



Towards Ecologically Sound Fisheries Management in European Waters

**Comments by the Federal Agency for Nature Conservation (BfN) on the Green
Paper “Reform of the Common Fisheries Policy” (COM(2009) 163 final)
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General Comments

In the opinion of BfN, **the new Green Paper of the EU Commission provides a good basis** for the urgently needed **fundamental** reform of the Common Fisheries Policy (CFP).

Fisheries is utilizing a common resource, i.e. one that belongs to all inhabitants of the European Union and beyond. In fact, fisheries have been granted the permission to utilize this property for the benefit of all owners. In this respect, fisheries that are adversely affecting the integrity of the ecosystem lose the right to continue its exploitation. Based upon this rationale, a more responsible role of the fisheries could increase the sustainability. Although the introduction of the ecosystem approach to fishery management was specified as a main target in the reformed CFP in 2002 (Council regulation No. 2371/2002), the implementation has left much to be desired. **The current EU fisheries management is oriented primarily toward managing individual fish stocks without adequately investigating, evaluating and minimizing the effects of fisheries on the marine ecosystem as a whole. In particular, aspects of nature conservation are inadequately covered in the present CFP.**

Even in the current Green Paper nature and biodiversity conservation aspects as important parts of an ecosystem approach to be implemented are not adequately covered. The problems of by-catch and discard are mainly approached with a focus on target or commercially exploited fish species. Thus, the effects on non-targeted species such as the by-catch mortality of marine mammals and seabirds as well as the destructive effects of bottom contacting gear on benthic habitats and associated communities received too little attention. In order to effectively implement commitments under the OSPAR and HELCOM conventions, the EU Birds Directive, the EU Habitats Directive and the EU Marine Strategy Framework Directive, a reform of the CFP, focused on the conservation targets, is inevitable.

Continuation of present management policies will result in continued declines of fish stocks and cannot succeed in rebuilding the fish stocks in European waters. Furthermore, the high fishery effort has a variety of adverse impacts on marine habitats and species negatively affecting marine ecosystems and thereby the economical basis of fisheries.

As perfectly well described in the Green Paper, one of the major problems in the CFP is the critical status of commercially exploited fish stocks in European waters, of which 88 % are overfished and 30 % are „beyond safe biological limits“ due to their small

spawning stock biomass. The constant overexploitation of commercial fish stocks has resulted in a shift in species composition and the trophic relationships towards small, fast-growing, plankton-feeding species, in marine ecosystems, which has been described as „fishing down marine food webs“ (Pauly et al. 1998). In particular, the numbers of large predatory fish species at the top of the food pyramid, such as tuna, cod, sharks and skates have been reduced so heavily that their stocks have declined by 90 % since modern fishing techniques began to be employed (Myers & Worm 2003). For example the Baltic Sea ecosystem has shifted from a cod dominated fish community to one that is dominated by sprat (Möllmann et al. 2009). Some scientists have predicted that the continued over-exploitation of fish stocks will lead to a collapse of commercially viable fish populations by the year 2048 and the breakdown of the dependent fishing industry (Worm et al. 2006).

Commercial exploitation of adult fish exerts a strong and artificial mortality compared to natural mortality, which mostly acts on eggs, larvae and juveniles. This fishery-induced mortality imposes an artificial selection pressure causing reductions in body size and age at first maturity (Darimont et al. 2009). As a result, many commercially overexploited stocks are dominated by juvenile fish, which often do not attain age of first maturity before harvested. In contrast, larger fish have a significantly higher reproductive capacity. Consequently, a sufficiently high proportion of large fish within populations is essential to increase resilience against pressures such as recruitment failure, over-exploitation or climate change. Furthermore, sufficiently represented age and size classes help to avoid a negative genetic selection towards a reduced maximum body size and age at first maturity (Brander 2008).

In the view of BfN the fundamental shortcomings of the current CFP are summarized in the following bullet points:

- **Overcapacity of the fishing fleet** exerts too high pressure on fish populations because its magnitude is two to three times greater than a sustainable size. Due to a misdirected subsidy policy, the reduction in capacity with regard to tonnage and engine power was more than compensated in many instances by increases in technical efficiency (more effective fishing gear, echo sounding systems, etc.).
- In the past, **the Total Allowable Catch (TAC)** agreed by the EU council regularly exceeds the **scientific advice** of ICES by between 30 % and 50 % and is therefore

more strongly influenced by socioeconomic and political factors than by ecological and biological necessity.

