Why hasn’t fisheries science enabled managers to implement precautionary elasmobranch management; could other tools complement their efforts?

Charlotte B. Mogensen and Sarah Fowler

WWF European Policy Office, 36 Avenue de Tervuren - B12, 1040 Brussels, Belgium
E-mail: cmogensen@wwfepo.org
Naturebureau International, 36 Kingfisher Court, Hambridge Road, Newbury, RG14 5SJ, UK.
Fax: +44 (0)1635 550 230. Email: sarah.fowler@naturebureau.co.uk.

Abstract

Fisheries science demonstrates that elasmobranchs are highly vulnerable to depletion by fisheries and slow to recover from such depletion. There is international agreement that applying the precautionary approach to fisheries management in general and elasmobranch fisheries in particular should be given high priority. Stock assessments and CPUE data clearly indicate that some European species, including regional endemics, are seriously depleted. Regardless, the EU has still not adopted sufficient fisheries management measures to address these issues and/or to reverse these trends. There is limited monitoring, control and surveillance activity focused on elasmobranchs in EU waters and compliance with the requirement to record catches (whether retained or discarded) is almost non-existent. Nevertheless, imperfect data should not be used to justify inaction by policy-makers or managers and elasmobranchs are a perfect example of the need to apply a precautionary approach to management. It is suggested that biodiversity instruments, such as CITES, could be important complementary tools for the conservation, management and recovery of elasmobranch stocks.

Keywords: Elasmobranchs, precautionary approach, CITES.
Introduction

Although the status of the majority of elasmobranch stocks in the Northeast Atlantic is poorly known, many of those that have been studied are considered depleted (e.g. Heessen, 2003; Dulvy et al., 2000; Rogers and Ellis, 2000; Ellis et al., 2004). This is the result of unregulated target and bycatch fisheries mortality acting upon species that are biologically highly vulnerable to exploitation because of their heavily K-selected life histories (Holden, 1974; Musick, 1999). It is very likely that the majority of other elasmobranch species are similarly depleted, although data are lacking and stock assessments have not been attempted. Indeed, some of the largest bodied species, which are morphologically the most vulnerable to fisheries in addition to usually being biologically the most vulnerable to overexploitation, have now been extirpated or locally extirpated from some coastal waters (e.g. white skate Rostroraja alba, common skate Dipturus batis, angel shark Squatina squatina, common sawfish Pristis pristis, and largetooth sawfish P. perotteti (Dulvy et al., 2002, 2003)). No assessment has been attempted for tope Galeorhinus galeus, although this species is still commercially important and targeted in European waters and has been seriously depleted by fisheries in other parts of its range. Even the moderately-sized and very widespread spurdog Squalus acanthias, which is still sometimes referred to erroneously as one of the most abundant of elasmobranchs, has declined in the Northeast Atlantic to less than 10% of its carrying capacity, and possibly as low as 5% of virgin biomass (Hammond and Ellis, 2005). Conversely, stocks of some of the most fecund small-bodied taxa (e.g. lesser-spotted dogfish Scyliorhinus canicula and starry ray Amblyraja radiata) are either stable or have increased as a result of their low commercial value and high discard rates (Heessen, 2003; WGEF, 2005), possibly coupled with competitive release through the depletion of larger species of elasmobranch and teleost.

This paper considers the limited availability of data and stock assessments for elasmobranchs in the region, how these data contribute towards the development of management advice, and the extent to which sustainable fisheries management is being implemented for this vulnerable taxonomic group. It considers other management options currently available and whether these may be used in complement to fisheries instruments to achieve the common goal of sustainable elasmobranch populations.
Stock assessments and scientific advice

The introduction of improved fisheries management measures (or indeed any species-specific measures) for the elasmobranchs is seriously hampered by the lack of the essential prerequisite for meaningful assessment and management: quantitative stock assessments, including data on the structure and identity of exploited stocks. The single most important regional initiative in this respect has been the EC-funded “Development of Elasmobranch Assessments” (DELASS) project initiated in 1998 (Heessen 2003), but even these studies and the associated work of the ICES Working Group on Elasmobranch Fishes (e.g. WGEF, 2005) have had to draw conclusions on the basis of limited information.

