



BRIEFING  
October  
2011



## COMMON FISHERIES POLICY REFORM: GETTING MSY RIGHT

### What is MSY?

The maximum sustainable yield (MSY) for a given fish stock means the highest possible annual catch that can be sustained over time, by keeping the stock at the level producing maximum growth. The MSY refers to a hypothetical equilibrium state between the exploited population and the fishing activity.

**Recruitment overfishing** occurs when a stock level is low, the amount of fish that can be harvested is limited because of a lack of adults, which in turn produce too few fish that are able to replenish those that have been removed. **Growth overfishing** is where the recruits to a fishery are caught before they reach the size that would produce the maximum yield per recruit.

At the other extreme, when a stock is excessively large yield is restricted; the growth of the stock slows down due to competition for food, cannibalism or the limitations in the carrying capacity of the environment. In between these two states lies a stock size at which the sustainable catch is at the highest level – MSY.

### International context

The MSY approach has been widely accepted as an objective for fisheries management. The United Nations Convention on the Law of the Sea (UNCLOS, 1982<sup>1</sup>) notes:

*“...State(s) must set an allowable catch, based on scientific information, which is designed to maintain or restore species to levels supporting a maximum sustainable yield (MSY).”*

This policy was reaffirmed by WSSD (Johannesburg, 2002<sup>2</sup>) which called on States to:

*“Maintain or restore stocks to levels that can produce the maximum sustainable yield with the aim of achieving these goals for depleted stocks on an urgent basis and where possible not later than 2015”.*

### Understanding the MSY approach: MSY, B<sub>MSY</sub> and F<sub>MSY</sub>

When discussing “MSY”, it is essential to distinguish between 3 closely related concepts: MSY, B<sub>MSY</sub> and F<sub>MSY</sub>. The effective implementation of the overall “reach MSY” goal depends on a clear understanding of the relationships between these 3 concepts.

<sup>1</sup> UNCLOS 1982: United Nations Convention on the Law of the Sea (UNCLOS).

[http://www.un.org/Depts/los/convention\\_agreements/convention\\_overview\\_convention.htm](http://www.un.org/Depts/los/convention_agreements/convention_overview_convention.htm)

<sup>2</sup> Johannesburg, 2002 : World Summit on Sustainable Development (WSSD), Johannesburg, South Africa.  
[http://www.un.org/jsummit/html/documents/summit\\_docs.html](http://www.un.org/jsummit/html/documents/summit_docs.html).

MSY is supported by a stable population size<sup>3</sup> known as  $B_{MSY}$  (= “biomass MSY”). Consequently, **“reaching MSY” means rebuilding fish populations to the  $B_{MSY}$  level, in order to be able to support the level of annual catches known as MSY.**

While MSY is a catch and  $B_{MSY}$  is a population size (=a biomass),  $F^4_{MSY}$  (= “fishing mortality MSY”) is a catch rate (resulting from dividing MSY – an annual catch - by  $B_{MSY}$  – a population size).

When the fish population is at  $B_{MSY}$  and the fishing fleet is catching an annual amount of fish equal to MSY, then the resulting fishing mortality is  $F_{MSY}$ .

## Reaching MSY

Starting from an overfished stock (thus at a population size below  $B_{MSY}$ ), **reaching MSY means implementing a management policy that rebuilds the stock to the  $B_{MSY}$  level within a chosen time frame.** This is typically done by managing fishing mortality over a multiannual period (by setting catch or effort limits) until the stock biomass rebuilds to  $B_{MSY}$  and, consequently, annual catch and fishing mortality reach MSY and  $F_{MSY}$ , respectively.

Additionally, there is scientific consensus that it is technically very difficult to know where MSY lies exactly, and therefore it is recommended that  $B_{MSY}$  be taken as a limit rather than as a target: biomass should also be kept *above* this value (rather than *at* this value).

## Key conclusions

Several basic conclusions can be drawn from the above:

1. A fisheries management policy based on the MSY principle aims at keeping the biomass of fish stocks **above  $B_{MSY}$** .
2. When the stock in question is overfished a timeframe needs to be introduced to allow stocks to reach MSY. Catch levels should be adjusted during a transitional period in such a way to allow for the biomass of the stock to increase so as to be above  $B_{MSY}$  level by the given **deadline**.
3. When discussing MSY,  $F_{MSY}$  must not be confused with  $B_{MSY}$  (and vice-versa), as the two terms refer to very different concepts.
4. Setting fishing levels at  $F_{MSY}$  will not achieve MSY unless the stock biomass is already at  $B_{MSY}$  level! **Rebuilding the stock to above  $B_{MSY}$  is the necessary precondition to reaching MSY.** So, achieving  $F_{MSY}$  in an overfished fishery (= with a biomass below  $B_{MSY}$ ) does not necessarily mean the given stock will recover to MSY within the fixed timeframe.

