

F. ACAMPA<sup>1,2,3,4</sup>, E. FABBRIZZI<sup>2,3</sup>, S. GIAKOUMI<sup>5</sup>, S. MORO<sup>6</sup>, F. COLLOCA<sup>6</sup>

<sup>1</sup>Department of Earth and Marine Sciences, University of Palermo, 90123 Palermo, Italy

<sup>2</sup>National Biodiversity Future Center, 90133 Palermo, Italy

<sup>3</sup>Department of Biology, University of Naples Federico II, 80126 Naples, Italy

<sup>4</sup>WSense s.r.l., 00198 Rome, Italy

<sup>5</sup>Department of Integrative Marine Ecology, Stazione Zoologica Anton Dohrn, 90149 Palermo, Italy

<sup>6</sup>Department of Integrative Marine Ecology, Stazione Zoologica Anton Dohrn, 00198 Rome, Italy  
corresponding author: francesca.acampa@unipa.it

## **BALANCING MARINE CONSERVATION AND REGIONAL USES: A TOOL-BASED ASSESSMENT OF POTENTIAL OECMS IN CAMPANIA (WESTERN MEDITERRANEAN)**

### **BILANCIARE CONSERVAZIONE MARINA E USI REGIONALI: STRUMENTO PER LA VALUTAZIONE DI POTENZIALI OECM IN CAMPANIA (MEDITERRANEO OCCIDENTALE)**

**Abstract** – *The maritime area of the Campania Region hosts numerous sites of ecological interest, but also faces significant and often unregulated human pressures, underscoring the need for more targeted conservation efforts. In this context, Other Effective area-based Conservation Measures (OECMs) – areas contributing to biodiversity conservation without formal Marine Protected Area status – offer a promising yet underestimated approach to safeguard biodiversity and ecosystem services. This study applies a novel decision-support tool from the EU-funded MarinePlan project to assess potential OECMs in the maritime area of the Campania Region, starting from its current protection framework. The tool uses a quantitative ranking system that objectively prioritizes areas based on their conservation value, management feasibility, and social acceptability. Four sites are presented to illustrate its practical application. By integrating ecological and socioeconomic factors, the tool effectively balances biodiversity conservation with other sectoral uses, providing a flexible solution where other legally designated areas may be unfeasible.*

**Keywords:** *coastal management, conservation planning, data-driven assessment, ecosystem-based approach, site prioritization*

**Introduction** – The maritime area of the Campania Region (central-southern Tyrrhenian sector, western Mediterranean Sea) is one of the most complex areas surrounding the Italian peninsula in terms of geomorphological and hydrodynamic features. Identified in the Italian Maritime Spatial Plans (MIT, 2024) as a biodiversity hotspot, it hosts ecologically valuable habitats, such as seagrass meadows and coralligenous assemblages. The presence of canyons, seamounts, and gas emission sites further enhances productivity, supporting unique benthic environments and pelagic species of Community interest. According to the Italian Ministry for the Environment (MASE, 2024), Campanian waters currently host four Marine Protected Areas (MPAs) established under the national Framework Law on Protected Areas (Law 394/1991), covering about one-quarter of the regional coastline: Punta Campanella, Regno di Nettuno, Santa Maria di Castellabate, and Costa degli Infreschi e della Masseta. The first of these has also been designated as a Specially Protected Area of Mediterranean Importance (SPAMI). Within the regional waters, there are also twenty marine or partially marine Natura 2000 sites (under 'Habitats' Directive 92/43/EEC), one candidate MPA (Isola di Capri), and the only two nationally recognized Underwater Parks (Baia and Gaiola). The diversity of marine and coastal ecosystems hosted in Campania not only has intrinsic natural value, but also represents an essential socio-economic resource. The Campanian fishing fleet accounts for nearly 15% of the national total and is largely composed of small-scale artisanal coastal fisheries. Aquaculture, especially mussel farming, complements fisheries as a key activity in the area. The regional port system has major economic and employment value, with steadily increasing cargo and passenger traffic that underlines its strategic importance for both

