



Republic of Italy
Ministry of the Environment, Land and Sea
Convention on Biological Diversity
Fourth National Report

31/03/2009

Executive Summary	4
CHAPTER I - Overview of status, trends and threats to biodiversity	8
I.A THE COUNTRY	8
I.A.1 Geography and Geo-morphology.....	8
I.A.2 Climate overview	9
I.A.3 Pedology.....	10
I.A.4 Land cover and use	10
I.B BIODIVERSITY OVERVIEW	14
I.B.1 Landscape and habitat.....	14
I.B.2 Marine environment.....	17
I.B.3 Terrestrial species: fauna and flora.....	18
I.B.4 Marine species: Fauna and Flora	28
I.B.5 Genetic Diversity	30
I.C TRENDS UNDERWAY AND THREATS TO BIODIVERSITY	34
I.C.1 Introduction.....	34
I.C.2 Main factors of threat: terrestrial habitats and species.....	35
I.C.3 Main threat factors: marine habitats and species	47
Chapter II – Current status of national strategy and plans of action for biodiversity (NBSAP)	49
Social and Administrative Framework	49
From the European Action Plan to National Biodiversity Strategy.....	50
Strategic Area A –Biodiversity in Italy.....	51
II.A.1 Strategic Objective 1: To safeguard the EU’s most important habitats and species	51
II.A.2 Strategic Objective 2: To conserve and restore biodiversity and ecosystem services in the wider EU countryside.....	60
II.A.3 Strategic Objective 3: To conserve and restore biodiversity and ecosystem services in the wider EU marine environment.....	64
II.A.4 Strategic Objective 4: To reinforce compatibility of regional and land development with biodiversity in the EU	69
II.A.5 Strategic Objective 5: To substantially reduce the impact on EU biodiversity of invasive alien species (IAS) and alien genotypes	74
Strategic Area B –Italy and global biodiversity.....	77
II.B.6 Strategic Objective 6: To substantially strengthen effectiveness of international governance for biodiversity and ecosystem services	77
II.B.7 Strategic Objective 7: To substantially strengthen support for biodiversity and ecosystem services in EU external assistance.....	77
II.B.8 Strategic Objective 8: To substantially reduce the impact international trade on global biodiversity and ecosystem services	78
Strategic Area C – Biodiversity and climate change	80
II.C.9 Strategic Objective 9: To support biodiversity adaptation to climate change	80
Strategic Area D – The biodiversity knowledge base in Italy	81
II.D.10 Strategic Objective 10: To substantially strengthen the knowledge base for conservation and sustainable use of biodiversity, in the EU and globally.....	81
Chapter III – Sector-based and intersector-based plans affecting biodiversity	83
III.A Safeguarding biodiversity in the plans and programmes of various sectors.....	83
III.A.1 rural development and Agriculture	83
III.A.2 Forests	87
III.A.3 Fishing.....	89
III.A.4 Quarries and Mines	91
III.A.5 Tourism	92
III.A.6 Human Health Policies related to biodiversity	93
III.A.7 FOOD SECURITY	94

III.B	International Biodiversity Agreements at the global, regional and European level	95
III.B.1	Global biodiversity tools	95
III.B.2	Regional transnational biodiversity tools.....	96
III.B.3	European and Pan-European tools	96
III.C	Other conventions affecting biodiversity	99
III.C.1	The other Rio Conventions	99
III.C.2	Other global and regional transnational tools that affect biodiversity	100
III.D	Biodiversity in other national and sub-national strategies and programmes	102
III.D.1	National Sustainable Development Plans and Activities.....	102
III.D.2	Local Action for Environmental Sustainable development	102
Chapter IV	– Conclusions: Progress towards the 2010 Target and Implementation of the Strategic Plan.....	103
IV.A.	Progress Towards the 2010 Target.....	103
IV.B.	Progress Towards the Goals and Objectives of the Strategic Plan of the Convention	104
IV.C.	Conclusions.....	104
Bibliography	107
Sitography	111
Abbreviations and acronyms	114
Appendix I	– Information regarding reporting party producer and national report preparation.....	115
A.	Reporting Party	115
B.	Process of preparation of national report	116
Appendix II	– Additional sources of information.....	117
Appendix III	– Progress towards targets in the global plant conservation strategy and work programme for protected areas	118
	Progress towards Targets in the Global Plant Conservation Strategy	118
	Progress towards Targets of the Programme of Work on Protected Areas	126
Appendix IV	– National indicators used in this report	134

EXECUTIVE SUMMARY

Italy is extremely rich in biodiversity and, within the European Union, it has the highest number and density of both animal and plant species. Given the high human density and in order to give adequate protection to this biodiversity heritage, more than 20 % of the territory is included into different types of protected areas, referring both to the national legislation on protected areas and to the Natura 2000 Network according to the European Bird and Habitat Directives.

On the other hand, by now Italy hasn't a National Biodiversity Strategy, under this premises the conservation policies are carried out in accordance with the European Strategy and more in detail following the European Action Plan for the Biodiversity COM(2006)216. In the meanwhile approaching the important deadline of 2010 there is a commitment in order to deliver a National Biodiversity Strategy for the coming period.

Mid-term revision of the European Biodiversity Action Plan presented at the European Parliament in December 2008, highlighted the fact that achieving Target 2010 is extremely difficult and is unlikely to be achieved with the current level of commitment in Italy and the other European countries. This general prospect, which requires a considerable increase in efforts to halt biodiversity loss, has some positive experiences.

Examination of the information provided in Chapter 1 and the actions and policies analyzed in Chapters 2 and 3, the following basically emerges:

1. although the system of protected areas and Natura 2000 Network require improvement, they make a considerable contribution to conserving biodiversity and are a strength for conserving biodiversity, supplying ecosystem services in Italy and adapting and mitigating climate change;
2. there are different results regarding the state of conservation in different groups of species, however many situations are positive and there is a tendency towards improvement; there is still much to do in relation to conservation and for an effective monitoring mechanism;
3. while genetic diversity has been studied, it still has not been appropriately dealt with in terms of conservation;
4. sustainable use of resources is a topic requiring more effort; although there are some positive experiences from agriculture, there is still a lot to do concerning inland waters and sea-related resources;
5. while application of Community Directives such as VAS and VIA help deal with threats to biodiversity deriving from habitat loss and changes in land use, there is still much to do in relation to planning vast areas, conserving landscapes and guaranteeing adequate ecological networks;
6. the problems deriving from invasive alien species are increasingly evident; there is currently an acceptable knowledge base although the ability to act to prevent and combat biological invasions is insufficient;
7. perception of the strong inter-dependence between climate change and biodiversity is expanding and the topic should be developed extensively in the future both in terms of mitigating impacts and adapting to effects;
8. efforts to improve provision of ecosystem services must also be considerably increased, although there are already some positive experiences, above all in protected areas and agriculture;
9. the considerable Italian socio-cultural richness and diversity are an important element in biodiversity conservation strategies and protected areas play an important role from this viewpoint;
10. although there are some specific experiences, accessing and sharing genetic resources is one of the topics that require development of a clear and coherent approach at the national level;
11. Italy has always been committed to supporting developing countries, however the recent economic crisis risks substantially affecting this area negatively.

The content in this Report provides an analysis of the knowledge and activities regarding Biodiversity and its wider meanings and applications that Italy has promoted with considerable efforts in synthesis and flexibility.

The general overview that emerged in Chapter I most certainly is that of a country that has – at all levels, from genetic- to ecosystem and landscape-related - a high level of Biodiversity thanks to its physical, geographical and historical characteristics. This is demonstrated by the numerous studies and research activities that exist in this country – at times achieving excellence - and are the vital presupposition for future choices and actions relating to environmental sustainability. In relation to Italian knowledge of Biodiversity, one of the main obstacles at the national level was bringing together the numerous sources of information available throughout the territory for various reasons (academic, agency, public, private, local and central).

In order to overcome this problem and achieve Target 2010 through a National Biodiversity Strategy according to that established in Article 6 of the CBD, the Ministry of the Environment, Land and Sea's Nature Protection Directorate - as National Focal Point of the CBD - commissioned a publication entitled "Status of Biodiversity in Italy – Contribution to National Biodiversity Strategy" in 2005. This report was written by over 100 researchers and experts (botanists, zoologists, forestry officers, etc.) illustrates the status and trend of Biodiversity in Italy, providing a basic scenario in line with the ecosystem approach. A DVD entitled "GIS Natura" comprising maps and databanks of national value was produced the same year.

In addition to these two tools, created for the purposes of national implementation of Target 2010 in the Strategic Plan, further efforts and specific detailed works regarding taxonomy and distribution of animal and plant species, identifying communities, habitats and landscapes have been carried out since 2005, both to comply with that established by European Regional Strategy through COM 216 (2006) and to refine national and local knowledge in order to produce appropriate tools for identifying national targets.

Chapter I of this Report provides additional update and completion of that produced in 2005 both in terms of content and expanding the subjects involved. "National Strategy" that actually began in 2005 and was implemented over the following years, also in view of the aforementioned European Strategy, was based on this knowledge.

Extensive cooperation between the various players involved in preparing this report is another element of progress in implementing National Biodiversity Strategy. According to that indicated by the guidelines from the Secretariat, an attempt was made to combine scientific knowledge with that of sector-based institutional policies from the local to the national level in each chapter herein. Considerable efforts were made to summarize considerations, problems and needs deriving from the different local and sector-based situations both using indicators known and adopted at the national and international level and adopting the various existing approaches.

Starting from the widely-held supposition that the knowledge base and ongoing monitoring of the status and trend of biodiversity elements are a fundamental and vital element in National Strategy made it possible to identify a number of stakeholders to involve in developing National Strategy, above all in consideration of its real implementation on the territory. As highlighted in Chapters II and III, current lack of a national strategy has not hindered implementation of the commitments made through ratification of International Conventions and Agreements although, in relation to the transversal nature of Biodiversity, the need to "institutionalize" coordination among the various sector-based policies and among the various levels of action on the territory strongly emerged and from all sectors. This is almost certainly derives from the need to implement a Community Action Plan by deploying mechanisms for integration that can be used to conserve Biodiversity through Target 2010 and implementing the Strategic Plan, as required by the three CBD objectives.

Italy wishes to leave behind a period in which more conflict than synergy emerged, which is why implementing a National Biodiversity Strategy by 2010 would be a real achievement with respect to the commitment to halt biodiversity loss, despite the delay.

Despite initial difficulties found in terms of both terminology and competences that characterized past experience and hindered the success of previous attempts at a National Biodiversity Plan and however implementing Strategic Lines which, while promptly identified two years after signing the

CBD (1994 ICEP Deliberation), have never been shared and implemented, debate and activities have carried on.

1994 Strategic Lines have now been overcome by new international objectives and the path taken has ensured identification of the presuppositions and steps required to ensure that Italy has a tool to implement that established in Article 6 of the CBD and Decisions by the COP by 2010.

In April 2009, Italy shall host the G8 Environment Summit in Siracusa, which will have a session dedicated to post-2010 Biodiversity as a new prospect to State and Government policies. This new prospect derives from the awareness gained on the way to achieving Millennium Development Goals and political desire to acknowledge that the importance of ecosystem services to human welfare is still underestimated and not acknowledged by all.

Biological diversity is the basis of life and the economy. Each future political action – both short- and long-term – needs to recognize the economic value of ecosystem services in achieving sustainable development and human wellbeing.

Dealing with matters relating to biodiversity offers new opportunities to businesses and to promoting conservation and sustainable use of biological resources. There are numerous possible applications for recognizing the economic value of ecosystem services, however greater efforts are required to establish effective connection and implement control mechanisms (feedback) between progress in scientific biodiversity knowledge (status and trends = monitoring) and the areas responsible for political decision-making on the territory.

Italian experience based on solid and independent scientific information on matters related to biodiversity has led to the acknowledgement that the factors affecting ecosystems are such that a pure approach focussing solely on biodiversity is no longer sufficient; the analytical process must taken into account social, cultural and economic factors: integrated examination of conservation and development needs is the key to a new approach to sustainability in which economic, biological and cultural diversity play an essential role.

Post-2010 National Biodiversity Strategy shall be built on this multi-disciplinary approach involving strong cooperation between political decision-makers, administrations, agencies, academic world and stakeholders to thereby achieve social, cultural and economic objectives that reciprocally contribute towards improving the quality of life of citizens over the next few years and for generations to come.

As mentioned in chapter 2 there are increasing roles and competences transferred to the Regions and a strong relationship of these competences with the environment protection which belongs to the Ministry of the Environment. Due to this organisation fundamental contributions for the fourth National Report came from the Regions, which reported on their engagement for biodiversity conservation in relation to the European Action Plan for the Biodiversity. Even if it was not possible to translate the 21 contribution coming from the 19 Regions and the 2 Autonomous Provinces, it was considered useful to give full access to these in a separate document.

A valid contribution in defining National Biodiversity Strategy will always be represented by the results from technical-scientific documents drawn up as part of a specific Convention between the MATTM and WWF Italia.

There is a strong awareness of the fact that training, information, communication and sensitizing public opinion are essential ways to involve local communities and all stakeholders in programmes and political actions.

Citizens should be informed of what Biodiversity is and how ecosystem services at the basis of survival must no longer be threatened by human actions.

In order to implement a virtuous mechanisms to involve all citizens and make them conscious participants in national commitment to conserving Biodiversity, a substantial part of National Strategy shall be based on including Biodiversity-related topics in wide-scale training, information and communication programmes.

By way of conclusion assessing actions undertaken at the national level to achieve Target 2010 and the objectives in the Strategic Plan, it is opportune and significant to note that the work already commenced in 2005 is materializing effectively and according to expectations.

Despite the fragmentary nature of biodiversity initiatives that have been carried out over the last few years - which made it difficult to draw up the outline presented in this Report -, many actions have been taken at various levels allowing us to reach and involve political decision-makers, players and stakeholders in the common objective of defining National Strategy and thereby fulfil that required by CBD, including beyond 2010.

In order to achieve these objectives, Italy has undertaken a direction in line with the federalism process underway, whereby Regional councils are responsible for governing their territories and the State is responsible for Biodiversity. The State-Region Conference is the institutional office in which the National Biodiversity Strategy will be approved by 2009 and officially presented during the First National Biodiversity Conference, an important opportunity to raise awareness of the year 2010 – the World Biodiversity Year.

CHAPTER I - OVERVIEW OF STATUS, TRENDS AND THREATS TO BIODIVERSITY

I.A THE COUNTRY

I.A.1 GEOGRAPHY AND GEO-MORPHOLOGY

Italy is located on the Mediterranean sea between latitudes 36° and 47° N and longitudes 8-18° E. It comprises a high-heeled boot-shaped peninsula, two large islands (Sardinia and Sicily) and several groups of small islands, for a total of around 8,000 km of coastline.

Approximately 35.2% of Italy's land area (301,000 km²) is occupied by mountains, which are edged by hills: 41.6 % (up to 600-700 m above sea level). The remaining 23.2 % comprises plains, mostly the Po river plain ("*Pianura Padana*") formed around the Po, the longest (652 km) and largest Italian river.

