

Flora-Fauna-Habitat Biotopes in Italy: policy and management issues

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Abstract

With reference to the Directive 92/43/EEC, Italy is responsible for the management of 2280 Sites of Community Importance (SCI) and 590 Special Protection Zones (SPZ), encompassing three biogeographic regions: Alpine, Continental, Mediterranean. The lack of scientific knowledge and limited economical resources makes conservation to be based on the establishment of priorities, that too often give more emphasis to the recreational/aesthetical function of biotopes and biodiversity rather than on their functional role. It is argued that to preserve biodiversity on the long term, it would be probably a more effective measure to reduce the energetic inputs around the protected areas, rather than to implement management plans and actions within them.

Key words: Natura 2000, SCI, SPZ, biodiversity, conservation, sustainability, technosystems, ecosystems, perception.

1. Introduction

All the European lands undergo an intense direct pressure from dense human populations and their activities. With the aim at putting some obstacles on the way of the decline of biodiversity in all its forms, the European Community has implemented a network of protected areas, through the „Birds Directive“ (79/409/EEC) and the „Habitats Directive“ (92/43/EEC). The sites identified throughout Europe on the basis of these two directives are largely overlapping and form a coherent network for the protection *in situ* of habitats and species recognized as „of Community Importance“ (PETERMANN & SSYMANK 2007). These sites are seen as a Community resource which should be managed through initiatives that are not simply limited to the conservation of biodiversity, but also fulfil social and economic needs at the local scale, with the general aim at achieving the best balance between ecological integrity and requirements of people living and working nearby.

Indeed, as it was declared in the leaflet „NATURA 2000 - managing our heritage“, published by the Office for Official Publications of the European Community, „The Habitat Directive contributes to the general objective of a sustainable development. Each Member State can choose the mechanisms it will use to implement the relevant conservation measures on its territory. These must take account of scientific, economic, social and cultural requirements, with the general aim at favouring the conservation of biodiversity“.

Italy has the responsibility of ensuring the proper management of 2280 Sites of Community Importance (SCI) and 590 Special Protection Zones (SPZ), covering altogether about 5.8 Mio. ha (19.3%) of the Italian territory, sea excluded (source: website of the Italian Ministry for the Environment, link reported below). Now that the Italian Natura 2000 network is almost completed (management plans for all the SCIs should be ready by 2010), it seems appropriate to carry out some considerations on how Natura 2000 will contribute to the conservation

of the national biodiversity heritage and on what specific issues should be taken into account in the policy and management of the SCIs in general.

2. Natura 2000 in Italy

The Italian territory is well known for its diversity of habitats and landscapes, that largely contributes to the high species richness of the Country and offers a major perspective on all the problems and challenges of accommodating humans and nature in the frame of traditions and traditional land uses which are fading away at present times, as a consequence of the incorporation of the social, economic and cultural development into the broader scenery created by modernization. Tackling these issues requires first an understanding of the basic features and differences among the three biogeographic regions into which the Italian SCIs and SPZs are encompassed (Fig. 1).

