsrechts, (status: 12th supplement, 2003), G marginal no. 27; *Thiele*, in: Calliess/Ruffert, EUV/EGV, 2nd edition, 2002, Art. 37 EC Treaty, marginal no. 11.

63 As such, cf. only *Callies*, in: Calliess/Ruffert, EUV/EGV, 2nd edition, 2002, Art. 5 EC Treaty, marginal no. 27; *Hix*, in: Schwarze, EU-Kommentar, 2000, Art. 37 EC Treaty, marginal no. 25; *Vedder*, in: Grabitz/Hilf, EUV/EGV (status: 21st supplement., 2003), Art. 133 EC Treaty, marginal no. 10 (but there focussing on the recognised sole competence of the Community for the common trade policy).

competing competence. Here the Member States are – theoretically – authorised to exercise jurisdiction, provided the Community has not made (definitive) use of its regulatory competence[64]. Admittedly, we cannot overlook the fact that the Community has already adopted far-reaching provisions in this particular field, so that ultimately, the Community's competence for the Common Fisheries Policy, whilst not "*compétence exclusive par nature*", is nevertheless "*compétence par exercise*" [65]. The absence of independent provisions by the Member States is therefore solely attributable to the fact that the Community has already exercised its regulatory authority to a large extent, rather than to the fact that only the Community is authorised to do so.

Hence, this blocking effect exists only insofar as the Member States are not entitled to adopt their own measures by virtue of an explicit authorisation, including an authorisation under secondary law[66]. The scope of the Member States' residual competencies therefore depends on the extent to which harmonisation has been achieved and pursued by the Community. In conclusion, however, the Member States are not merely authorised, but rather obliged, to establish the Habitats regime in the Exclusive Economic Zone. Against this background, the implementation of secondary law obligations under the Habitats Directive is not a case of the Member States becoming active as trustees of a common interest in the face of inactivity on the part of the Community legislator[67], but is rather – in the absence of a corresponding definitive provision by the Community in this specific area – an original competence on the part of the Member States. Nor is this opposed by the fact that the ECJ, in its ruling on sea fishing conservation measures[68], has taken the view that Member States are only authorised to adopt provisional rulings and must furthermore adhere to a specific consultation procedure. The restriction of fishing in the Exclusive Economic Zone does not prejudice a specific future ruling under Community law; instead, it is a question of meeting an obligation under secondary law. This approach, therefore, is also in keeping with the trend evident in the ECJ's more recent jurisdiction[69] of placing greater emphasis on the competencies of the Member States.

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64 *Thiele*, in: Calliess/Ruffert, EUV/EGV, 2nd edition, 2002, Art. 37 EC Treaty, marginal no. 21.

65 Cf. also *Mögele*, Agrarrecht, in: Dauses (editors), Handbuch des EU-Wirtschaftsrechts, (status: 12th supplement 2003), G marginal no. 28; *Thiele*, in: Calliess/Ruffert, EUV/EGV, 2nd edition 2002, Article 37 EC Treaty, marginal no. 21.

66 *Hix*, in: Schwarze, EU-Kommentar, 2000, Art. 37 EC Treaty, marginal no. 25.

67 Cf. as such only with further references from the case-law of the ECJ *Hix*, in: Schwarze, EU-Kommentar, 2000, Art. 37 EC Treaty, marginal no. 25; *Thiele*, in: Calliess/Ruffert, EUV/EGV, 2nd edition 2002, Article 37 EC Treaty, marginal no. 23; *Vedder*, in: Grabitz/Hilf, EUV/EGV (status: 21st supplement, 2003), Art. 133 EC Treaty, marginal no. 11.

68 Case 804/79, collection 1981, 1045 (1074).

69 In particular, the ECJ ruling, joined Cases C-164/97 and C-165/97, collection 1999, I-1139 ff.

Summary

In consequence, the growing environmentalisation of the fisheries policy has its legal basis in the integration clause contained in Article 6 of the EC Treaty. However, this does not mean that all environmentally relevant fishery problems should be regulated solely by the Community. Article 6 of the EC Treaty aims to improve environmental protection by integrating environment-related considerations into other policy-making areas, without at the same time restricting the Member States' competence to adopt environmentally protective measures. This is particularly true when considering the fact that the Member States are actually obliged, under secondary law, to adopt provisions to this effect. The EU fisheries legislation, therefore, does not prevent the Member States from adopting the necessary national provisions to create protected marine areas.

4.2 Relationship of the Common Fisheries Policy and the Habitats and Birds Directives

John Clorley, Marine and Coastal Natura 2000 Policy Advisor, Department for Environment, Food and Rural Affairs, UK.

Summary
The establishment of *Natura 2000* sites in the marine environment will increasingly lead to a requirement to manage threats to these sites caused by fishery activities. The new Common Fisheries Policy (CFP) Regulation brings enhanced powers for the management of these activities. The closure of the Darwin Mounds to bottom trawling provides an excellent example of how this Regulation can be used to protect habitats listed on Annex I to the Habitats Directive. Despite this, there is still some legal uncertainty about whether these provisions are the only method by which fishery activities, including those by other Member States' vessels, can be managed for nature conservation purposes, or whether Member States themselves have the power to take action outside the framework of the CFP.

Abstract
Both the Birds[70] and Habitats[71] Directives require Member States to locate, assess and then select "important" areas. These areas – Special Areas of Conservation under the Habitats Directive and the Special Protection Areas for the Birds Directive - will form the *Natura 2000* network. While the selection of these sites is now well established for terrestrial and coastal areas, it is only in recent years that Member States have accepted that the Directives apply to areas outside territorial waters. Member States obligations with respect to these sites are outlined in Article 4 and Article 6 of the Birds and Habitats Directives respectively.

One of the main sectors affecting *Natura 2000* sites is considered to be fishery activities. It is generally considered that the Common Fisheries Policy (CFP) governs the management of fishery activities. Although the CFP has been used to regulate environmental activities not directly related to the conservation of fish stocks (e.g. sand eel closure in the North Sea for birds[72] – high seas drift net ban for cetaceans and turtles[73]), the new CFP Regulation[74] gives more prominence to the management of the marine eco-system. Under Article 2(1) of the Regulation it is stated that *"the Community shall apply the precautionary approach in taking measures designed to protect and conserve living aquatic resources, to provide for their sustainable*

[70] Council Directive 79/409/EEC
[71] Council Directive 92/43/EEC
[72] Council Regulation 850/98 Art 29a
[73] Council Regulation 894/97, as amended by Council Regulation 1239/98
[74] Council Regulation 2371/2002

exploitation and to minimise the impact of fishing activities on marine eco-systems" with the aim of ensuring *"exploitation of living aquatic resources that provides sustainable economic, environmental and social conditions".* Article 4(2)(g)(iv), permits the Community to "*approve specific technical measures to reduce the impact of fishing activities on marine eco-systems and non target species*."

Furthermore, Article 7 provides that, if there is evidence of a serious threat to the conservation of living aquatic resources, or to the marine eco-system resulting from fishing activities and requiring immediate action, the Commission, at the substantiated request of a Member State or on its own initiative, may decide on emergency measures for a maximum period of six months, which can be extended. Article 8 allows Member States to introduce emergency measures to prevent a "serious and unforeseen threat" to the conservation of living aquatic resources, or to the marine eco-system" where "undue delay would result in damage that would be difficult to repair" and Article 9 allows Member States to take "non-discriminatory measures" within 12 miles for the conservation of marine eco-systems.

The new CFP Regulation can be regarded as a step forward in acknowledging the impact fishing practices can have on the marine eco-system, and has teeth to apply measures to control those damaging activities. In addition, the powers available under the CFP are not only tied to *Natura 2000* sites, or any other type of Marine Protected Area, but can be applied wherever required.

The introduction of emergency and, later, permanent measures, on the Darwin Mounds provides a useful example of how the new Regulation can work to protect the marine environment. The Darwin Mounds are a unique collection of sand and cold-water coral mounds, located in the Rockall Trough at a depth of c. 1000m about 185km northwest of Scotland. The importance of the Darwin Mounds was demonstrated in 1998 by Southampton Oceanography Centre engaged in an environmental survey of the deep-waters to the north and west of Scotland, carried out on behalf of the Atlantic Frontiers Environmental Network, a consortium of oil companies with interests in these areas.

The Darwin Mounds consists of some hundreds of mounds in two main areas referred to as Darwin Mounds East and Darwin Mounds West. Other mounds are scattered at lower densities in nearby areas. The mounds are comprised of dome-shaped mounds of sand, termed "sand volcanoes," with living stands of *Lophelia pertusa* and other cold-water corals at their summits. Each of the mounds is approximately 100m in diameter and 5m high, and distinguished by a "tail" feature.

Studies of the reef have shown what would appear to be the damaging effect of demersal trawling on the area. High frequency sonar observations show seabed lineations and parallel scar marks, some tracking directly through the Mounds, most likely caused by demersal trawl nets. Damage was visible across about half of the Darwin Mounds East. Other studies have recorded smashed and damaged coral over significant areas of the Mounds and with a subsequent reduction in biodiversity.

Reefs are listed on Annex I to the Habitats Directive, and in view of the importance of the Darwin Mounds, the UK Government took steps to designate the area as a candidate Special Area of Conservation under the Habitats Directive. In advance of designation, the Government decided to make an approach to the Commission for the introduction of fishery restrictions to prevent further damage. In view of the fragile nature of the habitat, as well as pursuing a permanent prohibition on bottom trawling, the Government pressed for the introduction of emergency measures under Article 7 of the new CFP Regulation.

During the first part of 2003, the UK Government carried out a range of consultations with the Commission and those Member States who fisheries may be affected by any closure. These discussions were essential to ensure that the evidence base for any closure was accepted by the main parties affected prior to presenting the formal request for closure to the Commission. Following these discussions, on the 24 July 2003, the UK made a formal approach to the Commission to use their emergency measures under Article 7. No objections were received from any Member State and on 22 August 2003 the Commission introduced emergency measures under article 7 to prohibit bottom trawling in the Darwin Mounds area for a 6-month period – the maximum permitted by Article 7. Soon after the introduction of these measures, the Commission developed draft Council Regulations for permanent measures. These draft Regulations were published on 11 September 2003. Permanent measures require the opinion of the European Parliament and decision by the Council of Ministers. This opinion was not expected before February 2004, and to cover any possible shortfall between the ending of the emergency measures and the introduction of permanent measures, in line with Article 7, the emergency regulations were extended on the 16 February for a further 6 months. The permanent Regulation[75] was agreed by the Agriculture and Fisheries Council of Ministers on 22 March and comes into force on 23 August 2004.

The Darwin Mounds case demonstrates that the new CFP Regulation can be an effective tool to preserve marine eco-systems in the offshore area from damage caused by fishing methods. Although the overall response time from the UK's consideration of the use of CFP emergency powers to the introduction of the Commission's Regulation was not rapid, this must be put in the context that this was one of the first uses of this new instrument, and it was in the interest of all parties that the use of the Regulation was not seen to fail at one of its first attempts.

However, despite the success in protecting the Darwin Mounds, the process raised questions over the reliance on an instrument designed for fisheries management, ultimately requiring the agreement of the Fisheries Council, and whether this was the appropriate mechanism to protect nature conservation interests in the marine environment. This then led to questions over how Member States could meet their obligations to conserve *Natura 2000* sites and whether these obligations in themselves could be considered to provide powers to manage fisheries, including those involving other member states' vessels.

[75] Council Regulation 602/2004

For this reason Member States sought the advice of the Commission. In advice provided to the Habitats Committee[76] in 2000, and 2004 the Commission indicated that only the Community is authorised to protect *Natura 2000* sites from fishing activities and that Member States do not have any powers to act unilaterally beyond their territorial waters to take measures for the conservation and management of marine resources which would apply to vessels registered in other Member States or non-member countries. However, if for any reason the Community does not act the Member State has to act since "the management of the common heritage is entrusted, for their respective territories, to the Member States."

So can Member States act, and if so, to what extent? There are counter arguments to the line that Member States have no (or very limited) powers to act to manage fishery activities that threaten marine nature conservation interests, especially *Natura 2000* sites. It has been argued that Member States' obligations to manage fishery activities to meet obligations under the Habitats Directive do not necessarily fall within the remit of fisheries management part of the Treaty[77], but under the environmental part of the Treaty[78]. If this was the case then Member States would be in a position to implement measures to protect sites from threatening fishery activities without the need for agreement at Community level[79]. It is clear however that the interaction between environment protection, fisheries management and Community competences raises a number of issues that require further clarification. This may be forthcoming in the guidance being prepared by the Commission with assistance from the EU marine Experts Group, but ultimately it may only be resolved in the European Court of Justice.

[76] The Committee set up under Article 20 of the Habitats Directive
[77] Article 37 of the EC Treaty
[78] Article 175 of the EC Treaty
[79] These arguments are covered in Owen D (2004*) Interaction between the EU Common Fisheries Policy and the Habitats and Birds Directive*; IEEP Policy Briefing. Institute for European Environmental Policy. London

4.3 Protecting marine SACs and SPAs from fishing activities: who has the power to impose restrictions?

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Introduction

This paper is based on a briefing written by Daniel Owen for the Institute for European Environmental Policy (IEEP). The briefing is entitled *Interaction Between the EU Common Fisheries Policy and the Habitats and Birds Directives*. It was published by IEEP in April 2004, and an electronic version is available at <www.ieep.org.uk>. **The material below is merely a summary from the briefing, and in some cases may be a simplification of the actual situation.**

Under the EC Habitats Directive and the EC Birds Directive, Member States have obligations to establish and manage special areas of conservation ("**SACs**") and special protection areas ("**SPAs**"). These obligations apply not just on land, but also in the marine environment. It is clear that the Directives apply in Member States' internal waters and territorial seas; it is becoming increasingly accepted that they also apply to the exclusive economic zone and the continental shelf.