- The high fishing mortality has led to a steady **decline of target fish stocks** and a massive overall decrease in age and size distributions.

- A continued unsolved problem in specific European fisheries is the **high by-catch rate of marine mammals, seabirds, invertebrates and other marine species, which are discarded on sea together with undersized fish of the target species, or other fish species for which fishermen have no quota.**

- The **negative impact of bottom contacting gears** (bottom trawls, beam trawls) on the seafloor and associated species. Some areas in the North Sea are trawled up to 20 times per year.

- **Shortcomings in the monitoring and control of fishery measures.** Only part of the commercial fishing fleet (vessels of more than 15 meters total length) is equipped with a satellite based Vessel Monitoring System (VMS) and even those operate with a very low signaling rate (one signal every two hours).

- **The lack of knowledge about the effects of commercial fishing activities on protected species and habitats,** because the monitoring programs of fisheries research institutes are primarily focused on commercial fish species. In particular, smaller commercial fishing vessels engaged in secondary fishing activities are not covered by existing observation programs

- **Inadequate implementation of EU regulation for the avoidance of cetaceans by-catch in fisheries (EU COM 812/2004),** which covers the application of acoustic deterrent devices and monitoring programs for larger fishery vessels (12 and 15 meters total length respectively) in certain regions. Outside of protected areas for harbour porpoises, mandatory use (and implementation control) of acoustic deterrent devices ("pingers"), independent of the vessel size, length of the net and mesh size for the avoidance of harbour porpoise by-catch in gillnets and entangling nets.

Beside other measures which, will be mentioned in the context of the questions raised in the Green Paper, BfN is seeing urgent need of action in the following areas:

Implementation of a well-managed network of Marine Protected Areas (MPAs)

From the view of BfN MPAs if adequately managed are the principal instruments to implement the ecosystem approach to commercial fisheries.

Generally, it is possible to distinguish between protected areas dedicated to the management and/or to the recovery of commercially exploited fish stocks and such protected areas with the primary goal to protect marine biodiversity from the effects of human activity. For example, Natura 2000 sites are designed primarily to protect marine biodiversity and restore favourable conservation status for selected species and habitats that are protected according to the EU Birds and Habitats Directives.

On the other hand closed areas or no-take zones have been shown in a number of scientific studies to be an appropriate tool to protect and rebuild exhausted fish stocks globally and in European waters (Gell & Roberts 2003, Halpern 2003). Individual fish in closed areas get older, grow to larger sizes and have higher fecundities. Additionally, fish stocks outside protected areas benefit from the recovery of fish stocks within sites by spill-over effects.

It has often been argued, that closed areas are not efficient for migratory stocks in temperate waters (Sweeting & Polunin 2005). In contrast, the closure of large parts of the Grand Banks after the collapse of the cod stock in the 1990s have resulted in the increase of several demersal fish stocks like haddock, yellowtail and winter flounder (Murawski et al., 2005).

In the opinion of BfN “closed areas” of sufficient size and duration should be implemented in European waters on a scientific basis to increase the knowledge about the benefits of closed areas to rebuild exhausted fish stocks.

Closed areas (no-take zones) can be much more efficient management tools than technical regulations like Total Allowable Catch (TACs) or effort regulations like “days at sea”, currently in place to regulate fishery effort, if effectively implemented. Closed areas are much easier to control than other technical regulations and would result in a much higher level of compliance. Therefore closed areas as a management tool would also be an opportunity to reduce significantly the over-regulation of fisheries.

In the future the targets of MPAs designated for biodiversity conservation and closed areas for fisheries management should be aligned to reach benefits for both commercial fisheries and nature conservation. MPAs would then on the one hand side safeguard the protection of habitats and species, and at the same time improve the status of exhausted fish stocks. As fishing activity from closed areas might be displaced in other marine areas, the overall fishery effort has to be reduced and the selection of MPAs should safeguard the protection of most vulnerable habitats and species.

