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MARINE VEGETATION AREAS IDENTIFIED AS SCI (E.C. HABITAT DIRECTIVE) IN THE LIGURIA (NW-MEDITERRANEAN)

ABSTRACT

Along 359 km of the Ligurian coastline (N-W Mediterranean Sea) 26 sites have been recognized as SCIs, sites of community interest (as defined by the Habitat Directive, EEC 92/43). Approximately 80% of the surface of these sites are covered by the seagrass *Posidonia oceanica* (L.) Delile for a total of about 40.5 km².

KEY-WORDS: Protected areas, *Posidonia oceanica*, Ligurian Sea, Mediterranean Sea

INTRODUCTION

In 1994 Italian Ministry of Environment in collaboration with the Regional Authorities and scientists promoted a large project called BioItaly in which the marine environment was analyzed limited to the coastal bottoms inside the 50 m depth. The aim was to census and describe all areas relevant to the EEC Habitat Directive 92/43 (on the conservation of natural habitats and of wild fauna and flora). The choice and description of the sites and biotopes were made following the CORINE - Natura 2000 protocols. Attention was focused to list the SCIs, Sites of Community Importance (in Italian describes as SIC), as defined in paragraph k of the article 1 of the above mentioned directive and mainly related to Annex I (Natural habitat types of community interest whose conservation requires the designation of special areas of conservation) and Annex II (Animal and plant species of community interest whose conservation requires the designation of special areas of conservation). As the marine habitats described in Annex I and in the CORINE system are poorly representative of the marine Mediterranean habitats, the utilisation of these parameters for the definition of the marine environment proved very difficult.

MATERIALS AND METHODS

The census of SCIs in Liguria was made on the basis of all the available data found in literature, including gray literature, by the Institute of Zoology (at present DIP.TE.RIS.) and the Regione Liguria according to the procedures listed in the CORINE - Natura 2000 protocols. Each site, chosen on the basis of Annex I and II of the Habitat Directive, was roughly mapped following preliminary maps prepared by Bianchi and Peirano (1990) and identified by a code. The surface covered by *Posidonia oceanica* was evaluated.

RESULTS

Along the 359 km of Ligurian coastline 26 SCIs (table 1) were identified in all those situations in which *P. oceanica* occurs, whereas few other types of biocenoses were censused.

This phanerogam, listed in Annex I and endemic of the Mediterranean Sea, establishes a very important marine ecosystem (Arata and Diviaco 1989, Boudouresque and Meinesz 1983, Mazzella et al. 1987) up to about 40 m depth. Some sites are composed by several subsites

like in the Golfo di Rapallo where 10 small meadows (from 0.3 to 14.1 ha) were censused. The size of the SCI are quite different from 9.7 ha (n° 21) to 621.3 ha (n° 5) and the larger single meadow identified was n° 6 with 450.1 ha. In total the surface covered by this seagrass is estimated at 4051.4 ha (about 40.5 km²).

DISCUSSION AND CONCLUSIONS

The 26 *Posidonia* beds listed in table 1 present an extension of 40.5 km² on a surface, within the 50 m depth, extending approximately 481 km² which means that only 8.4 % of the surface is covered by *P. oceanica*: in other words all *Posidonia* beds of the Liguria coastline can be included in a square of 6.36 km side.

Many papers have been published on the presence of *P. oceanica* in the Ligurian Sea since the first scientific descriptions of Issel (1912, 1918) and the lists provided by Bianchi et al., (1987) and Relini (1994). Among the most important works are the maps of *P. oceanica* and *Cymodocea nodosa* (Ucria) Ascherson along the Ligurian coast (Bianchi and Peirano 1995) and the Report of the quality of the natural coastal marine environment in Liguria (Diviacco 1998). In the latter 13 maps (1:50.000) describe the quality of the marine environment between the coastline and the 50 m depth and beds of two seagrasses are recorded. In the volume prepared by Bianchi and Peirano (1995) a set of 44 color maps (1:25000 U.T.M. projection) of beds of the above mentioned seagrasses are reported. The maps show the occurrence and the extension of seagrass beds, the position of their upper and lower limits, and the presence of rock or non-vegetated «matte» (i.e., the network of rhizomes in which interstices are filled with sediment). They have evaluated that in total, *P. oceanica* meadows extend a little less than 140 km of the coastline (nearly 42% of the total length of Ligurian coastline) and cover less than 4800 hectares (10-15% of the Ligurian sea floor between coastline and 35 m depth). This is a value higher than that evaluated by us (4051.4). The difference could be in relation to different methods of calculation for the coverage. The surface of *Posidonia* beds cover off the Western Riviera is almost triple that off the Eastern Riviera, where individual prairies are also smaller. The maximum depth of the lower limit is around 35 m, but recedes to about 20 m in front of the areas with the highest urban and industrial impact (Genoa, Savona, etc.). Similarly, the upper limit, which in a few cases is still at the sea surface, is commonly below 10 m depth.