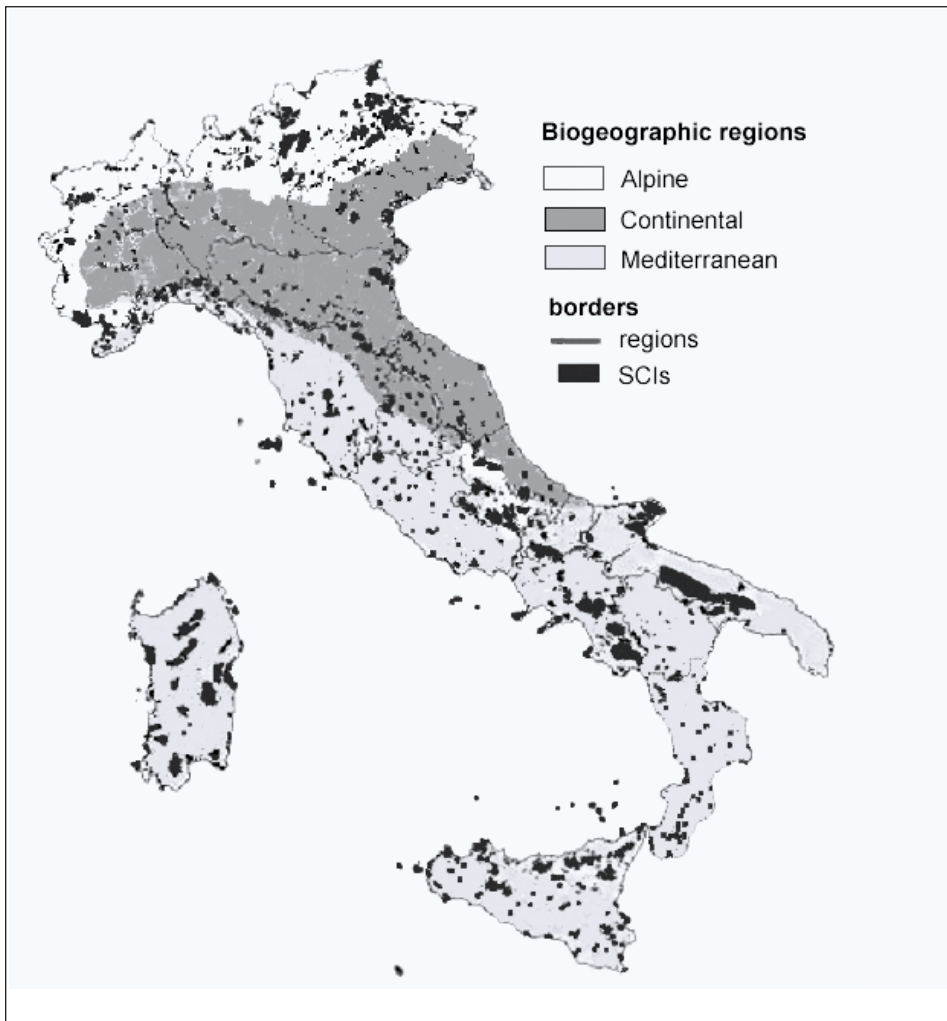


Fig. 1: Distribution of the SCIs in Italy (from the website of the Italian Ministry for the Environment, modified).

● Alpine Region

In the Alpine Region, mountains are the predominant element of the landscape. The high topographic and biological diversity is driven by the occurrence of steep ecological gradients, from the foothill to the highest peaks. Human activities are concentrated at the bottom of the valleys and there is a great abundance of natural and semi-natural ecosystems. The land use is negligible on approx. 30 % of the Alpine Region, 18% are pasturelands, 18% woodlands, 15% meadows, 19% intensive agriculture and human settlements (source: Corine Land Cover).

In the Alpine Region, 29% of the Italian Natura 2000 network is occurring, with 452 SCIs and SPZs covering about 1.34 Mio. ha (~ 23% of the part of Italian territory ascribed to the Alpine Region). Most of these sites are found in depopulated areas, at more than 1000 m a.s.l.; for this reason, their size tends to be the largest of Italy, with an average extension of 2752 ha per site. Besides the Alps, also the highest mountains of Central Apennines are considered as belonging to the Alpine Region. Out of the 100 types of habitat listed in the Directive 92/43/EEC and recorded for the Alpine Region, only 29 are not represented in the Italian territory (Fig. 2).

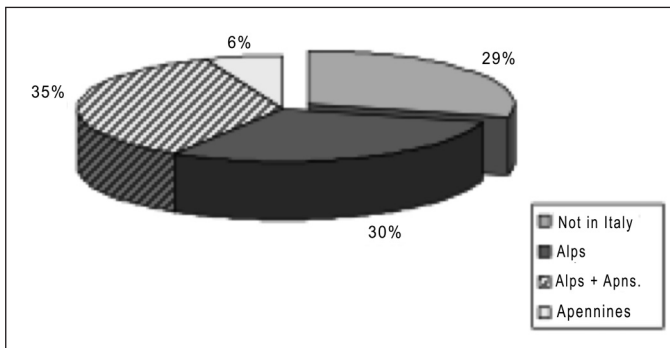


Fig. 2: Percentage of Alpine habitats represented in the Italian territory.

● Continental Region

In the Continental Region, urbanization and intensive agriculture are prevalent, little space is left to natural and semi-natural ecosystems, and the topographic and biological diversity is quite low, with smooth ecological gradients, in most cases interrupted by the human interference. The habitat loss and fragmentation is the most severe of Italy, due to the wide spread of human activities and infrastructure. The land use is negligible on approx. 4% of the Continental Region, 10% are woodlands, 11% are meadows and shrublands, 56% intensive agriculture and 19% human settlements and technological infrastructures (source: Corine Land Cover).

