IDENTIFYING METIERS AND SPATIO-TEMPORAL DYNAMICS OF SMALL-SCALE FISHERIES IN THE FUTURE MPA OF "TAZA" (ALGERIA, SW MEDITERRANEAN)

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Abstract
Creation of a marine protected area (MPA) in "Taza" (Gulf of Béjaia, Algeria - SW Mediterranean) was first proposed by the staff of Taza National Park in 2000. The main objective of this work was to identify the *métiers* practiced by artisanal fishermen in this area through direct observation method of daily landings. It is found that among the five *métiers* characterized by target species, gear type, fishing grounds, and fishing seasons, two *métiers* ("*Mullus surmuletus* trammel net" and "Sparids monofilament gillnet") are practiced throughout the year, while the remaining three ("*Sarda sarda* driftnet", "*Merluccius merluccius* set gillnet", and "*Pagellus* set gillnet") are specific to a determined period of the year. Moreover, the spatial distribution of fishing effort shows that the fishing grounds are mainly at depths <100 m.

Keywords: South-Western Mediterranean, Fisheries, Marine reserves, Algerian Sea

Introduction
In the Mediterranean Sea, the small-scale fisheries (SSFs) have a high socio-economic relevance for the local communities as they represent an important share of the fish caught and constitute about 80% of the fisheries in terms of fishing vessels [1]. SSFs are characterized by a diversity of target species, gear, and fishing tactics. The diversity and the great variety of their *métiers* create great uncertainty from the perspective of the protection and sustainable management of marine resources. The *métiers* correspond to fishing practices at the scale of the fishing operation, defined as the combination of four variables: one or more target species, a fishing gear, a fishing ground, and a period of the year [2]. In 2009, with the support from the network of MPA managers in the Mediterranean (MedPAN), Taza National Park began a process to include its adjacent marine area covering 9603 ha (Fig. 1) [3].

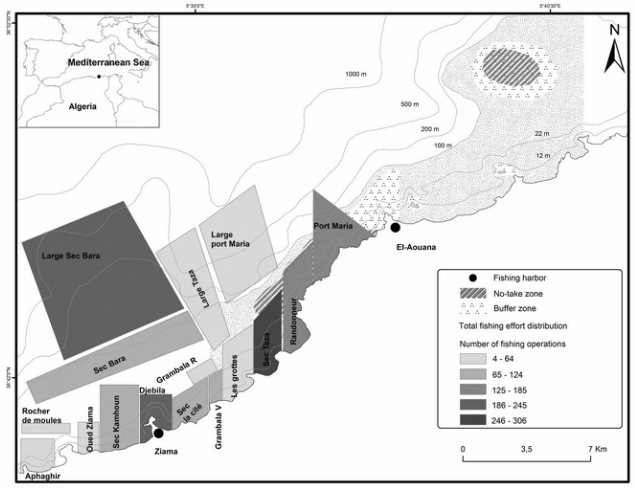

Fig. 1. Map showing location and spatial distribution of the total fishing effort in the future MPA of "Taza", Algeria. Effort was represented on the basis of the number of fishing operations carried out in the different fishing grounds.

Material and Methods
The study area is located within the future MPA of "Taza" (Algeria, South-Western Mediterranean) (Fig. 1). Catch data were collected via a direct observation method of landings on a daily basis between May 2013 and April 2014. In order to characterize the small-scale fishery activity of the future MPA of "Taza", at Ziama harbor, and during an annual cycle, daily observations were made with the help of two observers from the Directorate of Fisheries and Aquaculture of Jijel. A Multiple Correspondence Analysis (MCA) was applied to the data from the active variables: target species, gear type, fishing ground, and fishing period. Then, the main factorial axes were kept for the Hierarchical Cluster Analysis (HCA) based on Ward's criterion [2]. The latter provided us with a scree plot to which a partition was applied. Each cluster obtained from the multivariate analyses is considered as a *métier*.

Results and Discussion
A total of five *métiers*, using four different gears and targeting 5 main species and/or groups of species, were identified in the area of the future MPA of "Taza". In terms of fishing gear, gillnets, which account for 59.7% of total fishing operations, are the more common gear used by the Ziama small-scale fleet. Thirteen of the sixteen fishing grounds used by small-scale fishers are mainly at depths <100 m (Fig. 1) while five of them are located within the perimeter of the future MPA. Observation of the monthly landings (Fig. 2) showed that the fishing of the target species is distinctly seasonal, demanding that fishers tend to rotate between various *métiers* throughout the year and adapt to variations in resource availability.

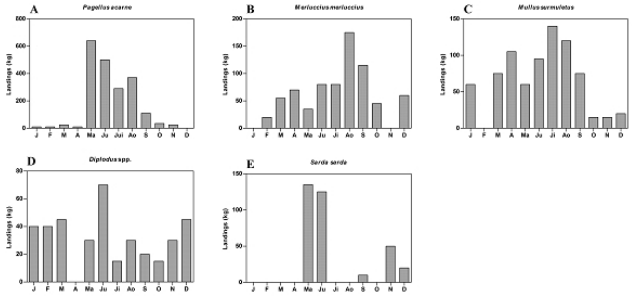

Fig. 2. Monthly landings (in kg) for the five main target species: A, *Pagellus acarne*, B, *Merluccius merluccius*, C, *Mullus surmuletus*, D, *Diplodus* spp. and E, *Sarda sarda* of the small-scale fishery from Ziama bay (Southwestern Mediterranean) between May 2013 and April 2014. Source [4].