Two important mountain systems dominate Italian territory: the Alps (direction E-W) with steep slopes and high altitudes (i.e. Mount Bianco: 4,810 m) and the Apennines (NW-SE), (i.e. Mount Gran Sasso: 2,912 m). Natural lakes of different origin (i.e. glacial, volcanic) are located in Northern (Maggiore, Garda, Como, Iseo) and Central (Trasimeno, Bolsena, Bracciano) Italy.

Sicily may be considered as the East-West trending southerly extension of the Apennines; it also hosts the highest European volcano (Mt. Etna: 3,330 m). Sardinia, where the oldest rocks in Italy outcrop, and Corsica rotated from the European margin and the rotation was complete over 15 Mya. The Alps have widespread outcrops of basement rocks, whereas the Apennines mainly comprise sedimentary rocks. From Veneto to Sardinia a magmatic activity developed in Italy during the Cenozoic era. The various magma types cover almost all the known magmatic suites.

Analysis of the Italian territory according to its relative features and structure demonstrates the presence of 7 large physiographical categories, the land areas in km² and relative percentages of which are shown in Table I.1 and Fig. I.1.

Table I.1 – Macro-level physiographical categories on Italian territory.

	Macro-level physiographical landscape categories	Surface (Km ²)	Surface (%)
1	LOW PLAINS	72,349	23.94
2	HILLS	86,121	28.49
3	TABULAR OR SLIGHTLY UNDULATED HILLS	35,923	11.88
4	ROCKY HILLS	92,346	30.55
5	TABULAR OR SLIGHTLY UNDULATED ROCKY HILLS	1,342	0.44
6	DEPRESSED HILLS IN MOUNTAIN AREAS	11,230	3.72
7	CHARACTERIZED BY SPECIAL ELEMENTS (isolated rocky outcrops, isolated coast outcrops, small islands)	2,949	0.98

Source: APAT, 2003.

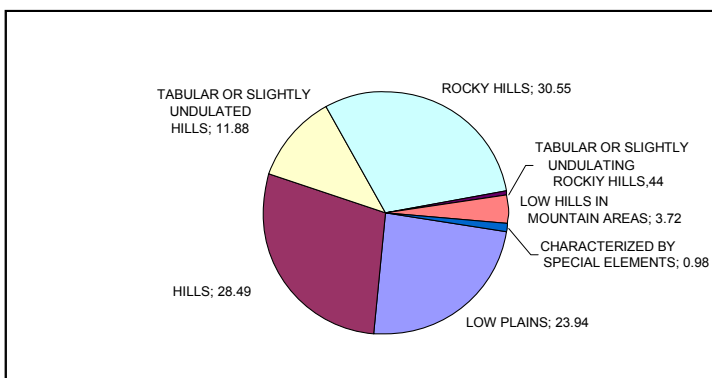


Fig. I.1 – Land area and percentage of Italian territory affected by each of the 7 macro-level physiographical categories.

Source: APAT, 2003.

As part of the project concerning *Assessment of the Status of Conservation of National Parks and Italian Landscapes* (Blasi C., 2007), a new analysis was recently carried out in Italy to identify landscape types through multi-scale land classification (Klijn & Udo de Haes 1994, Bailey 1996, Blasi *et al.* 2000, 2005). This process defines and maps environments that are similar in terms of physical and biological features, hierarchically classified as landscape Regions - identified on a bioclimatic basis (Blasi e Michetti, 2005) -, Landscape Systems – relating to lithogenical similarity – and landscape sub-systems – defined according to morphology.

Applying this classification on a scale of 1:1.000,000 ensured qualification and quantification of the special physical and environmental similarity throughout Italian territory, which is hierarchically organized into in 3 landscape Regions, 24 landscape Systems and 149 landscape sub-systems. The relative results also illustrated constant extension of a transition Region (18% of overall territory) between the Mediterranean Region (25%) and the Temperate Region (58%), which is linked to particular conditions in terms of the ocean or continental nature of a number of peninsular areas. The complex nature of these landscape Systems therefore derives from a combination of these 3 Regions with 8 different lithological types (5 of sedimentary, 2 of igneous and 1 of metamorphical origin) and the complex nature of the landscape sub-systems derives from further articulation of the Systems in 7 categories of physiographical and morphogenetic similarity (coast, plain, mountain foot-top, plateau, face, summit system, valley), as well as glaciers, water lakes and lagoons considered as distinct units.

I.A.2 CLIMATE OVERVIEW

The special geographic position and extreme variability of physical features determine the conditions for extremely wide-ranging climate.

Mean annual temperatures, measured between altitudes of 2,500 and 0 m, can range between 0 (in the Alps) and 17°C (Sicily). Annual precipitation varies between 300-400 mm (in the South and the main islands) and 3,200-3,300 mm (North Eastern Alps and Northern Apennines).

According to Köppen climate classification, the following main temperature and precipitation regimes can be found in Italy:

Temperature: continental (cold winter and warm summer); maritime (mild winter and warm summer); mountain-Alpine (cold winter and cool summer); mountain-Apennine (cold winter and mild/warm summer).

Precipitation: continental (summer precipitation); Mediterranean (winter precipitation); intermediate (equinoctial precipitation); transition.

Bioclimatic classifications also help scientific planning of resource management. Italy has a “Phytoclimate Map” designed as part of the programme “Completion of the Nature Knowledge Base” established by the Ministry of the Environment’s Nature Protection Directorate.

This map was designed using approximate information (1955-1985) regarding maximum and minimum temperatures and rainfall from 400 thermopluviometric stations to establish the ranges for categories and introduce use of Rivas-Martinez thermopluviometric indexes for bioclimatic classification (Blasi & Michetti, 2005). Twenty-eight categories were identified in the Continental and Mediterranean macro-climate regions on Italian territory, for which transition regions were also identified. Using these scales, 83 variants were also identified. See *Status of biodiversity in Italy* (Blasi & Michetti, 2005) for full results and maps.

In a more recent paper (Blasi, 2007), the two transition regions were combined to make just one group, as the cold climate in winter is the variable that generates such.

The minimum temperature in winter does not come into play in Rivas-Martinez summer ombroclimate indexes and this, along with consequent continentality index, leads to Transition. In fact, this index always varies between 14 and 16 °C in a Mediterranean Region, whereas temperatures exceed 17 °C in a Transition Region (semi-continental or sub-continental).

As Daget indicated (1977), three situations must occur at the same time to ensure that a climate is Mediterranean: a difference between the highest and lowest temperatures in one day of max. 14-16°C, precipitations in autumn and winter and aridity in summer. When the difference between the highest and lowest temperatures in one day exceeds 17 °C, then we are in a Transition Region (e.g.: dells in the Apennines and valleys in the Sub-Alpines).

I.A.3 PEDOLOGY

A wide range of soil types has been produced by differences in climatic conditions, topography, geology and land use in Italy. The Alpine sector of Italy (Soil Regions of the Alps; 51,309 km², 16.8% of Italian territory) is characterised by shallow soils of highest elevations (*Lithic Cryosols*) and more or less acid soils (*Leptosols*, *Cambisols*, *Podzols*, *Umbrisols*, *Regosols* according to the World References Base classification). *Eutric*, *Calcaric* and *Dystric Cambisols* are the main soil types in the “Soil Regions of the Apennines” (67,251 km², 22% of Italy), with subordinated *Leptosols*, *Luvisols*, *Regosols* and *Andosols*. Also the “Soil Regions in the Italian hills” sector (99,301 km², 32.5%) is dominated by *Cambisols* with local prevalence of *Calcisols* (on terrigenous deposits), *Leptosols* (on limestones), *Andosols* (on effusive volcanic rocks), *Regosols*, *Fluvisols* or *Solonchaks* (strongly saline soil, Sicily). The richest and more productive soils for agriculture in Italy are located in the “Soil Regions on the Italian alluvial and coastal plains, and associated hills” (68,624 km², 22.6% of Italy) with wide development of *Luvisols*, *Fluvisols* (especially in the terminal sector of Po River), *Cambisols*, *Calcisols* and minor presence of *Vertisols*, *Gleysols* and saline soils.

I.A.4 LAND COVER AND USE

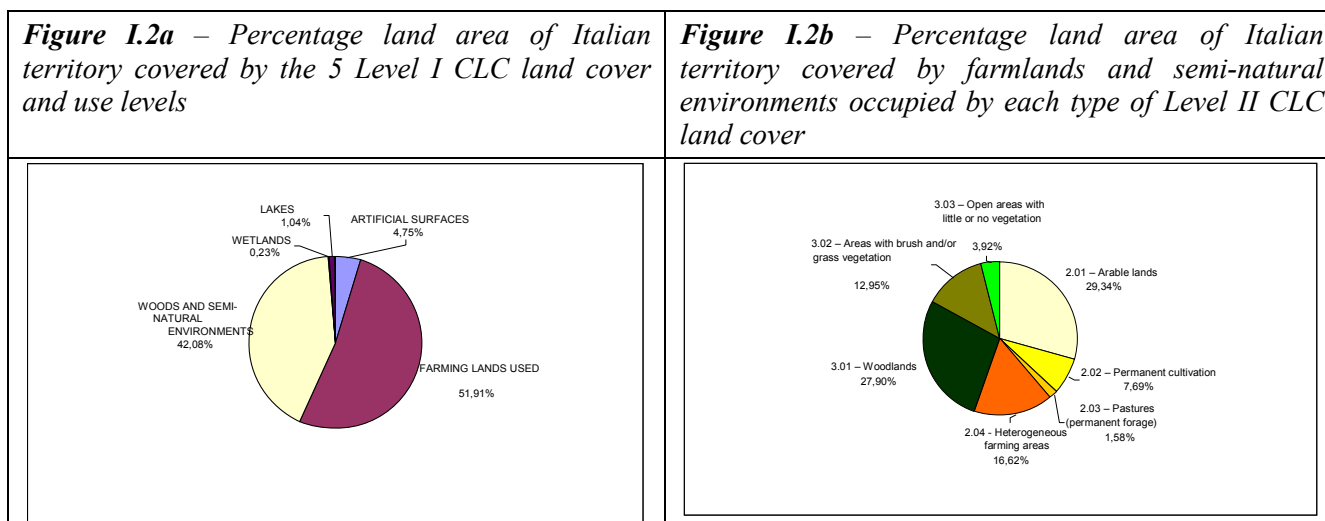
The European Commission’s CORINE Programme (Coordination of Information on the Environment, <http://www.eea.europa.eu/publications/COR0-landcover>) was established to gather information on the status of the environment in relation to a number of specific topics, such as land use, coastline erosion, biotopes, etc. and to combat a lack in the completeness and comparability of environmental information within the European Community and therefore the difficulties in developing effective environmental policy. Two systems for classifying land units were therefore developed in relation to land use (CORINE Land Cover) and biotopes (CORINE Biotopes).

The aim of CORINE Land Cover is to provide information regarding land cover and changes over time. The first was carried out in 1990, however this was updated in 2000 and involved 26 countries. This project involves interpreting satellite photos (Landsat 7 ETM) and classifying land cover units on a scale of 1:100.000. The hierarchical standards adopted by the CLC2000 system is the most popular for land cover and use type classification, which allows more categories to become progressively more detailed by exploiting the different level of resolution in information sources and is easy to use at different planning levels.

The CORINE Biotopes Project fulfils the fundamental need for easy-to-access information on distribution and status of ecosystems, habitats and species. The European Community Council chose the “Biotopes Project” with the main objective of «*identifying and describing biotopes of utmost importance to conserve nature throughout the European Community*». The CORINE Biotopes System was adopted in Italy as part of the Nature Map Project designed on a scale of 1:50.000 (APAT, 2004, 2009).

According to the CORINE Land Cover 2000 System, Italy is mostly covered by *used farming land* (51.91%), followed by *woodlands and semi-natural environments* (42.08%), *artificial surfaces* (4.75%) and *water bodies and wetlands* for a total of 1.27% (Figure I.2a).

As far as farming systems and semi-natural land environments are concerned, level II of the CLC System (Table I.2) highlights that arable lands and farming areas occupy a larger land area (45.96%) than woodlands and brushes (40.85%) (Figure I.2b).



Source: APAT, 2005b.

Table I.2 – Distribution in km² and percentage of various types of level 2 land cover in 2000

CLC II code	Level 2 CLC land use	Land area [km ²]	Land area [%]
1.1	Residential areas	10,819.6	3.59
1.2	Industrial, commercial and infrastructural areas	2,631.9	0.87
1.3	Quarries and mines, work sites, disposal areas and unnatural and abandoned lands	565.1	0.19
1.4	Artificial non-farming green areas	299.6	0.10
2.1	Arable lands	83,121.9	27.58
2.2	Permanent crops	21,780.0	7.53
2.3	Grasslands (permanent pastures)	4,475.3	1.48
2.4	Diverse farming areas	47,075.6	15.62
3.1	Woodlands	79,025.6	26.22
3.2	Areas with brush and/or grass vegetation	36,685.9	12.17
3.3	Open areas with little or no vegetation	11,112.3	3.69
4.1	Internal wetlands	159.0	0.05
4.2	Coastline wetlands	531.8	0.18
5.1	Continental waters	2,186.2	0.73
5.2	Marine waters	945.5	0.31

Source: APAT, 2005b.

A more detailed level (CLC, level 3, Table I.3) illustrates that, as far as artificial surfaces are concerned, residential areas are the most extensive (65.33%), followed by industrial and trade areas (15.21%) and uninterrupted residential areas (10.25%) (Fig. I.3a).

As far as farming areas are concerned, arable lands are the most common (cereals, rotating crops, industrial plants, horticulture) in non-irrigated areas (5.2%), followed by crop systems and complex land (14%) and tree cultivations (olive, vines, citrus and other fruits), which also occupy 14%. While arable lands are equally distributed among northern and southern regions, tree cultivations are mainly located in southern regions. Permanent pastures occupy 3% of farming land (Fig.I.3b).

Fig. I.3a – Artificial land areas: percentage land areas for each type (CLC3).