industry and tourism. Intensive sea use is further reflected in settlement patterns: nearly 40% of the Campanian population lives in coastal municipalities (ISTAT data, 01-01-2023), despite these covering only about 13% of the regional territory. In light of the heavily exploited yet biodiverse maritime area of the Campania Region, identifying conservation priorities is an urgent task. This requires considering the current configuration of nationally designated areas and aligning with both the National Maritime Spatial Plans (MSP) (2014/89/EU) and the National Biodiversity Strategy (SNB) 2030 (M.D. no. 252, 03/08/2022). In this regard, supplementary instruments such as Other Effective area-based Conservation Measures (OECMs) may be particularly relevant (MIT, 2024). According to Decision 14/8 of the Convention on Biological Diversity (CBD, 2018), an OECM is an area that meets the following criteria: (A) it is not currently recognised as a protected area; (B) it is governed and managed; (C) it achieves sustained and effective contribution to in-situ biodiversity conservation; (D) it supports ecosystem functions and services while respecting cultural, spiritual, socio-economic, and other locally relevant values. OECMs may therefore include pre-existing measures that, while not historically recognised for their conservation value (a prerequisite for PA designation), nonetheless can deliver long-term biodiversity benefits, even indirectly; examples include military areas and fisheries closures. Consequently, these areas are identified and recognized rather than formally designated (Petza *et al.*, 2024). To operationalize this definition, the IUCN World Commission on Protected Areas (WCPA) developed a screening tool to provide additional guidance for the identification, recognition, and reporting of OECMs (IUCN-WCPA, 2019). These must undergo a detailed empirical assessment, with the consent of the competent governance authority, before they can be reported to national or international databases. As of September 2025, no OECMs have been added for Italy to the World Database on Other Effective Area-based Conservation Measures (WD-OECM) ([www.protectedplanet.net](http://www.protectedplanet.net)). As also highlighted by Shabtay *et al.* (2019), the official guidelines for the identification of OECMs have not yet been applied in the MSP context, despite the requirement to assess the potential of OECMs to contribute to environmental protection objectives within twelve months of the approval of the National Maritime Spatial Plans (MIT, 2024). This study reviews the current state of protection in the maritime area of the Campania Region and explores how potential OECMs could be integrated into the existing framework. To this end, a tool developed within the European project MarinePlan ([www.marineplan.eu/](http://www.marineplan.eu/)) is introduced and applied to four test sites demonstrate its practical application in regional waters. The aim is to provide the scientific community with a user-friendly yet methodologically robust guide, grounded in the CBD/IUCN criteria.

**Materials and methods** – The candidate sites were evaluated using the MarinePlan OECM Assessment Tool. It employs a Multi-Criteria Decision Analysis (MCDA) approach and is structured in a tabular format, where the CBD/IUCN criteria are reformulated into nine sequential questions (Fig. 1). For each question, the operator must select one of multiple pre-defined answers, each associated with a rate. Then, the tool automatically calculates a criterion score, obtained as the product of the rate and the certainty grade of the operator in providing that answer (low: 0.2; medium: 0.5; high: 1). The geometric mean of the criterion scores for a given site represents the overall site score (0-100). The sites were assessed using the best available data obtained from official sources, including scientific literature, institutional websites, and ministerial decrees. Spatial overlap analyses were conducted with thematic layers available on the Geoportal for Marine Biodiversity in Italy ([www.nbfc.it/en/news/geoportal-for-biodiversity-in-italy](http://www.nbfc.it/en/news/geoportal-for-biodiversity-in-italy)), implemented by the National Biodiversity Future Center (NBFC), and on the Geoportal of the Campania Region ([geoportal.bioinfo.szn.it/](http://geoportal.bioinfo.szn.it/)), developed under the Operational Programme FEAMP Campania 2014-2020. In QGIS (3.30.3), a

cumulative impact index was generated from raster layers of different marine uses to show the generalized distribution of human pressures in the area. All sites partially overlap with existing designations, such as Natura 2000 sites and MPAs; in line with the CBD/IUCN criteria, only the non-overlapping portions were considered in the assessment.

**Results** – Spatial analyses indicate that the current extent of protected marine area in Campania, excluding overlaps among MPAs, Natura 2000 sites, and Underwater Parks, is approximately 480 km<sup>2</sup>, corresponding to about 3.5% of regional waters within 24 nautical miles (FEAMP boundaries). Considering that nearly 12% (~40,000 km<sup>2</sup>) of Italian marine jurisdictional waters (i.e., Territorial Waters + Ecological Protection Zones) are under legal protection (ISPRA, 2024), the Campania Region is contributing just over 1% of this total. According to Strategic Objective A of the SNB 2030 (MASE, 2023), which calls for at least 30% of national marine waters to be legally protected by 2030 through an integrated system of MPAs, Natura 2000 sites, and other legally designated areas, reaching this national target will require more than doubling the current extent of protected marine waters. Within this framework, the four sites in Fig. 1 were assessed for OECM recognition to evaluate their potential to complement the existing network. They cover a total of ~500 km<sup>2</sup> and include two permanently closed military areas (#1 and #2) and two biological protection zones (#3 and #4) subject to fishing restrictions. Comparing the four sites, #1 and #2 obtained the lowest scores (33), followed by #3 (41) and #4 (47), showing a gradient of progressively increasing biodiversity. Governance and management mechanisms were assessed as only partially effective at all sites, although with some degree of uncertainty. Moreover, no evidence was found that the three dimensions of equity (i.e., recognition, procedure, distribution) (CBD, 2018) are currently being implemented or prioritized in governance practices.