ICES has been evaluating the status of elasmobranch fishes through its Study Group (latterly Working Group) on Elasmobranch Fishes (WGEF) since 1989. WGEF has attempted assessments of spurdog *Squalus acanthias*, blue shark *Prionace glauca*, Portuguese dogfish *Centroscymnus coelolepis*, leafscale gulper shark *Centrophorus squamosus*, kitefin shark *Dalatias licha*, lesser-spotted dogfish *Scyliorhinus canicula*, blackmouth catshark *Galeus melastomus*, thornback ray *Raja clavata* and cuckoo ray *Leucoraja naevus* in the ICES area and the starry ray *Amblyraja radiata* in the Barents Sea and North Sea, but in several cases was unable to determine stock trends or status.

The EC’s Scientific, Technical and Economic Committee on Fisheries (STECF) Sub-Group on Elasmobranch Fisheries has been asked to “identify possible desirable management objectives and strategies for the various species or group of species and fisheries targeting elasmobranchs”. In 2003 the sub-group identified appropriate stock and management units for some elasmobranchs and recommended objectives and contents for a Community Plan of Action for Sharks, but did not develop any species-specific management recommendations on quotas (Anon., 2003).

In 2004 an Inter-sessional meeting of the ICCAT Sub-Committee on Bycatches conducted stock assessments of Atlantic blue shark *Prionace glauca* and shortfin mako *Isurus oxyrinchus* stocks. Based on this information and in view of the very incomplete nature of the catch reporting for blue shark and shortfin mako to the Secretariat, the Group decided to attempt to construct a more accurate picture of shark catch and mortality in the Atlantic.
tuna fleets based on ratios of shark to tuna landings from fleets reporting both to ICCAT and using these ratios to reconstruct an example catch history by major gear type. The estimates are still considered highly uncertain, but for blue shark the current biomass appears to be above the biomass at MSY and the fishery therefore sustainable. The conclusions for the North Atlantic shortfin mako stock are that this has historically experienced stock depletion greater than 50%, that the stock is continuing to decline, and that the fishery is unsustainable (Anonymous 2005).

To date, available data and the quality of assessments have proved inadequate to assess stocks relative to reference levels of biomass (B) and fishing mortality (F), as is the norm in teleost fisheries. However ICES ACFM for the first time in 2005 advised the European Commission on the status of basking shark *Cetorhinus maximus*, porbeagle *Lamna nasus*, spurdog, kitefin shark, Portuguese dogfish, leafscale gulper shark and skates and rays.

Perhaps as a result of these shortcomings, the Council of Ministers has failed to adopt precautionary management for these species, either by not implementing the scientific advice from ICES or the less precautionary European Commission recommendations for elasmobranch fisheries management. Current management measures are summarised in the following section.

**Elasmobranch fisheries management**

At present, the only fisheries management in place for elasmobranchs within the European Union is the use of total allowable catches (TACs) to allocate quotas for Member States. These are restricted to the TACs set for all skates and rays (combined), basking shark and for spurdog in the North Sea only. These are ‘precautionary’ TACs, meaning that they are adopted in order to maintain stability of fisheries within the North Sea, not based on stock assessments or any biological considerations at all. They are not, therefore, precautionary in the sense that they restrict catches to levels that should reduce the risk of stock depletion where there is scientific uncertainty. Rather, current TACs are based on historic catch levels and do nothing to control the exploitation of the species, because they have consistently been higher than the landings achieved.
In January 1998, a precautionary TAC for skates and rays of 6,060 tonnes was introduced for EU waters of ICES division IIa and the North Sea based on landing statistics from the previous five years. This TAC has progressively been reduced, but is still significantly higher than recent landings most recently with 15% to 2,737 tonnes despite ICES advice for a zero quota in 2006.

