

AN ESSAY OF THE USE OF THE HABITAT EVALUATION PROCEDURE IN THE PLANNING OF A MARINE RESERVE (PELAGIAN ISLANDS, SOUTH MEDITERRANEAN)

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The Pelagian archipelago includes 2 major islands : Linosa, further north, Lampedusa, about 30 mls south, with the rock of Lampione. The former is an extinct volcano, made up of recent olivinic and feldspathic basalts rising on a platform of eruptive debris; the latter isles are a calcareous protrusion of the African shelf; their substrata are a mixture of holocene sandstone and miocene dolomitic rocks. The good state of their coastal environment and the high landscape diversity makes the Pelagian islands an appreciated touristic resort and a major biological reserve as well. The need for a conservative management of the coastal system has boosted a comprehensive bionomic survey (CHEMELLO and DI GERONIMO, 1992), whose results are still under examination. The perspective of setting up a marine reserve has led us to apply to the Pelagian biotopes some of the most advanced methods used to assess the value of terrestrial areas. A major drawback has been to find marine biological indicators corresponding to the terrestrial ones; the rarity of endemic and/or significant taxa has made our task particularly difficult. Therefore we have adjusted the available information in order to fit the main guidelines of the U.S. Fish & Wildlife Service and worked out the data according to a modified version of the H.E.P. (Habitat Evaluation Procedures) applied to the conservation of marine coastal areas (CHEMELLO, 1991). Methods and results are summarily reported in the following text : three different scales of indicators of ecological interest have been chosen, values have been assigned to single areas, and the results have been combined to obtain a comprehensive coefficient of the importance of each biotope and/or community. The Mollusc syntaxon has been used as basic descriptor. Twelve major environmental units (EU) have been identified, each encompassing a homogeneous coastal section, suited for one sampling and two bionomic transects, statistically representative of the biotic systems. The following parameters have been chosen: extension (EX); environmental health (EH); anthropic interest (AI); protection of terrestrial systems (SP); environmental diversity (ED). From paired comparison of the main values, the most important criteria have been referred to as : EH, SP, ED. Criteria and relative weights (RW) assigned to each EU have been arranged in a matrix, where numbers were respectively 0.1, 0.5, 1.0. Relative values (UVR) of EUs have been obtained by multiplying the value of each EU by the RW assigned to the single criteria. The actual value (HRV) calculated for each EU has been obtained by the UVR/MUVR (= maximum recorded UVR) ratio. The highest numbers have characterized the 11th and 12th sector of Linosa as well as the 4th sector of Lampedusa, whereas the lowest HRVs have been recorded in in the 1st, 2nd and 8th sectors of the same island. The following 7 criteria have been selected for the calculation of the naturalistic, scientific, and recreational index (NSRV): naturality (NA), aesthetics (AE), biotic diversity (BD), water quality (WQ), naturalistic (NI), economic (EI) and recreational interest (RI) : NA, EI and AE have been identified as highly significant. The 12 EUs have been ordered in a matrix using the same procedure as above. The 7th, 2nd and 1st sectors of Lampedusa have shown, in the order, the highest values, especially referred to BD. From cross comparison of the HRVs and NSRVs a scale of importance of the coastal sectors has been created : the 11th and 12th sectors of Linosa and the 7th sector of Lampedusa have ranged in the top three.

A list of significant biotopes has then been made, using the following selective criteria : extension (ET), resilience (RE), diversity according to Shannon (DH); early sensitivity (ES), that is, the ability to respond quickly to habitat alterations; easiness of control (CE), expressing the availability of monitoring facilities; anthropic importance (AT), related to educational and economic fruition; autochthonicity (AH), quantification of the importance of endemic or rare organisms. DH, ET and CE have appeared most suited to our survey; RE and ES have been of less use. The following parameters have been chosen to calculate the sensitivity index (SI): resilience (RL), species richness (SR), biotic diversity (BD), species rarity (SY), size criticality (SC), functional specificity (FS), specific sensitivity (SS), generic sensitivity (GS). BD has been confirmed as the most significant sensitivity criterion, followed by SS, FS, SC, GS. Use of SI has stressed the primary role of the *Posidonia oceanica* meadow, followed by the photophilous infralittoral settlements and the fringe communities. Our results have enabled us to identify and assign importance values to the areas more worth conservation, and therefore put forward an overall plan of the forthcoming reserve, as illustrated in Fig. 1.

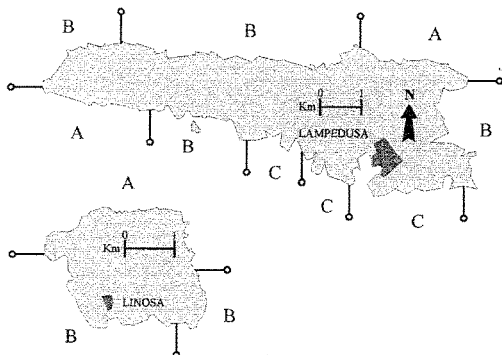


Fig. 1: the Islands Lampedusa and Linosa, with location of zones A, B and C, suggested by HEP.

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