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to	:	Mr Javier SOLANA, Secretary-General/High Representative
Subject:		Commission Staff Working Paper: Ad hoc Expert Group on Indicators of Environmental Integration for the Common Fisheries Policy (Brussels, October 2003)

Delegations will find attached Commission document SEC(2004) 29.

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[1]   The text annexed hereto has been received in English only by the General Secretariat of the Council.

COMMISSION OF THE EUROPEAN COMMUNITIES

COMMISSION STAFF WORKING PAPER

**Ad hoc Expert Group on Indicators
of environmental integration for the common fisheries policy**

Brussels, October 2003

This report has been evaluated by the Scientific, Technical and Economic Committee for Fisheries (STECF) in its plenary session of 3-7 November 2003.

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This report does not necessarily reflect the view of the European Commission and in no way anticipates the Commission's future policy in this area.

COMMISSION STAFF WORKING PAPER

Ad hoc Expert Group on Indicators
of environmental integration for the common fisheries policy

1. TERMS OF REFERENCE

The Ad hoc Expert Group on Indicators met in Brussels on 28-29 October 2003 to:

a.   Discuss the report of the Contract Study by Jaakko Pöyry Infra, on the "Development of Preliminary Indicators of Environmental Integration of the Common Fisheries Policy" (Doc. No. FISH/2002/08);

b.   Assess the appropriateness of the selection of indicators suggested in this study;

c.   Analyse the operational requirements (data availability, computation needs) to attribute numerical values to the selected set of indicators.

The Expert Group had to prepare a working document, that has to be presented at the STECF during its plenary session of 3 November 2003.

2. PARTICIPANTS

Ms. Raquel Goñi (Instituto Español de Oceanografia, Spain)

Mr. Hans Lassen (ICES)

Mr. Gerjan Piet (Chair) (Netherlands Institute for Fisheries Research, Netherlands)

Mr. Frank Redant (Sea Fisheries Department, Belgium)

3. EVALUATION PROCESS AND STRUCTURE OF THE REPORT

The starting point for the discussions within the Ad hoc Expert Group on Indicators (EGI) was the Contract Report on the "Development of Preliminary Indicators of Environmental Integration of the Common Fisheries Policy" (Doc. No. FISH/2002/08) and particularly its Annex II. This annex gives a short-list of the indicators that were judged by the Contractor as being suitable to evaluate the environmental aspects/ achievements of the CFP. Potential indicators are listed with ranks: 1 (best fit to the evaluation purpose), 2 (less fit) and 3 (least fit).

EGI discussed all proposed indicators with rank 1 and some of those with lower ranks, and examined them for their potential to properly and unambiguously answer the questions listed in the Contract Report. The questions and proposed indicators are recapitulated in the present document, and commented upon by EGI.

EGI found that the Contractor's Report covered the indicator issue well and with the reservations listed in the subsequent sections supports its conclusions.

Some indicators were considered by EGI to be acceptable without major change. On a number of others, EGI had some doubts (e.g. with regards to their definition, rationale, the type of supportive information needed, etc.), and minor modifications are proposed. A final group of indicators was considered by EGI as being unlikely to give the proper signals, and therefore to be rejected. If so, the reasons why are explained and, whenever possible or needed, more suitable alternatives are proposed. Most often, these alternatives were chosen from the existing list of indicators, where they figured with a lower initial rank.

With respect to the proposed suit of indicators, EGI wishes to stress that because of the diversity of the fisheries, the complexity of the ecosystem and the socio-economic factors related to fisheries, a limited suit of indicators will never be able to provide a comprehensive description of this system. However, as a first step towards the

integration of environmental concerns into the Common Fisheries policy (CFP) the aim was to cover as much as possible of the complexity of this system using a minimum number of indicators. In doing this EGI followed the Contractors Report and distinguished indicators for:

- Conservation measures
- Structural measures
- Market measures
- Horizontal issues

Under the section "Indicators on Structural Measures" (section 5), EGI has introduced a new question and a set of associated indicators that address the issue on how well the CFP promotes "good fishing practice".