There is a TAC for spurdog in the EC waters of the North Sea (ICES sub areas IV and IIa) for EC nations (Belgium, Denmark, Germany, France, The Netherlands, Sweden and the United Kingdom) and Norway. The Norwegian quota includes longline catches of other sharks (tope, velvet belly *Etmopterus spinax*, birdbeak dogfish *Deania calceus*, leafscale gulper shark *Centrophorus squamosus*, greater lanternshark *Etmopterus princeps*, smooth lanternshark and Portuguese dogfish *Centroscymnus coelolepis*) that may be taken in ICES sub-areas IV, VI and VII. The TAC for EC nations has been reduced from 8870 tonnes (1999–2001) to 7100 t (2002), 5640 t (2003), 4472 t (2004) and 1136 t (2005), with the most recent reduction for 2006 of 15.4% to 961 tonnes, in the face of ICES advice for a zero quota. Under Council Regulation 2056/2001, the EU mesh size requirement for vessels targeting spurdog is 120–219 mm.

For deepwater sharks, a TAC of 6763 t has been set for ICES areas V, VI, VII, VIII and IX. The TAC is 14 t in area X, and 243 t in Area XII. These TACs are allocated by country and apply to the following species: Portuguese dogfish (*Centroscymnus coelolepis*), Leafscale gulper shark (*Centrophorus squamosus*), Birdbeak dogfish (*Deania calceus*), Kitefin shark (*Dalatias licha*), Greater lanternshark (*Etmopterus princeps*), Velvet belly (*Etmopterus spinax*), Black dogfish (*Centroscyllium fabricii*), Gulper shark (*Centrophorus granulosus*), Blackmouth dogfish (*Galeus melastomus*), Mouse catshark (*Galeus murinus*), Iceland catshark (*Apristuris spp.*). In Subarea XII, *Deania histicosa* and *Deania profundorum* are added to this list. The status of many of these species is completely unknown, but stock assessments demonstrate that *C. coelolepis* and leafscale gulper shark *C. squamosus* are seriously depleted (WGEF 2005) while the declining combined CPUE data for all species of deepwater sharks indicate that several other species are also seriously depleted and near to collapse. ICES advice in 2005 was for a zero quota for all deepwater
shark species in 2006, but the Council of Ministers failed to adopt any measures to reduce fishing mortality on deepwater sharks at its meeting in December 2005.

Ideally, elasmobranch management and monitoring for both target and bycatch fisheries will be implemented through the measures set out in the UN FAO International Plan of Action for the Conservation and Management of Sharks (IPOA–Sharks), adopted in 1999. The IPOA aims to ensure the conservation and management of sharks and their long-term sustainable use, requiring States that voluntarily adopt the Plan to identify and pay special attention, in particular, to vulnerable or threatened species. Progress with the implementation of the IPOA-Sharks has been very limited since its agreement, with very few States having developed Shark Assessment Reports or National Shark Plans, and even fewer new shark management measures having been delivered as a result. This disappointing progress suggests that this initiative is most unlikely to deliver sustainable shark fisheries management or conservation in the foreseeable future.

The Council regulation on the conservation and sustainable exploitation of fisheries resources (Council Regulation (EC) No. 2371/2002) extends the CFP to take into account conservation, management and exploitation of living aquatic resources whenever adopting management regulations. Furthermore the communication from the Commission COM(2002) 186 final, 28.05.02, includes a commitment to implement a Community action plan to manage sharks in the context of FAO IPOAs and to propose legislation for this purpose before the end of 2003. Nearly five years after the FAO’s suggested target date for development and implementation of NPOAs and the very limited circulation of a preliminary draft European Shark Plan at the FAO Committee on Fisheries (COFI) meeting in early 2001, no European Shark Plan had yet formally been developed for consultation, nor had any Northeast Atlantic States implemented a Shark Plan within their territorial waters.