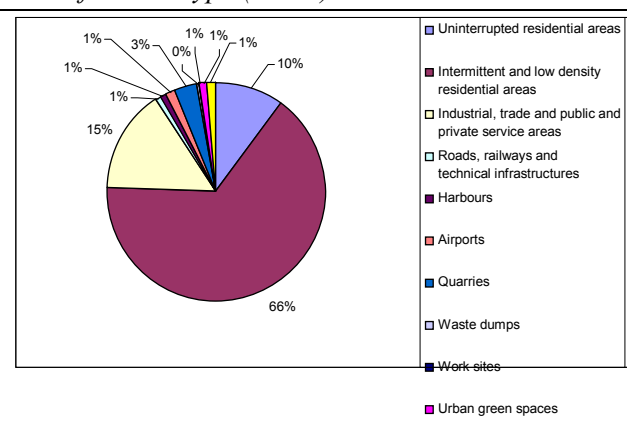
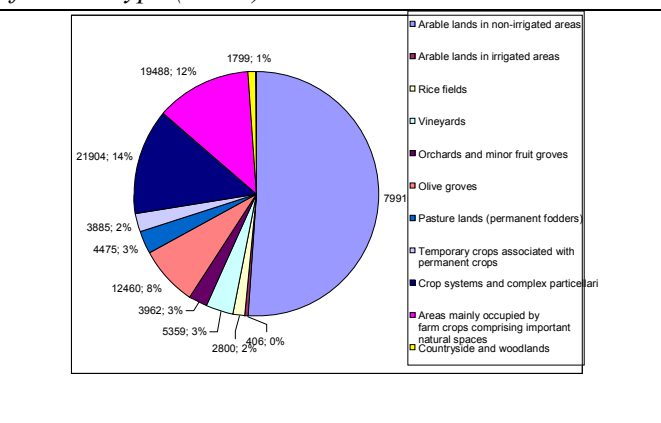


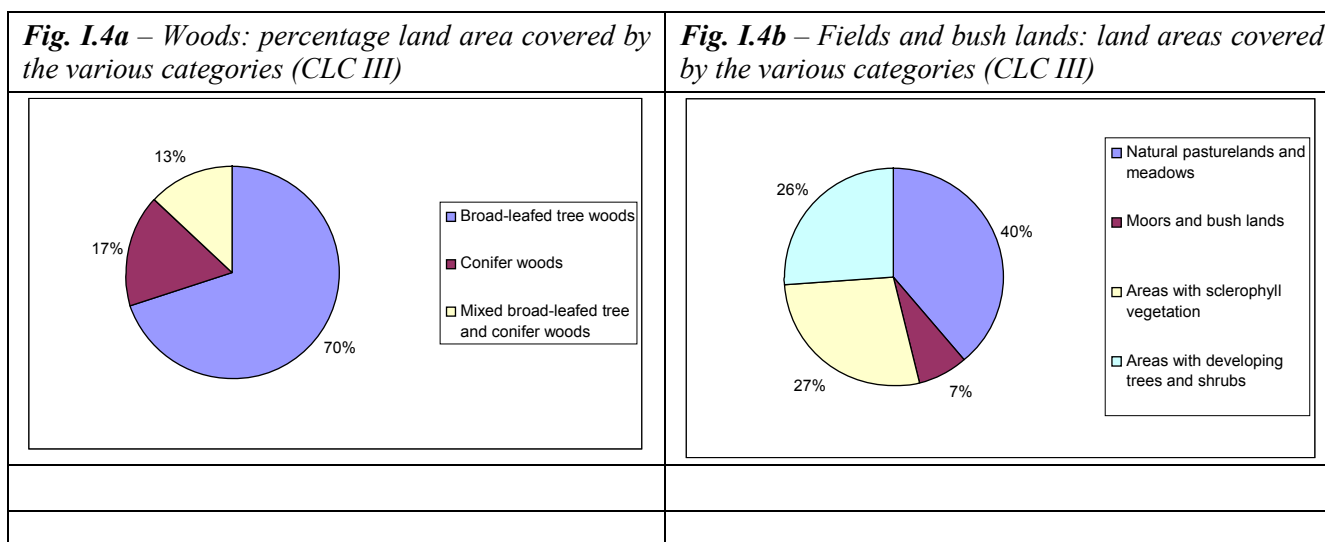
Fig. I.3b – Agricultural lands: percentage land area for each type (CLC3).



Tab. I.3 – Distribution of various types of level III land cover in 2000 in km² and percentages.

CLC III Code	Level III CLC unit	Land area (km ²)	Land area (%)
1.1.1	Uninterrupted residential areas	1467	0.49
1.1.2	Intermittent and low density residential areas	9352	3.10
1.2.1	Industrial, trade and public and private service areas	2177	0.72
1.2.2	Roads, railways and technical infrastructures	134	0.04
1.2.3	Harbours	113	0.04
1.2.4	Airports	207	0.07
1.3.1	Quarries	471	0.16
1.3.2	Waste dumps	20	0.01
1.3.3	Work sites	74	0.02
1.4.1	Urban green spaces	104	0.03
1.4.2	Recreation and sports areas	196	0.06
2.1.1	Arable lands in non-irrigated areas	79915	26.51
2.1.2	Arable lands in irrigated areas	406	0.13
2.1.3	Rice fields	2800	0.93
2.2.1	Vineyards	5359	1.78
2.2.2	Orchards and minor fruit groves	3962	1.31
2.2.3	Olive groves	12460	4.13
2.3.1	Grasslands (permanent pastures)	4475	1.48
2.4.1	Temporary crops associated with permanent crops	3885	1.29
2.4.2	Crop systems and complex parcels	21904	7.27
2.4.3	Areas mainly occupied with farm crops comprising important natural spaces	19488	6.47
2.4.4	Countryside and woodlands	1799	0.60
3.1.1	Broad-leaved tree woods	55276	18.34
3.1.2	Conifer tree woods	13364	4.43
3.1.3	Woods with both conifer and broad-leaved trees	10386	3.45
3.2.1	Free grasslands and meadows	14197	4.71
3.2.2	Moors and bushland	2750	0.91
3.2.3	Sclerophyll areas	10086	3.35
3.2.4	Areas with developing trees and shrubs	9653	3.20
3.3.1	Beaches, dunes and sands	826	0.27
3.3.2	Bare rocks, cliffs, crags and outcrops	4834	1.60
3.3.3	Areas with low-density vegetation	4853	1.61
3.3.4	Areas hit by fire	84	0.03
3.3.5	Glaciers and perpetual snow	516	0.17
4.1.1	Inland wetlands	159	0.05
4.1.2	Peat bogs	0,4	0.00
4.2.1	Salt marshes	432	0.14
4.2.2	Salt mines	100	0.03
5.1.1	Waterways and canals	493	0.16
5.1.2	Water basins	1693	0.56
5.2.1	Lagoons	943	0.31
5.2.2	Estuaries	3	0.00

Woodlands and semi-natural areas cover 42.08% of the national territory, 26.22% of which are woods, 12.17% are fields and bushlands and 3.69% are open areas with little or no vegetation (Table I.2). As far as woods are concerned, 70% comprise broad-leafed trees, 17% comprise conifers and 13% have both broad-leafed trees and conifers (Fig. I.4a). Fields and bush lands comprise 4 sub-categories: natural grasslands and meadows (40%), areas with sclerophyll vegetation (27%), areas with developing trees and shrubs (26%), moors and bush land (7%) (Fig.I.4b).

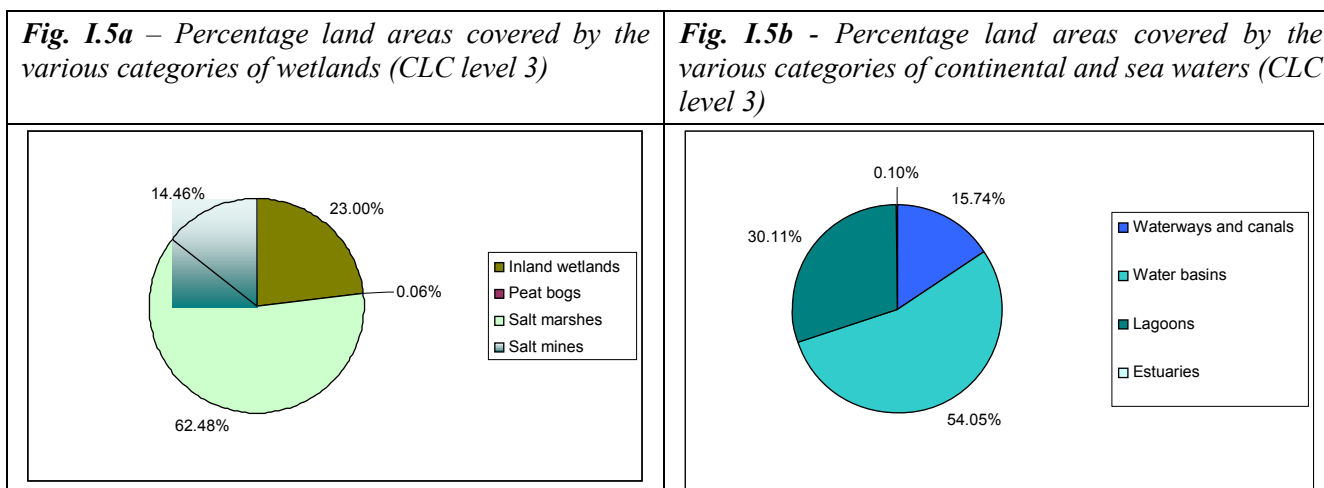


With regard to the remaining land area (3.69 % - open areas with little or no vegetation), 44% is covered by areas with little vegetation, 43% by bare rocks, cliffs, crags and outcrops, 7% by beaches, dunes and sand, 5% by glaciers and perpetual snow and 1% by areas hit by fire.

Wetlands in Italy cover an overall land area of around 691 km², which is just 0.23% of the territory. These comprise inland (wetlands and peat bogs covering a total of 159 km², in other words 0.05% of Italian territory) and sea wetlands (salt marshes and salt mines covering a total of 531.8 km², in other words 0.18% of Italian territory).

Salt marshes are the wetlands that cover the largest land area (62.48% of the overall land area), followed by inland wetlands (23.00%) and salt mines (14.46%). While peat bogs are punctiform environments covering a very small overall land area (0.06%), they play an essential role in preserving Italian biodiversity (Fig.I.5a).

Continental waters (covering 0.73 % of national territory) are mainly water basins (77.45 % - lakes of various origin and with different morphologies and functions), whereas the remaining 22.55 % comprises waterways and canals. Due to the special peninsular shape of Italy, waterways are rather short and with modest hydrographical basins, with few exceptions (River Po). Inland sea waters (0.31 % of national territory) are almost solely lagoons (99.68 %) with a limited number of estuaries (0.32 %) (Fig.I.5b).



Italy – with its shape and numerous islands – stretches into the Mediterranean sea with around 7,400 Km of coastline and territorial waters of 12 NM from the baseline.

I.B BIODIVERSITY OVERVIEW

I.B.1 LANDSCAPE AND HABITAT

Italian landscapes

The land cover map developed through the CORINE Land Cover Project illustrates the current diversity in the mosaic that is Italy.

Over the last few years, projects funded by the Ministry of the Environment Nature Protection Directorate such as “Completing Nature Knowledge Base” coordinated by the Department of Plant Biology at the “La Sapienza” University of Rome (Blasi, 2003; Blasi et al., 2004) and “Assessing the state of preservation of Italian National Parks and landscapes” coordinated by the Inter-University Research Center “Biodiversity, Plant Sociology and Landscape Ecology” (Blasi, 2007), have made it possible to map the potential diversity throughout the territory, in other words the ecosystem diversity that would occur if there were no interference from man. This map was created on the basis of leading geographical procedures for the landscape ecosystem and ecology, overlaying and integrating physical layers of information (climatic, lithological and morphological features) and biological features (flora and vegetation).

The hierarchical classification process adopted (Blasi et al., 2000; Blasi et al., 2005) ensured identification and mapping of 3 Regions, 24 Systems and 149 Sub-Systems for landscapes (Blasi et al., 2009; Blasi et al., 2007). The Temperate region is the most extensive in Italy and is distributed throughout northern Italy, on the mountains in central and southern Italy and on the main Islands and is where the ‘Sub-system of plains on clastic sedimentary lithologies’ prevail, followed by the ‘Sub-system of Plains on earth deposits’ and ‘Sub-system of Plains on clastic terraced lithologies’; the Mediterranean Region – extending along the Ligurian, central-southern and Sardinian coastlines and also on inland Sicily – ‘Sub-systems of Plains on clastic lithologies’ and ‘on clastic terraced lithologies’ prevail; the Transition Region is dominated by the ‘Sub-system of faces on earth deposits’ followed by other morphological types still on earth deposits and, secondarily, on biochemical deposits.

On the basis of the aforementioned land units identified through integration of structuring physical features (climate-region, lithology-system, morphology-sub-systems), the relative vegetation was also defined according to a phytosociological and syndynamic approach (Rivas-Martinez, 1976; Gehu & Rivas-Martinez, 1981). This process ensured that all types of potential natural vegetation

could be identified and mapped and all communities and dynamic statuses in these series could be described. This information was recorded on regional monographs supporting the maps and comprise cenologic- and syntax-related details, thereby completing the map definition of vegetation potential, or establishing the spaces in “homogeneous areas”, to which each vegetation category belongs.

Habitats in Italy according to Directive 92/43/EEC

With regard to European Directive 92/43/EEC (Appendix I), 124 of the 218 European types of habitat – in other words 57% - can be found in Italy, 40 % of which - in other words 27 – are priority habitats. Therefore, over half of the overall European habitats can be found in a country that represents less than 10 % of European land cover (Giovi, 2005).

The habitats established in this Directive are organized in the same hierarchical manner for all Member States and divided into bio-geographical regions. The three bio-geographical regions in Italy according to Directive 92/43/EEC are the Alpine, Continental and Mediterranean regions.

The **Alpine region** comprises the Alps and the Apennines, being characterised by a relatively cold and harsh climate, high altitudes and an often complex, varied topography. Forests and semi-natural grasslands envelop the lower slopes but, as the altitude increases and the temperature drops, trees become scarcer and eventually give way to alpine grasslands, fells and scrub heath communities. At the very top, amongst the rocks and snow, the vegetation is reduced to only a handful of highly adapted plants able to tolerate such extreme conditions.

The **Continental region** covers the major plains of Northern Italy (Po River plain), but also parts of the Adriatic coastlines are included. The climate is generally characterised by strong contrasts between the cold winters and hot summers. The continental nature of the weather becomes more pronounced on moving inland, where the extreme conditions of hot and cold, wet and dry, are more common and have a strong impact on the vegetation. Moving seawards, the characteristics become less noticeable due to the oceanic influences of the Adriatic Basin, which brings milder conditions.

The **Mediterranean region** covers the major part of the Italian Peninsula, characterized by typical Mediterranean climate with hot, dry summers and mild, rainy winters. Typically adapted to this climate is the sclerophyllous vegetation, with evergreen, hard, thick, leathery, and usually small leaves.

The Alpine region in Italy comprises 70, the Continental region comprises 89 and the Mediterranean region comprises 102 of the habitats conserved according to Annex I of Directive 92/43/EEC (Table I.4). Please see publication entitled “Status of Biodiversity in Italy” (Giovi, 2005) for more details regarding such habitats.

Despite the fact that around half the habitats identified in the aforementioned Directive can be found in Italy, it has often been pointed out that such definitions for natural habitats do not match situations in this country. For this reason, the manual for interpreting habitats is currently being reviewed and integrated through researchers working throughout Italy to describe the types in question and provide precise indications in relation to the situation in Italy.

Table I.4 – Number of habitats of European importance (Annex I Directive 92/43/EEC) in relation to the three Bio-geographical regions in Italy..