Integrating the Birds and Habitats Directive in the reformed CFP

Germany is the first EU member state that has designated a comprehensive set of Natura 2000 sites in its Exclusive Economical Zone (EEZ) in 2004. After the designation and adoption of a coherent network of Natura 2000 sites, member states have the obligation to implement management plans/measures to reach the favourable conservation status of protected species and habitats as soon as possible at latest 6 years after designation. Nevertheless the progress in Germany and other member states to implement management measures is still slow.

To fulfil the requirements implementing the Habitats and Birds Directives it is necessary to analyse conflicts between fishing activities and conservation objectives in Natura 2000 sites and beyond. Therefore, BfN has initiated from 2006 until 2008 the research and development project “Environmentally Sound Fisheries Management in Protected Areas (EMPAS)” coordinated by the International Council for the Exploration of the Seas (ICES 2008). Based on a scientific conflict analysis essential conflicts between fishing activities and marine nature conservation objectives have been identified.

The main conflicts, which have been identified in marine Natura 2000 are the impact of bottom contacting gear on benthic habitats (sandbanks and reefs) and associated species in the North Sea and the high by-catch mortality of harbour porpoises and seabirds in static gear in the Baltic Sea.

The following measures are recommended in order to implement the results of the EMPAS project and to safeguard the protection of species and habitats in the marine Natura 2000 sites of the German „Exclusive Economic Zone“ in the North Sea and Baltic Sea (ICES 2008a):

1. Exclusion of fisheries with mobile bottom contacting gear (otter trawls, beam trawls) in the area of the protected habitat types sandbank and reefs.

2. Spatial and temporal exclusion of static gears (especially gillnets) in Natura 2000 sites in the Baltic Sea and North Sea
3. Promotion and mandatory use of selective, ecologically sound fishing gear (for example, fish traps) in areas in which harbour porpoises and seabirds are endangered by gillnets.

Although the main conflicts have been identified and ICES has advised management measures to solve these conflicts, fishing activities within Natura 2000 sites in the German EEZ are still not regulated. **Therefore it is urgently required that the European Commission is fostering the process and setting the legal framework to enable member states to fulfil the requirements of the Habitats and Birds Directives. Particularly in the Natura 2000 sites but also according to the Art § 12 Habitats Directive.**

In 2008 the **EU Commission has published a non-paper “Fisheries measures for Natura 2000 sites”** outlining the process for the implementation of fisheries management measures to reach a favourable conservation status of habitats and species. Although BfN welcomes the current initiative by the EU Commission to develop a guideline document to outline the implementation process and application requirements for member states to achieve fisheries measures in marine Natura 2000 sites, there are several points of criticism:

The aspect of species conservation according to the Habitat Directives is not reflected appropriately within the non-paper. For example species that are listed under Annex VI of the Habitat Directive require particular conservation efforts for which specific management measures are required (Art. 12 Hab. Directives). This may require management measures for the protection of a population throughout its range even if this goes beyond the boundaries of established Natura 2000 sites.

The current version of the non paper is placing the entire responsibility to the member states to evaluate, if ongoing fishing activities are conflicting with nature conservation targets. In the future it should be approved that the originator of a negative effect (in this case the fisheries sector) is proving that fishing activities do not compromise the Natura 2000 conservation targets (“Reversal of the burden of proof”).

The non paper is asking for fisheries data that are currently not readily available, and put all the responsibility on the Member States to collect these data, without offering any assistance from DG MARE.

Industrial Fisheries

The fisheries with small meshed trawls targeting schooling fish species (e.g. sandeel, sprat) for industrial purposes (e.g. reduction to fish meal and oil) is not compatible with the ecosystem approach and should be banned. Predators of higher trophic levels, like marine mammals, seabirds and piscivorous fish compete for the same food resource with industrial fisheries and can be negatively impacted, due to significantly reduced food availability. Furthermore, by-catch of juveniles of commercial exploited fish species imposes further problems on the sustainability of this practice.

The proposed discard ban and landing obligation of fish that could not be sold would be an alternative source to substitute landings from industrial fisheries. Small pelagic fish species would then be available for predators of higher trophic levels like marine mammals, piscivorous fish and seabirds within the marine ecosystem.

Detailed answers on some selected questions raised in the Green Paper (numbers refer to respective chapters in the Green Paper):

4.1 Addressing the deep-rooted problem of fleet overcapacity

Should capacity be limited through legislation? If so, how?