**Applying the Precautionary Approach**

The United Nations Fish Stocks Agreement (UNFSA) provides an effective framework for national and international organizations in their efforts to adopt precautionary measures. Specifically, the UNFSA promotes the conservation and management of straddling fish stocks and highly migratory fish stocks in high seas areas regulated by Regional Fishery
Management Organizations (RFMOs). However, unlike traditional fisheries management (which tends to take a “single species approach”), the UNFSA framework provides a broader mandate for managing ecosystems by advocating for the protection of non-target species, habitats and biodiversity as well. The premise of the precautionary approach (PA), as defined by the UNFSA, is that fishery managers should strive to take appropriate conservation actions even in cases where the information is uncertain, rather than delay any action while waiting for better data. Precautionary conservation and management measures should be put in place to reduce the risks of irreversible resource changes even if complete scientific information is unavailable. In these situations, fishery managers should seek to quantify risks to resources relative to predetermined reference points, including limit reference points and target reference points. Currently, however, fisheries management measures are usually only brought into force well after a major conservation problem has been arisen (and too frequently not even then). Precautionary management measures should, in contrast, be designed and implemented to avoid such conservation problems in the first place or to ensure that they never recur. Another important aspect of the precautionary approach is the intent to promote a more equitable balance between short-term considerations (which lead to overfishing) and considerations of a longer term approach (MRAG, 2005).

The precautionary principle is embodied within the *Maastricht Treaty*, Article 130(2) in the EU, which states that: ‘Community policy on the environment ... shall be based on the precautionary principle ... (and) environmental protection requirements must be integrated into the definition and implementation of other Community policies.” One of the key changes in the reform of the Common Fisheries Policy (CFP) was the adoption of a stronger commitment to the protection of the marine environment from the impact of fishing as a fundamental objective. For the purpose of delivering sustainable exploitation under the CFP, the Community is committed to the application of the precautionary approach to management in a way that minimizes impacts of fishing on the marine ecosystem. Precautionary approach fisheries management is defined under the CFP as “Precautionary Approach to fisheries management” means management action based on the principle that absence of adequate scientific information should not be used as a reason for postponing or failing to take measure to conserve target species, associated or dependent species and non-target species and their environment. A further objective of the
CFP is to aim at a progressive implementation of an ecosystem-based approach to fisheries management. Therefore, it can be seen that the Common Fisheries Policy framework regulation provides a clear legal basis for future measures intended to reduce the negative impacts of fishing on the marine environment.

Following a request from the European Commission, the International Council for the Exploration of the Sea (ICES) has developed a procedure for implementing the precautionary approach in its advice to the Commission on fish stocks and future catch levels. This is done by setting reference points for individual stocks covered by the TACs and quotas regime - in effect trigger levels at which management action should be taken. ICES identified two types of reference points: 'limit' and 'precautionary'. The current management objective is that fish stocks are managed so they do not exceed the precautionary reference point. However the application of the precautionary approach is limited, although the legal basis for measures intended to reduce negative impacts of fishing on the environment, overall as well as within recovery and management plans are available for fisheries management EC 2000. Previous communication from the Commission has set out the precautionary approach to fisheries on how to deal with risk and uncertainty when data are available to support extensive scientific analysis against specific reference points.

The precautionary approach has, however, only been applied to a selected sub-set of commercial fish stocks for which ICES advice has been requested. Stocks of other species have not yet received such consideration, for example, sharks, rays and many deep-sea fish stocks. Furthermore, the precautionary approach is not being applied in situations where adequate scientific data are lacking about the impacts of fisheries on non-managed stocks. For fisheries management to include elasmobranchs in the management system there is an urgent need for the precautionary approach to be regarded as a routine procedure rather than something introduced as an emergency measure for stocks, which are under the threat of overexploitation. At present two factors constrain this approach: 1) the poor quality of catch reports and the reliability of effort data, and 2) a lack of dialogue between the parties involved; namely the scientists, managers and industry.
The above precautionary conservation and management measures can be implemented taking into account the following challenges:

- achieving sustainable management of fisheries that take species of different productivity, or when species are taken in two or more fisheries;
- ensuring that data collection, assessment and research are sufficient and adequate;
- achieving consistent and complementary management arrangements across fisheries, particularly where the fisheries extend across administrative boundaries; and
- ensuring that adequate resources are assigned to the above.