4. INDICATORS ON CONSERVATION MEASURES

4.1 Q1: Are fisheries sustainable towards individual species?

Proposed indicator: Proportion of commercial stocks that are within safe biological limits

EGI agrees with the proposed indicator and its rationale. However, EGI proposes that in this context commercial stocks/populations are defined as those stocks for which a formal assessment is available, and hence SSB and F are known. Furthermore, the indicator should be limited to stocks for which precautionary levels are available. For this indicator to be informative, the list of stocks included should be kept constant throughout the time series and should be clearly stated. As assessments on more stocks become available, a new indicator will have to be calculated, based on this enlarged set. For this indicator, *within safe biological limits* is defined as $SSB > B_{pa}$ and $F < F_{pa}$ considered together (see pages 69-70 of Contractor's Report).

Proposed indicator: Proportion of a set of non-commercial populations which are decreasing in number

EGI agrees with the proposed indicator and its rationale, provided that the definition be changed to *Proportion of a set of non-assessed populations which are decreasing in number*.

The quantification of this indicator is through abundance survey and/or commercial catch rate data. The information content of this indicator depends on the subset of species chosen in the same way as when considering assessed species/stocks. The use of vulnerable species would improve the responsiveness of the indicator.

The indicator must consider another subset of species not because they are vulnerable but because they are "charismatic" (i.e. the public has a special interest in the species, like cetaceans). A large proportion of those species decreasing (whether due to fishing or otherwise) is always causing alarm.

EGI notes that for many species other than fish and shellfish, it will be difficult to find data that can be used to quantify such indicators.

4.2 Q2: Are fisheries sustainable towards fish communities?

The structure and ecological functioning of the fish community is determined by its components: it consists of different species, many of which change markedly throughout ontogeny in their behaviour, food preference and other characteristics. Therefore two important aspects of the fish community should be reflected in the choice of the indicators: size-structure and species composition.

Proposed indicator: Average size (length and weight) in the community

EGI agrees with the proposed indicator and its rationale. Average size (length & weight) in the community is a proxy of the size-structure of the fish community, where size selective fishing removes large fish and releases small fish from predation. Hence, fishing will cause average size to decrease.

For this indicator, mean weight should be preferred as an indicator, as it puts a higher weighting on the (removal of) large fish, which is a direct, first order effect of fishing (as opposed to the increase of small fish).

Proposed indicator: Proportion of predator species in the community

The indicator was not retained by EGI. This indicator was deemed unsuitable because there no clear distinction between predator and non-predator species exists. Moreover, this distinction will depend both on species and size.

Better ecological indicators can be obtained by weighting the abundance of species with a quantifiable characteristic, so that it reflects changes in the species composition that can be attributed to that characteristic. For example, by weighting species abundance with trophic level, one can derive the **Mean trophic level**. Trophic levels have been estimated for many species using stable isotope analysis, diet analysis and trophic models. Such estimates can be easily applied to species abundance data, but are sometimes difficult to interpret.

Another alternative that is indicative of changes in the species composition can be derived by weighting the species abundance with the maximum length or the size at maturity. This may result in two indicators: mean maximum length and mean size at maturity. These indicators have been suggested in other forums (e.g. ICES), but are not included in Annex II. Because of data availability the **Mean maximum length** is the preferred indicator to reflect the composition in terms of life-history types. As this indicator is based on more objective criteria, it is preferred to the proportion of predator species.

Note that since all the fish community metrics rely on a specific survey (i.e. sampling technique) the absolute value depends on the assemblage as it is caught in that survey. Therefore, time series are only useful when sampled in the same manner. Different assemblages will give different values.

Proposed indicator: Proportion discarded in the catch

This indicator was not retained by EGI in this context. The proportions of discards do not provide information on the impact of fishing on the fish communities. Instead, this indicator is used when considering good fishing practices (section 5).