Depending on the circumstances, a marine SAC or SPA may need to be protected from fishing activities. But who has the power to impose restrictions on fishing vessels? Is it the European Community ("**EC**") or is it the Member States?

Under the EC's common fisheries policy ("**CFP**"), the Member States' power to make rules for fisheries conservation has been transferred to the EC. This power rests exclusively with the EC, but some power has been delegated back to Member States. But does this necessarily mean that the EC has a power to deal with every aspect of a fishing vessel's activities?

This paper focuses on measures to restrict the activities of fishing vessels for the sole or primary purpose of nature conservation. It starts with an introduction to the concept of legal basis and moves on to consider the case law of the European Court of Justice ("**the Court**"), EC legislative practice under the CFP, and the scope for unilateral action by Member States under the CFP. In the final part of the paper measures outside the CFP are considered, and some conclusions are presented.

Introduction to legal basis

A measure adopted by a EC institution (a "**EC measure**"), such as a regulation or a directive, must have an appropriate legal basis. This basis must arise directly or indirectly from provisions of the Treaty establishing the European Community ("**the EC Treaty**"). The case law of the Court tells us that the choice of legal basis of a EC measure must rest on objective factors, including in particular the aim and content of the measure. If the measure has a twofold purpose (one predominant and one ancillary), the measure must be founded on the legal basis required by the predominant purpose.

The appropriate legal basis for EC measures adopted under the CFP is Article 37 EC. Thus a measure with the aim and content of fisheries conservation should be based on Article 37 EC. The appropriate legal basis for EC measures adopted under the EC's policy on the environment is Article 175 EC. Thus, in principle, a measure with the aim and content of environmental protection should be based on Article 175 EC. If the measure has a twofold purpose (fisheries conservation and environmental protection), we should be guided by the predominant purpose.

References below to a measure being based on a particular EC policy (e.g. the CFP or the EC's policy on the environment) or having such a policy as its legal basis should be construed as references to the appropriate provisions of the EC Treaty (e.g. Article 37 EC in respect of the CFP or Article 175 EC in respect of the EC's policy on the environment).

The situation is complicated by Article 6 EC, which requires environmental protection requirements to be integrated into the definition and implementation of the CFP. Article 6 EC justifies a degree of environmental protection purpose being covered by Article 37 EC. But can Article 6 EC justify a EC measure with the sole or primary purpose of nature conservation being based exclusively on Article 37 EC? Or does the influence of Article 6 EC only reach so far, after which point Article 175 EC must be used as the basis for the EC measure in question? It is necessary to look at the case law of the Court to see if it provides any answers. Notably, how has the Court's case law on legal basis been applied, in view of the influence of integration?

The case law of the Court

Three cases are considered here. In *Greece v Council* (Case C-62/88 [1990] ECR I-1527), one party argued that the common commercial policy ("**CCP**") was the appropriate legal basis for the measure in question, while the other argued that the measure should have been based on the EC's policy on the environment. In *Armand Mondiet* (Case C-405/92 [1993] ECR I-6133), the argument as to legal basis was between the CFP and the EC's policy on the environment. In *Austria v Huber* (Case C-336/00 [2002] ECR I-07699), the argument was between the common agricultural policy ("**CAP**") and the EC's policy on the environment.

In each case, the Court impliedly or expressly deemed environmental protection to be merely ancillary to the predominant purpose of, respectively, trade regulation (*Greece v Council*), fisheries conservation (*Armand Mondiet*) or agricultural production (*Austria v Huber*). As such, the Court impliedly or expressly allowed the ancillary environmental protection purpose by virtue of integration, rather than having to invoke the EC's policy on the environment as a legal basis.

What about when environmental protection is accepted by the Court as being the predominant purpose? In *Parliament v Council* (Joined cases C-164/97 & C-165/97 [1999] ECR I-1139), the argument as to legal basis was between the CAP and the EC's policy on the environment. The Court held that protection of forests was the predominant purpose of the measures in question, and that the measures should therefore be based on the EC's policy on the environment. But it arguable that the weighting given to the CAP was anyway rather low in this case, because (a) the threat to the forests in question did not come from agricultural practices and (b) the Court was unconvinced that trees and forests as a whole constitute "agricultural products" for the purposes of the CAP.

In *Biosafety Protocol* (Opinion 2/00 [2002] 1 CMLR 28), the Court was asked to rule on the appropriate legal basis for a Council measure concluding the Cartagena Protocol on Biosafety on behalf of the EC. The argument as to legal basis was between the CCP and the EC's policy on the environment. The Court was of the opinion that environmental protection was the predominant purpose of the measure in question and that, despite potential for the Protocol to affect trade, the measure should therefore be based on the EC's policy on the environment. This opinion clearly put the breaks on the influence of integration. But the Protocol affects transboundary movements in general, rather than trade exclusively. Therefore, the Court's opinion in *Biosafety Protocol* does not necessarily indicate what should happen where a measure aimed at protecting the environment affects fishing activities exclusively.

In conclusion, there is no case squarely on point to inform us whether Article 37 EC or Article 175 EC should be the appropriate legal basis for a EC measure that restricts the activities of fishing vessels for the sole or primary purpose of nature conservation. Furthermore, even if the Court were to find that the appropriate legal basis was Article 37 EC, should it automatically find that the EC has exclusive powers to adopt such restrictions? There is an argument that such powers should instead be shared between the EC and the Member States, albeit under the CFP.

Legislative practice under the CFP

Are there any EC regulations made under the CFP that are motivated at least in part by environmental protection? The answer is "yes". See for example some of the provisions of Council Regulation 2371/2002 ("**the Basic Regulation**"). More specifically, see for example Council Regulation 600/2004 (longlining and seabirds), Council Regulation 850/98 (Article 29a, regarding sandeel fishing) and Council Regulation 602/2004 (bottom trawling and *Lophelia*).

Let us assume that at least some of these specific measures have been adopted primarily or solely for the purposes of nature conservation. Yet actual adoption of such measures by the EC does not necessarily mean that they have been adopted using the appropriate legal basis. The ultimate arbiter of the appropriate legal basis for EC measures is the Court. Meanwhile, legislative practice by the EC should be seen as persuasive evidence of its power to act in this way, rather than as determinative of the issue.

Member State powers to act unilaterally under the CFP

Under the Basic Regulation, express powers for Member States are provided in Articles 8, 9 & 10. (See also Articles 45 & 46 of Council Regulation 850/98.) But, upon analysis, it can be seen that such powers are all limited in significant ways. These powers are unlikely to constitute a means for coastal Member States to fulfil their obligations under the Habitats and Birds Directives. As noted above, there is also an argument that powers to restrict the activities of fishing vessels for the primary or sole purpose of nature conservation should instead be shared between the EC and the Member States, albeit under the CFP.

Action outside the CFP

Let us assume, for the sake of argument, that EC measures restricting the activities of fishing vessels for the primary or sole purpose of nature conservation cannot lawfully be taken under the auspices of the CFP. In other words, let us assume that Article 37 EC is not the appropriate legal basis for such measures.

As such, a measure of this kind must instead be taken outside the CFP. In view of its focus on nature conservation, the aim and content of the measure would relate to environmental protection. In this field, the EC and the Member States share legislative jurisdiction. Who would be the most appropriate actor to adopt the measure? The Habitats and Birds Directives impose obligations on the Member States themselves. Therefore, where a measure was required to protect a specific SAC or SPA in a Member State's waters, it is arguable that the most suitable actor to adopt such a measure would be the Member State itself. In contrast, where a measure was required to protect a widely-distributed species from a threat arising from a widely-used fishing gear, it is arguable that the measure would be more appropriately taken by the EC (based on Article 175 EC).

Conclusions

Member States have obligations to manage marine SACs and SPAs. How should they act when faced with a threat posed by the activities of fishing vessels? Current case law of the Court does not clearly indicate whether Article 37 EC is an appropriate legal basis for measures restricting the activities of fishing vessels for the sole or primary purpose of nature conservation. Current EC legislative practice can

only be regarded as persuasive, rather than determinative, in this regard. Express powers of Member States to act under the Basic Regulation (or under Council Regulation 850/98) are unlikely to allow fulfilment of SAC and SPA management obligations.

If it were found that measures restricting the activities of fishing vessels for the primary or sole purpose of nature conservation could not be taken under the auspices of the CFP, those measures required by the Habitats and Birds Directives would instead need to be taken outside the CFP. Arguably, some such measures would be most appropriately adopted by the Member State itself. However, there are circumstances when action at the EC level founded on Article 175 EC may be more appropriate.

How could this matter come before the Court for a ruling? A new EC measure might be subject to (a) a challenge by a flag Member State (under Article 230 EC) or (b) a reference for a preliminary ruling (under Article 234 EC). A new Member State measure might be subject to (a) a reference for a preliminary ruling (under Article 234 EC) or (b) enforcement action by the Commission (under Article 226 EC). A Member State may be wary of the risk of incurring liability for harm caused to individuals by what may in due course be deemed a breach of EC law. Also, if significant displacement of fishing vessels were predicted as a response to a proliferation of measures to protect marine SACs and SPAs, action at the appropriate level would potentially be needed to address this.

4.4 DISCUSSION AFTER LEGAL PAPERS

The discussion centred on the role of the European Community (EC) and the Member States in adopting measures to restrict the activities of fishing vessels for the sole or primary purpose of nature conservation and, more specifically;

(a) the competence of the EC to adopt such measures to protect *Natura 2000* sites and
(b) the extent to which Member States could and should adopt such measures to protect these sites.

Secondary questions related to (a) whether any EC competence was exclusively under the Common Fisheries Policy (CFP) and if so, what powers under the CFP have been delegated back to Member States, and (b) whether there was any difference in the applicability of Article 37 EC (under the CFP) or Article 175 EC (under the EC's policy on the environment) as the guiding legislation under which to introduce regulation of activities of fishing vessels in *Natura 2000* sites.

Regarding the role of the EC, the Commission is working on the assumption that regulation of fishing vessels in *Natura 2000* sites should be done through the CFP. The Commission view is that once sites have been agreed through the appropriate regional biogeographic meeting, the targets defined, and the actions to be taken identified, if this includes fisheries then, at that time, the CFP provisions will determine the way to act. In most cases it will be EC action upon the request of Member States.

An alternative scenario might be for Member States to adopt regulation of fishing vessels to cover environmental matters if it is viewed as a shared competence under Article 175 EC or perhaps even under the CFP.

The question of how the EC and Member States might work together was also discussed. For example, while the Commission could adopt an emergency measure, based on Article 7 of the CFP's Basic Regulation (2371/2002) without the permission of the country concerned, such a measure might be overturned by the Fisheries Council.

The use of emergency measures (subsequently made permanent) to protect the Darwin Mounds from bottom trawling, was cited as one way to introduce fisheries regulations at *Natura 2000* sites. However, one issue of concern surrounding this approach, was that it makes it difficult to take a precautionary approach and to be pro-active with management provisions. There should also be more opportunity to extrapolate from the experience of other locations and scientific knowledge, which shows damage from particular fishing practices on certain habitats and species, without having to demonstrate this on the site where measures have been requested.

The debate over which legal avenue can be used to restrict the activities of fishing vessels for nature conservation purposes is complicated by the fact the Article 6 of the Treaty calls for the integration of environmental protection requirements into EC policy, including the CFP. There is some case law from the European Court of Justice relating to the extent to which integration allows the adoption of measure for environmental protection on the back of the CFP, Common Agricultural Policy (CAP) or Common Commercial Policy (CCP) but there is no case law, so far, that clearly indicates the appropriate legal basis for a EC measure regulating the activities of fishing vessels solely or primarily for nature conservation purposes.

The CFP's Basic Regulation refers to "living aquatic resources". The meaning of this broad term is open to interpretation. However this term is not used in the Treaty which instead includes an annex listing products covered by CAP/CFP. Participants commented that some nature conservation authorities of Member States would be unhappy with the view that the EC, by virtue of the CFP, has exclusive powers to regulate any fishing vessel activities affecting MPAs.

Whatever approach is taken, there is a need to find agreement between the various parties to make progress. A theoretical discussion over which legal avenue is appropriate emphasises the need for legal certainty. Experience relating to the introduction of fisheries controls in the Darwin Mounds (UK) shows that consultation and reaching consensus is complex. In this case the fishing vessels of only two countries were directly affected whereas in other cases there will undoubtedly be more. Consultation across international borders will therefore be essential and will undoubtedly be difficult.

5 ROUND TABLE SESSIONS

5.1 ROUND TABLE 1 - LEGAL ISSUES

Chair: Daniel Owen
Rapporteur: Michael Heugel

Participants: Meike Baretta, Thomas Borchers, Thomas Bosecke, John Clorley
Jan Willem Genuit, Anthony Grehan, Placido Hernandez-Aguilar, Michael Heugel, Bruno Hoffstadt, Astrid Langenberg, Thilo Maack, David Mallon, Stefanie Schmidt , Paul Vetter.