As explained above, quotas are in place for skates and rays (all species combined) and for spurdog in the North Sea (which represents only small part of this wide-ranging highly migratory stock). Minimum landing sizes have been set for skates and rays in some Member States. However, these measures are wholly inadequate to stem the current declining trend in chondrichthyan populations. More effective management measures are urgently needed. We suggest that such measures may be applied through the adaptation of existing mechanisms, complemented by biodiversity and trade conventions/regulations.

**International protection status of elasmobranch species**

*UN Convention on the Law of the Sea*

The UN Convention on the Law of the Sea (UNCLOS) has listed several elasmobranchs on Annex I, Highly Migratory Species (including sixgill shark *Hexanchus griseus*, basking shark *Cetorhinus maximus*, threshers Family *Alopiidae*, Family *Carcharhinidae* (including blue shark), hammerheads Family *Sphyrnidae* and Family *Isurida* (including shortfin mako and porbeagle *Lamna nasus*). This Annex requires coastal States and other States whose nationals’ fish in the region for the highly migratory species to “cooperate directly or through appropriate international organisations with a view to ensuring conservation and promoting the objective of optimum utilisation of such species throughout the region, both within and beyond the exclusive economic zone. In regions for which no appropriate international organisation exists, the coastal State and other States whose nationals harvest these species in the region shall cooperate to establish organisation and participate in its work”. Although the UN Fish Stocks Agreement (established to implement the provisions
of UNCLOS relating to the conservation and management of straddling fish stocks and highly migratory fish stocks) was ratified in 2001, there is still no apparent progress with the management and cooperation envisaged under UNCLOS. The UN Fish Stocks Agreement remains largely un-ratified.

The Barcelona Convention

The Barcelona Convention for the Protection of the Mediterranean Sea (1976) Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean was signed in Barcelona on 10 June 1995. Species listed on Annex II to the Protocol ‘Endangered or Threatened Species’ (white shark *Carcharodon carcharias*, basking shark and giant devil-ray *Mobular mobular*) should receive full protection in the Mediterranean once the Convention is ratified and appropriate legislation in place. This includes obligations in line with the provisions of Annex IV of Habitats Directive (Article 11 of the above protocol: regulate and, where appropriate, prohibit activities having adverse effects on such species or their habitats, and carry out management, planning and other measures to ensure a favourable state of conservation of such species…), and to Annex II of Habitats Directive (to ensure protection by designation of "Specially Protected Areas of Mediterranean Importance", art 8) The term “Mediterranean Sea” includes the maritime waters of the Mediterranean Sea proper, including its gulfs and seas (therefore, including offshore waters beyond territorial seas). The Convention also lists five more elasmobranch species on Annex III (Species whose exploitation is regulated): shortfin mako, porbeagle, blue shark, white skate *Raja alba* and angel shark *Squatina squatina*). Although this legally binding instrument came into force in 1999, Malta is so far the only signatory that has used its national legislation to provide legal protection to Annex II species (Fowler and Cavanagh 2005).

International trade regulation

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) recognises that international cooperation is essential for the protection of certain species from over-exploitation through international trade. It established the international legal framework for the prevention of trade in endangered species of wild fauna and flora and for the effective regulation of international trade in other species which may become
threatened in the absence of such regulation (Wijnstekers 2001). CITES operates through its Appendices, which list species that come under CITES’ remit, and its Resolutions and Decisions, which may require States to undertake additional actions for the conservation, monitoring and management of listed or unlisted species. Appendix I of CITES lists species that are threatened with extinction and for which no international trade is allowed (except under exceptional circumstances). Trade in the approximately 29,000 species listed on Appendix II is subject to strict regulation and monitoring to ensure that it is not detrimental to the survival of the listed species, or in other words that the wild populations supplying international trade are sustainably managed. CITES can contribute towards elasmobranch management by using its established trade monitoring role to assemble information on catch and trade that are not now collected, but that are crucial to the proper management of fisheries (Weber and Fordham, 1997). CITES does not, however, require that fisheries for listed species that supply domestic trade and consumption be regulated.