There is considerable confusion around MSY in the current CFP proposal, particularly concerning the appropriate management objectives (see Annex). The current text is not clear in setting  $B_{MSY}$  as the reference, and sometimes even mistakenly refers to  $F_{MSY}$ . For consistency with science and with the applicable international and internal commitments (UNCLOS, Johannesburg WSSD and EU MSFD, among others), Article 2 of the new CFP must read as follows:

“The Common Fisheries Policy shall apply the precautionary approach to fisheries management, and shall aim to ensure that populations of harvested species are above biomass levels which can produce the maximum sustainable yield by 2015.”

*For further information:*

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<sup>3</sup> unlike mammals or other animals, fish populations are not measured in numbers but on the basis of the total weight –or biomass- of individuals composing the population

<sup>4</sup> F is the symbol for fishing mortality used in fisheries science

## **References to “achieving MSY by 2015” and related concepts in the CFP proposal COM(2011) 425 final**

### **1. Explanatory Memorandum**

“The overall objective of the proposal is to ensure fishing and aquaculture activities that provide long-term sustainable environmental conditions and contribute to the availability of food supplies. The policy shall be aimed at exploitation of living marine biological resources that restores and maintains fish resources at levels which can produce the maximum sustainable yield, not later than 2015. The CFP shall implement the precautionary and ecosystem approaches to fisheries management.” (page 2)

“The overall objective of the CFP is to ensure that fishing and aquaculture activities provide long-term sustainable environmental conditions, which are a prerequisite to reach an economically and socially sustainable fishing industry that contributes to the availability of food. The impact assessment demonstrates that ambitious targets for the resources meeting the Union's international obligation of achieving maximum sustainable yield by 2015 can deliver important overall stock improvement leading to significant economic and social improvements. These positive outcomes from the impact assessment underline the premise of ecological sustainability as a requirement for long-term economic and social sustainability.” (page 6)

### **2. Preamble**

(5) “At the World Summit on Sustainable Development at Johannesburg in 2002, the Union and its Member States committed to act against the continued decline of many fish stocks. Therefore, the Union should improve its Common Fisheries Policy to ensure that as a matter of priority exploitation levels of marine biological resources stocks are restored and maintained at levels capable of producing maximum sustainable yields from the populations of harvested stocks by 2015. Where less scientific information is available, this may require applying proxies to maximum sustainable yield.” (page 12)

(6) “Fisheries targets were laid down in the Decision by the Conference of the Parties to the Convention on Biological Diversity on the Strategic Plan for Biodiversity 2011 – 2020, the Common Fisheries Policy should ensure coherence with the biodiversity targets adopted by the European Council<sup>21</sup>, and the targets of Commission Communication "Our life insurance, our natural capital: an EU Biodiversity Strategy to 2020", in particular to achieve maximum sustainable yield by 2015.” (page 12)

### **3. Legal text**

#### **Article 2: General objectives**

“The Common Fisheries Policy shall apply the precautionary approach to fisheries management, and shall aim to ensure, by 2015, that exploitation of living marine biological resources restores and maintains populations of harvested species above levels which can produce the maximum sustainable yield.”

#### **Article 5: Definitions**

“maximum sustainable yield' means the maximum catch that may be taken from a fish stock indefinitely;”

"conservation reference point" means values of fish stock population parameters (such as biomass or fishing mortality rate) used in fisheries management, for example with respect to an acceptable level of biological risk or a desired level of yield;"

## **Article 9: Multiannual plans**

1. "Multiannual plans providing for conservation measures to maintain or restore fish stocks above levels capable of producing maximum sustainable yield shall be established as a priority.
2. Multiannual plans shall provide for:
  - (a) the basis for fixing fishing opportunities for the fish stocks concerned on the basis of predefined conservation reference points; and ...."

## **Article 10: Objectives of multiannual plans**

1."Multiannual plans shall provide for adaptations of the fishing mortality rate, resulting in a fishing mortality rate that restores and maintains all stocks above levels capable of producing maximum sustainable yield by 2015."

### **4. Legislative financial statement for proposals (page 64)**

#### **1.4.3. Expected result(s) and impact**

*Specify the effects which the proposal/initiative should have on the beneficiaries/groups targeted.*

Sustainability is at the heart of the proposed reform of the CFP, with the objective that by 2015 fish stocks must be exploited at the level of maximum sustainable yield. Sustainable fisheries leading to increases in catches and profit margins will free the catching sector from depending on public support, and would also make it easier to achieve stable prices under transparent conditions, bringing also benefits to the consumers.

#### **1.4.4. Indicators of results and impact**

*Specify the indicators for monitoring implementation of the proposal/initiative.*

Environmental impacts: stocks at Fmsy, reduction of overcapacity and progress in implementing transferable fishing shares.

Economic impacts: income of actors in the catching sector, GVA, revenue/break even revenue and net profit margin.

Social impacts: Employment (FTE) and crew wage per FTE.

#### **1.5.4. Coherence and possible synergy with other relevant instruments**

The objective of achieving exploitation of fish stocks at the level of maximum sustainable yield established in the UN Convention on the Law of the Sea and was adopted at the 2002 World Summit on Sustainable Development as a target to reach by 2015, where possible. This objective will allow the reformed CFP to better achieve Good Environmental Status in the marine environment in line with the Marine Strategy Framework Directive.