The scope of the roundtable discussion was limited in the following ways:

Maritime area in question: focus on Community waters
Marine protected areas in question: focus on *Natura 2000* sites (while taking into account OSPAR, HELCOM and Barcelona Convention site protection initiatives, as well as nationally important sites)
Fisheries in question: focus on fisheries by foreign-flagged vessels, i.e. vessels of Member State A in waters of Member State B, or vessels of a third country (e.g. Norway) in Community waters (but taking into account own-flag vessels as well).

Five questions were identified for discussion:

(1) What species are covered by the CFP?

(2) Who has the power to restrict the activities of fishing vessels for the sole or primary purpose of nature conservation?

(3) Application of the precautionary principle

(4) Are fishery activities "plans or projects" for the purposes of Article 6(3) of the Habitats Directive?

(5) Potential capacity constraints within the European Commission (when faced with numerous requests by coastal Member States for action to protect sites) [NB. Time constraints meant that the group did not discuss this question]

What species are covered by the CFP?
If all species of living plants and animals are covered by the CFP, the EC might seek to justify those CFP measures that protect species and habitats by arguing that it has a direct remit to conserve such species.

It was noted that the Basic Regulation (2371/2002), adopted under Article 37 EC, uses the broad term "living aquatic resources" (defined as available and accessible living marine aquatic species. . . ").

But several people considered that the question of what species are covered by the CFP should be answered by reference to the EC Treaty, notably products listed in Annex I of the EC Treaty (referred to in Article 32(2) EC).

Some people thought it was also important to think ahead to the proposed new Constitutional Treaty for the EU; Article 12 of this proposed treaty refers to "marine biological resources" in the context of the CFP. However, this instrument has not entered into force, and so should not form the basis for decisions on current issues.

There was some discussion on the implications of the term "resources". This term implies use of a species. The point was made that some uses of marine species are non-extractive (e.g. whale watching). It was also noted that (a) a species may have been used in the past, but may not be used in the present or future (or some other combination) and (b) a species may be used in one State but not in another State. The answer to whether a particular species is a "resource" may therefore vary in space and time.

It was suggested that some species may indirectly be "resources" for conservation of fish stocks. For example, reefs formed by *Lophelia* could be viewed as a "resource" that helps replenish fish stocks.

The question of whether inclusion of a species in Annex II of the Habitats Directive meant that such a species was not a "resource" was discussed. Some considered that such inclusion did not preclude the species from also being a "resource" for use.

Reference was made to the Convention on the Conservation and Management of Fishery Resources in the South-East Atlantic Ocean, which the EC approved in August 2002. That treaty uses a wide definition of the term "living marine resources" (though a narrower definition of the term "fishery resources"). The Convention on the Conservation of Antarctic Living Marine Resources also uses a wide definition of the term "living marine resources". But it was noted that the fact that the EC is a party to a treaty that uses a wide definition of the term "living marine resources" does not necessarily mean that a similar term in EC legislation should have a similar wide meaning.

Who has the power to restrict the activities of fishing vessels for the sole or primary purpose of nature conservation?

The options were summarised in the following table:

Option I: Action inside CFP	**Option 2: Action outside CFP**
EC has exclusive powers to make rules EC for fisheries conservation. Measures at EC level are based on Article 37 EC.	EC and Member States share the power to make rules for EP. Arguable that measures restricting the activities of fishing vessels for sole or primary purpose of nature conservation are EP measures. Therefore arguable that either EC or Member State(s) could adopt such measures, outside the CFP. Measures at EC level would be based on Article 175 EC.
EC can integrate environmental protection ("EP") by virtue of Article 6 EC.	
Options for the Member State to adopt EP measures :	
(a) Article 8 of Basic Regulation (b) Article 9 of Basic Regulation (c) Article 10 of Basic Regulation (questionable, because Article 10 does not refer expressly to marine ecosystem) (d) Article 45(2) of Council Regulation 850/98 (questionable, because Article 45(2) does not refer expressly to marine ecosystem) (e) Article 46(1) of Council Regulation 850/98 (questionable, because Article 46(1) does not refer expressly to marine ecosystem) (f) by arguing that power to adopt EP measures under CFP is shared between MS and EC (g) by arguing that power to adopt EP measures arises if EC fails to act sufficiently to protect the site in question	
Options for EC to adopt EP measures : (a) Article 7 of Basic Regulation (b) through the normal route of the Commission placing a legislative proposal before the Council (Article 4(2) of Basic Regulation)	

It was emphasised that, despite questions of who has the power to take measures, the goal is to restore or maintain the favourable conservation status of the *Natura 2000* sites. There are several important steps to be taken before the task of actually restricting the activities of fishing vessels needs to be addressed (notably identifying sites, identifying conservation objectives, identifying threats to such objectives from fishing vessel activities).

Ultimately, however, the Habitats Directive ("**HD**") and Birds Directive ("**BD**") do place obligations on Member States to take management measures to protect SP As and SACs. There was a suggestion that the provisions of the CFP's Basic Regulation (2371/2002), notably Articles 4(2), 7, 8,9 & 10, were the most appropriate way to manage the interaction between site management and fishing activities and that these routes should therefore be tested first to see if they can adequately deal with the protection of SPAs and SACs. However, others considered that the routes available under the Basic Regulation should not preclude Member States from acting outside the CFP(see "Option 2" above).

It was noted that a Member State can only act to the limits of its powers in order to protect SPAs and SACs. Under the CFP, Member States have transferred the power to make rules for fisheries conservation to the EC. The question is, after this transfer, what powers do the Member States have left to fulfil their duties under the Directives? Despite the transfer, does a power to restrict the activities of fishing vessels for the sole or primary purpose of nature conservation remain with the Member State?

This led to a brief discussion on the influence of integration (under Article 6 EC). It was noted that there must be some limits to the influence of integration (as indicated by the Court in *Biosafety Protocol*). It was also noted that integration is not a reason to remove from Member States the power to adopt nature conservation measures. If so, this in turn suggests that even if the EC, by virtue of its fisheries conservation powers plus integration, does have a power to adopt environmental protection ("**EP**") measures, the Member States may equally be left with a power to adopt EP measures.

There was some discussion about the letter from DG Environment to the Habitats Committee, dated 11 May 2004. Paragraph 13 of this letter implies that if the EC fails to take measures for the protection of a *Natura 2000* site, then the relevant Member State would be under a duty to act instead. Questions were raised about what constitutes a failure to take measures; in other words, at what point would the Member State become bound to take measures itself? In the case of failure by the EC, what measures should a Member State take in order to avoid censure by the Court? Emergency measures under Article 8 of the Basic Regulation have only a limited duration. After that, should the Member State at least restrict the activities of its own flag vessels (under Article 10 of the Basic Regulation). If so, might this raise reverse-discrimination arguments (i.e. discrimination against the Member State's own fishermen)? Would such action be sufficient in the eyes of the Court?

It was asked whether the Council could be taken to the Court if it failed to introduce measures needed to protect a *Natura 2000* site. It was suggested that an action against the Council might be brought by the Member State with the *Natura 2000* site in question.

The point was made that penalties for offences under domestic EP law are often less than for offences under fisheries law. Therefore, if adopting measures outside the CFP, Member States should be careful to ensure that their laws establish sufficiently severe penalties.

There was some discussion about the Dutch Voordelta case. In this case, the Dutch government is providing for the enhancement of an existing *Natura 2000* site in order to compensate for damage caused to another *Natura 2000* site by a port development. The Dutch government proposed to the Commission that one of the management measures for the enhanced site should be a prohibition on fishing in parts of the enhanced site; this prohibition would affect, *inter alia*, foreign-flagged vessels. The Commission accepted this, but did not specify a procedure for establishing the fisheries ban.

The advantages and disadvantages of some of the options in the table above were discussed:

Member State adopting EP measures under Article 8 of Basic Regulation	
Advantages	**Disadvantages**
Can potentially solve a problem quickly	Measure is limited in time
Article 8 expressly provides for action to protect the marine ecosystem	There is a high threshold for justifying action
Action is permitted within any waters under Member State's sovereignty or jurisdiction	There is scope for the Commission or the Council to overturn the measure
Can apply to foreign- flagged vessels (subject to consultation procedure)	The measure may lead to displaced fishing effort (albeit only for the duration of the measure) that the Member State may not be best placed to deal with
Site in question need not be a *Natura 2000* site	

EC adopting EP measures through the normal route (Article 4(2) of the Basic Regulation)	
Advantages	**Disadvantages**
Permanent until repealed	Coordination between Member States and the EC is needed from the outset
Creates consistency and coherence across Community waters (depending on the type of measure involved)	Measure may take months to adopt (though any delay could be mitigated by emergency measures by the Commission under Article 7 of the Basic Regulation)
Basic Regulation expressly provides for EC to take action to protect the marine ecosystem	Possibility of Council failing to act to the satisfaction of the Member State concerned
Basic Regulation expressly provides for EC to apply precautionary approach	The EC has *discretion* as to whether to adopt such a measure, whereas the Member State concerned has a *duty* to implement the HD/BD
Action is permitted within any waters under Member State's sovereignty or jurisdiction	
Can apply to foreign-flagged vessels	

Site in question need not be a *Natura 2000* site	
Any displacement of fishing effort can be taken into account by the same body that is adopting the measure	
Possibility that Council may adopt a measure that is an improvement upon the Commission' s original legislative proposal	

Member State adopting EP measures faced with failure to act by Council	
Advantages	**Disadvantages**
Creates some kind of safety valve for the Member State	Large amount of legal uncertainty, enhancing possibility of litigation
	According to Commission' s letter to Habitats Committee, Member State's powers are restricted to Article 8 (of Basic Regulation) in these circumstances
	The measure may lead to displaced fishing effort that the Member State may not be best placed to deal with

Member State adopting EP measures within shared EP powers	
Advantages	**Disadvantages**
Management of sites exclusively within control of Member State: improved coherence	Large amount of legal uncertainty, enhancing possibility of litigation
Can potentially apply to foreign-flagged vessels	Possible need for new domestic measures to provide legal basis
	Would fishermen be less likely to accept a measure adopted outside the CFP?
	Less coherent management of protected habitats and species across the EC
	The measure may lead to displaced fishing effort that the Member State may not be best placed to deal with

It was discussed whether marine protected areas within OSPAR, HELCOM or Barcelona Convention frameworks, or on purely national grounds, require a different view. It was argued that *Natura 2000* sites would be given a higher priority by the EC, as far as the need to restrict the activities of fishing vessels is concerned. This is on the basis that such sites are provided for by EC law. But it was noted that the EC is a contracting party to the OSPAR, HELCOM and Barcelona Conventions, and so should also support marine protected areas initiatives under these initiatives. But the general point remains that marine protected areas, whether under *Natura 2000*,

OSPAR, HELCOM, Barcelona Convention or national initiatives, if for the purpose of protecting the marine ecosystem, should in principle not be neglected.

Finally, there was some consideration of what an EC measure under Article 175 EC might look like. The example of coral outside *Natura 2000* sites was considered. Such coral, in view of its apparently widespread nature, could potentially merit action at the EC level. It is arguable that a regulation, rather than a directive, would be the appropriate instrument (for the same reason that regulations are used under the CFP, albeit with Article 37 EC as their legal basis). Under Article 175 EC, the appropriate decision-making procedure is the co-decision procedure (under Article 251 EC). This would afford much greater prominence to the European Parliament than is the case for regulations adopted under the CFP.

Application of the precautionary principle

It was agreed that the precautionary principle is part of EC primary law (Article 174 EC). The Basic Regulation refers to the "precautionary approach" (in Article 2), but some subsequent provisions within the Basic Regulation appear to be inconsistent with this. Notably Article 8 requires the Member State to present "evidence of a serious and unforeseen threat. . . ". On the one hand, this formulation is precautionary in that it merely requires "evidence" of the required threat (rather than, say, "significant evidence"). On the other hand, the formulation is not precautionary in that the threat must be "serious and unforeseen".

There was some discussion about whether the precautionary principle/approach is justiciable. In other words, would the Court be prepared to find a breach of the precautionary principle/approach?

It was noted that the Commission, in the preamble to its legislative proposal for a trawl ban in parts of the Atlantic Ocean, has taken a precautionary approach.

It was considered that the precedent set by the EC's response at the Darwin Mounds site may make a precautionary response in respect of coral reefs easier in future.

Are fishery activities "plans or projects" for the purposes of Article 6(3) of the Habitats Directive?

It was noted that the Advocate General's opinion in Case C-127/02 was available. Nevertheless, it was decided to try to address this question irrespective of the AG's opinion.

The letter from DG Environment to the Habitats Committee, dated 11 May 2004 (at paragraphs 15-17) implies that it is not a requirement for the flag Member State to determine whether an appropriate assessment is required in respect of its vessel's activities in the *Natura 2000* sites in the waters of another Member State.

It was proposed that appropriate assessments should always be carried out by the Member State, rather than by the EC. However, what happens if the fisheries "plan or project" is at the EC level (e.g. a Commission proposal to open up a new area to fishing activities)? If it is for the Member State to conduct the appropriate assessment, the Member State would be assessing the impact of a EC plan or project. In turn, the Member State would be deciding whether that EC plan or project should go ahead.