To date, only three species of elasmobranchs have been listed, all on Appendix II. Two occur in EU waters: the basking shark and white shark *Carcharodon carcharias*. Internal EU proposals to list spurdog and porbeagle were turned down in 2004, but may re-emerge in future. In the EU trade is controlled within the provisions of EC Regulations Nos. 338/97 and 1808/2001. CITES has no effect upon the management of EU stocks that are consumed by EU markets and primarily affects imports of listed elasmobranch species to the EU.

CITES Decision 13.42, directed to Parties, *inter alia* encourages States to improve their data collection and reporting to FAO of catches, landings and trade in sharks, at species level where possible; and to take note of a number of species-specific recommendations (for unlisted species) with a view to ensuring that international trade is not detrimental to their status.

*Convention on the Conservation of Migratory Species of Wild Animals (CMS)*

CMS recognises the need for countries to co-operate in the conservation of animals that migrate across national boundaries, if an effective response to threats operating throughout a species’ range is to be made. Its regional structure provides a framework within which
Parties may adopt strict protection measures for endangered migratory species (listed under Appendix I), or conclude Agreements for the conservation and management of migratory species with an unfavourable conservation status (listed in Appendix II). These Agreements are open to accession by all Range States of the species concerned, not just to the CMS Parties.

Three species of shark are listed on CMS, two of which (basking shark and white shark) occur in European waters and are listed on Appendix I and II. Their inclusion in both Appendices provides a framework within which to coordinate the measures that may be adopted by range states to improve the conservation of the species and to promote their protection. Furthermore, the CMS listing has the potential to contribute towards the implementation of the UN FAO IPOA-Sharks through country co-operation at a regional level. This could, for example, be used to promote the standardisation of methods of data collection and data sharing on shark catch and bycatch rates, recognising that improved management and effective protection across international borders requires that the presence and status of the species within and between neighbouring range states be determined. Agreements between adjacent member states would also facilitate research and monitoring of contiguous populations between Contracting Parties and better facilitate management measures across international waters for the protection of the species.

In addition to the listings of three shark species, CMS now has a global mandate for the conservation of migratory sharks through a resolution that urges Contracting Parties to develop a global instrument for all migratory shark species listed on the Appendices of the Convention and to reduce shark bycatch. The resolution includes a call “to identify viable and practical alternatives to consumptive uses of migratory sharks while recognising the cultural and economic importance of these species for some communities”. In many respects, the provisions of CMS mirror some of those of the Fish Stocks Agreement and the two instruments list some of the same shark species. Furthermore, but less constructively, the degree of implementation of both instruments is similarly poor.

Regardless of the instrument in question, effective conservation of migratory species requires a consistent and coordinated approach to the development and application of
conservation measures throughout their species’ habitat, regardless of the jurisdiction within which they fall. This includes important feeding, mating and pupping sites, and the migration routes between them.

Parties to CMS have also secured a resolution on bycatch, which calls for action from CMS Parties, the Secretariat and the Scientific Council. Other actions include inviting CMS Party engagement in RFMO’s on bycatch mitigation, for relevant research to be funded, and encouragement to CMS Secretariat to take a role in promoting the trialling and uptake of new solutions for migratory species affected by bycatch.

*European implementation of international treaties*

Article 10 of the EC Treaty emphasises the duty of loyal co-operation between Member States and Community institutions. In addition, in the field of external relations of the EC, the European Court of Justice has established the principle of unity in the external representation of the Community. Therefore, when a Member State wishes to propose an amendment to either an Appendix of CMS or CITES, its proposal must first be presented to the relevant committee created under EC legislation in order for the Commission and the other Member States to consider the scientific soundness of the proposal and to clarify whether it is already covered by the *acquis* or if it would entail a change in existing EC legislation. If agreement is reached on the soundness of the proposal, the Commission undertakes to present a proposal for a Council Decision in order formally to establish the Community position.