In the Continental Region, 16% of the Italian Natura 2000 network is occurring, with 537 SCIs and SPZs covering about 0.86 Mio. ha (~ 9% of the part of Italian territory ascribed to the Continental Region). Most of these sites are in close proximity with densely populated areas and many of them occupy critically small surfaces. Indeed, the average size of the sites ascribed to the Continental Region is 1220 ha only. Out of the 134 types of habitat listed in the Directive 92/43/EEC and recorded for the Continental Region, only 41 are not represented in the Italian territory (Fig. 3).

● Mediterranean Region

The main feature of the Mediterranean region is a remarkable diversity of habitats, with hilly or mountainous inlands and some alluvial plains in coastal sites. There is a tight coexistence of natural and synanthropic ecosystems, with a great topographic and biological diversity, driven by ecological gradients of different intensity, highly influenced by the distance

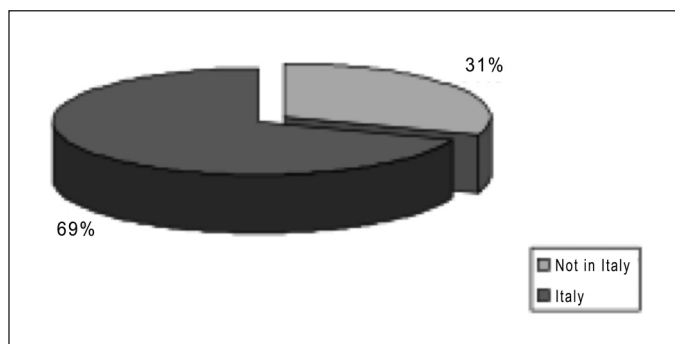


Fig. 3: Percentage of Continental habitats represented in the Italian territory.

from the sea and the orientation and altitude of mountain ranges. The natural patchiness of the Mediterranean landscapes has been often increased up to critical levels by the human activities. Land use and human demography have significantly changed during the last six decades, as a consequence of the mechanization of agriculture, the decline of the extensive land use and traditional agriculture (namely on terraced fields).

The development of new economic sectors, like services and infrastructures functional to the tourism, promoted the concentration of people within few miles from the coastline, with an ever increasing impact on coastal habitats. On the other hand, many lands which were used by agriculture or husbandry until recent times are currently abandoned, particularly in the mountain districts. For these reasons, two main kinds of SCIs and SPZs can be found in the Mediterranean Region: those occurring on mountains are on average quite extended, with an average size similar to the ones belonging to the Alpine Region; the coastal ones, instead, are on average rather small, and they have been set in the attempt to save the saveable, i.e. the few coastal traits escaped from the massive urbanization that took place in those districts in recent times. The conservation and management of the Mediterranean coastal sites, exposed to the pressure of strong economical interests, is quite problematic and poses a number of specific themes (CONRAD & CASSAR 2007).

In the Mediterranean Region, 55% of the Italian Natura 2000 network is occurring, with 1291 SCIs and SPZs covering about 2.7 Mio. ha (~ 18 % of the part of Italian territory ascribed to the Mediterranean Region). The average size of the sites ascribed to the Mediterranean Region is 1940 ha, but the coastal habitats are on average four times smaller than those of the inland. Out of the 142 types of habitat listed in the Directive 92/43/EEC and recorded for the Mediterranean Region, only 33 are not represented in the Italian territory (Fig. 4).

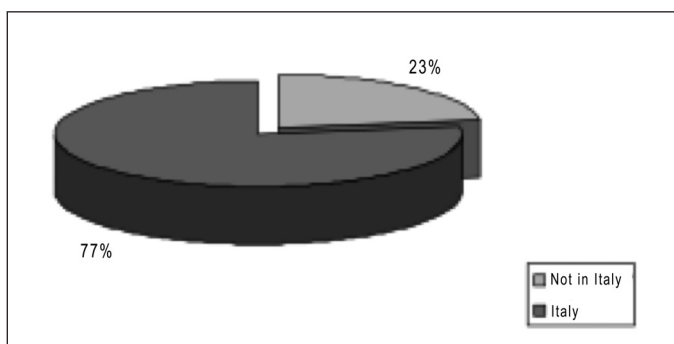


Fig. 4: Percentage of Mediterranean habitats represented in the Italian territory.