Overcapacity of the fishing fleet exerts pressure on fish populations because of its magnitude, which is two to three times greater than the sustainable level. Due to a misled subsidy policy in the past decades, the reduction in fishery capacity (with regard to tonnage and engine power) was more than compensated in many instances by increases in technical efficiency (more effective fishing gear, echo sounding systems, etc.). This is shown by the continuous decline of landings despite of constant increases of fishing effort (resulting in increasing fuel consumption per kilogram of landed fish).

The continual decrease in fish stocks, which requires a steadily increasing fishing effort, has led to a steady deterioration of the economic situation of most fishing enterprises. A significant reduction in the size of the European fishing fleet would make a sustainable utilization of fish stocks possible at a significantly higher income level with less fishing effort (size of fleet, fuel consumption). It would also give small fishing enterprises a better long-term financial future.

Subsidies should be restricted to measures which result in an effective reduction of fishing capacity and to management measures, that increase the ecologically sustainability of fishing activities.

4.2 Focusing the policy objectives

How can the objectives regarding ecological, economic and social sustainability be defined in a clear, prioritised manner which gives guidance in the short term and ensures the long-term sustainability and viability of fisheries?

The ecological sustainability has to be the guiding principle in the future CFP. An intact ecosystem and healthy fish stocks are the fundamental basis of economical and social welfare in fisheries. Several examples describe the severe economic and social consequences, which result from the collapse of large fish stocks (e.g. Grand Banks, Canada).

4.3 Focusing the decision-making framework on core long-term principles

How could the advisory role of stakeholders be enhanced in relation to decision making?

The **advisory role** of stakeholders should be increased in the future. A high level of compliance with regulations will only be reached if fisheries participate in the decision making process at an early stage but also only if the consequences of non-compliance become existential.

Stakeholder participation through the Regional Advisory Councils (RACs) is an important instrument to increase the level of compliance with fishery regulations. Nevertheless, from a conservation point of view it has to be safeguarded that nature and biodiversity conservation issues are better represented within the RACs. **The present constitutions of the RACs with one third representatives from nature conservation and two third from fishing industry is resulting in majority opinions often not adequately taking into account nature conservation aspects.** This imbalance does not adequately represent the role of ecological sustainability in future fisheries.

4.4 Encouraging the industry to take more responsibility in implementing the CFP

How can more responsibility be given to the industry so that it has greater flexibility while still contributing to the objectives of the CFP?

A higher responsibility of the industry in the management of fishery resources is desirable in the view of BfN.

A higher responsibility might be reached by a more flexible quota system e.g. (Territorial User Rights in Fisheries, TURFS) in coastal areas with less mobile species or Individual Transferable Quotas (ITQs) in offshore areas with more migratory fish stocks. On the other hand from a nature conservation point of view, also the responsibility fishing industry has to be increased to fulfil the requirements of nature conservation.

There is still a lack of data about the impact of fisheries on habitats and species, e.g. the by-catch of marine mammals and seabirds. Different from other human activities, fisheries in Natura 2000 sites does not have the obligation to perform an Environmental Impact Assessment (EIA). Therefore in the future fisheries should have the obligation to proof, that the activities have no significant negative impact on protected habitats and species ("Burden of proof"). An alternative approach would be to set Total Allowable Catch not only for the commercial target species, but also for protected species. In this case the responsibility would be with the fishing industry to document that its catch of

non-target species (e.g. marine mammals, seabirds, protected species) is not exceeding sustainable limits and to take adequate measures to ensure the fulfilment of the target. The documentation of compliance with conservation targets would be in the responsibility of the fishing industry.

Nevertheless this approach would depend on the efficient monitoring of the protected species and habitats to safeguard the compliance with conservation measures.

4.5. Developing a culture of compliance

How can data collection systems be improved in the short ensure coherent information for enforcement purposes?

There is still a fundamental lack of data about the spatial and temporal distribution of fishing activities and the impact of fisheries on habitats and species. Only part of the European fishing fleet (vessels of more than 15 meters total length) is equipped with a satellite surveillance system (Vessel Monitoring System) and even then with a very low signaling rate (one signal every two hours). Because of the overriding need to increase compliance with and to protect species in MPAs it is necessary for all commercial fishing vessels, regardless of length, to be required to be equipped with the VMS system and to increase the signaling rate to be able to effectively monitor compliance. An online tracking system with automated alarm functions to provide data on vessels that enter MPAs illegally would be one prerequisite for effective control.