4.3   Q3: Is the impact of fisheries on marine habitats and non-fish species sustainable?

Proposed indicator: Total benthos biomass / surface area

The indicator was not retained by EGI. The biomass of benthic communities is affected by many natural and man-made factors, one of which is fisheries. Because of the multitude of these interactions and their complexity, there is no unique link between fishing pressure and changes in the benthic communities. Therefore, EGI considers that benthic biomass as such is not a proper indicator of the impact of fishing activities on the ecosystem and hence that it should not be used as an indicator of environmental integration of the CFP.

Instead, EGI proposes to replace this indicator by the one proposed by the Contractor as *Trends in **Abundance of sensitive benthos species***. This indicator is likely to be more sensitive to changes in fishing pressure and the associated changes in physical impact on benthic communities. One possible means to detect such changes could be to analyse the long-term trends in abundance/biomass of species that are particularly sensitive to damage by ground gears (bottom trawls, dredges, etc.). Such indicator species should be selected *a priori* (i.e. before any trend analysis is undertaken and not afterwards), based on criteria such as life history, reproductive strategy, vulnerability to physical damage, resilience, etc.

Data could be obtained from demersal fish surveys and from national and international monitoring programmes of benthic communities. EGI wishes to stress that, whatever indicator of benthic communities is chosen, data availability will mostly be limited to continental shelf areas.

Proposed indicator: Higher vertebrate by-catch

This indicator was not retained in this context. The impact of fishing on higher vertebrate populations (sea turtles, birds, marine mammals, …) may be covered by the indicator ***Proportion of a set of populations which are decreasing in number*** in Q1: Are fisheries sustainable towards individual species.

The issue of higher vertebrate by-catch is also considered under a new question *Is the common fisheries policy contributing to good fishing practices?*, under Structural measures (see section 5).

EGI recommendation for the development of an additional indicator

Even relatively low levels of fishing can have major impacts on highly sensitive habitats such as seagrass beds, *Sabellaria* reefs, coral reefs, etc. Measuring the area covered by these habitats over time could give an indication on the extent of damage done, c.q. recovery achieved as a result of a decrease in fishing pressure. EGI recommends that this be explored further, in view of the development of a proper indicator for ***Area coverage of highly sensitive habitats***.

4.4   Q4: Is aquaculture getting more environmentally sound?

Proposed indicator: Aquaculture production per area

EGI agrees with the proposed indicator and its rationale, provided that the definition be changed to ***Total aquaculture production and total area occupied by aquaculture installations***, in accordance with the description given in the

body of the Contractor's Report (page 74). This indicator should be considered by major geographical area.

Proposed indicator: Water quality

EGI agrees with the proposed indicator, but it should not be restricted to potential causative agents of eutrophication (viz. excess food and faeces) only, and be expanded to also include other potentially harmful substances released into the environment by aquaculture production activities.

Proposed indicator: Eco-efficiency of aquaculture

EGI agrees with the proposed indicator and its rationale. There might however be some overlap between this and the previous indicator, in the sense that improved efficiency will also lead to improved water quality (less excess food and/or faeces released into the environment) and *vice versa*.

EGI recommendation for the development of an additional indicator

There is growing concern on the potential ***impact of aquaculture***, and particularly on the impact of reared fish (such as salmon) escaping from fish farms, ***on the genetic structure of wild (fish) populations***. EGI recommends that this aspect be further investigated, in view of the development of an indicator that would properly reflect the extent of this threat and the measures that are taken to counteract it.

5. INDICATORS ON STRUCTURAL MEASURES

5.1 Q1: Are the structure and organisation of the fishery sector supportive of environmental goals?

Proposed indicator: Fishing capacity and its spatial and temporal distribution

EGI agrees with the proposed indicator and its rationale, provided that the definition be changed to ***Effective fishing capacity and its spatial and temporal distribution***, thereby making the next proposed indicator redundant.

The disturbance of the ecosystem caused by fishing is determined by the overall level of effective fishing capacity as well as the spatial and temporal distribution of that capacity. A higher overall level of effective fishing capacity will cause greater disturbance or pressure exerted on the system both of which can be expressed in terms of the removal of target species, or unwanted mortality of non-target species. However, if this fishing capacity is restricted to a small part of the stock or a limited part of a sensitive area the disturbance to (sensitive components) of the system will be relatively small.

