

Title: A Stochastic Viability Approach for Ecosystem-Based Management of Mixed Fisheries: The Case of The Bay of Biscay Demersal Fisheries

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Abstract: Marine scientists and stakeholders are increasingly advocating ecosystem-based fishery management (EBFM). However, the way to operationalize such EBFM remains controversial. The viability approach can be a relevant modelling framework for EBFM as it accounts for dynamic complexities, uncertainties, risks and sustainability objectives balancing ecological, economic and social dimensions together with intergenerational equity. Mixed fisheries operating in the Bay of Biscay provide a challenging example to illustrate these issues. The present paper focuses on the case of the demersal fisheries catching nephrops, hake, sole and monkfish. A bio-economic multi-species and multi-fleets model is developed to examine the capacity for the stochastic viability framework to assist in developing practical approaches to EBFM. The model integrates the dynamics of the harvested stocks with an uncertain recruitment and technical interactions through joint catches. It relies on data from ICES and IFREMER. A co-viability analysis of the fish populations/fisheries system is performed to investigate how to simultaneously preserve the species (using Bpa precautionary referenced points) and guarantee economic incomes for the fleets. First results suggest that the viable harvesting intensities require a significant reduction in the effort of some fleets, as compared to reference year 2006.