Additionally BfN is supporting a discard ban and a landing obligation for target and non target species, which cannot be released alive or without injuries. Specially protected species, like marine mammals, marine reptiles and fish (e.g. FFH Annex II fish species) have to be documented and after that returned to the sea alive.

A landing obligation would fundamentally improve the data base for the assessment of commercially exploited fish stocks, but at the same time increase the knowledge of by-catch mortality of non target species like seabirds, marine mammals and invertebrates. On the other hand the limited capacity of fishing vessels **together with the withdrawal of by-catch from the quota** would be a high incentive for fishermen to limit by-catch rates of undersized juvenile fish.

5 FURTHER IMPROVING THE MANAGEMENT OF EU FISHERIES

5.1 A differentiated fishing regime to protect small-scale coastal fleets?

In the view of BfN that small scale fisheries have a higher potential to exploit aquatic resources in an ecologically sustainable manner in comparison to large scale fleets. This part of the fleet is characterized by small fishing capacity and is often not fully utilizing its quota. Therefore, the small scale fishery is less responsible for the general overexploitation of fish resources in European waters. For this reason, future management schemes should take into account that this part of the fleet is more sensitive to economical pressure and should be protected by adequate measures. In the long term there should be a move from large industrial fleet to a local, small scale fishery offering income and jobs in coastal communities.

Nevertheless, also small scale fisheries are not per se ecologically sustainable and have negative impacts on the marine ecosystem especially in coastal areas. E.g. gillnets which are one of the most important fishing gears in the coastal small scale fishery in the German Baltic Sea have almost no negative impact on the seafloor, but the by-catch mortality of seabirds and harbour porpoises is a major concern in this fishery. Therefore the goal should be to substitute harmful fishing gear by ecologically sound fishing gear (e.g. fish traps) and improve the economic situation of the fishery by eco-labeling.

Control and compliance with regulations is much more difficult to ensure in smaller fleets, due to the number of vessels and decentralized landing sites. Therefore a higher responsibility and compliance of fisherman is urgently needed. On smaller vessels video optical surveillance might be an appropriate measure.

The recreational fishery in German marine waters is almost unregulated. According to recent studies recreational fishery are harvesting a substantial biomass of commercial target species (e.g. landings by recreational fisherman in the German Baltic Sea in 2005 accounted for 50% of the commercial landings of cod (Schultz 2007)). From a conservation point of view even the catch of recreational fisheries needs to be monitored and landings have to be taken in consideration, by assessing fish stocks and integrating them into regulation measures (TACs).

5.2 Making the most of our fisheries

Should we consider reforming the CFP in two steps, with specific measures to move to MSY prior to 2015 followed by measures to maintain MSY as the upper exploitation level after that date?

Catching more fish than resulting in maximum sustainable yield reduces abundance and future yields and thus does unnecessary damage to stocks, ecosystems, and future

income of fisheries. Therefore in the view of BfN, the spawning stock biomass that produces Maximum Sustainable Yield (BMSY) cannot be the preferred target of fisheries management. BMSY is about 50 % of an unexploited stock and a fish stock below this biomass will not be able to fulfil its role in the ecosystem.

BMSY is the reference point agreed in the UN Law of the Sea and the World Summit on Sustainable Development (Johannesburg 2002). According to these conventions BMSY represents the lower limit: If the biomass falls below BMSY stocks need to be rebuilt. Additionally BMSY is associated with a confidence limit. The precautionary principle as enshrined in European primary law demands that in such case the precautionary limit (here: upper confidence limit) has to be applied. That would put the target biomass at about 2/3 of the unexploited stock biomass, i.e., close to the so called **Maximum Economic Yield (MEY)**. MEY is a reference level where the highest revenue is yielded with the lowest fishery effort and is from a conservation point the appropriate management target.

5.5. Integrating the CFP in the broader maritime policy context

How can the future CFP best ensure consistency with the Marine Strategy Framework Directive?

In the past fisheries management in the context of the CFP has been mainly influenced from an exploitation point of view. Fisheries managers are taking it for granted that fish stocks have to be exploited under the aspect of the maximum yield and are concerned that an under exploitation and leading to an “over aging” of the stock.