Estimation of effective fishing capacity, however, is difficult. In European waters, there are vast differences in vessel size, engine power, gear used and fishing techniques making it difficult to compare between metiers.

However, at least for some metiers it should be possible to devise indicators that reflect changes in effective fishing power, taking into account its spatial and temporal distribution. To some extent this may be done using the data based on EU logbooks as these data have a spatial and temporal component. A considerable improvement in quantifying this indicator could be achieved if the VMS data that are collected for enforcement purposes, become available to the scientific community.

Proposed indicator: Effective capacity of the fleets

Redundant (see above).

Proposed indicator: Total distribution of structural support

EGI agrees with the proposed indicator and its rationale, provided that the definition be changed to ***Structural support and proportion allocated to promote environmental friendly fishing practices***. This is a useful indicator, provided that strict criteria are applied to determine the type of support that can be considered environment friendly. In addition, a benefit will be that it forces institutions/administrations to take environmental concerns seriously.

EGI notes that this indicator applies to structural support both based on EU and national funding.

Proposed indicator: Level of evaluation of environmental effects of support decisions

Redundant (see above).

Additional question: Is the CFP contributing to good fishing practices?

The question on the structure and organisation of the fishery sector should be expanded to consider fishing practise. Fishing impact on the environment should be restricted to the mortality that cannot be avoided because fish are extracted for human consumption or for producing fish meal and fish oil. Any additional mortality should be avoided and the CFP should include measures that promote the reduction of such additional mortality. This additional mortality is generated in many forms, as discards (too small fish, too low priced fish or fish with no market value), as by-catch of seabirds and higher vertebrates (e.g. marine mammals) or as damage to the sea bottom and hence mortality on the benthos. Fisheries are also energy consumers and in line with other policies, the CFP should include incentives to reduce fuel consumption and hence CO_2 production.

EGI realises that it will be difficult to identify existing time series that can be used as appropriate indicators. However, there are a number of candidates:

- There are observer programs included in the EU Data Collection Regulation and this would provide a time series (in the longer term) of by-catches and discards of fish and shellfish. Similar observer programmes for other gear types could provide estimates on by-catches of sea turtles, seabirds and marine mammals;

- VMS data provides a geographical overview of the distribution of fishing with larger vessels, to-day for vessels with a LOA > 24 m. This lower limit will be reduced in the coming years. Combining effort distribution and habitat mapping will provide information whether sensitive habitats are affected or not;

- Certain gears are known to cause more damage on the bottom fauna than other gears, e.g. dredges, heavy beam trawls and heavy trawls with rockhoppers. Effort exerted by such gears are available through the logbook information and could be compiled to generate an indicator of trends towards more environmental friendly fisheries;

- Oil consumption would be a proxy for CO_2 production. As oil prices for fishing are subsidised in many countries, i.e. exempted from tax, there are potentially statistics available.

6. INDICATORS ON MARKET MEASURES

The association between the markets and the environmental friendliness of fishing practices is in many cases not direct. However, it is considered that consumers have great potential to contribute to greening the CFP and the two indicators proposed incorporate consumer patterns.

6.1 Q1: Does the market develop in a way that is supportive of environmental goals?

Proposed indicator: The share of fish produced (or consumed) that are eco-labelled

EGI agrees with the proposed indicator and its rationale. It is considered that when eco-labelling of marine products is well developed and labelling criteria are stable over time, this indicator will reflect the progression of environmental friendly fishing practices. The assumption is that this progression will be in detriment of less environmentally friendly fishing practices. This assumption will have to be corroborated.

Until this indicator becomes widely available, the indicator ***Initiatives to support eco-labelling and use of eco-labelling*** (ranked 3 in Annex II) could be employed.

Proposed indicator: The amounts of fish taken out of the market and/or traded on secondary (intervention) conditions

EGI agrees with the proposed indicator and its rationale. EGI has reservations on the applicability of this indicator as it is only partly driven by market conditions which affect overall fishing pressure. However, factors such as local fish aggregations and weather conditions also influence market withdrawal of fish.