TYPES OF HABITAT	NO. OF TYPES OF HABITAT PER BIO-GEOGRAPHICAL REGION		
	Alpine	Continental	Mediterranean
1 – COASTAL AND HALOPHYTIC HABITATS	-	13	13
2 – COASTAL SAND DUNES AND INLAND DUNES	-	10	9
3 – FRESHWATER HABITATS	11	11	12
4 – TEMPERATE HEATH AND SCRUB	4	4	3
5 – SCLEROPHYLLOUS SCRUB (MATORRAL)	3	6	11

6 – NATURAL AND SEMI-NATURAL GRASSLAND FORMATIONS	11	11	10
7 – RAISED BOGS, MIRES AND FENS	8	6	5
8 – ROCKY HABITATS AND CAVES	10	9	11
9 – FORESTS	23	19	28
TOTAL types of Habitat	70	89	102

Source: Giovi, 2005

CORINE Biotopes habitats in Italy

A census of habitats carried out on a scale of 1:50,000 based on the CORINE Biotopes Project through Progetto Carta della Natura (Nature Map Project - Framework Law 394/1991 for Protected Natural Areas) illustrated that there are 230 categories of level III-V habitats. In many cases, the corresponding phytosociological category was identified by adapting the European CORINE Biotopes system to the situation in Italy and the level of detail reached. With regard to natural or almost-natural habitats, correspondence to 119 plant associations, 103 alliances, 69 orders and 42 classes were found. A comparative analysis with the Natura 2000 classification system resulted in the 230 habitats being represented by 89 of the categories protected according to Directive 92/43/EEC (Natura 2000 codes), 20 of which were priorities.

Work under way regarding a census on the scale of 1:10,000 has already led to identification of 772 CORINE Biotopes categories, 711 of which are natural or near-natural (Table I.5).

Table I.5 – CORINE Biotopes macro-level categories (level I), type and number of associated habitats in Italy (levels III-V) on a scale of 1:10,000.

Level I CORINE Biotopes code	Macro-level category name	Description	No. CORINE Biotopes Habitats
1	Coastal and halophytic habitats	This category includes all habitats directly or indirectly linked to the presence and action of the sea. No strictly marine habitats (codes 11,12 and 13) are taken into consideration in this key (as they are not involved in the project), whereas infra coastal areas – although not easy to distinguish - are. These generally involve small or fine-grained mosaic-like land areas.	51
2	Non-marine waters	This category includes all non-marine water environments, in other words those not directly affected by the sea or wave movement. Lagoon and salt marshes are therefore included.	70
3	Scrub and grasslands	Scrub and heath: this category includes both scrub under development (31.8) and primary and/or lasting scrubs (31.4). Sclerophyllic scrub: matorral, thermal Mediterranean scrub formations, garrigues. Phrygana: this is shrubland comprising thorny and deciduous species in summer, concentrated in coastlands. Xeric calciphile grasslands and steppes: all secondary grasslands of both hemicryptophyte and therophyte nature found throughout the country that mainly develop on calciphile substrata but may also be found on land of siliceous origin are included. Xeric siliceous grasslands: this category includes meadows developing on acidified siliceous substrata and characterized by an abundance of acidophyle species spreading from the hill plain to the mountain. Alpine and sub-Alpine grasslands: grass formations developing from the mountain conifer plains to the edge of vegetation are included here. Xeric grasslands and high-grass formations: these are all grasslands conditioned by good water availability. Mesophile meadows.	249
4	Woodland	CORINE classification for woodland is not clear and exhaustive in relation to the situation in Italy. Mediation between ecology and phytogeography was attempted time to time, thereby avoiding classification into just a few ecological types and excessive numbers of categories.	194
5	Bogs and marshes	These generally localized and limited habitats. High bogs; vegetation on the edges of swamps; Swamps, transition bogs and sources.	72
6	Rocky habitats	This includes both screes with stable grassy vegetation and those almost without vegetation. Two main categories are involved for mountainous Alpine and sub-Alpine screes (Acidophilic and basiphilous) and one for more thermophile habitats. Calciphile precipices: all basic precipices that develop on calciphile Dolomite lithotypes are included. Siliceous precipices including serpentine precipices.	51

Volcanoes: all formations directly deriving from recent volcanic activity are included.		
8	Agricultural land and highly artificial landscapes	All systems linked to the modifying actions and management by Man are included. This includes traditional and extensive farming, industrial areas and urban areas.
TOTAL		772

Source: AA.VV., 2009.

I.B.2 MARINE ENVIRONMENT

The Mediterranean Sea, although only counting for 0.8% of the surface area and 0.3% of the volume of all oceans, comprises extensive biological diversity. The number of indigenous species is very consistent and estimated at around 25% of the entire Mediterranean biota.

This specific abundance in the Mediterranean derives from the variety of climatic and hydrological situations that currently co-exist and the complex geological background and bio-geographical evolution involved. The Mediterranean Sea was originally connected to the other oceans before separating from the Indo-Pacific and Atlantic Oceans, thereby becoming a closed basin and heading for the so-called Messinian “salinity crisis”. It re-established its link with the Atlantic Ocean around 5 million years ago via the Gibraltar Straits. For this reason, the species living therein have very different bio-geographical origins: pan-oceanic, Atlantic-temperate, Atlantic-sub-tropical, indigenous Atlantic-boreal and migrating (from the southern Atlantic and, following opening of the Suez Canal, also from the Red Sea).

Benthic zoning in Italian waters was carried out according to that proposed by Pérès and Picard (1964), who established a system of classification for the main benthic populations. Recent revision carried out as part of conservation activities by UNEP-MAP RAC/SPA in Tunis estimated a total of 162 populations in Mediterranean waters (between biocenoses, *facies* and associations), 61 of which are considered of interest in terms of conservation (UNEP (OCA)/MED WG 149/5 Rev.1).

Annex I of the Habitat Directive lists 9 marine habitats, 2 of which are priority habitats (Poseidon meadows and coast lagoons). The “reefs” category is currently being studied in depth in order to identify Mediterranean populations that can help create secondary hard bottoms.

Italy has carried out specific studies, through which maps of *Posidonia oceanica* meadows were prepared for all national territorial waters (MATT, 2001; RIPO, 2002; MATT, 2004), *conditio sine qua non* to outline studies with the objective of assessing the effectiveness of management measures to limit the loss of biodiversity in coastal waters. Benthic populations (of biological origin, such as *trottoir* to *Dendropoma petreum* and *Lithophyllum byssoides* in the intertidal and splash zones, pre-coralligens and coralligens in the splash zones and circalittoral zones, deep corals in the trawling zone) that can help create secondary hard bottoms are particularly important and studies are currently underway to outline their distribution and assess their health conditions in order to define appropriate measures for protection.

The living component in the pelagic domain mainly comprises small species of plankton with short life cycles that are highly affected by the characteristic changes in season that occur in water masses. A system of food webs is based on plankton and keeping this in good condition ensures conservation of top-level species, such as sea reptiles, skates, cetaceans and sea fauna. There is a lot of information (AAVV, 2007) and many studies focus on improving knowledge with regard to the composition of biotic communities, especially in the waters of the Pelagos Sanctuary. The check list of marine species was updated as at 2005 by SIBM by appointment to MATTM-DPN (see par. I.B.4)

I.B 3 TERRESTRIAL SPECIES: FAUNA AND FLORA

Fauna

The *Checklist of Italian Fauna Species* (Minelli *et al.*, 1993-1995) provided an initial assessment regarding knowledge of the specific composition and distribution of fauna species in Italy. This stage involved census of over 55,000 species. The *CKmap* Project (i.e. *Checklist and distribution of fauna in Italy*) subsequently further developed the work carried out with the *Checklist* by creating a specific *database* between 2001 and 2005. Ten thousand terrestrial and freshwater species considered good fauna and bio-geographical bio-indicators were selected from this latest *Checklist*. In addition to all “inferior” invertebrates, the *CKmap* database included species of invertebrates considered of most interest in terms of conservation in Italy (Annelids, Molluscs, Arachnids, Crustaceans, Insects), as well as all the terrestrial and freshwater species included in the annexes to the Habitat Directive (92/43/CEE). Ecological information and data regarding distribution was collected for each species, amounting to 538,000 records. Each record has a geographical reference, thereby ensuring mapping can be carried out using a GIS application. This tool can be used to create topical maps for distribution of species and to identify biodiversity hotspots for rare and indigenous species. It also ensures that various types of analyses can be carried out, red lists can be drawn up and conservation strategies can be planned. *CKmap* therefore comprises all the data and information required to make topical maps on biodiversity, indigenous nature, rarity and threats. The land units selected derived from landscape units (Map of Landscape Aspects in Italy, created by the Department of Forestry Environmental Technology and Science at Florence University). Finally, all the results were grouped together in a summarized map representing the faunal importance of the various areas in question. The units with the highest level of fauna – called *IFA (Important Faunal Areas)* – are the priority areas for protecting so-called “minor” fauna.

According to studies carried out until now, Italy has the highest number of animal species in Europe, with a high incidence of indigenous species (around 30%). Italian fauna has been estimated to include over 58,000 species (Table I.6). This includes around 55,000 species of Invertebrates and 1812 species of Protozoans, which together represent around 98% of the overall number of species, as well as 1265 species of Vertebrates (2%). The most extensive phylum is that comprising Arthropods (over 46,000 terrestrial and marine species), 37,000 species of which (around 65%) belong to the Insects class. Coleoptera orders prevail with 12,000 species - over 20% of the overall biodiversity found in Italy – followed by Hymenoptera (7,500), Diptera (6,600) and Lepidoptera (5,100).

Tab Table I.6 – Taxonomic composition of Italian fauna (2005)

Systematic groups		Species	Sub-species	Total
		no.	no.	no.
Protozoans		1,812	5	1,817
Invertebrates		54.947	3.680	58.627
	Dicyemida	13	0	13
	Orthonectida	2	0	2
	Porifera	477	6	483
	Cnidaria	461	0	461
	Ctenophora	32	0	32
	Platyhelminthes	1.317	11	1.328
	Gnathostomulida	6	0	6
	Nemertea	96	1	97
	Gastrotricha	228	0	228
	Rotifera	246	1	247
	Nematoda	1.357	8	1.365
	Nematomorpha	23	0	23
	Acanthocephala	27	0	27
	Kinorhyncha	22	0	22
	Loricifera	4	0	4
	Priapulida	3	0	3

Systematic groups		Species	Sub-species	Total
		no.	no.	no.
	Kamptozoa	16	2	18
	Mollusc	2.158	181	2.339
	Annelids	1.163	25	1.188
	Pogonophora	1	0	1
	Echiura	5	0	5
	Sipuncula	18	1	19
	Arthropoda	46.403	3.404	49.807
	Tardigrada	244	6	250
	Phoronidea	3	0	3
	Bryozoa	305	25	330
	Brachiopoda	12	0	12
	Chaetognatha	18	1	19
	Echinodermata	118	2	120
	Hemichordata	5	0	5
	Chordata	164	6	170
Vertebrates		1.265	93	1.358
	Agnatha	5	0	5
	Chondrichthyes	74	0	74
	Osteichthyes	494	37	531
	Amphibia	37	10	47
	Reptilia	55	25	80
	Aves	473	3	476
	Mammalia	127	18	145

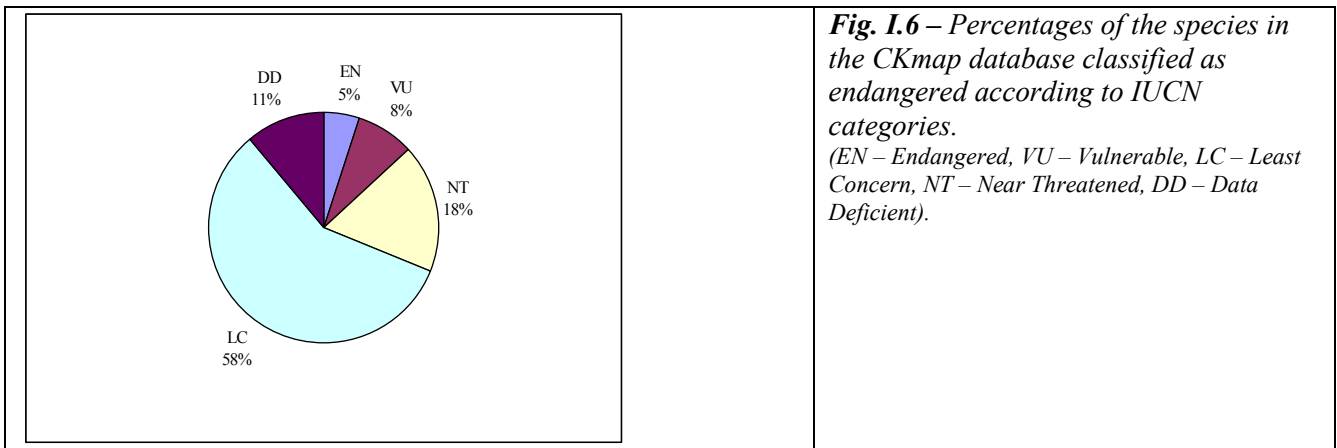
Fonte: Processed by ISPRA using data in MATTM, 2005.

Around 4,000 of the roughly 42,000 terrestrial species that have undergone census until now are indigenous (10% of the total). The taxa with the highest number of indigenous species include Pseudoscorpions, which have 58% of indigenous species, Isopodes (terrestrial) and Diplopodes, both with rate of endemism of 59%. The highest rate of indigenous species for Insects is provided by Diplura (47%) and Blattari (52%), whereas the orders with the lowest rate are Hymenoptera (0.9%) and Thysanoptera (0.5%) (Minelli, 2007).

As far as Vertebrates are concerned, Italian fauna includes 14 indigenous Amphibious species, which has the highest rate of endemism at 37%, whereas there are only 3 indigenous and 5 sub-indigenous Reptile species (15%) and 4 Mammal species (4%).

Rarity – both in terms of distribution and the individuals in a specific area – strictly depends on the ecological needs of the species, their bio-geographical background and transformations throughout the territory due to man-made action. Generally speaking, the data processing carried out as part of the CKmap project illustrated that the highest concentration of hotspots is located on the Islands, on the Alpine and pre-Alpine belt and in some isolated areas in the Apennines and Puglia (La Posta & Duprè, 2008).

The level of threat to each of the 10,000 species in the database according to IUCN (La Post & Duprè, 2008) was assessed as part of the CKmap Project. This analysis demonstrated that 5% of the species in question are endangered (EN), whereas 8% should be considered vulnerable (Fig. I.6).



Source: La Posta & Dupré, 2008

An overview of the level of threat to animal species in Italy has been provided by various authors in specific Red Lists exclusively for the various categories of Vertebrates. These assessments of the level of danger according to IUCN categories (1994) illustrated that the percentage of endangered Invertebrate species oscillates on average – depending on the author in question – between 47.5% and 68.4% (Fig. I.7). More specifically, the situation for over 40% of the endangered species of Cyclostoma and Freshwater fish is particularly critical (IUCN CR categories – *critically endangered* and EN – *endangered*), whereas 14% of threatened Amphibian species are endangered (EN category), 5% of endangered Reptile species are critically endangered (CR category) and 23% and 15% respectively of Birds and Mammals species are in high danger of extinction (CR and EN categories). Further analysis carried out on indigenous and sub-indigenous species of Vertebrates confirmed this overview: over 13% of threatened species (CR, EN and VU categories) are indigenous. More specifically, one third of endangered Freshwater fish and one sixth of endangered Reptiles are indigenous. However, the most critical situation involves Amphibians, where the percentage of endangered indigenous species is the highest, exceeding 66%. Furthermore, over one third of Italian freshwater fish can only be found on Italian territory. With regard to Amphibians, half of the endangered species only live in our country.