Fisheries management in the past was focused on single stocks without investigating, evaluating and minimizing the effects on mixed stocks and or the larger ecosystem. In contrast the Marine Strategy Framework Directive (MSFD) should function as the environmental pillar of the European Marine Strategy. The CFP should deliver a framework for a regional approach to support the targets of the MSFD and to reach a “good environmental status” of the whole ecosystems of the European Seas. The descriptor 3 of the MSFD “Populations of all commercially exploited fish and shellfish are within safe biological limits, exhibiting a population age and size distribution that is indicative of a healthy stock“. is of major relevance to the CFP.

According to descriptor 3 the main targets of the MSFD are the recovery and rebuilding of commercial fish stocks to a biomass level safeguarding that the species will be able to fulfil its role in the marine ecosystem. Therefore target biomass should be at about 2/3 of the unexploited stock biomass, i.e., close to the so called **Maximum Economic Yield**

(MEY). MEY is a reference level where the highest revenue is yielded with the lowest fisheries effort and is from a conservation point the appropriate management target.

The second attribute of the descriptor 3 is asking for an age and size structure of fish populations that is indicative of a healthy stock. A natural age and size distribution is characterized by a high proportion of older and larger individuals. Therefore, from a nature conservation point of view **fish should not be harvested that is less than 30% of their maximum weight or 2/3 of their maximum length, allowing all individuals of stock to reproduce before harvested** (Froese *et al.* 2008).

Furthermore also the targets as laid out by the following descriptors of the MSFD are effectively interlinked with the CFP:

(1) Biological diversity is maintained. The quality and occurrence of habitats and the distribution and abundance of species are in line with prevailing physiographic, geographic and climatic conditions.

(4) All elements of the marine food webs, to the extent that they are known, occur at normal abundance and diversity within levels capable of ensuring their long-term abundance of the species and the retention of their full reproductive capacity.

(6) Sea-floor integrity is at a level that ensures that the structure and functions of the ecosystems are safeguarded and benthic ecosystems, in particular, are not adversely affected.

All four above descriptors are of particular importance in describing Good Environmental Status (GES) as they are the only 4 descriptors purely indicating the status of marine ecosystems whereas the remaining 7 descriptors describe the levels of human activities. At the same time, all these four descriptors are largely affected by fisheries that impose the main threat to status in case of all four issues. Hence the overall aim of reaching GES, a legal obligation for all EU member states to be fulfilled until the year 2020, is largely depending on the future CFP. A tight interlinking of EU environmental and fisheries policy should thereby be a task of first priority to deal with negative impacts of fisheries on the marine ecosystem as the elimination of by-catch and discard of fish, seabirds and other marine species, by mandatory use of ecologically sound, more selective fishing gears, exclusion of harmful fishing practise in protected areas and efficient surveillance by observer programs.

5.8 The external dimension

As a result of the poor condition of fish stocks in European waters, the majority (85 %) of the fish and shellfish imported into Germany and other European countries is from non-member states. For the same reason, Europe's commercial fishing fleet has expanded its fishing areas further and further and now gets the majority of its catch in non-European waters. As a result, European fishing vessels that practice fishing on an industrial scale compete with local artisanal fisheries in regions like the West-African Shelf for the same resources, thereby endangering the supply of animal protein to local people.

The over-exploitation of fish stocks in the productive shallow water areas of the continental margins (the so-called shelf areas) has caused commercial fishing to spread to areas beyond national jurisdiction („high seas“), that is, beyond 200 nautical miles from shore, in order to exploit the fish populations there down to a depth of 2000 meters. These deep-sea fisheries are targeted on those fish species that, because of their biological characteristics including slow growth, late maturity and low fecundity, are especially vulnerable to over-exploitation. Approximately 80 % of deep-sea fishing is carried out with bottom trawls in areas of sensitive habitats such as seamounts and cold water corals. It results in significant destruction of habitat structures and imperils biodiversity. Fishing activities in these high sea areas are, in most cases, completely unregulated.

5.9 Aquaculture

What role should aquaculture have in the future CFP: should it be integrated as a fundamental pillar of the CFP, with specific objectives and instruments, or should it be left for Member States to develop on a national basis? What instruments are necessary to integrate aquaculture into the CFP?