Proposed indicator: The size of the European market for fish

EGI agrees with the proposed indicator and its rationale. EGI recognises that the overall market size determines the general pressure on fish stocks, but is not convinced that there is a relationship between the size of the European market and the degree to which environmental friendly fishing occurs.

EGI recommendation for the development of an additional indicator

A further indicator is proposed that measures ***changes in consumer preferences in relation to environmental issues*** such as consumption of depleted or threatened species or of undersized organisms. The indicator could measure these changes of preferences through periodic surveys or just incorporate statistics on consumer education initiatives launched at the EU and national levels.

7.   INDICATORS ON HORIZONTAL MEASURES

7.1   **Q1: Are the structure and organisation of the fishery inspection sector supportive of environmental goals?**

Proposed indicator: Quantity of inspections made/ quantity of infringements identified

The indicator was not retained by EGI. The proposed indicator is very crude and as such not likely to be useful. EGI considered that the more useful indicators are often rates, and in this case the rates should be (a) *number of inspections per landing*, and (b) *number of infringements over number of inspections*. Such indicators should be broken down by major fishery. As the indicator should measure whether the fishery inspection sector is supportive of environmental goals, the infringements that shall be recorded should relate to the relevant sections of the CFP. The rationale should be reformulated as: "*The CFP defines a number of regulations intended to achieve better environmental fishing practise. Inspection should actively check on the compliance to these regulations as well as other regulations in the CFP.*"

Proposed indicator: Number of inspectors operating in different regions and among different fisheries

Redundant (see above).

Proposed indicator: Level of imposition of punishment

EGI agrees with the proposed indicator and its rationale.While inspections will generate a general pressure on compliance with the management measures, the number of inspections should not be seen in isolation. Inspections will in some cases find possible infringements. The indicator should also include how many of these supposed infringements actually lead to persecution and in which form.

7.2   **Q2: Is stakeholder participation increasing?**

Proposed indicator: Number of violations (assuming that inspection is efficient)

This indicator is the same as that defined under Horizontal measures under Q1. The indicator may not provide information on stakeholder participation as this participation does not necessarily lead to a higher degree of compliance. This higher degree could only be established by comparison to another identical fishery but with different stakeholder participation.

Proposed indicator: Level of voluntary environmental protection measures undertaken by stakeholders

The indicator was not retained by EGI. EGI considers that this indicator is difficult to quantify and that it is doubtful whether the data are as easily obtainable as indicated by the Contractor.

Proposed indicator: Attitudes and awareness of stakeholders towards CFP environmental goals

EGI agrees with the proposed indicator and its rationale. The collection of these data requires interviews with the fishermen or similar data collection. The European Fisheries Ecosystem Plan (EFEP) is an EU funded project where

stakeholders' attitude to the CFP and its environmental aspects are being mapped. It may be of interest to repeat such an interview round after some years to investigate if there is a change in attitude among fishermen.

EGI notes that the approach to measuring stakeholder participation is restricted. The discussion should be expanded to consider stakeholder participation and to developing indicators to that effect on fishermen participation in research activities (typically research cruises, abundance surveys and observer programmes).

7.3 Q3: Is the understanding of complex environmental issues improving in research as well as integration of scientific advice to decision making?

Proposed indicators: Total quantity of funds allocated to relevant research and Distribution of research funds

EGI agrees with the proposed indicators and their rationale. However, the two indicators should be seen as a pair that goes together, not as separate ones. It is obvious that the research area that is relevant for understanding the environmental issues should be clearly defined and the statistics on funds available collected based on common definitions. EGI notes that funding is through many different channels, including the FP6, national funds and other international projects, e.g. the Globec projects, the GEF projects and the Census of Marine Life projects. A possible extension of the indicator would be to include the proportion of the total available funds for CFP related research that are allocated to environmental relevant projects.

Proposed indicators: Scientific advice in decision making

EGI agrees with the proposed indicator and its rationale.