Tab. 1: Synopsis of the SCIs and SPZs in the Italian regions (from the website of the Italian Ministry for the Environment, modified).

Region	Special Protection Zones			Sites of Community Importance			Overlap (%) SCI/ZPS	TOTAL	
	nr.	surface (ha)	surface (%)	nr.	surface (ha)	surface (%)		surface (ha)	surface (%)
Abruzzo	5	307956	28,5	53	252587	23,4	89,4	421456	39,1
Campania	28	215763	15,9	106	363215	26,7	97,6	395520	29,1
Liguria	7	19615	3,6	125	145428	26,9	99,7	147228	27,2
Lazio	42	412074	24,0	182	143107	8,3	99,0	430708	25,0
Puglia	10	253039	13,1	77	465449	24,0	99,5	474282	24,5
Trentino	26	62383	10,1	152	151627	24,4	99,9	152033	24,5
Val d'Aosta	5	60695	18,6	28	71790	22,0	98,6	76244	23,4
Molise	25	45585	10,3	85	97750	22,0	100,0	97750	22,0
Veneto	67	331498	18,0	100	367765	20,0	98,1	403705	21,9
Sicilia	29	364773	14,2	217	383820	14,9	93,7	545544	21,2
Calabria	6	262255	17,4	179	85609	5,7	96,6	314347	20,8
Alto Adige	17	142513	19,3	40	149819	20,3	100,0	149819	20,3
Sardegna	15	51206	2,1	92	426251	17,7	100,0	427183	17,7
Friuli V.G.	7	98666	12,6	56	132170	16,8	99,3	137084	17,5
Basilicata	13	148788	14,9	47	55462	5,6	99,2	157232	15,7
Lombardia	62	204319	8,6	193	224201	9,4	94,9	344926	14,5
Umbria	7	47093	5,6	98	109667	13,0	98,8	120158	14,2
Marche	29	131014	13,5	80	102607	10,6	99,4	136847	14,1
Piemonte	54	245287	9,7	123	270364	10,6	97,4	334284	13,2
Toscana	61	126887	5,5	120	282515	12,3	99,5	293106	12,8
Emilia Rom.	75	175919	8,0	127	223757	10,1	98,5	256847	11,6
TOTAL	590	3707328	12,3	2280	4504960	15,0	97,1	581228	19,3

The number of SCIs and SPZs for each Italian region is reported in Tab. 1. Abruzzo is the only region in which all three biogeographic regions are significantly represented; not surprisingly, 39% of its regional territory belongs to the Natura 2000 network. It is interesting to observe that Emilia Romagna, i.e. the only region almost entirely included in the continental Region, has the least percentage of Natura 2000 sites. Italy is the only responsible for the conservation of 2 habitats (9210* and 9220*), 41 animal and 50 plant species of Annex II. Further statistic details are reported on the website of the Italian Ministry for the Environment : www2.minambiente.it/Sito/settori_azione/scn/rete_natura2000/banche_dati/psic_zps.asp

It must be noted, however, that the main emphasis of the Directive 92/43/EEC is placed on the protection of habitats, at least for what concerns the Italian territory. This becomes evident when one compares the number of habitat types listed in Annex I to the number of species listed in Annex II. Two thirds of the 198 habitat types listed in Annex I are represented in Italy, whereas out of the 200 animal and 435 plant species listed in Annex II only 98 and 84, respectively, are native to Italy. Especially with the plant species of Annex II, the main emphasis is seemingly placed on the West Mediterranean and Macaronesian (Canaries, Azores, Madeira) flora, if we consider that the Red lists of the Italian flora (CONTI et al. 1992, 1997) count many hundreds of *taxa*.

In the national strategy for nature conservation, the SCIs and SPZs of Italy take part to the network „Progetto Natura“, which includes both terrestrial and marine natural parks and wildlife reserves. With reference to the terrestrial ecosystems, 22 national parks (1.34 Mio. ha), 146 national reserves (0.12 Mio. ha), 105 regional parks (1.17 Mio. ha) and 476 regional reserves (0.27 Mio. ha) are covering 9.62 % of the National Territory. The Natura 2000 network overlaps almost entirely these parks and reserves and, when the management of SCIs and SPZs will become operative, „Progetto Natura“ will be encompassing 21.7% of the Italian territory. Besides the terrestrial ecosystems, 2 marine parks and 23 marine reserves, covering 2.8 Mio ha., are included in the „Progetto Natura“.