Useful References:

EC (2004). Link between Community policy on fishing and the “Habitats” and “Birds” Directives”. Note for the attention of the Habitats Committee. Brussels, 11 May 2004. ENV.B.” D(2004) 320407.

Owen, D. (2004) Interaction between the EU Common Fisheries Policy and the Habitats and Birds Directive. Briefing by Daniel Owen, Fenners Chambers. Institute for European Environmental Policy.

5.2 ROUND TABLE 2 - BENEFITS OF MPAs TO FISHERIES

Chair: Susan Gubbay
Rapporteur: Catherine Zucco

Participants:
Claire Armstrong, Svane Bender, Ali Champion, Staffan Danielsson, Christian von Dorrien, Fiona Gell, Charlotte Johnston, Jochen Krause, Iris Laforet, Minna Pyhälä, Mattias Sköld , Krzysztof Skora, Christine Wenzel

The scope of the work of the round table and various elements of the terminology were considered at the outset.

For the purposes of the discussion, MPAs were considered to be sites that had been established specifically for conservation of biodiversity and were not limited to "no-take zones". Regarding the relationship to *Natura 2000* sites in the marine environment, it was clear that while all of these were MPAs only some or parts of some were no-take zones.

Where possible the group referred to studies and data from sites in temperate areas as this was the principle expertise of those present.

Context
There are a large number of MPAs in Europe, some of which have been established for many decades however, in relation to the question of benefits to fisheries from MPAs set up for nature conservation:

- there are limited data, from a few sites in temperate waters, with different management regimes (including NTZs), making it difficult to interpret and extrapolate effects
- there are also studies on sites, which have not been set up for nature conservation (fisheries management, oil platforms, military areas) which need to be considered

To examine the question of benefits the situation both within and outside MPAs needs to be considered. Any discussion of benefits associated with MPAs should also be aware of costs as the two aspects are closely linked.

What constitutes a 'benefit' to fisheries

Following some initial discussion about the benefits of MPAs in general (eg. conservation of biodiversity, education and interpretation, supporting certain types of tourism and increasing surrounding land values) the following were identified as potential benefits to fisheries. The determination of whether they should be seen as benefits or indeed costs, would also depend on the timescale and geographic area under consideration (ie. within or outside MPAs or both). The benefit to fisheries also depends on how heavily an area has been impacted by fisheries activities in the first place and whether there is potential for recovery.

They examples given during the round table discussion of potential benefits were:

- Increase in fish stocks
- Safeguarding local populations and genetic diversity
- Protection of 'critical habitats' of target species
- A fishery that operates on a sustainable basis
- Reduction of by-catch
- Socio-economic advantages
- Opportunities for diversification
- Research (including the potential to study undisturbed areas and use as control sites.
- Management cost reduction
- Conflict resolution
- Hedge against mismanagement

A number of these were discussed in more detail with reference to case studies.

(a) Population structure effects – eg. more, large fish and therefore increased potential reproductive output. Situations where this has been reported include scallops (in the Isle of Man), demersal species in an area closed to trawling in The Sound (Sweden), crayfish and snappers in a no-take zone in Leigh (New Zealand) and game fish in a restricted access zone around Cape Canaveral (USA).

(b) Increases in fish biomass and abundance – which may lower the risk of population collapse and enhance fishery yield in adjacent fishing grounds. The scale of any benefit will depend on aspects such as the mobility of the species, the fish species, starting condition and timescale over which the issue is considered. Examples from the USA, UK and Canada include increase in abundance of copper rockfish in the Edmonds Underwater Park, lingcod in the Shady Cover reserve (San Juan Islands), rock fish in Hopkins Marine Reserve (California), sandeels in the Wee Bankie and Marr Bank closures (Scottish east coast) and haddock and yellowtail flounder in the Georges Bank closures (East coast, Canada).

(c) Protection of nursery grounds and (where population levels are very low) protection of spawning stock biomass. This could also help to maintain the genetic diversity of stocks. There are examples in Norway where benefits from protecting such areas have been observed and anecdotal information relation to increases in

flounder off the coast of the German Wadden Sea following protection of the inshore nursery grounds.

(d) Ability to have stricter controls over point source pollution.

(e) The maintenance of "healthy habitats" which will have benefits for the associated species.

(f) Keeping options open for different types of fisheries.

The following examples of the associated costs were discussed:
(a) Reduction in the geographic area available to fishermen
(b) Displacement of fishing activity
(c) Changes in fishing practice (gears, new locations)
(d) Increasing natural competition in protected areas (birds, seals)
(e) MPAs acting as a focal point for increasing conflict between user groups

Likely Benefits/Costs to fisheries from *Natura 2000* sites
The issues listed above relate to MPAs in general however, the round table also discussed whether any of the potential likely benefits were specific to *Natura 2000* sites. The following were highlighted;

- *Natura 2000* sites have long-term protected status whereas some other MPAs may be short term or seasonally protected areas

- *Natura 2000* sites have legal backing and therefore the ability to regulate activities if required, rather than rely on voluntary co-operation

- *Natura 2000* sites have a direct benefit for commercial fish species where these are listed in the Annex as requiring protection (eg. sturgeon)

- *Natura 2000* sites will form part of a European network of protected areas and may lead to the establishment of sites which cross international boundaries.

- *Natura 2000* sites have monitoring requirements. This will enable us to learn about scale, types of benefits from different management regimes.

In conclusion, the most significant specific benefit of *Natura 2000* sites was considered to be the legal obligation to establish and manage the sites.

Next Steps
The following areas of work were identified as useful next steps in learning more about the potential benefits of MPAs for fisheries and achieving such benefits in practice.

- Improving the exchange of information on the effects of MPAs on fisheries (including historic data and research initiatives) and making the results of studies widely available.
- Ensuring baseline and trend data are available (on aspects such as use and condition) both inside and outside the MPA
- Having clearly stated targets for MPAs,
- Improving co-operation between stakeholders and their involvement in all aspects of MPAs
- Considering other aspects in evaluations such as social and economic costs/benefits as well as biological
- Clarifying aspects of NTZs eg. size, location, objectives
- Carrying out trials to provide more information about the effects of NTZs and other measures, which could protect marine biodiversity and benefit fisheries.
- Carry out some comparative studies to get a better idea of appropriate ways in which to measure costs/benefits
- Prepare some simple guidance on how people can be part of the MPA process eg. surveys, monitoring.

In relation to *Natura 2000* sites there was a need to be clearer about potential benefits to fisheries that are specific to these sites and perhaps use some *Natura 2000* sites as an opportunity to test different marine management options including no-take zones.

This could be taken a step further by having fisheries targets in *Natura 2000* sites however there were differing views in the round table and during discussions in feedback session to plenary about whether this would be a good idea. For example, while bringing fisheries aspects more clearly into the MPA, such an approach could be problematic as the sites were selected with the conservation of specific habitats and species in mind, rather than for fisheries benefits. On the other hand having fisheries targets would help draw fishermen into the management of the sites in a way where they felt was more in their interests. This might be particularly important in some areas where *Natura 2000* sites cover large areas of sea and therefore leaving few areas where the operation is fisheries specific.

There was scope to run some parallel monitoring to collect data of value to the fisheries and examine potential benefits although certainly no guarantee that they would help fisheries. Apart from the fact that sites have not been selected with this objective in mind, the success or failure in reaching such targets are linked to what is happening on fisheries management outside the area. There may, for example, be a need for overall effort reduction as well as fisheries closures within the area of the MPA. This was also a subject which is unlikely to be under the influence of an individual *Natura 2000* site managers or even the government ministry responsible for nature conservation.

The plenary discussion concluded with the view that *Natura 2000* sites presented an opportunity for site managers to draw fishermen into the nature conservation debate. Taking the opportunity for fisheries related monitoring was seen as useful, especially as questions were likely to be asked in the future about this question and in finally, in recognition of synergies between biodiversity conservation and fisheries management, opportunities to test fisheries targets within *Natura 2000* sites should be encouraged.

In conclusion, there was still a question mark over whether there is enough evidence to convince others about the benefits for fisheries of MPAs set up for nature conservation. This was especially the case with N2K sites. However, there was consensus that it was worth some specific trials geared to assessing fisheries effects of these sites. Such action should also be weighed up against a potentially significant cost to fisheries if the potential benefits of MPAs were not explored in more detail.

Useful references

Gell, F.R. & C.M. Roberts (2003a) The fishery effects of marine reserves. WWF-US Washington, USA. http://www.worldwildlife.org/oceans/pubs.cfm

Gell, F.R. & C.M. Roberts (2003b) Benefits beyond boundaries: the fishery effects of marine reserves. Trends in Ecology and Evolution 18(9): 448-455. http://www.panda.org/downloads/marine/benefitsbeyondbound2003.pdf

Gubbay, S. (2001) No-Take Zones: The next step for nature conservation and fisheries management in the North-East Atlantic. Report to the World Wide Fund for Nature (UK).

ICES (2004) Report of the Working Group on Ecosystem Effects of Fishing Activities, 14 -21st April, 2004. ICES CM 2004/ACE 03.

5.3 ROUND TABLE 3 - DIFFERENT FISHING PRACTICES AND THEIR EFFECTS IN MARINE PROTECTED AREAS

Chair: Jürgen Ritterhoff

Rapporteur: Dieter Boedeker

Participants: Pedro Afonso dos Santos, Ralf Doring, Claire Eno, Jan Kube, Iwona Kuklik, Han Lindeboom, Saskia Richardz, Rita Van Den Tempel

After some initial discussion the group decided that a useful approach would be to prepare a schedule (or cookbook) which could be used to assess fishing activities taking place within *Natura 2000* sites, their likely effects, and any steps that should be taken as a consequence. A six stage process was identified.

Stage 1 – Assessment of present fishing activity
The assessment could usefully cover aspects as varied as the type of fishing activity, intensity, seasonality, and flag states involved and use a variety of methods to carry out the task. They include fishing independent methods, such as aerial surveys, boat surveys, satellite data, black box records and information from sidescan/multibeam surveys. Fisheries dependent data could be gathered from logbooks and by contact with fisheries authorities and the fishermen themselves.

The most important aspect was to get site specific data that would be relevant to the *Natura 2000* assessment process. This may require specific studies if the data were not already available in some form but the need to collect additional information should not delay the process of implementation as the precautionary approach should be pursued. It was also noted that where new data were being collected, at least one year of records would be necessary to adequately reflect seasonal effects.

Stage 2 – Determining the effects of fishing activity
There is already a great deal of information available on the effects of fishing gear and fishing practices on the marine environment. Much has been published in scientific journals, and research projects have been carried out by the industry as well as by regulatory authorities who have looked at the efficiency as well as the wider effects of using particular gear. Nevertheless, there is a case for collecting more site-specific information within *Natura 2000* sites to assist those carrying out the management task. One way in which this might be summarised is through the development of an "effects matrix" perhaps at a biogeographic or regional scale. Using this as a starting point, a more comprehensive and detailed site-specific "effects matrix" could be prepared, including an evaluation of long-term and short terms effects.

An illustration of this approach is given below.

Draft Example: NATURA 2000 sites for possible effects of different fishing gears (for habitats based on the disturbance of the physical structure with respect to Annex I of Habitats Directive)

	Benthic trawls	Pelagic trawls	Dredging	Netting	Potting	Longline	Collecting
Habitats							
Sandbanks which are slightly covered by seawater all the time	relevant		relevant				
Submerged or partially submerged sea caves							
Estuaries	relevant	relevant	relevant	relevant			relevant
Sand- and mudflats	relevant		relevant				relevant
Lagoons*	relevant	relevant	relevant				relevant
Large shallow inlets and bays	relevant	relevant	relevant				relevant
Reefs	relevant		relevant		relevant	relevant	
Submarine structures made by leaking gases	relevant		relevant				
Species groups							
Mammals		relevant		relevant			relevant
Fish species of annex 2, Habitat directive	relevant ?	relevant	relevant ?	relevant			
Birds		relevant		relevant		relevant	relevant
Reptiles		relevant		relevant	relevant	relevant	

The matrix was also discussed during the roundtable feedback session to plenary where it was presented as an example of how to approach the problem although there was clearly more work to be done on this, given the limited time available to working group, and need for contributions for other people.

A parallel exercise could be the development of a "sensitivity matrix" which assessed the sensitivity of Annex I and II species and habitats against the different fishing practices taking place in the area. The type of approach was describe during a presentation to the workshop in an early session (see paper by C. Eno).

Additional note: Following the workshop the matrix shown above was circulated among participants for additional comments. Subsequently, a substantial further development of the proposal was handed in by Saskia Richartz which has been included in these proceedings under ANNEX 2 for further discussion.

Stage 3 Assessment
By overlaying the two matrices (on effects and sensitivities), it will be possible to assess the fishing activities taking place in the site. Measures could then be proposed by considering these in the light of the conservation objectives for the site. Furthermore, once the effects occurring from activities other than fishing had been considered, an overall assessment should be undertaken. Stakeholder participation and communication to the public is essential as this work proceeds on to the next stages which are:

Stage 4: Proposals for measures (possibly presented in map-based format)
Stage 5: Development of a Management Plan
Stage 6: Enforcement, Control and Monitoring

The group recommended that the results of this round table discussion be forwarded to the Marine Expert Group of the Habitats Committee for comment and further consideration. The European Commission could also be asked to establish a working group to develop guidelines on the assessment of fisheries activities in *Natura 2000* sites.