In addition, EGI considers that the performance of the policy makers should be monitored as well. In order to define a relevant indicator, policy makers should define their own success criteria, e.g. satisfaction with fisheries management among those affected or the status of fish stocks. These indicators are mentioned under different headings in the Contractor's Report, but an explicit question on ***Policy makers performance*** should be included in the package.

8. CONCLUSIONS

EGIs conclusions on indicators of environmental integration of CFP are summarized in table 1. This table lists all indicators discussed in the report and states EGIs decision on their acceptability. In addition an appreciation is given of data availability and an estimation of the time-scale in which their implementation may become effective.

Table 1. Summary of EGIs conclusions on the indicators of environmental integration of CFP. The numbers of those indicators that passed the selection are in bold

Indicator No.	Indicator	Decision	Data availability[1]	Implementation
	Indicators on conservation measures			
1	Proportion of commercial stocks that are within safe biological limits	Accepted	Good	Short-term
2	Proportion of a set of non-assessed populations which are decreasing in number	Modified	Medium-Good	Mid-term
3	Average size (length and weight) in the community	Accepted	Good	Short-term
4	Proportion of predator species in the community	Rejected		
5	Mean trophic level	Alternative to 4	Good	Short-term
6	Mean maximum length	Alternative to 4	Good	Short-term
7	Proportion discarded in the catch	Rejected		
8	Total benthos biomass / surface area	Rejected		
9	Abundance of sensitive benthos species	Alternative to 8	Medium	Mid-term
10	Higher vertebrate by-catch	Rejected, part of 2		
11	Area coverage of highly sensitive habitats.	Proposed	Poor	Long-term
12	Total aquaculture production and total area occupied by aquaculture installations	Modified	Good	Short-term
13	Water quality	Accepted	Good	Short-term
14	Eco-efficiency of aquaculture	Accepted	Good	Short-term
15	Impact of aquaculture on the genetic structure of wild (fish) populations	Proposed	Poor	Long-term
	Indicators on structural measures			
16	Effective fishing capacity and its spatial and temporal distribution	Modified	Good	Short-term
17	Effective capacity of the fleets	Rejected, part of 16		
18	Structural support and proportion allocated to promote environmental friendly fishing	Modified	Medium	Short-term

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19	Level of evaluation of environmental effects of support decisions	Rejected		
20	Indicators on good fishing practice	Recommended	Variable	Short- to Mid-term

<center>**INDICATORS ON MARKET MEASURES**</center>

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21	The share of fish produced (or consumed) that are eco-labelled	Accepted	Poor	Mid-term
22	Initiatives to support eco-labelling and use of eco-labelling	Alternative to 21	Good	Short-term
23	The amounts of fish taken out of the market and/or traded on secondary (intervention) conditions	Accepted	Good	Short-term
24	The size of the European market for fish	Accepted	Good	Short-term
25	Quantity of inspections made/ quantity of infringements identified	Rejected		
26	Changes in consumer preferences in relation to environmental issues	Proposed	Poor	Long-term
	Indicators on Horizontal measures			
27	Quantity of inspections made/ quantity of infringements identified	Rejected		
28	number of inspections per landing	Alternative to 27	Good	Short-term
29	number of infringements over number of inspections	Alternative to 27	Good	Short-term
30	Number of inspectors operating in different regions and among different fisheries	Rejected		
31	Level of imposition of punishment	Accepted	Unknown	Unknown
32	Number of violations (assuming that inspection is efficient)	Rejected, part of 29		
33	Level of voluntary environmental protection measures undertaken by stakeholders	Rejected		
34	Attitudes and awareness of stakeholders towards CFP environmental goals	Accepted	Medium	Mid-term
35	Total quantity of funds allocated to relevant research and Distribution of research funds	Accepted	Good	Short-term
36	Scientific advice in decision making	Accepted	Good	Mid-term
37	Policy makers performance	Proposed	Unknown	Unknown

Short-term: Readily available to months

Mid-term: Within next five years

Long-term: More than five years