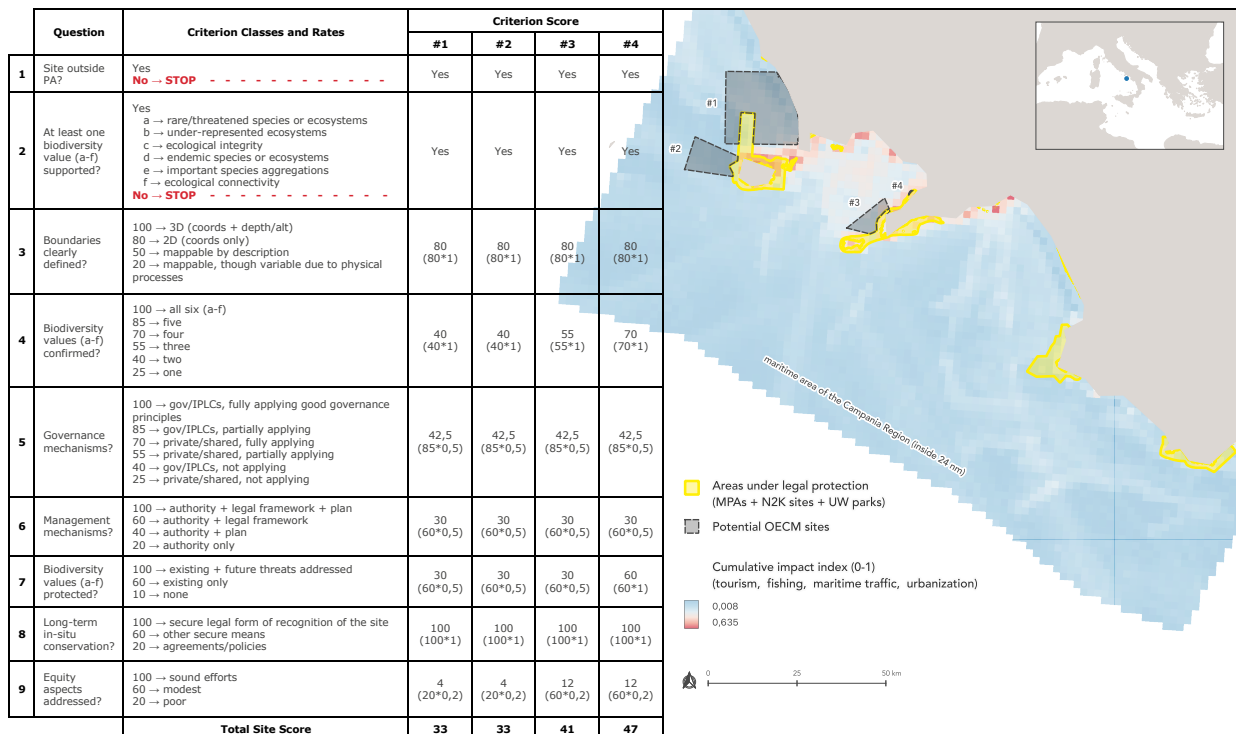


Fig. 1 - Potential OECM sites within the maritime area of the Campania Region (right) and the MarinePlan OECM Assessment Tool applied for their evaluation (left).  
*Potenziali OECM nell'area marittima della Regione Campania (a destra) ed il Tool sviluppato nell'ambito del progetto MarinePlan applicato per la loro valutazione (a sinistra).*

**Conclusions** – The Ecosystem-Based Approach (EBA) provides a crucial link between the Marine Strategy Framework Directive (MSFD – 2008/56/EC) and the Maritime Spatial Planning Directive (MSPD – 2014/89/EU) (MIT, 2024). Its implementation is necessary throughout the various phases of the National Plans to ensure alignment with environmental objectives (e.g., achieving Good Environmental Status, GES) and to promote a balanced integration of marine resource sustainability and utilization. In this context, recognizing and protecting new areas as OECMs is not only a conservation priority but also a key step toward ensuring the long-term resilience of marine ecosystems and the communities that rely on them. This is especially important for regions like Campania, where human activities at sea have been ongoing for millennia, and conflicts among competing uses are likely to increase as maritime space becomes more crowded. This study aimed to introduce the MarinePlan OECM Assessment Tool to the scientific community and to provide a demonstrative example of its operational workflow. The tabular structure of the tool and the step-by-step questioning process make it easy to complete, while its combination of ecological, socio-economic, and governance/management criteria underscores its comprehensive approach. Notably, the proposed assessment is an initial exploration by the scientific community; following official guidelines, all relevant actors must participate in the process to build consensus and clarify gray areas (e.g., implementation of management plans and enforcement of related restrictions), ultimately allowing sites to be confirmed as OECMs. For example, spatial analyses detected fishing activities in some sites despite existing restrictions. Overall, a more collaborative and consistent application of the tool could strengthen national MSP efforts and help integrate OECMs into the MPA and Natura 2000 networks, thereby supporting the achievement of the national and European 30x30 biodiversity targets. Future results will also be incorporated into the ongoing territorial analyses within the MarinePlan project, which includes Campania among its Planning Sites. Lastly, the tool will be freely accessible, in line with the MarinePlan commitment to the Open Science Strategy and the project’s core principle of being fully measurable, validated, and verifiable.

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