Useful references:

Hollingworth, C.E. (Ed) (2000) Ecosystem Effects of Fishing. Proceedings of an ICES/SCOR Symposium held in Montpellier, France, 16-19 March, 1999. ICES Journal of Marine Science. 57(3). 465-791

Marine Life Information Network (MarLIN) http://www.marlin.ac.uk [Sensitivity criteria and assessment]

Gubbay, S. & Knapman, P.A. (1999) A review of the effects of fishing within UK European marine sites. English Nature (UK Marine SACs Project). 134 pages.

UK Marine SACs Project. (1996-2001) Dynamics and sensitivity characteristics of marine features. Nine reports covering *Zostera* biotopes, intertidal sand and mud flats, seapens and burrowing megafauna, subtidal brittlestar beds, maerl, intertidal reef biotopes, infralittoral reef biotopes with kelp species, circalittoral faunal turfs, biogenic reefs.

6 MARINE PROTECTED AREAS AND FISHERIES; CASE STUDIES

6.1 Conserving deep-water corals within offshore areas under Irish jurisdiction

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Background

Ireland's seafloor territories, including the 200 mile Exclusive Fisheries Zone and claimed Extended Continental Shelf, cover some 900,000 sq. km, almost 9 times the land area of Ireland. There has been a gradual realisation that this huge marine resource is of national strategic importance which is reflected by the allocation, in the recent National Development Plan (2000-2006), of investment of over 150 million euros in the marine sector. One of the most significant actions arising from this investment was the ambitious programme to map the entire Irish undersea territory. The 32 million euro National Seabed Survey project managed by the Geological Survey of Ireland has already completed one hundred percent coverage, high resolution multi-beam mapping of the entire Irish offshore area deeper than 200m, which amounts to more than 450,000 sq. km. The dataset includes detailed bathymetry and inferred substrate type (based on interpreted backscatter returns) and will in the future provide the basic information required to develop comprehensive spatial resource management strategies.

In the offshore area, the dataset will be of immediate use in supporting the delineation of boundaries around Special Areas of Conservation required to conserve *Lophelia pertusa* cold-water coral reefs under the EU Habitats Directive. Irish waters contain many outstanding examples of the deep-water coral habitat. The best developed of these are usually found close to the summit of 'giant' carbonate mounds. Several mound provinces exist in the Porcupine Seabight and Rockall Trough (Fig. 1)(Croker & O'Loughlin, 1998). Typically, they occur in water depths between 500 to 1200 m and vary from small structures of a few meters to over 300 m in height (Kenyon *et al.,* 1998; De Mol *et al.,* 2002). Densest living coral cover occurs on the summits of mounds where current flow is generally highest. Intensive study of mounds during a number of EU funded research programmes, particularly the Atlantic Coral Ecosystem Study (ACES) in each of these mound provinces has shown that coral associated biodiversity is rich (over 1,300 species recorded) and varies from province to province (Freiwald *et al.*, 2004).

Conservation Issues

Part of the work of the EU Atlantic Coral Ecosystem Study was to develop a scientist-stakeholder partnership. Concerns were expressed about possible damage of the

deep-water coral habitat by fishing activity at the first ACES Scientist-Stakeholder workshop held in Galway in June 23rd, 2000. It was apparent that little was known about the distribution of deep-water corals in Irish waters, whether they were being damaged by anthropogenic impacts, or indeed, what legal instruments could be used to protect corals if threat to the future sustainability of the ecosystem was perceived (Grehan *et al.,* 2001). In January 2001 acting on the recommendation of the ACES Stakeholder workshop, an Irish Coral Task Force was established to assist the ACES project at national level in delivering appropriate advice to policy makers (Grehan *et al.,* 2002). Membership included representatives from Duchas (Heritage Service), the Marine Institute, the Irish Sea Fisheries Board (BIM), the Irish Naval Service, the Department of Marine and Natural Resources, the Heritage Council, the Geological Survey of Ireland, the Universities and the Atlantic Coral Ecosystem Study.

Threats to deep-water corals

At present the major activities likely to impact *Lophelia pertusa* reefs are: i) deep-sea fishing, particularly trawling, ii) oil and gas exploration, iii) bio-prospecting, iv) neighbouring aggregate extraction, v) scientific research, and vi) the laying of telecommunications cables and oil and gas pipelines. These activities will primarily cause physical disturbance to reefs. Climate change may cause temperature and salinity fluctuations in the future which may also alter current *Lophelia* distribution patterns. However, deep-sea trawling is the impacting activity of most immediate concern (Hall-Spencer *et al.* 2002).

Fishing impacts

Three major research campaigns using 'state of the art' remotely operated vehicles permitting detailed, georeferenced, *in situ* investigations have taken place in Irish waters in the last four years (CARACOLE, 2001 and ARK XIX/3A, 2003, using the IFREMER 'VICTOR' ROV; and Meteor 61/3, 2004 using the Univ. of Bremen 'QUEST' ROV). During CARACOLE , no evidence of destructive fishing activity was uncovered although lost static gears (gill/tangle nets) used to fish for monkfish or anglerfish (*Lophius spp.*) and hake (*Merluccius merluccius*), were imaged lost on the side of mounds (Grehan *et al.* 2004). Both, ARK XIX/3A and Meteor 61/3, found examples of lost, coral filled, tangle nets deployed in or near areas of coral. More seriously, ARK XIX/3A provided the first concrete evidence of the impact resulting from the use of heavy demersal trawl gear in fishing for orange roughy. At one mound location, west of the Porcupine Bank, an area of coral had been completely reduced to rubble (Grehan *et al.* 2003).

Future Concerns

The orange roughy fishery which utilises robust trawl gear is distinctly coral unfriendly. Orange roughy fishing in the Southern Hemisphere, particularly in Australia and New Zealand, has had a major impact on seamount coral ecosystems (Probert *et al.,* 1997, Koslow *et al.,* 2000; Koslow *et al.,* 2001). Almost 90% of corals

have been removed in some places (Koslow *et al.,* 2001). Although, the recent introduction of Total Allowable Catches and quotas for several deep-water fish species in European Community waters (European Community, 2002) will go some way to reducing the potential damage of unregulated fishing, nevertheless, the nature of the orange roughy fishery which puts a premium on the identification and exploitation of virgin stocks, suggests that the capacity for collateral habitat damage during exploratory fishing, by itself, will remain high. Use of static gears has also been demonstrated to have an effect in certain instances, particularly when snagged on coral during recovery. Therefore both trawling and static gear fisheries will require some degree of regulation in management plans proposed to ensure the conservation status of deep-water corals within Special Areas of Conservation.

Legal instruments to conserve coral

A review of the legal instruments available to conserve deep-water corals in waters under Irish jurisdiction was undertaken by Long and Grehan (2002) and updated by Long (2003). They recommended three actions that could be taken at European and coastal state level to protect the unique ecosystems associated with deep-water coral:

i) Adoption at Community level of a specific technical conservation measure in the Common Fisheries Policy.

ii) Implementation by the coastal state of an ecosystem management approach to the marine environment through designation of sites of deep-water coral under the EU Habitats Directive as Special Areas of Conservation.

iii) Improved monitoring and assessment of the conservation and management framework.

Special Area of Conservation designation status

The Irish government made a commitment to designate a number of offshore Special Areas of Conservation (SAC) sites to protect deep-water corals at the OSPAR/HELCOM Ministerial Meeting in Bremen in June, 2003. The Department of Environment, Heritage and Local Government, the competent Irish authority, have begun the process of SAC designation by gathering all relevant scientific data. Identification of potential SAC sites is expected by the end of 2004.

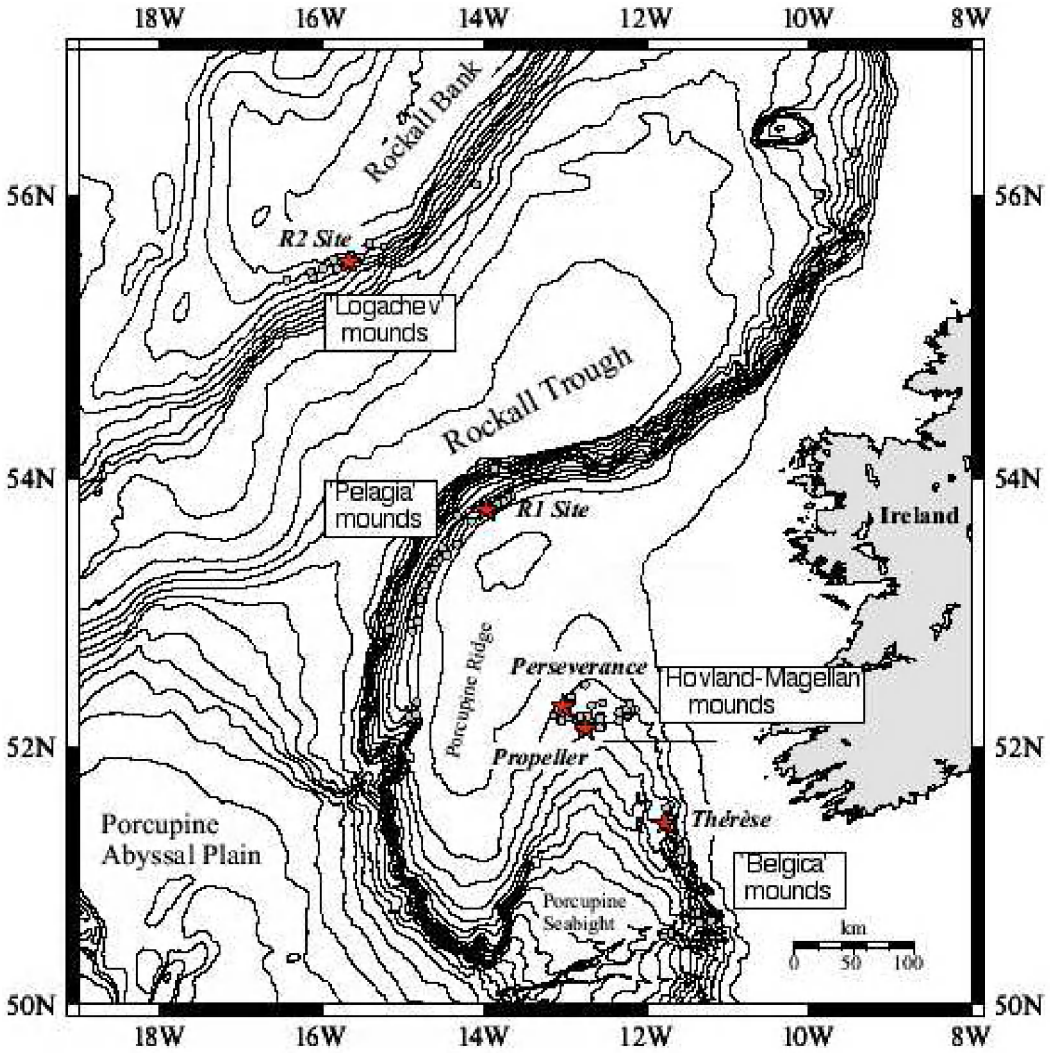
Conclusions

Ireland has a number of pristine, well-studied, deep-water coral sites of European and (probably) global importance.

While measures to protect representative sites are in train, the process is slow.

Recent research has provided evidence of a demonstrable threat to coral from contemporary fishing activity, i.e. trawling. Therefore, at the earliest opportunity, the Irish authorities should move to protect intended SAC sites from any potential impacts from these activities through the implementation of appropriate interim and permanent technical conservation measures under the Common Fisheries Policy.

Figure 1. The location of carbonate mound sites investigated during the CARACOLE 2001 cruise (stars). Circles highlight carbonate mound locations identified on the basis of seismic data (Croker & O'Loughlin 1998).



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6.2 The Puck Bay – priority candidate marine protected area in the Polish EEZ

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The Puck Bay is the best investigated marine area in Poland. First studies were carried out at the beginning of the 20th century (in 1920). Both those and further studies have indicated a high biodiversity of species and habitats in the area. They have also shown significant changes which occurred in the structure of different groups of living organisms due to human activities. The first symptoms of degradation, already apparent in the first half of the 20th century, were the elimination of big predators – grey seals (*Halichoerus grypus*) and harbour porpoises (*Phocoena phocoena*), as well as an extinction of sturgeon (*Acipenser oxyrynchus*). Degradation continued in 1970's and 1980's, mainly as a consequence of severe eutrophication and overexploitation. One-third of the total number of phytobenthos as well as zoobenthos species in the shallowest waters from 0 to 10 m deep have been eliminated. As well as habitat changes, the high impact of fishing has led to the extinction of commercial fish species such as white fish (*Coregonus lavaretus*), pike (*Esox lucius*), vimba (*Vimba vimba*) and roach (*Rutilus rutilus*) and significant reductions in others such as perch (*Perca fluviatilis*), eel (*Anguilla anguilla*), bream (*Abramis brama*) and garfish (*Belone belone*). In 1990, a new factor was an invasion of Pontocaspian species – round goby (*Neogobius melanostomus*). This newcomer has forced out the inhabitants of the bottom niches and has had a knock on effect on some other elements of the ecosystem such as birds, ichthyofauna, molluscs.

