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, Mikel Zabala, Bernat Hereu, 2016.

[Ordinary and extraordinary movement behaviour of small resident fish within a Mediterranean Marine Protected Area](#)

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Abstract: It is important to account for the movement behaviour of fishes when designing effective marine protected areas (MPAs). Fish movements occur across different spatial and temporal scales and understanding the variety of movements is essential to make correct management decisions. This study describes in detail the movement patterns of an economically and commercially important species, *Diplodus sargus*, within a well-enforced Mediterranean MPA. We monitored horizontal and vertical movements of 41 adult individuals using passive acoustic telemetry for up to one year. We applied novel analysis and visualization techniques to get a comprehensive view of a wide range of movements. *D. sargus* individuals were highly territorial, moving within small home ranges (less 1 km²), inside which they displayed repetitive diel activity patterns. Extraordinary movements beyond the ordinary home range were observed under two specific conditions. First, during stormy events *D. sargus* presented a sheltering behaviour, moving to more protected places to avoid the disturbance. Second, during the spawning season they made excursions to deep areas (> 50 m), where they aggregated to spawn. This study advances our understanding about the functioning of an established MPA and provides important insights into the biology and management of a small sedentary species, suggesting the relevance of rare but important fish behaviours.

Keywords: Marine fish, Animal behavior, Fish biology, Marine ecology, Conservation science, Acoustic signals, Acoustics, Animal migration