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TITLE: Cold-Water Corals and Anthropogenic Impacts in La Fonera Submarine Canyon Head, Northwestern Mediterranean Sea

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ABSTRACT:

We assess the occurrence and extent of cold-water coral (CWC) species *Madrepora oculata* and *Dendrophyllia cornigera*, as well as gorgonian red coral *Corallium rubrum*, in La Fonera canyon head (Northwestern Mediterranean Sea), as well as human impacts taking place in their habitats. Occurrence is assessed based on Remotely Operated Vehicle (ROV) video imaging. Terrain classification techniques are applied to high-resolution swath bathymetric data to obtain semi-automatic interpretative maps to identify the relationship between coral distribution patterns and canyon environments. A total of 21 ROV immersions were carried out in different canyon environments at depths ranging between 79 and 401 m. Large, healthy colonies of *M. oculata* occur on abrupt, protected, often overhanging, rocky sections of the canyon walls, especially in Illa Negra branch. *D. cornigera* is sparser and evenly distributed at depth, on relatively low sloping areas, in rocky but also partially sedimented areas. *C. rubrum* is most frequent between 100 and 160 m on highly sloping rocky areas. The probable extent of CWC habitats is quantified by applying a maximum entropy model to predict habitat suitability: 0.36 km<sup>2</sup> yield *M. oculata* occurrence probabilities over 70%. Similar predictive models have been produced for *D. cornigera* and *C. rubrum*. All ROV transects document either the presence of litter on the seafloor or pervasive trawling marks. Nets and longlines are imaged entangled on coral colonies. Coral rubble is observed at the foot of impacted colonies. Some colonies are partially covered by sediment that could be the result of the resuspension generated by bottom trawling on neighbouring fishing grounds, which has been demonstrated to be responsible of daily increases in sediment fluxes within the canyon. The characteristics of the CWC community in La Fonera canyon are indicative that it withstands high environmental stress of both natural and human origin.

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