

## HYDRODYNAMIC CONNECTIVITY AND DISPERSAL PATTERNS IN THE STRAIT OF GIBRALTAR: IMPLICATIONS FOR A TRANSBOUNDARY SPECIES

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### Abstract:

The blackspot seabream (*Pagellus bogaraveo*) is a highly appreciated demersal species that has an important target of the Spanish and Moroccan fisheries in the transcontinental waters of the Strait of Gibraltar area (Gil, 2006). It is also one of the most exploited resources of the region, which has led to a notable drop of catches over the years, arriving to a vulnerable status nowadays. Consequently, a reduction of fishing mortality towards sustainability levels was recommended (GFCM, 2021). Improving our knowledge on the interaction of this species with its physical environment is a key issue in the efforts towards rebuilding the fishery target population until its maximum sustainable yield (Cowen et al., 2006). To gain insight into this interaction, a high-resolution circulation model coupled to a lagrangian tracking module has been employed, using eggs and larvae (early-life-stages, ELS) as purely passive particles advected by simulated currents. Several spawning scenarios consisting of different temporal (tidal phase and strength) and spatial (depths and sites) initial conditions have been analyzed to identify the most likely pathways of ELS dispersion. Eastward transport by the Atlantic Jet exiting the Strait of Gibraltar is the most influencing process in that dispersion. Regarding temporal fluctuations, fortnightly tidal modulation appears to be the prevailing factor determining the horizontal paths of ELS, being the spring tide responsible of the greatest scattering of eggs and larvae. Interestingly, the spatial distribution numerically simulated is consistent with results of larvae distribution obtained from samples collected during recent scientific surveys. The results presented in this study can be certainly different attending to the species strategy. The role of other important larval traits not included in this study requires also further research that may help decision-makers to establish biological rest periods that lead to maximize connectivity and sustainability.

**Key words:** Alboran Sea, blackspot seabream, early-life-stages (ELS), hydrodynamic connectivity, transboundary stock

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