When species are included in certain international conventions, European law requires that they also be included in the Annexes of the “Habitats and Species” Directive 92/43/EEC. Thus, when a species is listed on the Annexes of the CMS, the relevant annexes of the Habitats Directive also become necessary under Community law. This measure has not yet been implemented for any listed elasmobranch, and indeed not even the most threatened of Northeast Atlantic elasmobranchs has been listed on the Habitats Directive.
OSPAR Convention

The OSPAR (Oslo and Paris) Convention on the protection of the marine environment of the Northeast Atlantic lists a small number of ‘threatened and declining’ species of elasmobranch, including the basking shark, common skate, and spotted ray *Raja montagui*. The latter was listed although it is apparently neither significantly threatened nor declining (Walker and Hislop, 1998), but it shares with the other listed species a low or no commercial value. Other seriously threatened and/or depleted elasmobranchs originally proposed for OSPAR listing (angel shark *Squatina squatina*, white skate *Rostroraja alba*, thornback ray *Raja clavata*, spurdog, blue shark, tope and porbeagle) were rejected. Since, however, no management measures have been implemented to reverse the declines in those species that were listed, those species omitted from the initial list have not, so far, missed out.

IUCN Red list

The IUCN Shark Specialist Group is currently assessing the status of all the chondrichthians regionally and worldwide, drawing upon a number of scientific and fisheries information sources in order to place species within the appropriate categories of the IUCN Red List of Threatened Species (www.redlist.org). Red List criteria and fisheries stock assessments provide broadly comparable information on the status of populations exploited by Northeast Atlantic European fisheries. None of the stocks currently listed as threatened by IUCN have been advised by ICES as being exploited within safe biological limits and it appears that IUCN red lists can be used as an indication of the status of elasmobranch species (Dulvy *et al*., 2005). Northeast Atlantic and Mediterranean red list assessments should be completed for all regional elasmobranch species in 2006.

Conclusion

The elasmobranchs pose particular challenges for fisheries managers. This arises because of their biology; the lack of adequate data, particularly at species level, and associated constraints upon developing stock assessments and management advice; the practical difficulties of achieving sustainable management for highly depleted species with low rebound potential that almost inevitably continue to be taken as bycatch in fisheries for more fecund species; and their relatively low economic value compared with other
commercial species. Rather than bringing these taxa higher on the list of species requiring strict application of the precautionary approach, which includes the management of European fisheries on the basis of probable outcomes, rather than certainty (which is unattainable), we conclude that these factors and the uncertainties that they generate are actually tending to result in elasmobranchs being rated as a lower priority for fisheries research or management investment, which in turn tends to result in a continued downward population trend in the larger and more vulnerable species and increased extinction risk.

Conversely, many of the above factors mean that elasmobranchs are a high and rising biodiversity conservation priority, internationally, regionally and nationally. Awareness of the vulnerability and threatened status of these taxa increases each year, partly driven by current drive through the IUCN Red List programme to assess the extinction risk for all chondrichthyan species globally.

This increased awareness and representation of elasmobranchs on biodiversity instruments does not necessarily mean that these species should only be managed through a species conservation approach (although this is unfortunately becoming one of the most important option for steadily increasing numbers of seriously threatened species). In those cases where marine species are particularly difficult to manage, it is important to use all available management tools, both fisheries and biodiversity. Biodiversity instruments can support and complement national, bilateral and multilateral elasmobranch fisheries management measures in several ways. To take CITES as one example: this can provide a standardised global monitoring system to apply trade-related measures to marine fish. Where IUU fishing is a problem, it can also provide a tool to combat IUU fishing that targets fish that primarily enter international trade.

Unfortunately, the potential for synergies between fisheries management and biodiversity conservation instruments has not been realised, even in those European States where these two aspects of natural resource management fall within the remit of the same government department, nor within the Commission, even though EU regulations are increasingly focused on achieving precautionary natural resource management across all environmental issues. What is becoming increasingly clear, however, is that stocks or even species may
be lost if fisheries management and biodiversity conservation tools are not implemented together in order to achieve elasmobranch stock recovery and the sustainable management and exploitation of these species.
Reference:

17/18


MRAG Americas, Evaluation of Northwest Atlantic Fisheries Organization’s (NAFO) implementation of the Precautionary Approach, 2005.


