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## Commentary to J.F. Caddy's paper "Criteria for sustainable fisheries on juveniles illustrated for Mediterranean hake: control the juvenile harvest, and safeguard spawning refugia to rebuild population fecundity"

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**Comentario al artículo de J.F. Caddy "Criterio para una pesca sostenible de juveniles, tomando como ejemplo la merluza del Mediterráneo: control de la pesca de juveniles y preservación de refugios para reproductores, con el fin de rehacer la fecundidad de la población"**

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The motivation of the present comments to J. F. Caddy's publication entitled "Criteria for sustainable fisheries on juveniles illustrated for Mediterranean hake: control the juvenile harvest, and safeguard spawning refugia to rebuild population fecundity" is purely driven by the facts that our marine living resources are extremely valuable as natural and healthy food and that the management related to their exploitation should consider their state and roles in the relevant ecosystem. To this end, the conclusions of the paper concerned are supported as a first step into the right direction, a general reduction in exploitation. The provided comments should be interpreted as an incentive to enhance the scientific advice with the view to support sustainable ecosystem-based fisheries management, in particular in the Mediterranean Sea, where about 90% of the assessed stocks are overfished with reference to maximum sustainable yield (MSY).

It is confirmed that European hake *Merluccius merluccius* (Linnaeus, 1758) in the Northwestern Mediterranean Sea is heavily overfished, i.e. that stock productivity is currently reduced far below its maximum possible because of continued unsustainable fishing intensity, which forced and maintains the stock at a

rather depleted state with no realistic chance of rebuilding. An identification of both the stock boundaries and the involved fisheries with a quantification of their individual impact is essential for the understanding of the situation, as European hake is widely distributed and jointly selected by rather multi-species (mixed) fisheries of various countries. It is fully acknowledged that many Mediterranean fisheries are not among the best-reported ones in terms of fishing effects. Nevertheless, significant information gaps, e.g. trends in fishing effort and catch volumes including discards and quality, should be tagged and listed as a basis to find solutions to avert misinterpretation and hence management risks.

The author of the commented publication presents an equilibrium stock production model, from which a sustainable management reference level is derived with particular emphasis on exploitation of juveniles and fecundity. Dynamic ecological effects from the variable state of the ecosystem are ignored. However, it is recognized that the proposed management reference value regarding an adequate fishing mortality is significantly lower (50%) than the assessed actual fishing mortality, and hence implies a significant reduction in exploitation. However, there is no consideration of

the politically agreed solution of the UN Sustainability Summit in 2002 and the European Common Fisheries Policy (CFP) with the adoption of the fishing mortality at MSY ( $F_{MSY}$ ) as being the appropriate sustainable management level for marine exploited resources. Noticeably, such sustainable  $F_{MSY}$  for hake stocks in the northwestern Mediterranean are scientifically estimated to represent a small percentage (20%) of the proposed adequate level.

The commented publication also focuses on potential fisheries management solutions with the aim of reducing exploitation to the so-called adequate level. Proposals to achieve the postulated reduction in exploitation through area and/or seasonal closures in combination with effort restrictions appear well intended but uncertain when it comes to quantification of likely core and side effects on expected stock and fisheries developments. A detailed description of international and national management objectives and rules would largely support any fisheries management ad-

vice. Fisheries management requires fisheries-specific analyses and fisheries-specific advice, in particular in the present example of competing mixed fishing strategies representing different and competing species and size selections. Experience has demonstrated that it requires international efforts by means of symposia and workshops to gather sufficient acceptance through scientific advice, stakeholder involvement and political decisions towards the elaboration of multi-annual management plans. This is of particular importance as the European hake stock is straddling territorial waters, for which a good environmental status is to be achieved by 2020 (European Marine Strategy Framework Directive), and international waters, where the General Fisheries Commission for the Mediterranean (GFCM) is the overall acting management body, with European fishing activities being based on the same principles and standards as those applicable under Union law (CFP).