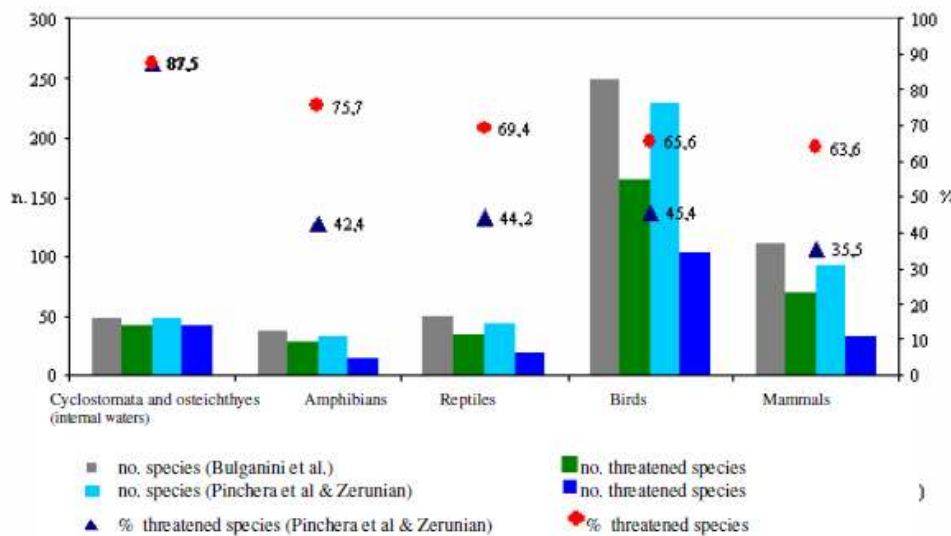


Fig. I.7 – Species of Vertebrates living in Italy and percentage of species included in Red Lists

Source: Processed by ISPRA using data from: Zerunian, 2002; Bulgarini *et al.*, 1998; Pinchera *et al.*, 1997

There is no similar assessment regarding the level of danger to species of Invertebrates. However, considering the much greater overall number of species of Invertebrates, the higher percentage of indigenous species – exceeding 10% of the total (Fig. I.8) – and the limited size of the habitat of many species, it can reasonably be supposed that the risk of extinction under similar factors of threat is decidedly higher than for Invertebrates.

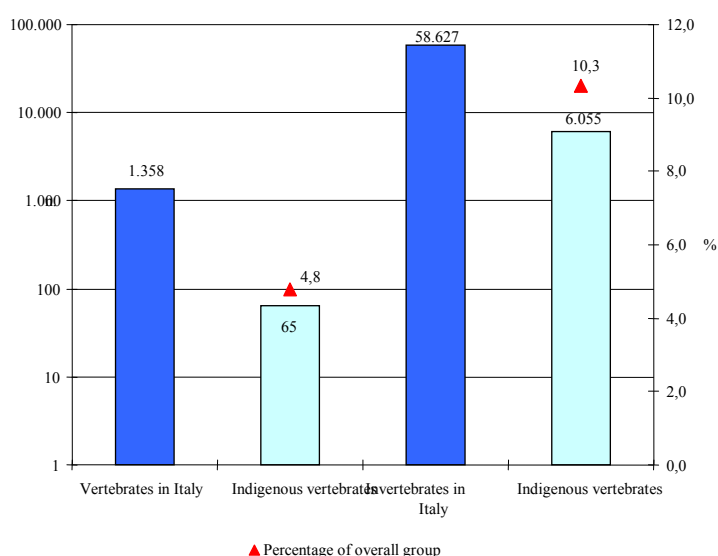


Fig. I.8 – Confrontation between Vertebrate taxon (species and sub-species) and Invertebrate taxon (excluding Protozoans living in Italy and relative number of indigenous taxa

Source: Processed by ISPRA using data in: MATT, 2005; Pinchera *et al.*, 1997; Zerunian., 2002; Bulgarini *et al.*, 1998.

Vascular flora

Italian **Vascular flora** comprises 6,711 species, divided into 196 families and 1,267 kinds, according to information in the national flora Checklist (Conti *et al.*, 2005). This checklist updates information in “Flora d’Italia” (Pignatti, 1982) further to acquisition of new knowledge and also comprises regional lists of indigenous, exclusive and naturalized alien species (Table I.7). The increased number of species, kinds and families with respect to “Flora d’Italia” may be attributed to taxonomical research, new attributions at the level of species, the discovery of some new elements and also the arrival of increasingly numerous alien species.

Indigenous plant species in Italy represent 15.26% of overall flora (Table I.7), comprising those found on the main Island in the Mediterranean (Corsica and Malta) and excluding indigenous Alpine species, which may also be found outside Italy. Fig. I.9 highlights the importance of Sicily and Sardinia within the national context, where over 11% of flora is represented by indigenous species. The percentage of regional exclusive specimens, in other words the characteristic component of each Region, provides an indication of the potential vulnerability to significant loss in biodiversity. The highest number of exclusive Regional flora is obviously found in Sardinia and Sicily (Tab. I.7).

Table I.7 – Italian vascular plants. Overall number of species per Region and percentage of indigenous and exclusive species.

Region	Overall species.	Indigenous species		Exclusive species	Exclusive species (no dubious species or those no longer found)	
	No.	No.	%	No.	No.	%
Piemonte	3,304	40	1.21	88	64	1.94
Valle d’Aosta	2,068	6	0.29	21	19	0.92
Lombardy	3,017	61	2.02	48	42	1.39
Trentino Alto Adige	2,776	59	2.13	89	82	2.95
Veneto	3,111	53	1.70	25	21	0.68
Friuli Venezia Giulia	3,094	28	0.90	133	111	3.59
Liguria	2,977	55	1.85	52	39	1.31
Emilia Romagna	2,609	61	2.34	12	8	0.31
Tuscany	3,249	155	4.77	64	62	1.91
Umbria	2,241	95	4.24	0	0	0
Marche	2,436	106	4.35	3	2	0.08
Lazio	3,041	166	5.46	14	11	0.36
Abruzzo	2,989	180	6.02	29	25	0.84

Region	Overall species.	Indigenous species		Exclusive species	Exclusive species (no dubious species or those no longer found)	
	No.	No.	%	No.	No.	%
Molise	2,308	117	5.07	0	0	0
Campania	2,691	154	5.72	21	18	0.67
Puglia	2,199	96	4.37	39	34	1.55
Basilicata	2,501	159	6.36	6	6	0.24
Calabria	2,513	206	8.20	49	47	1.87
Sicily	2,793	322	11.53	344	308	11.03
Sardinia	2,295	256	11.15	277	270	11.76
ITALY	6,711	1,024	15.26	-	-	-

Source: Conti *et al.*, 2005.

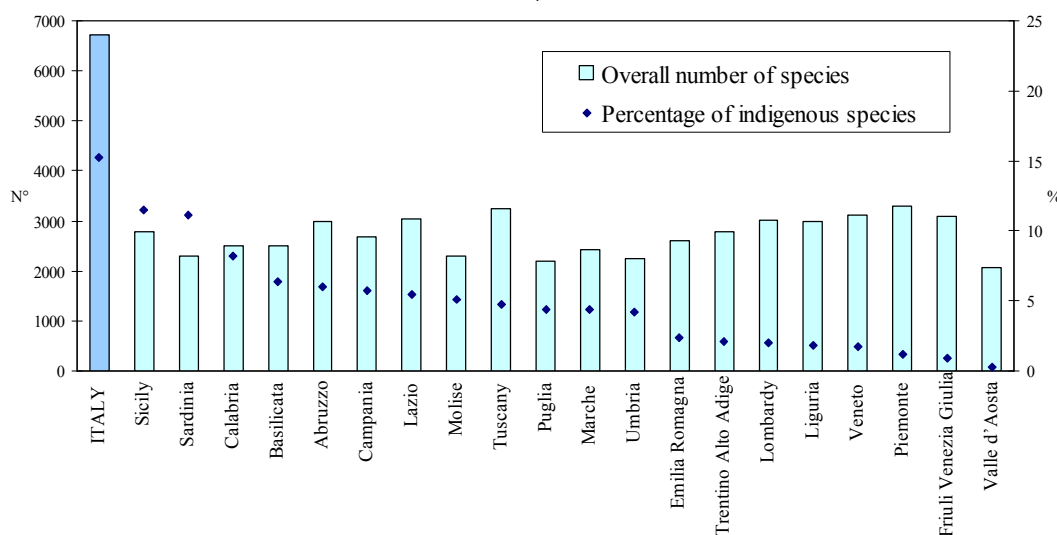


Fig. I.9 – Overall number of species at the national and regional level and percentage of indigenous species.

Source: Conti *et al.*, 2005

Knowledge regarding the **state of risk to plant species** are provided in Table I.8 and Fig. I.10, where the level of risk is shown according to IUCN categories (version 2.3 of 1994). On the whole in relation to endangered vascular plants, 18.8% are Pteridophyta, 17.9% are Gymnosperm and 15.1% Angiosperms. Around 40% of the overall known species of inferior plants are endangered, a large number of epatics and mosses are extinct (205 species) and many are considered in danger of extinction (217 species), while over 200 species of lichens are included in IUCN categories (Nimis, 1992; Cortini Pedrotti & Aleffi, 1992) (Table I.10).

Table I.8 – Italian plant species divided according to IUCN danger category.

IUCN danger category	Hepatics	Mosses	Lichens	Total endangered hepatics, mosses and lichens	Pteridophyta	Gymnosperm	Angiosperm	Total endangered vascular plants
	n.							
EX	60	145	6	211	0	0	8	8
EW	0	0	0	0	0	1	21	22
CR	0	0	0	0	3	1	124	128
EN	37	180	77	294	4	1	144	149
VU	6	14	76	96	17	1	258	276
LR	0	0	0	0	1	3	401	405
DD	0	0	0	0	2	0	22	24
R	26	28	117	171	0	0	0	0
New species	0	0	0	0	0	0	8	8
TOTAL	129	367	276	772	27	7	986	1020

Sources: Conti *et al.*, 1992; Conti *et al.*, 1997; Scoppola & Spampinato, 2005.

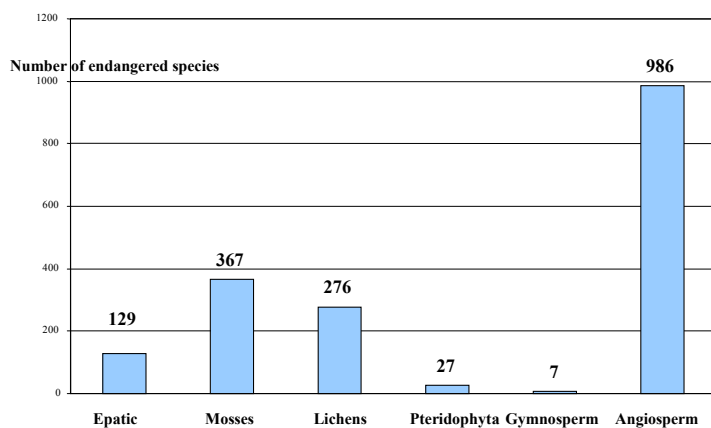


Fig. I.10 – Number of endangered plant species in Italy, divided according to systematic group.

Sources: Conti *et al.*, 1992; Conti *et al.*, 1997; Scoppola & Spampinato, 2005.

According to that currently known in Italy, there are 1,020 **endangered vascular flora** species, which is 15.2% of Italian flora. These figures derive from the Atlas of species threatened with extinction (Scoppola & Spampinato, 2005), which implements national and regional Red Lists (Conti *et al.*, 1992; Conti *et al.*, 1997), also indicating distribution of species throughout the country. This Atlas includes 8 new endangered species with respect to the Red Lists (Table I.8) and highlights the species considered as extinct in nature, those indicated by mistake and those previously considered as extinct and recently re-discovered (Scoppola & Caporali, 2005).

Table I.9 provides a summary of past assessments regarding the risk to vascular flora in Italy. Information regarding endangered plant life is still a long way from being exhaustive in Italy, as the status of taxa conservation is still not assessed in terms of quantity according to recent IUCN standards. This is why the Italian Botanic Society established an "Italian Initiative for Implementing IUCN Red List Categories (ver. 2001) when Writing New Red Lists" in 2006. The experts involved in this initiative recently published the initial results from applying IUCN standards (version 3.1 of 2001) to 40 target species of Italian flora, including 4 species of bryophytes, 2 species of lichens and 2 species of fungi (Rossi *et al.*, 2008).

Table I.9 – National lists of endangered vascular flora, IUCN assessment systems used and number of vascular species included in the lists (therefore not including species of bryophytes, lichens and fungi when present).

	NATIONAL LISTS FOR ENDANGERED FLORA	No. vascular species	IUCN RED LIST CATEGORIES			
			IUCN 1978	IUCN 1994	IUCN 2000	IUCN 2001
1992	Conti <i>et al.</i> – Red Book of Italian Plants	458	X			
1997	Conti <i>et al.</i> – Regional Red Lists of Italian Plants	1011		X		
2001	Pignatti <i>et al.</i> – Red and Blue Lists of Italian Flora	77			X	
2005	Scoppola & Spampinato – Atlas of species risking extinction	1020		X		
2008	Rossi <i>et al.</i> - Flora to be conserved – Initiative for implementing IUCN red list categories (2001) when writing new Red Lists	32				X

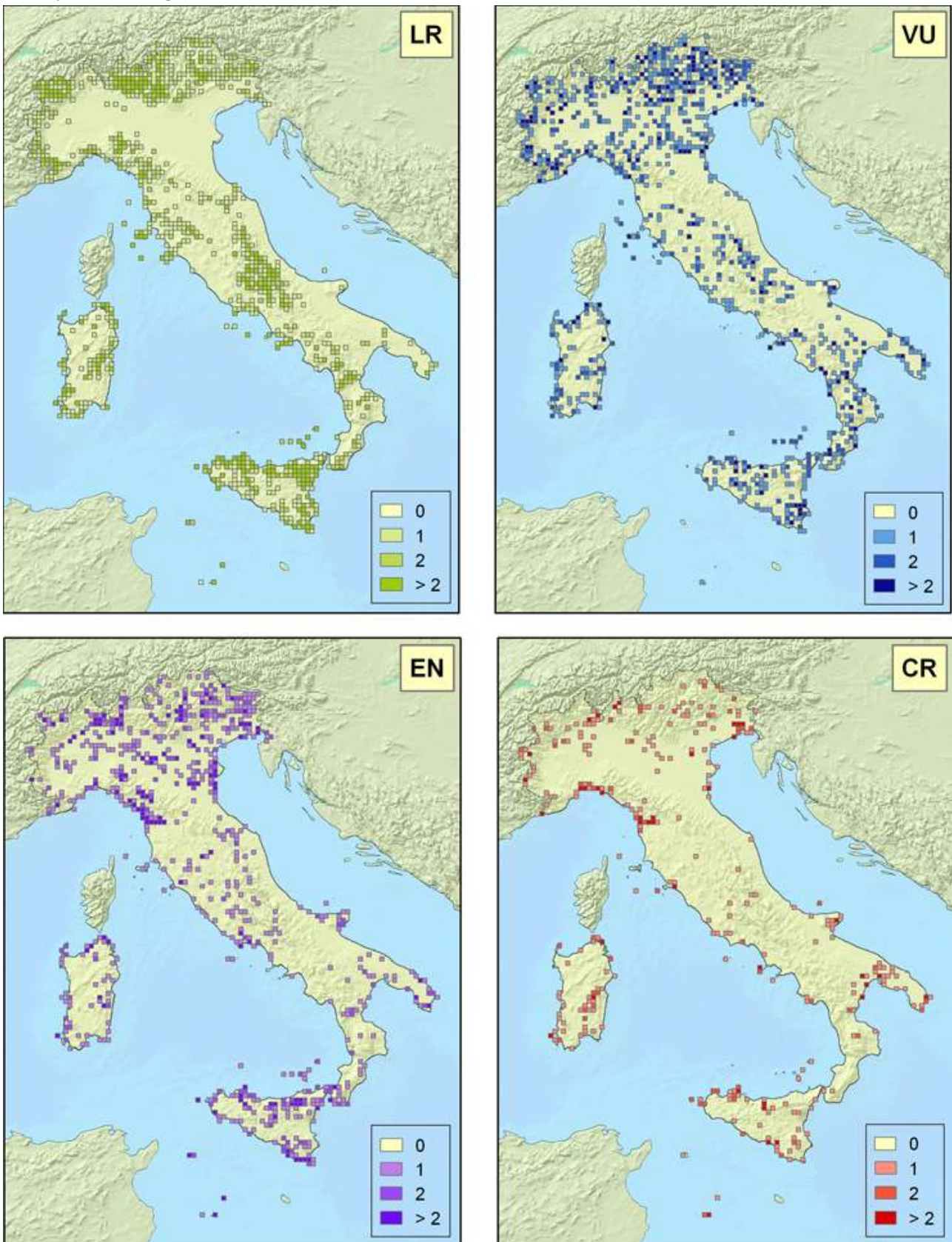
The Atlas of species threatened with extinction provides the location in Italy of each endangered plant using a map of distribution on grids (square grids 10km on each side). This information regarding distribution shows the current density of these species throughout the country (Fig. I.11). Breaking down the information according to IUCN status provides the distribution and density of species in categories LR, VU, EN and CR (Fig. I.12).