According to the above mentioned authors, *C. nodosa* meadows line 114 km of the coastline (a little more than 34 % of the total length of the Ligurian coastline) and cover about 2300 hectares (4-7 % of the Ligurian seafloor between sea surface and 35 m depth); they often grow on dead *Posidonia oceanica* «matte».

The ratio of the surface (in hectares) covered by *C. nodosa* meadows to that covered by *P. oceanica* prairies shows greater values in front of the areas with the highest urban and industrial development (Bianchi and Peirano, 1995). The authors hypothesise that the enhancement of *C. nodosa* at the expense of *P. oceanica* is related to decreased environmental quality.

The destruction of *Posidonia* and the regression of two limits are due to human activity in particular illegal trawling, sewage discharge, and beach reconstruction utilising wrong methods. Growing concern is the possible danger due to arrival of the allochthonous alga *Caulerpa taxifolia* (Relini and Torchia, 1992; UNEP, 1998).

Code	Ner of subsites	Site name	SCI area (ha)	P. oceanica beds Area (ha)	%
IT1316175	3	FONDALI CAPO MORTOLA - SAN GAETANO	136,0	122,4	90
IT1316274	4	FONDALI S. REMO - ARZIGLIA	413,4	372,1	90
IT1315973	3	FONDALI ARMA DI TAGGIA - PUNTA S. MARTINO	378,7	378,7	100
IT1315972	3	FONDALI RIVA LIGURE - CIPRESSA	188,4	169,6	90
IT1315971	3	FONDALI PORTO MAURIZIO - S. LORENZO AL MARE - TORRE DEI MARMI	621,3	621,3	100
IT1315670	0	FONDALI C. BERTA - DIANO MARINA - CAPO MIMOSA	450,1	450,1	100
IT1325675	0	FONDALI CAPO MELE - ALASSIO	140,4	112,3	80
IT1324974	0	FONDALI S. CROCE - GALLINARA - CAPO LENA	178,4	142,7	80
IT1324973	3	FONDALI LOANO - ALBENGA	346,1	311,5	90
IT1324172	0	FONDALI FINALE LIGURE	5,9	5,3	90
IT1323271	4	FONDALI NOLI - BERGEGGI	106,7	85,4	80
IT1322470	3	FONDALI VARAZZE - AIBISOLA	36,6	29,3	80
IT1332477	3	FONDALI ARENZANO - PUNTA IVREA	87,1	78,4	90
IT1332576	2	FONDALI BOCCADASSE - NERVI	466,4	419,8	90
IT1332575	3	FONDALI NERVI - SORI	499,0	499,0	100
IT1332674	0	FONDALI M. PORTOFINO	390,6	78,1	20
IT1332673	10	FONDALI GOLFO DI RAPALLO	54,6	49,1	90
IT1333372	0	FONDALI PUNTA SESTRI	9,8	8,8	90
IT1333371	0	FONDALI PUNTA MANARA	18,3	14,6	80
IT1333370	0	FONDALI PUNTA BAFFE	11,7	10,5	90
IT1333369	0	FONDALI PUNTA DI MONEGLIA	9,7	8,7	90
IT1343474	0	FONDALI PUNTA APICCHI	22,8	20,5	90
IT1344273	0	FONDALI ANZO	11,4	10,2	90
IT1344272	0	FONDALI PUNTA LEVANTO	15,8	14,2	90
IT1344271	0	FONDALI PUNTA PICETTO	13,6	12,2	90
IT1344270	3	FONDALI PUNTA MESCO - RIO MAGGIORE	524,2	26,2	5

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