Due to the lack of commercial fish species many fishermen have stopped fishing and become involved in tourist business. The most obvious evidence of this change is an extension of the campsites along the coast, which have in turn led to the destruction of the natural environment of the shallowest water eliminating reeds and bullrush. Many natural coastal habitats in this zone (narrow beaches, reeds – spawning and nursery areas) have already been destroyed or lost in many places due to intense coastal defence constructions built of stones and concrete blocks which are not natural materials for this environment.

A mix of anthropogenic factors has resulted in a significant restructuring of living resources in the Puck Bay. It still remains a highly biodiverse marine area, however other species, that were previously not dominant or which even did not occur in the bay, are now present as a result of both intentional and unintentional changes in the environment. Among the ichthyofauna non-commercial species such as *Gasterosteidae*, and a new alien species – the round goby, are now in the majority. The macrophytobentos is now dominated by filamentous brown algae instead of *Fucus vesiculosus* and *Furcellaria fascigiata.*

The Puck Bay is still a site of rare and threatened migratory species, which indicates its overall significance for Baltic biodiversity. Marine mammals such as the harbour

porpoise and grey seals, as well as wintering birds and rare fish species (*Alosa fallax*) are observed within the area. However, many of them are exposed to the main threat in this area which is bycatch in fishing gear.

At present fauna and flora of Puck Bay is well protected against pollution thanks to several sewage plants, but environmental management and measures are still inadequate.

The Puck Bay is an area which has been protected for a longest time in Poland. The first regulation of nature protection implemented in the Bay concerned different fishing practices. Protected spawning grounds were designated, and seasonal fishery closures and a ban on trawling were implemented. In 1978 an internal shallow part of the Puck Bay (Puck Lagoon) was included in the administration borders of Nadmorski Landscape Park. In 1990, this part of the Puck Bay was proposed for the Baltic System of Protected Areas through HELCOM.

This year Puck Bay has become a potential *Natura 2000* site but the officially proposed area is about 30% too small and insufficient for the protection of the fauna and flora of the Bay especially for threatened species such as the harbour porpoise.

6.3 Marine Protected Areas and fisheries: two case studies from Sweden

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This paper presents two cases where conservation work integrates with fisheries management: (1) the Koster-Väderöfjord *Natura 2000* area and (2) the trawling boundary on the Swedish west-coast. The paper focuses on the processes, the stakeholders' participation and contribution, the outcome of the processes and the lessons learnt.

Case 1: The Koster-Väderöfjord *Natura 2000* area:
The Koster-Väderöfjord is a deep trench that connects to the deep Norwegian trench in Skagerrak. It has a high diversity of biotopes and species, and about 209 species have only been found here in Swedish waters. It is also designated as a *Natura 2000* area with reefs and sub-littoral sand banks. Of particular conservation value are the deep (>200m) nearshore soft and hard bottoms and the exposed shallow areas facing the open Skagerrak. This is the only area in Sweden where these biotopes and their associated fauna and flora occur.

The fishery values in the area include important habitats for commercially important species of fish, molluscs and crustaceans. The most important fishing activity is trawling for deep water shrimp (*Pandalus borealis*). No other form of trawling is permitted. The shrimp trawling in the area has been going on for about 100 years, and has always been regulated. About 50 fishermen (30 boats) operate in the fjord and their yearly catch of shrimp is around 200 tonnes.

The Swedish Environmental Protection Agency (EPA) declared in a report in 1996 that the area should become a "marine reserve" The fishermen saw this as a threat, feared substantial closures and reacted strongly to the report from the EPA. The authority that has the power to enforce nature reserves in Sweden is the County administration. In 1996 the County Administration of Västra Götaland arranged a meeting with stakeholders and declared that before any work with the establishment of a nature reserve would start, the values would be described in more detail. Accordingly, the County Administration and the EPA appointed the Tjärnö Marine Biological laboratory to survey and map the biological values of the area. The inventory was carried out with remotely operated vehicles and multibeam scanning bathymetry. In addition, all data from more than 30 years of research and sampling in the area was compiled. In particular, 10 areas with special biological values were identified.

When the inventory was almost finished in early 1999 the County Administration arranged a meeting with all stakeholders to discuss conservation interests and activities going on in the area. The outcome of the meeting was disappointing and it was clear that the fishermen had no confidence in the County Administration to handle the process and positions were locked.

By the end of 1999 a new attempt was made, this time with the local fishermen and the presidents of the municipalities of Strömstad and Tanum taking the initiative. This initiative was successful and a working group was set up with the particular aim to remove the shrimp fishery as a local threat to biodiversity in the fjord area. The group included the County Administration, the local fishermen and their organisations, the presidents of the municipalities and the National Board of Fisheries.

The basis for the working group was:

- The knowledge base provided by scientists (maps of species and habitats, detailed bathymetry)
- The fishermen's knowledge of precision when fishing, the behaviour of their trawling gear and positions of their hauls.
- An open dialogue between authorities and the fishermen together with the will to find novel solutions
- A driving force was also that the area now was identified as a *Natura 2000* site

In the working group threats were discussed and it was acknowledged that direct physical impact was an obvious threat to the values. Resuspension of sediments and the potential deposition of sediments on nearby sensitive habitats were acknowledged as a possible threat, but it was concluded that more knowledge was needed before any measures related to trawling and resuspension of sediment could be discussed.

Further, each of the 10 sub areas of particular biological interest were carefully examined in the light of the ongoing shrimp fishery and conflicts between trawling and conservation of these areas were identified. Gaps of knowledge were identified and further surveying was done for two sub areas.
Final results from the working group were:

- Adjustment of borders for most subareas to allow for manoeuvring of the trawling gear etc. i.e. compromises
- Closures for trawling (6 subareas)
- Passage for the trawling through one area
- In 4 areas no direct conflict between trawling and the values of the particular area were identified. Careful trawling can go on in these areas

- Lowering of the minimum trawling depth from 50 to 60m (increases the area protected)

The legal instrument used was the national fishery regulations.

Parallel to the process the fishermen also took the initiative for regulations to reduce the bycatch of fish in the shrimp fishery and limit the size of their gear. Their incentive was to make the fishery sustainable and to keep the fishery local by effectively reducing the access to the fjord for the larger more flexible fleet. The use of excluding device (Nordmörerist or sorting grid) effectively reduces the problems with bycatch of fish and discards by around 85%.

The regulations strengthen the basis for the local agreements between the fishermen that operates in the fjord i.e. only fishing 4 days a week.

Case 2: Protection of sensitive habitats from bottom trawling for Norway lobster:
To protect coastal fish populations, nursery areas and sensitive bottom habitats the National Board of Fisheries decided to extend the trawling boundary on the west coast of Sweden from 2 to 4 nm from the baseline in January 2004.

The stock of Norway lobster *Nephrops norvegicus* is in good condition and selective trawling i.e., trawls equipped with excluding devices and square mesh panels, could be allowed within defined zones inside the boundary as long as sensitive habitats were protected.

The most sensitive habitats were considered to be rocky bottoms with structuring epifauna. *Nephrops* trawling could thus be allowed in larger continuous soft bottom habitats as this approach also would protect smaller areas of soft or mixed bottom habitats, canyons and slopes in between the rocky bottom habitats.

Identifying the sensitive habitats and zones suitable for *Nephrops* trawling was, however, difficult as data on seabed structure and biology was scarce and completely lacking in the northern part of the coast. Also, to be able to take into consideration the opinion from the fishermen, detailed information on how the fishery is performed was needed.

Data on seabed bathymetry and structure were surveyed using multibeam scanning techniques. In particular the information of bottom structure, interpreted from backscatter was used to identify rocky seabed.
Following consultations, trawl tracks from fishing vessels navigational systems were compiled by the fishermen showing in detail where trawling was taking place (Oskarsson *et al.* 2004).

Combining the data sets showed that:

- The seascape in the area was complex with rocky seabed, soft sediment areas, slopes and canyons
- Historical data on trawl tracks showed that the trawling is performed mainly on soft seafloor areas but in close proximity to rocky seabed.

With the result common knowledge database on the spatial extent of the *Nephrops* fishery and maps of the seabed structure, constructive discussions about the zonation were held between the National Board of Fisheries and stakeholders and new zones for trawling for *Nephrops* can be established.

Experiences and recommendations:

- It is important to have a solid knowledge basis for the acceptance of conservation initiatives, and as a basis for constructive solutions;
- It is necessary to work with the stakeholders in trying to find solutions;
- When conflicts are identified, it is important to focus the process and the working group on the problem.

Case 1, Kosterfjorden, is a unique case in terms of the knowledge base and the group of users, i.e. the fishermen, who are homogenous and local. In open access waters with mixed fisheries, the situation is very different as many fisheries interest operate. Case 2 represents a mixed fishery case in coastal waters under national jurisdiction i.e. it was more problematic to find solutions as more categories of fishermen were represented.

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6.4 Implementation of *Natura 2000* in the Azores: Balancing marine conservation and fisheries management

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This paper updates the progress in the implementation of the technical proposals for management plans of marine Sites of Community Interest (SCIs - *Natura 2000*) in the Azores. Specifically, it addresses the questions whether i) Marine Protected Areas can be used as a management tool to benefit fisheries in the region and ii) the potential usefulness of the *Natura 2000* network and other existing local MPAs within this context.

The marine environment of the Azores archipelago and its surrounding EEZ of around 1 million km^2 is of high conservation and marine biological interest due to a series of traits brought about by its isolation. On the other hand, pressure on littoral and offshore local resources has increased with the development of commercially based operations in the past two decades, and there is growing evidence of detrimental effects on local stocks (Santos *et al.,* 1995). This fact has raised the need for protective management measures that can integrate conservation and sustainable exploitation of species and habitats.

One of such measures are Marine Protected Areas (MPAs). MPAs can integrate conservation and fisheries management goals by reducing conflicts and facilitating the implementation and enforcement of spatial management schemes, mostly through the spatial discrimination (zoning) of incompatible activities. By protecting species and habitats and by promoting the recovery of heavily exploited resources within its boundaries, MPAs should serve as a measure to conserve biodiversity and protection against further deterioration of exploited stocks and extreme events such as recruitment failure. Moreover, well-designed MPAs can actively help fisheries because their unexploited populations may replenish neighbouring fishing grounds through the export of adults and/or larvae (Russ 2002).

Experience with MPAs in the region started in the mid-80's with the designation of six small coastal MPAs (ranging in size from 8 to 281 ha) for conservation and fishery purposes. The absence of monitoring programmes collecting before-after data has meant it is not possible to evaluate whether the MPAs have prevented further degradation and recovery of marine resources within their boundaries. The offshore Formigas bank has been an MPA for almost 20 years, but again there is no evidence of recovery of commercial stocks from recent monitoring programmes (Tempera *et al.* 2001). Common to these cases is ineffective or absent enforcement of fishing restrictions, preventing a proper assessment of the effects of protection on local fish populations. Two encouraging exceptions are: i) the higher abundance and size of parrotfish in the Monte da Guia partial reserve and in the island of Corvo, two sites

where the gillnet fishery does not occur (Afonso 2004) and ii) the recovery of limpet populations in the western and central group islands after the establishment of permanent no-take reserves for this resource in 1993 (Ferraz *et al* 2001).

The list of Azorean SCIs published in December 2001 by the European Commission designated 15 coastal SCIs covering a portion of marine area and two offshore marine SCIs in addition to 13 coastal Special Protection Areas (SPAs) already derived from the Birds Directive. The marine SCIs are distributed across all of the nine islands of the archipelago, ranging from 50 to 700 ha of marine area. These are generally limited to depths of 50m and typically extend to a distance of ¼ nautical miles from the shore. The two offshore sites are D. João de Castro Bank, designating 1550 ha around a shallow seamount, and the Formigas bank, designating 3628 ha of marine area. The latter is within territorial waters. Designation of marine SCIs was based on conservation goals for the species and habitats listed in the EU Habitats Directive present in the areas, namely *Tursiops truncatus*, *Caretta caretta*, coastal lagoons, shallow bays, reefs and submerged and semi-submerged caves. However, the formal commitment to meet the *Natura 2000* conservation goals and the possibility of implementing MPAs that integrate the sites represent an excellent opportunity to promote integrated management measures and test the benefits of MPAs.

Three EU-funded projects, to be undertaken jointly by the University of the Azores, the IMAR Institute, and the Azorean Regional Government have been carried out since 1998 to support the production of management plans for the 18 marine SCIs. Five of these are published. The technical approach has been that of characterising the biological and socio-economical components of the SCIs and surrounding waters, including their economic relevance to local fisheries. One major conclusion was that the SCIs areas were generally restricted, and in some cases excessively coastal. Such characteristics would result in an insufficient biological potential to allow direct and significant repercussions in the management and conservation namely of the bentho-pelagic assemblages associated to the Habitats Directive features that justified their designation. Therefore the proposals adopted Marine Parks including the SCIs and wider surrounding waters as the formal tool because this would allow i) an ecosystem approach and ii) protect the SCIs and other ecologically relevant non-classified areas. In the two coastal cases, Corvo Island (2SCIs) and the Faial-Pico channel (3 SCIs), the parks included zoning schemes regulating all activities, including no-take (reserve) areas and conditioned fishing areas.