Fig. I.11 – Density on kilometric grid (grids of 10 kilometres each side) of endangered vascular flora species. Six categories considered important are used: no endangered specie in the grid, 1 specie, 2 or 3 species in the grid, between 4 and 6 species in the grid, between 7 and 9 species in the grid and over 10 species in the grid.



Sources: Processed by ISPRA using data from Scoppola & Spampinato, 2005.

Fig. I.12 – Density on kilometric grid (grids of 10 kilometres each side) of endangered vascular flora species, broken down according to IUCN status: LR (Lower risk), VU (Vulnerable), EN (Endangered), CR (Critically endangered). Four categories are used: no specie, 1 specie, 2 species and over 2 species with this level of risk in the grid.



Sources: Processed by ISPRA using data from Scoppola & Spampinato, 2005.

Bryophytes

Bryologic flora in Italy is one of the richest in Europe, with 1130 species out of 1690, 851 of which are mosses (Cortini Pedrotti, 1992; 2001) and 279 Hepatic (Aleffi & Schumacker, 1995). The particular affluence of plants in our country is mainly due to its extensive geological and geomorphological diversity, which causes extreme mesoclimatic variety. The affluence and bryological diversity in Italian regions is illustrated in Table I.10.

Conserving bryological diversity in Italy is above all linked to conserving their natural habitats, which are above all forests and humid environments, due to their extreme microclimatic and substratum diversity.

Table I.10 – *Affluence and bryological diversity in Italian regions. The number of species comprises Mosses and Hepatics and percentages refer to the overall Italian bryological flora in Italy (1130 taxa).*

Regions	No. species.	%	Land area (km ²)	No. taxa per km ²
Trentino Alto Adige	904	80.5	13,613	0.066
Lombardy	853	75.9	23,835	0.036
Piemonte	785	69.9	25,399	0.031
Tuscany	660	58.8	22,992	0.029
Veneto	632	56.3	18,369	0.034
Friuli Venezia Giulia	607	54.0	7,845	0.077
Valle d'Aosta	521	46.4	3,262	0.160
Sicily	506	45.0	25,709	0.020
Lazio	480	42.7	17,202	0.028
Emilia Romagna	472	42.0	22,122	0.021
Sardinia	425	37.8	24,090	0.018
Campania	407	36.2	13,596	0.030
Liguria	391	34.8	5,413	0.072
Abruzzo	356	31.7	10,794	0.033
Calabria	336	29.9	15,080	0.022
Marche	312	27.8	9,691	0.032
Umbria	233	20.7	8,456	0.028
Puglia	221	19.7	19,347	0.011
Molise	181	16.1	4,438	0.041
Basilicata	169	15.0	9,992	0.017

Source: Aleffi, 2005.

The affluence of bryological flora in Italy can also be clearly seen by analyzing phytogeographical types (Table I.11), with a decisive prevalence of the boreal element (24% of Mosses; 20.9% of Hepatics), sub-oceanic elements – especially in relation to Hepatics (15.4%), a taxon particularly linked to humidity, and sub-Artic and sub-Alpine elements, which comprises Mosses (15.3%) and Hepatics (10.2%) (Table I.11). The Oceanic-Mediterranean element (12.9% of Hepatics, 10.4% of Mosses) is particularly important at the bio-geographical level, as it highlights the transition between regions with a typically Mediterranean climate and those subjected to Atlantic influence and comprises various species from varying areas and of indigenous character.

Table I.11- Phytogeographical spectrum of Italian bryopytes.

Phytogeographical element	Mosses	Hepatics	TOT	%
Arctic - Alpine	36	28	64	4,26
Sub-Arctic - sub-Alpine	129	29	158	15,27
Sub-Oceanic	92	44	136	10,89
Boreal	202	60	262	23,91
Oceanic	30	11	41	3,55
Oceanic - Mediterranean	88	37	125	10,41
Mediterranean	23	10	33	2,72
Sub-Oceanic - sub-Mediterranean	27	5	32	3,2
Sub Mediterranean	64	14	78	7,57
Temperate	125	42	167	14,79
Continental	28	7	35	3,31
Sub-Tropical	1	0	1	0,12

Amended by: Aleffi, 2005.

Fungi

With regard to fungi in general, it is estimated that there are around 1,500,000 species on Earth, only 72,000 of which have been described until now – just 4.5 % of the estimated number (Franchi *et al.*, 2006). Around 20,000 species of Macromycetes and Mixomycetes are known in Italy (fungi that can be seen by the naked eye), however this number is far from the truth as at least 20 new species are published in Italy every year (Associazione Micologica Bresadola, 1957-2009).

A census has been going on for a few years now in order to create a checklist of Italian fungi, which has currently published information regarding Basidiomycetes (Onofri *et al.*, 2005a). Until now 4,296 elements – 3,973 of which are species, 6 sub-species, 263 varieties and 54 forms – in the *Basidiomycetes* category have been registered until now. More specifically, Italy has a particular affluence of *Aphylophorales*, involving 233 kinds and 1,047 species, and *Agaricales*, involving 119 kinds and 1,782 species (Onofri *et al.*, 2005b). These also included 12 alien species.

The extraordinarily high number of indigenous plants in the Mediterranean area (around 13,000; Myers *et al.*, 2000; Médail & Myers, 2004) leads us to believe there is equally high biodiversity in the micro-organisms related thereto, which obviously also means fungi (mycorrhiza). An idea of the extent of Mediterranean micodiversity can be deduced from global data: around 6,000 species of fungi living in symbiosis with the roots of around 240,000 species of plants are known worldwide.

Currently, no fungi species are included in the Annexes to the Berne Convention and Habitat Directive. Italy does not yet have a real Red List for fungi, although studies on this topic and lists of species that are considered “endangered” have been made (Venturella *et al.*, 1997; Venturella *et al.*, 2003). With regard to the Basidiomycetes elements that have been registered, 56 species that may be classified as indigenous and 87 that may be classified as rare and/or risking extinction have been identified (Onofri *et al.*, 2005b). Furthermore, the species *Boletus dupainii* Boud. and *Psathyrella ammophila* (Durieu et Lév.) P.D. Orto, were included in the “Initiative for Implementing IUCN Red List Categories and Standards in Italy (ver. 2001) for Writing New Red Lists” (Perini & Venturella, 2008).

Lichens

The *checklist* for Italian lichens (Nimis & Martellos., 2002) includes 2323 taxa, making Italy one of the European countries with the highest level of diversity in terms of lichens accounting for over 14% of lichen flora worldwide (Nimis & Martellos, 2005). The most affluent are crustose lichens – accounting for 69.2% - followed by foliose (13.8%), fruticose (10.9%), squamulose (5%) and leprose (1.1%). The Photobionts category comprises 79% green chlorococcale algae of the *Threntepholia* kind and 12% cyanobacteria (Table I.12).

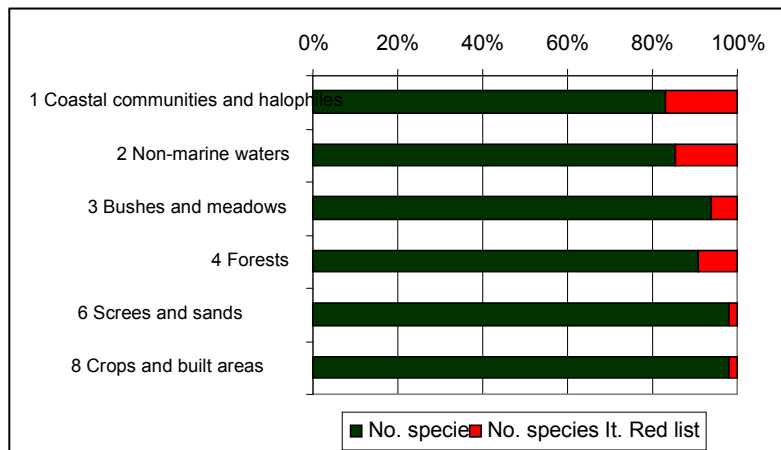
Table I.12 – Percentages of various growth forms in Italian lichens in relation to the substrata.

(Frut: fruticose; Frut.f: fruticose filamentous; Fol: foliose; Fol.b: foliose with broad lobes; Fol.n: foliose with narrow lobes; Cr: crustose; Cr.end: endolithic crustose; Cr.pl: placodiomorph crustose (with lobed margin); Sq: squamulose; Lepr: leprose; LF: lichenous fungi; F: non-lichenized fungi).

Substrata	Growth Form												Row total
	Frut	Frut.f	Fol	Fol.b	Fol.n	Cr	Cr.end	Cr.pl	Sq	Lepr	LF	F	
rocks	4.22	0.97	0	3.9	4.14	63.5	6.17	5.2	3.01	2.03	1.79	0.41	1231
lignum	13.7	2.65	0	.53	2.65	67.7	0	0	3.7	2.12	2.12	4.76	189
bark	5.49	4.49	0	10.4	7.99	58.4	0	0.25	3.37	2	2.5	4.87	801
soil, terricolous mosses, plant debris	22.0 7	0.7	0. 23	8.92	1.41	43.1 9	0	2.58	15.49	3.29	.94	0.94	426
leaves	0	0	0	0	0	100	0	0	0	0	0	0	28

The Red List for Italian lichens (Nimis, 1992) comprises 276 rare or severely declining species. The most endangered species are sub-Oceanic epiphytes, the ecological *optimum* of which is semi-natural forest vegetation. These are the most sensitive to atmospheric pollution and are affected by destruction of their optimum habitats. These are followed by Mediterranean terricolous lichens, which are affected by intense tourism, sheep farming and fires. Coast lichens are also seriously endangered due to general decline in littoral environments (Nimis & Martellos, 2005).

Fig. I.13 – Percentage of lichen species in the Red List with respect to the overall number of each large type of habitat in Italy (CORINE Biotopes level I)



Source: Processed by ISPRA

I.B 4 MARINE SPECIES: FAUNA AND FLORA

The checklist for marine species allowed Italy to implement an important prospective tool. The list of macrophytobenthos species (obtained through analysis of 533 publications and subsequent revision of the taxonomy and names of 1,063 taxa registered in this way at a specific and intra-specific level) amounts to 924 accepted taxa (46 *Cyanophyta*, 509 *Rhodophyta*, 2 *Chrysophyta*, 208 *Phaeophyta*, 154 *Chlorophyta* and 5 *Spermatophyta*) (Furnari *et al.*, 2003). The “Società Italiana di Biologia Marina” (SIBM – Italian Society of Marine Biology) was appointed by MATTM to update the list of marine fauna species drawn up in the Nineties (Minelli *et al.*, 1993). On the whole, the 9,194 species of marine fauna underwent census in Italian waters, 1,047 of which are Protozoans. Information on the presence of species in Italian seas provided for 9 bio-geographic units are currently being printed and can be accessed on the SIBM website (www.sibm.it).