References
1 - Maynou, F., Morales-Nin, B., Cabanellas-Reboredo, M., Palmer, M., García, E. *et al*., 2013. Small-scale fishery in the Balearic Islands (W Mediterranean): A socio-economic approach. *Fisheries Research*, 139, 11-17. https://doi.org/10.1016/j.fishres.2012.11.006
2 - Pelletier, D., Ferraris, J., 2000. A multivariate approach for defining fishing tactics from commercial catch and effort data. *Canadian Journal of Fisheries and Aquatic Sciences*, 57 (1), 51-65. https://doi.org/10.1139/f99-176
3 - Boubekri, I., Djebar, A.B., 2016. Marine protected areas in Algeria: Future marine protected area of "Taza" (SW Mediterranean), continuing challenges and new opportunities facing an integrated coastal management. *Ocean and Coastal Management*,130, 277-289. https://doi.org/10.1016/j.ocecoaman.2016.06.021
4 - Boubekri, I., Caveen, A., Djebar, A.B., Amara, R., Mazurek, H., 2018. Structure and spatio-temporal dynamics of the artisanal small-scale fisheries at the future MPA of "Taza" (Algerian coast, SW Mediterranean). *Mediterranean Marine Science*, 19(3), 555-571. http://dx.doi.org/10.12681/mms.16192

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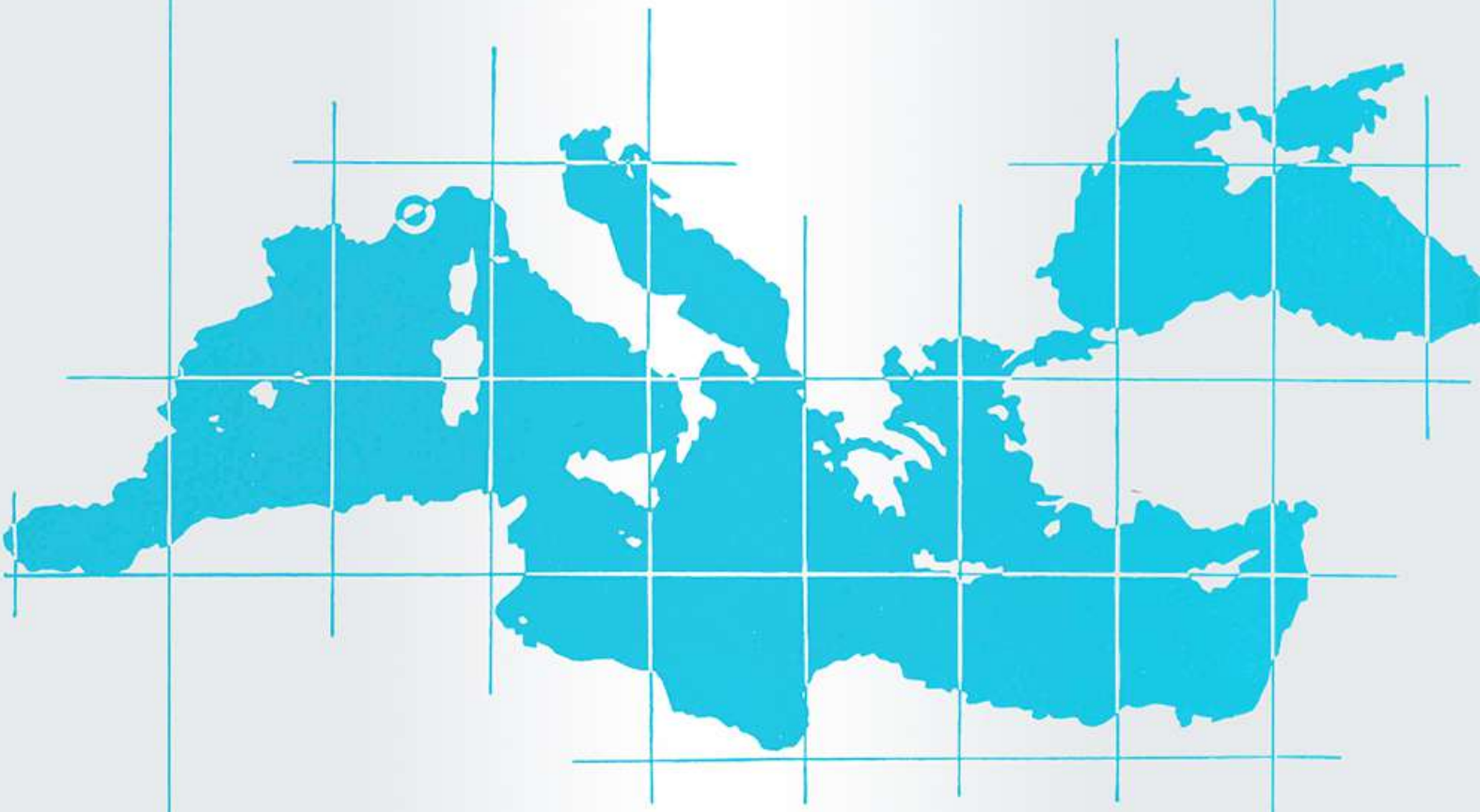

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