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Assessment of biomass export from marine protected areas and its impacts on fisheries in the western Mediterranean Sea

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The export role of MPAs has been emphasised as one of their major prospective benefits but evidence are rare and it is difficult to raise any conclusion. However, such export is a main economic and output of MPAs as it represents a production that can be used without damaging the MPA itself.

The present work reports on a large project targeting 3 main goals:

1/ to estimate potential biomass export of adult fishes from MPAs. Evidence of biomass export was obtained by assessing the existence of a gradient of abundance and mean size of target species across boundaries of the reserve,

2/ to estimate potential pelagic export resulting from the dispersal of eggs and larvae, and

3/ to estimate the potential contribution of adult fish export to fisheries.

These three approaches were conducted in 6 MPAs in the north-western Mediterranean following a common sampling protocol in order to obtain comparable data sets for a better comparison of MPAs and in order to determine if there are common trends.

Overall, the evidence of gradients in fish biomass and mean fish size supports the existence of fish exportation outside MPA, following our initial hypothesis. However, this exportation would benefit local fisheries only at a small spatial scale, from tens to hundreds of meters, even if fishes were able to migrate longer distances. The small scale (100 to 1000 m) on which fish biomass gradients from the MPAs studied were revealed was probably related to the high fishing pressure existing in the Western

Mediterranean outside MPA and, in some case, to habitat discontinuities.

We can conclude that results of such project have brought evidence of fish biomass export from MPA to fished areas in the NW Mediterranean, for adults as well as for eggs and larvae of some species or groups of species depending on the MPA.

Even if fish biomass export from MPA varies greatly in space and intensity according to fish species, and is restricted to a small distance from MPA border, it is likely to have positive effects on adjacent fisheries.