3. Discussion

Aim of „Natura 2000“ and „Progetto Natura“ is to promote conservation strategies *in situ* for habitats and species of Community importance. In the intention of the European Community, this should be done by the set up of a network of stakeholders, administrators and scientific experts which will support capacity building, management and policy actions throughout the areas included in „Progetto Natura“. The knowledge-base on impact assessment and strategic evaluation for the sustainable development of protected areas should promote an harmonious territorial integration and development throughout the Italian regions.

Unfortunately, these intentions are inevitably constrained by the lack of scientific knowledge on the ecosystem functioning and by the reality of limited economical resources. Conservation must therefore be based on the establishment of priorities, in order to determine how these limited resources could be best allocated.

On one side, the knowledge on many Italian SCIs and SPZs is still limited to the few and often imprecise information reported in the standard formularies (just to make an example: in the standard formulary of the SCI „ITA030031 – Isola Bella, Capo Taormina e Capo S. Andrea“, the E-Mediterranean habitat 5430: „Endemic phryganas of the Euphorbio-Verbascion“ is mistakenly recorded, while two very important endemics, like *Colymbada tauromentana* and *Limonium jonicum* are not mentioned).

On the other side, the people's perception on protected areas is, in most of the cases, limited to the recreational or aesthetical function of biotopes and biodiversity: a kind of „playground for ecologists“ that can be used for outdoor activities and experiential marketing (see, for instance, <http://www.wildwilderness.org/docs/mcwilder.html>). This limited view should be widened through the use of SCIs and SPZs as living labs for the environmental education, to raise the public awareness on the function of ecosystems, but unfortunately managers and planners seem to be much more sensible to the marketing and promotion of typical products and to the construction of infrastructures in order to improve accessibility and usability of these areas. This is not necessarily a negative aspect, but it can be so if it becomes the priority target for the development of protected areas. Environmental education is also education to a smart parsimony, to the reduction of waste, to the awareness of gestures. It is also education to the motion, to walk on natural terrains by adapting to the roughness of the pathways. Too many habitats and natural sceneries have been irreparably spoiled by senseless interventions to „improve“ accessibility and usability. This is the case, for example, of the renowned „Rock of the Bear“, in Palau (NE Sardinia), where the former pathway has been turned into a paved road, with benches and lamps, where one can walk absent-mindedly without risks, with best regards to the superficiality which characterizes the average way of living of the urban people. Instead, SCIs and SPZs should be seen as ideal spaces to stimulate people to see what they are looking at, to make them knowing that there is another spatial and temporal dimension, wider and slower, which regulates the ecosystems, but where the dynamics and competition for space are similar to those regulating the technosystems and the life style of the human beings.

Like every ecologist knows, the habitats listed in the Directive 92/43/EEC are the result of interactions between living organism, based on antagonism and mutualism, under the selective pressure of given environmental factors. But every natural habitat is, on its turn, the result of the competition between ecosystems and the human social, cultural and technological infrastructures, that can be defined as „technosystems“. The energetic inputs of ecosystems and technosystems were almost the same until the so-called „industrial revolution“, i.e. when human beings started to make use of fossil fuels to boost the human development and demographic growth. Since then, the gap between „ecoscapes“ and „technoscapes“ became progressively more and more evident. Both elements are belonging to the global productive sys-



Fig. 5: The striking contrast between ecoscapes and technoscapes reminds the juxtaposition between paradise and hell. Top right, abusive urbanisation against the sand dunes (Gela, S-Sicily), bottom right, intensive agriculture against a coastal wetland (Falasarna, W-Crete): both places are SCIs.

tem called „noosphere“ (VERNADSKY, 1993), but the energy requirements, and therefore the „ecological footprints“ (WACKERNAGEL & YOUNT, 2001), of technosystems are higher than those of the ecosystems, so that the space needed to ensure the maintenance of technosystems can be much bigger than the mere physical space occupied by them. Ecosystems and technosystems develop in the fractal dimension of the noosphere in close spatial contiguity; actually they are belonging to the same global system and undergo the same basic rules on relationships and productivity, but we often look at them as if they were parts of two isolated systems. This will be discussed in the next chapter.