CHECK LIST	AUTORI	Tot. Specie checklist 1994	Tot. Specie checklist 2005
1 - PROTOZOA	Dini F., Banchetti R., Gradoni L.	1947	1973
2 - PORIFERA	Pansini M., Longo C.	472	495
3 - CTENOPHORA	Redazione e C. Mills	32	33
3 - CINDARIA		457	495
Anthozoa	Pessani D., Morri C., Esposito F.	125	128
Hydrozoa	Boero F., Gravili C., Licandro P.	315	349
Scyphozoa	Avian M.	16	17
Cubozoa	Avian M.	1	1
4 - TURBELLARIA	Curini Galletti M.	322	379
4 - GNATHOSTOMULIDA	Redazione	6	9
4 - ORTHONECTIDA	Bello G.	2	2
4 - DICYEMIDA	Bello G.	13	14
4 - NEMERTEA	Redazione	93	231
5 - DIGENEA	Paggi L., Orecchia P., Ortis M.	188	199
6 - CESTODA	Paggi L., Orecchia P.	70	75
6 - MONOGENEA	Di Cave D.	86	88
7 - GASTROTRICHA	Todaro M.A., Balsamo M., Tongiorgi P.	138	153
8 - ROTIFERA	Fontaneto D., Ricci C.	7	40
9 - NEMATODA ADENOPHOREA		308	532
non parassiti	Semprucci F., Sandulli R., de Zio Grimaldi S.	303	524
parassiti	Paggi L., Orecchia P.	5	8
10 - NEMATODA RHABDITA	Paggi L., Orecchia P.	6	6
11 - NEMATODA SPIRURIA	Paggi L., Orecchia P.	63	57
12 - NEMATOMORPHA	Redazione	1	1
12 - KINORHYNCHA	Sandulli R., de Zio Grimaldi S.	22	47
12 - LORICIFERA	Todaro M.A.	4	5
12 - PRIAPULIDA	Redazione	2	3
12 - KAMPTOZOA	Balducci A., Chimenz C., Rosso A.	17	17
13 - CAUDOFOVEATA	Salvini-Plawen L.	4	6
13 - SOLOGASTRES	Salvini-Plawen L.	12	16
13 - MONOPLACOPHORA	Dell'Angelo B.	1	1
13 - POLYPLACOPHORA	Dell'Angelo B.	24	27
14 - GASTROPODA PROSOBRANCHIA	Sabelli B., Oliverio M., Spada G. e coll. (1)	601	633
14 - HETEROBRANCHIA HETEROSTROPHA	Sabelli B.	128	146
15 - GASTROPODA OPSTOBRANCHIA	Cattaneo-Vietti R., Giovine F.	355	371
16 - GASTROPODA PULMONATA	Manganelli G.	6	6
17 - BIVALVIA	Schiaparelli S.	316	336
17 - SCAPHOPODA	Steiner G.	13	13
18 - CEPHALOPODA	Bello G.	58	58
19 - ANNELIDA POLYCHAETA	Castelli A. e coll. (2)	800	866
19 - POGONOPHORA	Redazione	1	1
19 - ECHIURA	Redazione	5	5
19 - SIPUNCULA	Pancucci-Papadopoulou M.A.	16	25
20 - ANNELIDA CLITELLATA		38	44
Hirudinea	Minelli A.	7	7
Oligochaeta	Rota E.	31	37
24 - ACARI	Carriglio D.	58	62
25 - PYCNOGONDA	Chimenz Gusso C., Bartolino V.	44	44
26 - CRUSTACEA BRANCHIOPODA	Marganitoro F.G.	5	6
27 - CRUSTACEA OSTRACODA	Aiello G., Barra D.	345	376
28 - CRUSTACEA MAXILLOPODA		797	869
Copepodi planctonici	Mazzocchi M.G.	234	234
Copepodi iperbentonici	Zagami G.	-	9
Copepodi parassiti	Mariniello L.	334	334
Copepodi Ciclopodi Bentonici	Stoch F.	-	10
Harpacticoida	Todaro M.A., Ceccherelli V.U.	179	221
Mystacocarida	Redazione	1	1
Cirripedia	Relini G.	49	60
29 - CRUSTACEA MALACOSTRACA I		149	129
Phyllocarida	Froggia C.	3	5
Hoplacarida	Froggia C.	8	8
Mysidacea	Ariani A.P., Wittmann K.J.	66	81
Cumacea	Petrescu I.	72	35
30 - CRUSTACEA MALACOSTRACA II		698	714
Tanaidacea	Riggio S., Lorenti M.	47	48
Isopeida	Argano R., Campanaro A.	191	194
Amphipeda	Ruffo S.	447	459
Eufausiacea	Guglielmo L.	13	13
31 - CRUSTACEA MALACOSTRACA III (Decapoda)	Froggia C.	268	290
107 - TARDIGRADA	Sandulli R., de Zio Grimaldi S.	53	77
108 - PHORONIDA BRACHIOPODA	Emig Ch.	15	19
108 - BRYOZOA	Balducci A., Chimenz C., Rosso A.	308	339
109 - DEUTEROSTOMA (excl. Vertebrata)		307	341
Chaetognata	Ghirardelli E.	18	20
Echinodermata	Matarrese A.	118	121
Ascidacea	Mastrototaro F., Tursi A.	113	128
Hemichordata	Redazione	5	6
Appendicularia	Licandro P.	30	41
Thaliacea	Licandro P.	22	24
Cephalochordata	Redazione	1	1
110 - VERTEBRATA AGNIATHA	Relini G.	3	3
110 - CHONDRICHTHYES	Vacchi M., Serena F.	74	78
110 - OSTEICHTHYES	Relini G.	429	436
110 - REPTILIA	Mo G.	5	5
110 - MAMMALIA	Mo G.	15	17
TOTALE		9'309	10'313

(1) Gli altri collaboratori del fascicolo 14 Prosobranchia sono Manganelli G., Giovine F., Giannuzzi-Savelli R., Pusateri F.

(2) I collaboratori del prof. A. Castelli per il fascicolo 19 Polychaeta sono Bianchi C.N., Cantone G., Cinar M.E., Giangrande A., Iraci Saren D., Lanera P., Licciano M., Musco L., Sanfilippo R.

Source: from www.sibm.it

Table I.13 – Comparison between the number of animal species in the main systematic groups found in Italian waters in 1994 and 2005.

There are 10 species of cetaceans represented by populations in the Mediterranean Sea, just 8 of which may be considered regular (* in Table I.14) in Italian waters. IUCN review of the status of cetaceans in the Mediterranean Sea in 2008 indicated a lack of information (DD) regarding the Globicephalus (*Globicephala melas*), vulnerability (VU) for the Sperm whale (*Physeter macrocephalus*), threat (EN) to the large baleen (*Balaenoptera physalus*) and less worry for other species (3, 4, 5, 6, 7 in Table I.14). The Mediterranean common dolphin population is considered

threatened (EN), with a trend to decrease. Trends are available for no other species and populations. Estimates in terms of numbers are only available for the common baleen whale (*Balaenoptera physalus*) in the Pelagos Sanctuary (Focarda *et al.*, 1995) and for the Stenella (*Stenella coeruleoalba*) in the South Tyrrhenian Sea (Fortuna *et al.*, 2007); a few other indications are available for limited areas, such as north-west Sardinia (Lauriano *et al.*, 2003). The absence of recent estimates and general lack of information regarding the trends of populations highlight the need for large-scale studies.

Table I.14 – Species present in the Mediterranean Sea and IUCN Status and Trend. (VU: Vulnerable, EN: Endangered, LC: Least Concern, DD: Data Deficient).

(*) REGULAR		
	IUCN status (2008)	IUCN Trend (2008)
1. <i>Physeter macrocephalus</i>	VU	Unknown
2. <i>Balaenoptera physalus</i>	EN	Unknown
3. <i>Tursiops truncatus</i>	LC	Unknown
4. <i>Delphinus delphis</i>	EN	Unknown
5. <i>Stenella coeruleoalba</i>	LC	Unknown
6. <i>Ziphius cavirostris</i>	LC	Unknown
7. <i>Grampus griseus</i>	LC	Unknown
8. <i>Globicephala melas</i>	DD	Unknown
OCCASIONAL	ACCIDENTAL	RARE
<i>Phocoena phocoena</i>	<i>Balaenoptera acutorostrata</i>	<i>Balaenoptera borealis</i>
<i>Pseudorca crassidens</i>	<i>Megaptera novaeangliae</i>	<i>Eubalaena glacialis</i>
<i>Steno bredanensis</i>	<i>Kogia sima</i>	<i>Hyperoodon ampullatus</i>
<i>Orcinus orca</i>		<i>Mesoplodon bidens</i>
		<i>Mesoplodon densirostris</i>
		<i>Mesoplodon europaeus</i>
		<i>Sousa chinensis</i>

Source: Reeves & di Sciara, 2006; IUCN, 2008

I.B 5 GENETIC DIVERSITY

Sustainable use of genetic diversity in agriculture

The role of sustainable agricultural practices, which are expanding in Italy (organic farming), in contributing to preserving the diversity of species and landscape structure, should be expanded. Traditional agricultural systems in mountains, hills and marginal lands could be integrated into protected landscapes (The European Landscape Convention), aiming to preserve genetic diversity in-situ in the original habitats or ecosystems. In-situ preservation of plant and animal species or breeds should be integrated, if needed, with ex-situ conservation programmes.

Agricultural biodiversity (ABD) is a broad term that includes all components of biological diversity of relevance to food and agriculture, and all components of biodiversity that constitute the agro-ecosystem (COP V.5) (<http://www.cbd.int/doc/meetings/sbstta/sbstta-09/information/sbstta-09-inf-30-en.pdf>).

The genetic erosion that has occurred over the last few decades is mainly linked to marginalization – if not complete abandonment – of many cultivated farm species (reduction in inter-specific variability) and replacement of many local varieties and eco-types with strong genetic variability, with a very limited number of varieties and strains with narrow genetic basis (reduction in intra-specific variability). Conversion towards highly-specialized methods of farming and breeding is the main cause of this simplification, although there is no detailed quantification of evolution in farm species due to genetic heritage over the last few decades. According to the Ministry of the Environment, 665 species are still cultivated in Italy, 551 of which are cultivated in central and northern Italy, 521 in southern Italy and Sicily and 371 in Sardinia.

The first step towards sustainable use of ABD is knowing and managing the genetic resources of cultivated plants in Italy, especially in relation to so-called *crop wild relatives* which are the primordial source of variability.

The genetic resources of food and industrial species in Italy are concentrated and mainly managed by public institutions, the “Consiglio Nazionale per la Ricerca e la Sperimentazione in Agricoltura” (CRA – National Council for Research and Experimentation in Farming), Universities and the “Consiglio Nazionale delle Ricerche” (CNR – National Council for Research); the latter also manages an important seed bank that was established in Bari in 1970.

While public management of genetic resources is not a total guarantee, it is an important presupposition for effective participation of local communities in *access and benefit-sharing* (as established through Decision IX/12 of the COP held in Bonn in 2008

(<https://www.cbd.int/doc/programmes/abs/factsheets/ABS-factsheet-nagoya-roadmap-en.pdf>).

MATTM provides information regarding overall accessions and Italian accessions conserved at the “Consiglio Nazionale per la Ricerca e la Sperimentazione in Agricoltura” (CRA) in the book entitled “Stato della biodiversità in Italia” (Blasi et al., 2005 – Status of Biodiversity in Italy). The high number of landrace and wild *cultivar* should be noted (Table I.15).

Table I.15- Overall accessions and Italian accession conserved at the Consiglio Nazionale per la Ricerca e la Sperimentazione in Agricoltura (CRA).

Experimental Institute	Genre	Species	Overall accessions	Italian accessions	Italian landrace and wild cultivar
Agronomy	1	1	202	159	159
for Citrus Cultivation	12	66	310	157	25
for Settlement	4	4	30	28	17
Forestry and Alpine Cultivation					
for Cereal Cultivation	5	43	8759	2366	1413
for Pasture Cultivation	2	3	1770	1770	1770
for Industrial Cultivation	4	5	826	206	51
for Food Industry	1	1	109	82	80
for Floriculture	13	60	379	165	22
for Fruit Tree cultivation	15	80	4546	1883	1775
for Olive Tree cultivation	1	1	296	256	256
for Horticulture	3	8	45	34	2
for Forestry	6	12	705	568	257
for Tobacco	1	68	1711	329	329
for Viticulture	1	8	2106	1681	1029
for Farm Zoology	1	6	49	19	19
Total	70	366	21843	9703	7204

Sources: MATT and CRA 2002

More specifically, with regard to genetic resources for the main food species, data produced by the Consiglio Nazionale per la Ricerca e la Sperimentazione in Agricoltura is provided (Table I.16).

Table I.16 – Main food species conserved at Consiglio Nazionale per la Ricerca e la Sperimentazione in Agricoltura (CRA) research institutes.

Species	no. accessions	of which wild, indigenous, etc.	Italian origin	Foreign origin	Health status
Oats	720*	9*	52*	668*	Good
Wheat*	9,414*	3486*	2375*	5463*	Good
Corn	5,626	1261	1999	2791	Good
Barley	1,175	457	723	452	Good
Rice	500		180	320	good

Source: CRA 2009 (Fideghelli, com. pers.)

Table I.17, which derives from the book entitled Status of Biodiversity in Italy (Blasi *et al.*, 2005), MATTM reports the institutions (mainly national and regional) that conserve main fruit species in Italy.

Table I.17 – Institutes conserving the main species of fruit in Italy.

Information	Species
Azienda Agricola Sperimentale Dimostrativa Pantanello (Metaponto, Mz)	Apricot, Quince; Fig; Strawberry; Almond; Medlar; Peach; Plum; Vines
Istituto Propagazione delle Legnose - CNR (Scandicci, Fi)	Cherry; Quince; Persimmon; Apple; Hazelnut; Pear; Peach; Plum
Istituto Fisiologia, Maturazione e Conservazione del Frutto delle Arboree Mediterranee - CNR (Sassari)	Cherry; Fig; Apple; Pear; Plum
Centro Ricerche Produzione Vegetale (Diegano, Fo)	Apple; Pear
Istituto Sperimentale per la Frutticoltura - SOP Caserta	Apricot; Chestnut; Cherry; Quince; Fig; Persimmon; Almond; Apple; Medlar; Hazelnut; Walnut; Pear; Peach; Plum
Istituto Sperimentale per la Frutticoltura - SOP Forlì	Strawberry; Apple; Pear; Peach; Plum
Istituto Sperimentale per la Frutticoltura - Roma	Actinidia; Apricot; Cherry; Strawberry; Apple; Hazelnut; Pear; Peach; Plum
Istituto Sperimentale per la Frutticoltura - SOP Trento	Cherry; Raspberry; Apple
Centro Sperimentazione Agraria Regionale Laimburg (Ora, Bz)	Apple
Ente reg. per la promozione e lo sviluppo dell'agricoltura Regione Friuli Venezia Giulia	Cherry; Apple; Pear; Peach
Agenzia Servizi Settore Agroalimentare Marche	Apple
Associazione Archeologia Arborea (Città di Castello, Pg)	Cherry; Fig; Apple; Pear; Peach; Plum
Veneto Agricoltura	Apple; Pear
Servizi sperimentazione, informazione e consulenza in agricoltura Regione Campania (Napoli)	Apricot; Cherry; Apple; Plum
Dipartimento Biotecnologie Agrarie e Ambientali - Università degli Studi di Ancona	Apricot; Cherry; Strawberry; Raspberry; Apple; Pear; Peach; Plum
Istituto Coltivazioni Arboree - Università degli Studi di Bari	Cherry; Fig; Almond
Dipartimento Colture Arboree - Università degli Studi di Bologna	Apricot; Cherry; Quince; Apple; Pear; Peach; Plum
Dipartimento Ortofrutticoltura - Università degli Studi di Firenze	Rossmum; Peach
Dipartimento Produzione Vegetale - sezione Coltivazioni Arboree - Università degli Studi di Milano	Apple
Dipartimento Arboricoltura, Botanica e Patologia vegetale - Università degli Studi di Napoli	Apricot; Persimmon; Apple; Walnut; Pear; Peach; Plum
Istituto Coltivazioni Arboree - Università degli Studi di Palermo	Apricot; Cherry; Apple; Pear; Peach; Plum
Istituto Frutti-Viticolture - Università Cattolica di Piacenza	Cherry; Quince; Apple; Pear
Dipartimento Agronomia Ambientale e Produzioni Vegetali - Università degli Studi di Padova	Apple; Pear; Peach
Dipartimento Coltivazione e Difesa Legnose - Università degli Studi di Pisa	Apricot; Almond; Apple
Dipartimento Colture Arboree - Università degli Studi di Torino	Apricot; Chestnut; Cherry; Raspberry; Apple; Hazelnut; Walnut; Pear; Peach; Plum
Dipartimento Produzione Vegetale e Tecnologie Agrarie - Università degli Studi di Udine	Actinidia; Apple
Dipartimento Produzione Vegetale - Università degli Studi della Tuscia, Viterbo	Hawthorn; Quince; Apple; Medlar; Pear; Vine

Source: MATT 2005.

Protecting traditional products (DOP, IGP etc.) is a valid means of ensuring a positive turning point for ABD's and quality and also supports effective participation from local communities (Table I.18).

Table I.18 – Various tools used to protect farm products according to Italian Region.

