

## Contribution of Cultural Ecosystem Services to Natural Capital in the coastal area of Civitavecchia (Latium, Italy)

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Natural Capital evaluation is emerging as a fundamental tool to support the management of natural resources. Indeed, the achievement of the compatibility among their multiple uses, often in conflict in coastal areas, is a priority to avoid the increasing undesirable effects which threat both ecosystems and human health and well-being. It represents the scientific basis for actions needed to enhance the conservation and sustainable use of those systems and their contribution to human well-being.

Furthermore the Millennium Ecosystem Assessment (called by Kofi Annan in 2000), assessed the consequences of ecosystem change for human well-being, and in particular, the analysis method has been centered on the linkages between “ecosystem services” and human well-being. This “Ecosystem Approach” allows to evaluate the consequences of ecosystems changes on human well-being through the assessment of the Ecosystem Services (ES), which are defined as “the benefits that people obtain from ecosystems”. These include provisioning services (food, water, timber, etc.), regulating services (climate, floods, disease, etc.); cultural services (recreational, aesthetic and spiritual benefits) and supporting services (soil formation, photosynthesis, nutrient cycling, etc.)

Also the reference guidelines for European Environmental Policy (Marine Strategy Framework Directive 2008/56 / EC - MSFD; Maritime Spatial Planning Directive 2014/89 / EC - MSP) are based on the principle of the Ecosystem Approach to define the monitoring criteria of marine and maritime space management ecosystems.

The assessment of ES provided by Natural Capital cannot overlook the integration of ecological data with economic and socio-cultural ones, since they are considered as the direct and indirect contributions to human well-being provided by ecosystems. Cultural Ecosystem Services (CES), often omitted in the cost-benefit impact studies, has been receiving increasing interest from the scientific community in order to improve the decision-making process on environmental issues, giving useful information on how environmental changes influence social well-being.

This work focused on the valuation of CES in terms of aesthetic value, tourism, cultural heritage, recreational potential and archaeology in the coastal area of Civitavecchia, taking in account also the quantification of the hedonic value provided by marine landscape along the coast. In the study area, a great archaeological heritage (due to the presence of two UNESCO sites and copious smaller sites spread all along the coast) and the presence of priority habitat and species (*Posidonia oceanica* – Habitats Directive cod. 1120; Reefs – Habitats Directive cod. 1170; *Pinna nobilis* - Annex IV, Natura 2000; *Corallium rubrum* - Annex V Habitats Directive) are overlapped with human activities involving an intense use of maritime spaces.

The collected data were used to calculate a provision level of CES according to their spatial distribution allowing to detect the ecosystem services hotspots which require targeted management interventions.