4. Conclusion

In around 1510, the famed painter Hieronymus Bosch depicted, on two panels that were to form the sides of a triptych, Heaven and Hell. In the „Heaven“ panel, the elements that stand out the most are trees, meadows, rocks, waters... and even the fall of the rebel angels is shown as a multicoloured pleiad of fantastic animals filling up the sky. In the „Hell“ panel, the centre is occupied by a building under construction, and the entire allegory takes place in a clearly urban setting, with walls, floors, warehouses... in the background is a single solitary tree, withered and devoured by fire. Bosch is famous for having shown with matchless mastery the monsters and fears moulded by the Middle Ages in the collective subconscious. The juxtaposition of the airy and sublime atmosphere of Eden with the anguish of the infernal prison is extraordinarily effective. Such juxtaposition is currently reminded by many biotopes, under the siege of urbanisation and intensive agriculture (Fig. 5): the contrast between the Euclidean linearity of the elements of the technoscape and the non-linear predictable chaos of

the ecoscape is almost as striking as the contrast between the Heaven and Hell in the Bosch's painting.

The anguish of the Original Sin, which caused the banishment from Eden, is in a certain sense relived by modern man when he deals with contexts perceived as „natural“ to the urban and technological system in which he carries on his daily activities. The awareness of the arrogance with which we have transformed the primordial landscape into a cultural landscape, creating infrastructure and services which we can no longer do without, lead anyone who feels trapped in his social role to long for an age of Eden when, without pollution, market laws, induced needs, people were freer and better integrated into the natural world. Hence, an ideal perception of the natural world, which exists in our mind, juxtaposed with the social and human context in which we function.

From this standpoint, Bosch's above-mentioned panels are extraordinarily topical: the sterile „urban“ environment of his Hell can be linked directly to the built-up, mechanized environment shown by Fritz Lang in the movie „Metropolis“.

The increasing importance attributed to the need to safeguard biodiversity refers, in the collective imagination, to a paradise lost, of which an attempt is made to save the saveable. But to what paradise, more or less consciously, does this refer?

Considering the torments that afflicted prehistoric man, it does not appear very likely that we can yearn for a primordial environment of which, moreover, very few traces remain in our collective imagination. Much more concrete are the references to a traditional world, to a cultural diversity whose uses and customs have been progressively cancelled by the post-industrial globalisation of communications, commerce, and technologies. Today we indicate that model of development as „sustainable“, i.e. respectful of the natural dynamic processes capable of ensuring the ecosystemic homeostasis and the perpetuation of „biodiversity“.

The enormous energy requirement necessary for maintaining the post-industrial sociocultural system, which has gone hand-in-hand with a huge increase in the human population, has progressively chipped away at the sustainability of our development model, leading the most advanced countries to invest part of their resources in trying to improve their „environmental performance“, i.e. the sustainability of their actions. This is done, on the one hand, by attempting to optimise production processes while, on the other, setting up nature preserves, like SCIs and SPZs, for the conservation of the living organisms we hold dearest.

Having the resources for investing in the search for more „ecocompatible“ technologies, and in the establishment of centres for the preservation of biodiversity, entails either a reduction of profits or an increase in the production rate in order to cope with the new expenses. Since man is very unlikely to give up, even in part, the condition of well-being he has acquired, we find ourselves faced with the obvious contradiction that in order to safeguard biodiversity on extremely limited portions of the planet, we exploit the remaining areas with greater intensity. This fuels a perverse feedback, which accentuates the gap between „natural“ systems (ecoscapes) and „technologised“ systems (technoscapes), increasing in the collective imagination the distance separating „polluted“ everyday life from a „whole“ and ideal naturalness, connected with an Arcadian idea of what is considered „traditional“ because it dates back to the pre-industrial period.

Biodiversity, today, is perceived by most as an ideal container of the remains of a vanishing traditional landscape, where man and nature lived together harmoniously. The safeguard of biodiversity thus becomes a moral alibi for some, and a profession for others, while for most it is „supported“ by the purchase of products that often appear „natural“ only because of the clever way they are packaged. The only way to contrast these dangerous shortcuts is to

look at the Natura 2000 network and, more in general, to every protected area, as a system with strong interactions with the non protected areas, i.e. part of the productive system at the basis of the economical development of the human societies. To preserve biodiversity on the long term, it would be probably more effective to reduce the energetic inputs around the protected areas, rather than to implement management plans and actions within them.

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