Often it has been suggested that aquaculture could be a solution for overexploited fish stocks and the resulting crisis of the fishing industry. From a conservation perspective one of the major problems of aquaculture is the food supply of carnivore aquaculture species with animal proteins, (e.g. fish meal and fish oil) from industrial fisheries. In 2006 the aquaculture sector utilized about 23.8 million t of wild fish to produce food for cultured species (Tacon & Metian 2009). Therefore aquaculture is not sustainable, but increasing the ecological problems like prey depletion and fishing down the food web.

Further negative impacts of aquaculture are eutrophication from feeds and effluents, the release of antifouling chemicals and antibiotics. Fish escaping from aquaculture farms

may compete with wild stocks for spawning grounds (e.g. salmon, sea trout). In addition, the transfer of parasites and diseases and interbreeding between escaped farmed fish and wild stocks negatively impacting the gene pool is a concern.

Therefore from a nature conservation point of view aquaculture can only be a sustainable alternative to fisheries, if all negative impacts on the marine ecosystem are avoided, for example by closed recirculation systems and the use of food that is not from industrial fisheries (see above).

The most important requirements, which have to be considered in the reformed CFP:

1. **Consistent implementation of the ecosystem approach and of the precautionary principal in fisheries management;** recognition of the multi-species approach (recognition of all fish species and not just the target species) and the effects of fisheries on the non-target species and habitats;
2. **Reversal of the burden of proof**, that is, it should become the task of the fishery in the future to verify that the catch and the methods used will not affect the viability of fish stocks and the ecosystem.
3. Adjustment of the excessive **fishing capacities** to the available fish resources in European waters, which means an overall **reduction of capacity by about 40%**.
4. Total Allowable Catch (TAC) should be agreed by the European Commission and not the Council of Ministers to reduce the influence of political interest in fisheries management. **TACs should be purely based on scientific recommendations.**
5. In the future the **ecosystem approach has to be the overarching principle** of scientific advice of advisory bodies like ICES. In the past scientific advice has been primarily focused on individual fish stocks without adequately investigating and evaluating the effects of fisheries on other components of the marine ecosystem.
6. The **spawning stock biomass** producing Maximum Sustainable Yield (BMSY) should be used in the near term as the lower limit for the management of fish stocks. In the long term, however, from the standpoint of nature conservation, the target biomass should be at about 2/3 of the unexploited spawning stock biomass, i.e., close to the biomass producing **Maximum Economic Yield (MEY)**
7. The **fisheries** with small meshed trawls targeting schooling fish species (e.g. sandeel, sprat) for **industrial purposes** (e.g. reduction to fish meal and oil) is not compatible with the ecosystem approach and **should be banned.**
8. **Establishment of a network of well-managed Marine Protective Areas** on a European level (especially the Natura 2000 sites). Implementation of fishery

management measures that ensure compliance and safeguarding the attainment of a favourable conservation status.

9. **Establishment of closed areas (No-take zones)** of sufficient size and duration to guarantee the recovery of exhausted fish populations and even more importantly, to effectively protect the spawning sites of fish species.
10. **Promotion of local, ecologically sound fisheries**; at the same time, utilization of the instruments for eco-certification of fishery products (for example, Marine Stewardship Council, MSC). In the future all fisheries in European waters should fulfil the criteria of ecologically sound fisheries management.
11. Step-wise **introduction of a discard ban and a landing obligation** of target and non-target species in European waters.
12. Outside of protected areas for harbour porpoises, mandatory use of acoustic deterrent devices ("pingers") , independent of the vessel size, length of the net and mesh size (implementation and development of Regulation (EG) No: 812/2004) for the avoidance of harbour porpoise by-catch in gillnet and entangling nets.
13. The promotion and obligatory **introduction of selective, ecologically sound fishing gear** (for example, fish traps) as a possible management measure in Marine Protected Areas, in order to achieve the conservation targets without excluding fisheries entirely.
14. Improved surveillance and enforcement of fishery regulations, **introduction of satellite based VMS for all fishery vessels independent of vessel size**, and an increase of the VMS signal rate in Marine Protected Areas.
15. Adaptation of the CFP currently being discussed to the EU Marine Strategy Framework Directive, which requires, among other things, that, in order to reach a good environmental status, "Populations of all commercially exploited fish and shellfish are within safe biological limits, exhibiting a population age and size distribution that is indicative of a healthy stock".

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