Proposals were informally presented in public forums and discussed by the research team members with local fishermen, leading to a reviewed proposal for Corvo. A strong emphasis on societal environmental awareness goals within the projects has also helped to create a wider acceptance of MPAs among the stakeholders. However, as of now, no formal public discussion has been conducted, and only the Formigas Reserve regional legislation has been published integrating most of the technical proposals.

Major considerations emerging from the present situation are:
i) The direct assessment of MPA benefits to fisheries is waiting for an effective implementation of site-based protection measures in the region. Implementation of *Natura 2000* marine sites constitutes an excellent opportunity to test such benefits.

ii) Standardized and continued procedures are essential to assess the effects of protection, including before-after data on the population structure of target species and fishing effort inside and outside MPAs. Existing programs should be continued and others implemented wherever absent.

iii) Compliance and enforcement of any fishery restrictions to be adopted is essential in order to effectively assess the potential MPA benefits. Weaknesses in past and present regional experience strongly stress the need to formally address this problem.

iv) The effectiveness of MPAs is directly dependent on its capacity to protect living organisms within its boundaries. Preliminary results of acoustic telemetry and standard tagging studies conducted by DOP/UAz are showing that the scale of spatial protection needed to effectively protect core populations varies with the species behavior, ranging from networks of small size MPAs for highly resident reef fishes such as the parrotfish to a network of larger MPAs in contrasting habitats for the blackspot seabream. This should be taken into account in future technical proposals.

v) The present SCI network leaves out a significant portion of representative species and habitats of high ecological and commercial value within the EEZ sub-area of the Azores, namely seamount and hydrothermal vent associated species. The inclusion of such representative features should be considered in future revisions of the Azorean *Natura 2000* network or other formal policies if MPAs are also to be considered and tested as a management tool for conservation- and fishery-management goals.

vi) The above arguments point to the need for an integrated spatial protection plan at the archipelago level that can identify specific goals and targets to achieve for conservation and fisheries management in the region.

vii) Outreach programs for environmental awareness targeting the different stakeholders and the society in general should be continued and strengthened in order facilitate future compromised solutions.

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6.5 NATURA 2000 and fisheries in the Odra estuary (Baltic Sea)

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Seven major rivers contribute about the half of the mean annual freshwater discharge to the Baltic Sea. The Odra River between Germany and Poland is one of them, and, even when considering the runoff volume, it is one of the most contaminated rivers in central Europe. The Odra River supplies only 3-4 % (18 km³) of the fresh water flowing annually into the Baltic Sea but accounts for about 15 % of the nutrient discharge. The huge (anthropogenic) nutrient supply results in a large primary and secondary production in the vicinity of the Odra estuary (von Bodungen *et al.* 1995).

The extraordinary high biomass of benthic filter feeders (especially bivalves) and fish (about 50 species) forms the basis for the most important stop over and wintering area for waterfowl of the entire Baltic Sea. About 1.5 million birds (30 species) winter in the coastal lagoons and shallow offshore areas. Another 0.5 million birds (an additional 30 species) use the Odra estuary to replenish their fat reserves during autumn and spring migration. The identification of Important Bird Areas (IBAs) in the Baltic Sea by Skov *et al.* (2000) covers the entire functional system of bird staging habitats of about 8.500 km².

The IBA system of the Odra estuary belongs to five different legal systems: Danish EEZ, Polish EEZ and 12-mile-zone, German EEZ and 12-mile-zone. This complicated political and legal pattern makes it difficult to establish the *Natura 2000* network under the Habitats and Birds Directives. So far, the local county of Mecklenburg-Vorpommern (Germany) designated SPAs and pSCIs in the 1990. Recently, Germany has also designated SPAs and pSCIs for its EEZ. Proposals for Polish waters are under preparation.

Once established, the *Natura 2000* network in the Odra estuary needs sufficient management to protect the marine habitats and the species listed in the Annexes of both the Habitats and Bird Directives. Management actions will require a large amount of information on the structure and function of the protected areas as well as on existing and potential threats caused by various human activities. So far, there is only a reasonable amount of knowledge on the distribution of marine habitats inside the designated MPAs of Germany. On the other hand, it is almost impossible to gain relevant information on the occurrence and ecology of annex II species, because all of them (three sea mammals, 2 lampreys and 7 fish species) are either extremely rare or freshwater species. The level of knowledge is much better for waterfowl species. Meanwhile there are data on bird distribution and seasonal patterns available. However, information on their feeding ecology and population dynamics are still lacking.

Several threatening human activities in the vicinity of the Odra estuary can be localised and quantified (e.g. gravel mining, commercial ship traffic, nutrient discharge). Others, especially fishing activities are very difficult to quantify because there are no reliable data available. Furthermore, negative effects of fishing activities on nature protection features (either habitats or species) have never been investigated scientifically. ICES data are the only useful source of information about fisheries in the Odra estuary. For German fishermen herring and cod account for 85 % of the total catch and for 70 % of the total profit. They apply predominantly bottom and pelagic trawls as well as gill nets and trap nets (coastal). Fishing trips for angling parties offer important supplementary profit.

ICES data provide useful information on catch, effort and gear on both a regional and seasonal basis and can be mapped for ICES rectangles. However, the size of these rectangles is larger than the size of any MPA in the Odra estuary making it difficult to localise certain threats inside the MPAs. Furthermore, it is not enough to analyse landings on a national basis, because fishermen from at least four different countries are catching fish in the Odra estuary. Hence, ICES data are not sufficient to analyse the threats caused by fishing activities in the MPAs of the Odra estuary.

So far it is expected that the following local conflicts may exist between the protection features of the MPAs and fisheries:

- disturbance/destruction of sea grass beds, sandbanks and reefs,
- massive Cormorant persecution for no reason,
- disturbance of moulting and wintering seabirds (divers),
- consumption of discard by seabirds (Herring Gull),
- predation on seabirds chicks by Herring gulls (alien species in the Baltic),
- seabird casualties in gill nets (some ten thousand birds per year).

These conflicts have to be quantified in space and time. Analyses require observations on habitats, seabirds and fisheries. Conflict solutions will have to focus on alternative fishing modes and restrictions (if necessary).

Since 2002 aeroplane surveys and side scan sonar mapping have been providing more specific and independent information on the effect of fisheries on the nature protection features inside the MPAs. Both methods seem to be useful tools to gain the necessary information. However, for the validation of the relevance of potential threats caused by fisheries, additional data concerning by-catch and disturbance effects have to be collected onboard the fishing vessels.

Already today, on the basis of the available information it can be concluded that certain changes in fishery are required in the future to ensure the protection of the MPAs in the Odra estuary (changes in fishing gear, regional or seasonal restrictions, financial solutions). Management measures need to be established by cooperation between fishery departments, nature conservation departments and national/local governments. Furthermore, national solutions will have to consider the EU-value of the MPAs.

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6.6 Dutch case observations: lessons learnt.

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In the past the North Sea looked completely different from its present day appearance. In 1883, Olsen published 'The Piscatorial Atlas' with over 50 maps of the distribution of fish species. On his map of the North Sea bottom, a large red area indicated huge numbers of oysters on the border of what are now known as the Dutch and German parts of the North Sea shelf. In those days, there was an area of about 20.000km² with very large oyster beds. In the 1930s, the last oysters were caught commercially, and since 1970 no living oysters have been reported in this area. Overfishing, most likely in combination with changing climate or changing ocean currents, and possibly diseases, wiped out the oyster and annihilated a complete habitat which must have been rich in biomass and biodiversity. This shows that the North Sea of 130 years ago was very different from the present North Sea, and surely the future again will be different.

Lesson 1: Both the natural and man induced variability of the marine ecosystem is much larger than we tend to think (Lindeboom, 2002). This should be taken into account when establishing Marine Protected Areas (MPAs), and especially when forecasting the future of such areas.

More than a decade ago, in 1990, proposals were made for two MPAs in the Dutch part of the North Sea. The Dutch government intended to establish at least one pilot project, but strong opposition from the fishing industry, in combination with internal political problems with the pig farmers, prevented any positive progress at that time. Nevertheless, a relatively small area known as the Frisian Front, where a high biomass of algae, benthic fauna, fish and birds is found, was proclaimed a Special Area (Lindeboom & Back, *in press*). The borders of this area were determined with reference to the higher silt distribution (>20%) in the sediment. The only human activity which the Dutch government could regulate in this area was oil and gas drilling, and special measures, e.g. a ban on the use and dumping of oil based muds, were taken. However, when actual gas drilling was in progress, surveys revealed that this area of mud with a higher silt distribution had moved about 15 miles to the east.

Lesson 2: When the borders of an MPA are based on rather 'soft criteria', sooner or later the feature they are trying to protect will move or disappear.

The Dutch government is presently considering five areas on the Dutch continental shelf that may qualify as MPAs. At the moment the borders of these areas are being determined taking into account the nature value (e.g. number of bird, fish and macrofauna species), and the requirements of the Habitat and Bird Directives.

The measures which will be introduced in these areas are still being debated, but sooner or later the future of fisheries will enter the discussion, especially when it becomes obvious that beam trawling has by far the highest direct impact on the benthic ecosystem. Once again there will be strong opposition from the fishing industry who use the failure of the 'Plaice Box' as an argument against MPAs. This Box, in front of the Dutch, German and Danish coast was established in 1989 to protect young plaice. For the first seven years, the box was only closed for larger vessels and for just 6 months around the winter period. Since 1997 it is has been completely closed to large fishing vessels but smaller vessels (<300 hp) are still allowed to fish in this area. Consequently it is not a true MPA. Ever since the establishment of the Plaice Box, the number of plaice have decreased, and the fishermen use this as an argument to question the usefulness MPAs. Nevertheless, I like to argue that it is most likely that the number of plaice declined in this period due to other causes, and that the Plaice Box prevented an even worse decline.

Lesson 3: Since it was never really closed to beam trawling, the Plaice Box is not a model MPA.

Lesson 4: The long term trend of specific species or ecosystems is the result of a very complex interplay of many driving forces, some of which are manageable and others are not.

To unravel this very complex interplay we developed a special computer tool called EMIGMA (Effect Modelling of Indicators, usage and Management). By combining the trends in ecological parameters and human uses we gain insight into possible cause-effect relationships. The longer the data sets, the better the analyses, which reinforces the need for long term monitoring programmes, both inside and outside the MPAs.

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6.7 A Marine Protected Area as nature compensation in the Rotterdam Mainport Development Project

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Marine protected area - WHY

Somewhere along the Dutch coast there will be - in about two years - a marine reserve within an already existing marine protected area (*Natura 2000*). The marine reserve is inextricably linked to the expansion of the Port of Rotterdam which is facing a shortage of space that cannot be solved in the existing harbour area. New land is needed and, as a result, there are plans for a land reclamation project in the North Sea .

The site for the land reclamation is within a location that is protected by the Birds and the Habitats Directives: The *Voordelta Natura 2000* site. The project will therefore have to meet the provisions of article 6 of the Habitats Directive before proceeding. These provisions are:

- to determine whether there will be any significant effect on the protected nature
- to determine whether there are any alternative to the project
- to determine whether the project is needed for imperative reasons of overriding public interest.

If the answer to these questions is yes measures will be needed to compensate for effects on the protected site and species.

The land reclamation will result in the permanent loss of part of the existing marine protected site (*Natura 2000*). This is a significant effect and as a consequence the Dutch government has decided to establish a marine reserve within the marine protected area as nature compensation.

As the first and only Dutch project possibly affecting a priority habitat type in a *Natura 2000* site (the adjacent dunes) the Opinion of the European Commission was needed. The Commission has since approved the plans, taking into account the various considerations set out above.

An aerial view of the Netherlands shows the location for the land reclamation next to previous land reclamation (also for the Port of Rotterdam) carried out in the last century; before Birds and Habitats Directives came into force. The Voordelta, where the land reclamation is planned, is a protected site under the Birds Directive as well as the Habitats Directive. This site was predominantly selected for wintering birds,

waders, seals and twaite. The area is around 90.000 ha. There is no management plan in place yet.

The Rotterdam Mainport Development Project has two objectives and several constituent projects including the land reclamation. Other constituent projects are directed at improving the quality of the living environment in and around the city of Rotterdam.

Decisions on how to proceed were made through the National Key Planning Procedure and were concluded with a government decision last autumn. All parties are now at the stage of negotiating final arrangement on finance, responsibilities and risks for actual realisation of the project. The final contract is planned for the end of this year.

Many parties are involved in the project:
- Five ministries: Transport, Public Works and Water Management (leading); Finance; Economic Affairs; Housing, Spatial Planning and Environment and Agriculture, Nature Conservation and Fisheries;
- Province of South Holland;
- Municipality of Rotterdam;
- Stakeholders like NGO's and local authorities were involved in consultation groups and there was a special body giving formal advice to the minister.

Marine protected area – WHAT?

In the marine reserve within the marine protected area all marine protected nature that is lost due to the land reclamation has to be replaced. Instead of creating a new (extra) area of marine nature - which is not possible – the intention is to improve the existing nature conservation interest in proportion to the loss due to the land reclamation.

To establish the effects that need to be compensated for, the proposal concentrated on the "qualifying" species and habitat types i.e. those species and habitat types for which the *Voordelta* was selected as a Special Protection Area under the Birds Directive or as a Special Area of Conservation under the Habitats Directive.

