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**What will ecosystem modelling reveal about improved trawl selectivity? Case study:  
Mullus Barbatius**

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Poor selectivity and high discard ratios of demersal trawls is a significant concern in the Mediterranean. A large number of studies exist on codend selectivity, most of which intensify on size and shape. In consideration of these studies, the General Fisheries Commission for the Mediterranean recently recommended the use of 40 mm square-mesh (SM40) or 50 mm diamond-mesh (DM50) codends.

However, the effects of improving codend selectivity on the ecology of the ecosystem are not well known. The goal of this study is to evaluate the potential effects of improved codend selectivity on the main target species, *Mullus barbatus*, as a case species. This study is based on well-described species-specific catch and selectivity data for commercial 44 mm diamond-mesh codend (CD44) and alternative codends (DM50 and SM40) fisheries from Mersin Bay in the eastern Mediterranean. Three Ecopath models, with 48 functional groups and similar topologies were developed to represent the effect of different codends on the ecosystem. Specifically, the impact on *M. barbatus* was described by splitting the functional group into two components according to minimum landing size (MLS). *M. barbatus* (<MLS and >MLS) showed the lowest trophic levels among demersal fish groups. For CD44, DM50 and SM40 codends, the catches were calculated as 0.013 t.km<sup>-2</sup>.y<sup>-1</sup>, 0.006 t.km<sup>-2</sup>.y<sup>-1</sup> and 0.003 t.km<sup>-2</sup>.y<sup>-1</sup> for *M. barbatus* (<MLS), and 0.050 t.km<sup>-2</sup>.y<sup>-1</sup>, 0.042 t.km<sup>-2</sup>.y<sup>-1</sup> and 0.041 t.km<sup>-2</sup>.y<sup>-1</sup> for *M. barbatus* (>MLS) respectively. Ecological network analysis highlighted that if trawlers switched from CD44 to DM50 or SM40 codends, metabolic activity of *M. barbatus* (<MLS) would increase. Reasons for this are that exports due to the fishing removals would decrease from ~11% to 7% or 3% respectively and respiration would increase from ~57% to 60% or 62% respectively. However, the CD44 codend was the best alternative for *M. barbatus* (<MLS) in terms of mixed trophic impact.

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