Impact assessment on those species and habitat types indicated that the land reclamation may only have significant effects on one or two bird species and one habitat type:
- Scaup (*Aythya marila*)
- Slavonian grebe (*Podiceps auritus*)
- Habitat type 1110 "Sandbanks which are slightly covered by seawater all the time"

The effects on habitat type 1110 have been transposed in effects on relevant species of benthic fauna, fish and birds as this habitat already exists, with the aim of

improving the quality of the habitat for such species. The exact size of the effects can only be determined when the definitive design of the land reclamation is established.

Conditions for compensatory measures, given in the manuals of the European Commission, include:
- Measures should be additional to existing policies and plans;
- Measures should be additional to normal implementation (conservation objectives) of Birds and Habitats Directives;
- Results of nature compensation should correspondent exactly to the negative effects on the specific species and habitats affected;
- Mature compensation should be operational at the time when the damage is effective.

Marine protected area – HOW?

In the Maine Protected Area human activities that have substantial negative effects on the qualifying species affected by the land reclamation and the species that are chosen as the quality parameters of habitat type 1110, will be restricted or forbidden. Relevant human activities can be:
- fishing by trawling, shell fish fisheries
- other forms of fishing
- different forms of water recreation
- other shipping travel
- use of the air space below 1000 m
- military activities
- mineral extraction

Having referred to national and international publications on the effects of human activities on marine wildlife and habitats a quality improvement of 10 % is predicted - a figure mostly based on publications on effects of bottom trawling on benthic fauna. As a consequence the marine protected area will need to be 10 times as large as the area that is lost by the construction of the land reclamation and therefore around 20.000 – 30.000 ha.

Benthic fauna forms the base of the food chain in the marine ecosystem. Fish and birds could profit of an increase in benthic fauna. Measures that provide a rise in benthic fauna are therefore most important in the marine reserve. Other measures will be introduced to protect birds from disturbance.

A monitoring and evaluation programme will be set up to determine whether the benefits of the Marine Protected Area are in balance with the effects of the land reclamation. This includes addressing the question of whether the Marine Protected Area is large enough or if it even can be smaller.

Establishment of this Marine Protected Area is not easy as there is no specific legislation available. Instead, it will be necessary to use a mix of existing legislation and to have the co-operation of many authorities. Social and economic effects, at least on the local level, will also have to be take account of.

Marine protected area - WHEN?

The Port of Rotterdam wishes to start construction of the land reclamation in the autumn of 2006. The nature compensation has to be ready when the negative effects show up. Recent discussions re-opened the question of when the marine protected area will be "ready". The view of the Ministry is that all the measures needed for the marine reserve must be in force when building of the land reclamation starts. Some stakeholders on the other hand think that construction of the land reclamation can only start after all marine nature that will be lost as a result of the work is compensated for present in the Marine Protected Area.

In the Netherlands discussions such as these may go on for many years without any final agreement. Discussions on the banning of cockle fisheries out of the Waddensea in favour of the birds, for example, have been ongoing for more than ten years. The Dutch government has recently decided that cockle fisheries will be banned from the Waddensea from next year, to resolve this issue. However, this was not because of agreement over the scientific arguments, but because of more political arguments.

It is unlikely that all questions relating to the land reclamation project can be answered within the next two years, simply because some questions can only be answered after the collection of data in an established marine reserve. The most important part of this nature compensation project will therefore probably be the monitoring and evaluation programme together with the involvement of all relevant authorities and stakeholders in this process.

Marine protected area and land reclamation: They only come together

Finally, it is important to note that there is no serious alternative to the compensation package. If we do not succeed in creating the Marine Protected Area, there will be no land reclamation. They only come together.

7 CONCLUDING DISCUSSION AND FURTHER ACTION

The final discussion session considered questions that could usefully be passed to the EU Marine Expert Group (which is considering matters linked to implementation of the Habitats Directive in the marine environment) or to the European Commission. In particular, questions on issues where discussed which were not exclusively under the control of Member States.

The key question of concern was: What mechanisms might be used to regulate fisheries in *Natura 2000* sites in the territorial seas and EEZ of Member States?
This issue had been touched on in the discussions following the legal papers (see Section 4.4) and by Round Table 1 (see Section 5.1). However there appear to be a number of possible approaches and Member States have yet to decide how they will proceed.
The Commission has delivered a considered option, based on questions raised by the UK, which states that the CFP provisions should be used to institute such regulations.

The steps that should be taken prior to any request to the Commission for action were also discussed. These included the possibility of joint submissions from several Member States asking for regulations on fishing vessels in *Natura 2000* sites. The extent to which this could be achieved would depend on the practicalities, including how many Member States were potentially involved. There may also be a role for emergency measures to be used (as in the case of the Darwin Mounds cSAC) to provide interim protection until permanent regulations had been agreed.

In conclusion:

- There appear to be a number of mechanisms that might be used to regulate fishing activities in *Natura 2000* sites in the territorial seas and EEZ of Member States.

- Member States have yet to decide how they will proceed with regulating fishing in those *Natura 2000* sites where they believed such action will be necessary to achieve or maintain favourable conservation status

- The Commission has provided clarification on some aspects of the question surrounding the regulation of fishing activities but has not given an opinion on all the questions raised by the legal round table i.e.

    1. Which species are covered by the CFP?
    2. Who has the power to regulate fishing activities primarily or solely for nature conservation?
    3. Should fisheries be considered a “plan or project” under Article 6.3 of the Habitats Directive?
    4. How can the precautionary principle be applied to fisheries in *Natura 2000* sites?

5. Are there likely to be capacity constraints within the Commission when faced with what are likely to be a large number of requests for emergency measures or legislative proposals to be put before the Fisheries Council to regulate the activities of fishing vessels in *Natura 2000* sites?

- The extent to which Member States should act jointly or independently in seeking fisheries regulations in *Natura 2000* sites is unclear.

- The question of how Member States can be precautionary in seeking fisheries regulations in *Natura 2000* sites and how they should act if there is delay or failure to act by the Commission needs to be clarified.

The workshop participants concluded and asked that these questions be passed to the EU Marine Expert Group and/or to the Commission to seek their views.

ANNEX 1
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ANNEX 2

PROPOSAL FOR AN IMPACT MATRIX RELATING FISHING ACTIVITIES TO RELEVANT MARINE INTEREST FEATURES OF THE EU HABITATS DIRECTIVE (92/43/EEC)

Saskia Richartz, IEEP

Annex 2

PROPOSAL FOR AN IMPACT MATRIX RELATING FISHING ACTIVITIES TO RELEVANT MARINE INTEREST FEATURES OF THE EU HABITATS DIRECTIVE (92/43/EEC)

Saskia Richartz, IEEP

This paper presents a *model* **Impact Matrix** for the assessment of potential impacts of certain fishing gear on relevant marine interest features of the EU habitats Directive. The model has been developed on the basis of discussion at the June 2004 Expert Workshop on Marine Protected Areas and Fisheries, organised by the *Bundesamt für Naturschutz* of the German Government.
In this context, it should be understood that the form and contents of the Matrix are to be seen simply as a basis for discussion, and that the aim is to test the ground for finding stakeholder consensus on the:

- use and usefulness of the Matrix;
- terminology and categories (ie the key to the table); and
- contents of the table (ie the actual weighting of impacts).

The Matrix should not in any form be seen as a final or even draft product.

1 Proposed Use of the Matrix

The proposed approach for use of the Matrix is in two stages:

Stage 1 - development of a ***general*** **Sensitivity to Impact Matrix** on a biogeographical or regional seas scale. This would be developed at the EU level to serve as a template for application at the site level. It would serve as a guide for Stage 2.

Stage 2 - development of ***site specific vulnerability to*** **Impact Matrices** for individual (c)SACs, as appropriate. These would be developed by site managers, using the general Matrix as a template. The weightings could at this stage be overruled if the conditions of the site render this necessary.

It should be considered whether different Matrices are needed for the different biogeographical regions, or even regional seas. The below example is considered to be adequate for the Atlantic Region and may need to be revised for the Macaronesian or Mediterranean Region. Moreover, A separate Matrix for SPAs could also be considered.

2 Purposes of the Matrix

The *general Sensitivity* to Impact Matrix is designed to rank the likelihood of different fishing gears impacting negatively on relevant marine species and habitat types, as listed in Annex I and II of the EU habitats Directive (92/43/EEC). It does so at a regional scale. The *general* Matrix can then be used by local site managers in assessing and ranking vulnerability of local interest features to respective fishing impacts. In guiding the development of local impact matrices, the general Matrix should be seen as a template for data processing and presentation, as much as a generalised assessment of likelihood of sensitivity to impact.

3 The Proposed Ranking System

It is proposed that the ***general Sensitivity to* Impact Matrix** uses a simple ranking system as follows. A draft template is presented at the end of this document.

Likely – activity is considered likely to have an effect on the species or habitat, or, in the case of habitats, the typical species that may affect the habitat's long-term natural distribution, structure and functions, as well as the long-term survival of its typical species;[80]

Possible - activity may under certain local circumstances (eg animals resting at the shore) have an effect on the species or habitat, or, in the case of habitats, the typical species that may affect the habitat's long-term natural distribution, structure and functions, as well as the long-term survival of its typical species.

Unlikely - activity not considered likely to have an effect on the species or habitat, or, in the case of habitats, the typical species that may affect the habitat's long-term natural distribution, structure and functions, as well as the long-term survival of its typical species;

It is further suggested that for the use at local level **(Stage 2)** a somewhat modified ranking system is used. In Stage 2, every activity considered likely to be significant according to the general Impact Matrix, should be ranked according to whether the vulnerability to impact is assessed to be high, moderate or low. Likewise, activities ranked at regional level to have a possible impact in certain circumstances need to be assessed locally, and the assigned rank needs to be explained. For instance, bait collecting may be classed as *'Possible'*, because resting animals at the shore may be disturbed. However, in light of an assessment at site level, it may be established that local shorelines are not used by eg seals. Hence, the rank for the impact of bait collecting in the site-specific Matrix may be down-scaled to *'Unlikely'*. An explanation should be given as to why the activity is considered unlikely to have an impact on the site.

[80] The wording follows Article 1 (e) of the habitats Directive, which defines the conservation status of a natural habitat as meaning 'the sum of the influences acting on a natural habitat and its typical species that may affect its long-term natural distribution, structure and function as well as the long-term survival of its typical species within the territory …'

Those activities that are generally considered *'Unlikely'* to have a significant negative effect, can be up-graded to *'Likely'* impact during Sage 2, if local circumstances render this necessary. In that case, the site manager should rank the impact appropriately as high, moderate or low impact. Moreover, an explanation should be given as to why the activity is considered to have likely significant affect on the site. Likewise, managers can consider to down-grade individual rankings, but should provide adequate information to support their judgement.

Consequently, the following ranking system should be used during Stage 2:[81]

High	- the habitat or species is very adversely affected by the external impact arising from human activity, and is expected to recover not at all or only over a prolonged period of time *[suggested is > 10 years];*
Moderate	- the habitat or species is adversely affected by the external impact arising from human activity, but is expected to recover in 1 to 10 years *[time period to be discussed];*
Low	- the habitat or species is adversely affected by an external impact arising from human activities but is expected to recover rapidly or in a short period of time *[suggested 1 – 5 years]*.

The following draft template should be considered as the basis for discussions.

[81] Definitions are loosely based on the UK Marlin classification system http://www.marlin.ac.uk/glossaries/combi_sens_ass_rat.htm#Table1

PROPOSAL FOR AN IMPACT MATRIX RELATING FISHING ACTIVITIES TO RELEVANT MARINE INTEREST FEATURES OF THE EU HABITATS DIRECTIVE (92/43/EEC)

General Sensitivity to **Impact Matrix** for the ranking of the impact of fishing activities on habitat and species features for which Special Areas of Conservation (SACs) have been selected.

	Benthic trawls	***Pelagic trawls***	***Dredging***	***Netting***	***Potting***	***Longline***	***Collecting***
Habitat types (Annex I)							
Sandbanks which are slightly covered by seawater all the time	likely	unlikely	likely	likely	unlikely	unlikely	likely
Posidonia beds	likely	unlikely	likely	likely	unlikely	unlikely	unlikely
Submerged or partially submerged sea caves	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely
Estuaries	likely	unlikely	likely	unlikely	unlikely	unlikely	likely
Sand- and mudflats	likely	unlikely	likely	unlikely	unlikely	unlikely	likely
Lagoons	possible	unlikely	likely	unlikely	unlikely	unlikely	likely
Large shallow inlets and bays	likely	unlikely	likely	unlikely	unlikely	unlikely	likely
Reefs	likely	possible	likely	likely	possible	likely	possible
Submarine structures made by leaking gases	likely	unlikely	likely	unlikely	unlikely	unlikely	unlikely
Species groups (Annex II)							
Mammals	likely	likely	unlikely	likely	unlikely	unlikely	possible
Fish species	likely	likely	possible	likely	possible	possible	unlikely
Reptiles	likely	likely	unlikely	likely	likely	likely	possible
IT IS PROPOSED THAT A SEPERATE MATRIX IS USED FOR SPAs							
Bird Species (Annex I)		likely		likely		likely	likely