Regions	DOP	IGP	DOCG	DOC	IGT
Abruzzo	6	2	1	4	10
Basilicata	2	3	0	3	2
Calabria	9	2	0	12	13
Campania	8	7	3	16	9
Emilia Romagna	14	12	0	20	10
Friuli Venezia Giulia	4	0	2	9	3
Lazio	8	5	1	26	4
Liguria	2	1	0	8	3

Lombardy	14	7	4	15	15
Marche	5	3	2	15	1
Molise	3	1	0	3	2
Piemonte	12	4	12	44	0
Prov.Aut.Bolzano	1	2	0	3	2
Prov.Aut.Trento	6	1	0	7	3
Puglia	9	3	0	26	6
Sardinia	5	1	1	19	15
Sicily	10	6	1	22	6
Tuscany	10	9	7	36	6
Umbria	3	3	2	11	6
Valla d'Aosta	4	0	0	1	0
Veneto	14	13	4	25	19
Total	149	85	40	325	135

Source: processed by ISPRA using information from MiPAAF site regarding DOP and IGP products, updated as at 4/02/2009, data regarding DOCG, DOC and IGT products updated as at 31/12/2008.

Genetic diversity in trees and Shrubs

The factors considered as most critical in relation to conserving the complexity of forest systems and their biological diversity include progressive marginalization and abandonment of woods and simplification of cultivation techniques, which favour – for example – using easy-to-access copses. Legislative Decree 386 dated 10 November 2003 comprises content that is extremely respectful of forests and protecting diversity through establishment of “Regions of Origin”. The territory or set of territories with sufficiently similar ecological conditions and in which sufficiently similar topsoil or sources for seeds from a phenotype and, when assessed, genotype viewpoint are identified for a species or sub-species, taking into account altitudinal limits, if appropriate. Currently, many Italian regions are working – often jointly – to establish regions of origin that must be indicated individually or further to joint agreement by official organizations.

By way of implementing Legislative Decree 227/2001, 4 National Centres for forest biodiversity have been established, 3 of which are managed by the State Forestry Department, to safeguard genetic and species biodiversity in Italian forests through conservation *ex situ* and by integrating activities with conservation *in situ*. It must be remembered that the *European Strategy for Plant Conservation* also aims to ensure that 80% of species threatened with extinction are conserved *ex situ* by 2010.

The State – Regions Conference approved a “Framework Programme for the Forestry Sector” in December 2008 (http://www.inea.it/pdf/PQSF%20DEFINITIVA%2012_111.pdf), which also deals with protecting forestry biodiversity *in situ* and *ex situ* among many other forestry-related aspects. ISPRA, with support from the two Ministries mainly involved (MATTM and MIPAAF) and various other research institutes and other types of organizations, is currently writing a document on *ex situ* conservation of the biodiversity of spontaneous and cultivated plant species in Italy, paying particular attention to the current status, critical areas and actions to take.

Genetic studies (genetic of populations, molecular genetics, DNA etc.) are not unusual in the Italian situation, which is demonstrated by the constant participation of Italy in projects by the *European Forest Genetic Resources Programme* (EUFORGEN) managed by Biodiversity International.

Domestic animal genetic resources

The domestic, cultivated, farmed and semi-wild species (mainly fishes, birds and mammals) whose production provides human food, together with the varieties and wild relatives, that expand the genetic resource base for future breeding improvements, belong to the "Producers" functional group within ABD, according to the classification of the Global Biodiversity Outlook (SCBD 2001) (<http://www.cbd.int/doc/meetings/sbstta/sbstta-09/information/sbstta-09-inf-30-en.pdf>). In relation to these animal genetic resources, the MIPAAF published a list of local bovine, ovine, caprinae, suina and equine breeds with a number of reproductive females below the threshold established by the regulation for implementing rural development below which a local breed is to be considered under endangerment of extinction in October 2007. This threshold is 7,500 individuals for bovines, 10,000 for ovines and caprinae, 15,000 for suina and 5,000 for equines. The threshold for volatiles not included in the list is 25,000 reproducing females. This Ministry list only includes animals for which pure breeding in their area of origin is entitled to public funds for rural development.

The highest number (71) of endangered breeds refers to ovine and caprinae breeds even though there are no definite values for such. The number of reproducing females amounts to around 4.6% of all reproducing ovines and caprinae (Table I.19). As far as bovines are concerned, 26 breeds are classified as threatened with abandonment amounting to 71,493 reproducing females, which is 3.1% of the overall amount. There are few endangered suina breeds (6) with a number of reproducing females representing just 0.7% of the overall number. However, there are 23 endangered equine breeds for a total of 16,716 reproducing females but, as there is no information regarding the overall number of brood mares, it is impossible to establish a percentage with respect to the overall number of breeds.

Table I.19 – *Endangered animal breeds and their consistency with respect to overall number.*

	Bovine	Ovine and caprinae	Suina	Equine
No. endangered breeds	26	71	6	23
Reproducing females	71,493	169,423	5,293	16,716
<i>% of reproducing females in endangered breeds with respect to overall breeds</i>	<i>3.1</i>	<i>4.6</i>	<i>0.7</i>	<i>n.d.</i>

Source: processed by INEA using information from MiPAAF – List of endangered breeds, 2007.

¹ EUROSTAT figures

I.C TRENDS UNDERWAY AND THREATS TO BIODIVERSITY

I.C.1 INTRODUCTION

The age-old presence of Man has altered ecosystems and natural habitats in Italy, as it has throughout the Mediterranean Basin. This is the main cause acknowledged throughout the planet for loss of biodiversity, fragmentation, decay and destruction of habitats, over-exploitation of resources and species and introducing alien species.

This section analyzes a number of the main sources of impact on Italian biodiversity, such as farming and forestry, Aquaculture, hunting, changes to the climate, changes in use of land, disturbances from Man (fires, sea transport and traffic, tourism, etc.), pollution (CO₂ emissions and nitrogen deposits, noise pollution, etc), changes and reductions to habitats, professional and amateur fishing, alien species.

There are many effects that the numerous sources of impacts may have on biodiversity and can impact individual species, populations, communities and ecosystems both directly and indirectly. It is not always easy to quantify the effects of various types of impact caused by Man and their incidence on the state of conservation of habitats and species.

I.C.2 MAIN FACTORS OF THREAT: TERRESTRIAL HABITATS AND SPECIES

Changes in uses of land and changes to habitats

Information regarding and use, plant cover and transition between various types of use are the most important kinds of information for checking and verifying the effectiveness of environmental policies and integration of environmental matters in specific policies (farming, industry, tourism, etc.). With regard to this, one of the main topics is transformation from a 'natural' use (such as forests and wetlands) to 'semi-natural' use (such as crops) or, even worse, 'artificial' use (such as building, industry, infrastructures). Such transitions not only in most cases determine the permanent and irreversible loss of fertile soil, but also have other negative effects such as fragmenting territory, reducing biodiversity, altering the hydrologic cycle and carrying out micro-climatic changes. The increase and diffusion of urban areas and relative infrastructures also cause an increase in the need for transportation and energy consumption, thereby causing an increase in noise pollution and emissions of atmospheric pollutants and greenhouse gas.

Transformation of territory that is not directly linked to action taken by Man, such as reduction in vulnerable coastland areas and related river plains due to a rise in the sea level (in turn deriving from the climate changes underway) should also be mentioned. Table I.20 provides national figures regarding transformation in land use between 1990 and 2000.

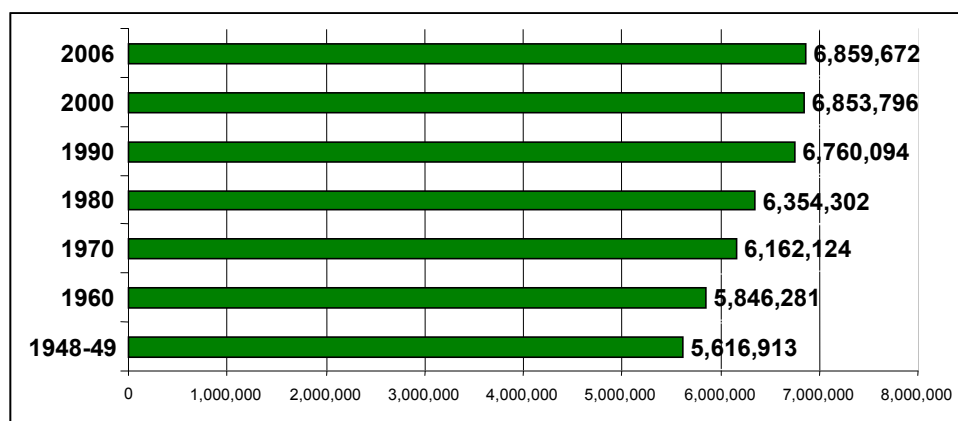
Table I.20 – Comparison between land use in 1990 and in 2000 according to CORINE LAND COVER level II figures.

CLC code	CLC Level 2 land use	2000 [km ²]	1990 [km ²]	2000 – 1990 [km ²]	2000 – 1990 [%]
1.1	Residential areas	10,819.6	10,315.7	503.9	4.88%
1.2	Industrial, commercial and infrastructural areas	2,631.9	2,377.9	254.0	10.68%
1.3	Quarries and mines, work sites, disposal areas and unnatural and abandoned lands	565.1	514.7	50.4	9.79%
1.4	Artificial non-farming green areas	299.6	281.1	18.4	6.56%
2.1	Arable lands	83,121.9	83,760.6	-638.7	-0.76%
2.2	Permanent crops	21,780.0	21,871.2	-91.2	-0.42%
2.3	Grasslands (permanent pastures)	4,475.3	4,552.2	-76.9	-1.69%
2.4	Diverse farming areas	47,075.6	47,702.9	-627.3	-1.31%
3.1	Woodlands	79,025.6	78,190.4	835.2	1.07%
3.2	Areas with brush and/or grass vegetation	36,685.9	36,969.5	-283.6	-0.77%
3.3	Open areas with little or no vegetation	11,112.3	11,065.0	47.2	0.43%
4.1	Internal wetlands	159.0	158.5	0.6	0.36%
4.2	Coastline wetlands	531.8	532.3	-0.4	-0.08%
5.1	Continental waters	2,186.2	2,175.1	11.1	0.51%
5.2	Marine waters	945.5	947.9	-2.4	-0.26%

Source: AA.VV., 2005b.

For thousands of years, Italian territory has been undergoing progressive reduction to forest systems, which have been subjected to great cuts and alterations over the centuries, especially in the areas considered more profitable to Man (coastline, plains, low hill areas). Hygrophilous woods in large valleys have been almost completely destroyed or replaced by secondary formations or forest plantations (e.g. poplar groves). Forest habitats are currently involved in an opposing trend to expand (Fig. I.15), however that which may appear to be a positive sign is the result of a progressive process of abandonment of rural areas, especially the more underprivileged areas such as in the mountains. Progressive incursion of shrubs and trees on grasslands and arable lands that are no longer cultivated occurs in these areas, thereby causing the landscape to lose its identity and negative effects of an ecological type, as important habitats and animal and plant species living therein disappear.

Fig. I.15 – Italian forest land areas (fro 1948-49 to 2006).



Source: ISTAT.

Diffusion of monocultures, structural simplification of farming landscapes due to mechanization and intensive farming have led to a drastic decline in plant biodiversity both in terms of the disappearance of spontaneous species and of structural elements typically found on traditional farming lands (hedges, groves, etc.) which are important to ecological connectivity and the survival of many species, especially avifauna. A study on the trend in bird populations in relation to farming environments provides useful indications on the quality of these habitats and how this changes over time and space. The Farmland Bird Index decreased by 10.4% between 2001 and 2005 in Italy. However this figure hides different trends at the regional level, a number of which register increases in this value although over half the overall regions confirm the negative trend (Tab. I.21).

Table I.21 - Farmland bird index (2000=100).

Regions and Aut. Provinces.	2001	2003	2005
Piemonte ¹	121.0	128.9	117.2
Valle D'Aosta	81.2	116.5	117.2
Lombardia ²	71.9	74.8	79.8
P.A. Bolzano	95.4	96.2	96.0
P.A. Trento ³	49.8	29.1	48.7
Veneto	69.7	52.5	60.5
Friuli V. G.	104.7	87.0	91.3
Liguria ³	100.0	73.6	58.7
Emilia Romagna	96.7	91.5	103.2
Tuscany	93.7	79.1	104.0
Umbria ^{1,2}	100.0	97.3	98.8
Marche	100.0	113.4	96.6
Lazio	83.4	83.0	92.0
Abruzzo	103.5	76.0	33.2
Molise	n.d.	58.8	n.d.
Campania	156.2	97.7	91.1
Puglia	111.0	116.5	90.5
Basilicata	111.1	71.6	81.1
Calabria	n.d.	n.d.	n.d.
Sicily	96.3	8.,2	104.5
Sardinia	n.a.	n.a.	n.a.
ITALY (IT)	100.8	86.9	90.4

¹Regional figures; ²Index is adapted to regional bird species; ³ The importance of this figure is reduced due to limits in the survey
Source: processed by INEA using data from LIPU/Fauna Viva; Lombardy Regional Council; Umbria Regional Council; EUROSTAT

Most of the bird species in decline live in open environments such as meadows, grasslands, resting lands, extensive arable lands, as well as non-cultivated elements on farmlands such as hedges, rows, field scrub.

Many examples of endangered vascular plants are also associated with these environments, as was illustrated by the analyses carried out by ISPRA and presented in Table I.22 (above all see codes:

82.3 – Extensive cultivations and complex farming systems; 34.5 – Mediterranean xeric grasslands; 34.6 – Mediterranean tall grass steppes; 34.81- Mediterranean and sub-Mediterranean subnitrophilous grasslands).

Table I.22 – Habitats (CORINE Biotopes and Natura 2000) with the highest number of endangered vascular flora taxa.

Habitat	CORINE Biotopes Category	Natura 2000 Codes	No. endangered species
Mediterranean dry grasslands	34.5	6220	121
Mediterranean cliff communities	18.22	1240	96
Mediterranean calcareous cliffs	62.11	8210	76
Southern Italian calcareous cliffs	62.14	8210	51
Aquatic vegetation	22.4	Vari	31
Alpine and sub-Mediterranean calcareous cliffs	62.15	8210	31
Mediterranean tall-grass steppes	34.6	6220	30
Liguro-Appenine calcareous cliffs	62.13	8210	29
Cyrno-Sardian mountain cliffs	62.24	8220	26
Central and southern Appenine dry grasslands	34.74	6210	24
Mediterranean and sub-Mediterranean subnitrophilous grasslands	34.81	-	24
Fresh waters (lakes, swamps)	22.1	3110 - 3120 - 3130 - 3140 - 3150 - 3160	22
Rich fens	54.2	7230	22
Shifting dunes	16.21	2110	21
Western meso-Mediterranean calcicolous garrigues	32.4	-	21
Extensive cultivation and complex agricultural systems	82.3	-	20
Sea-lavender salt steppes	15.81	1510	18
Acidic fens	54.4	7110	18
Sand beaches	16.1	1210 p.p.	17
Purple moorgrass meadows	37.31	6410	17
Mediterranean siliceous grasslands	35.3	6220	16
Alpine pennycress screes	61.22	8120	16
Alpine calcschist screes	62.21	8220	16
Large Sedge communities	53.2	-	15

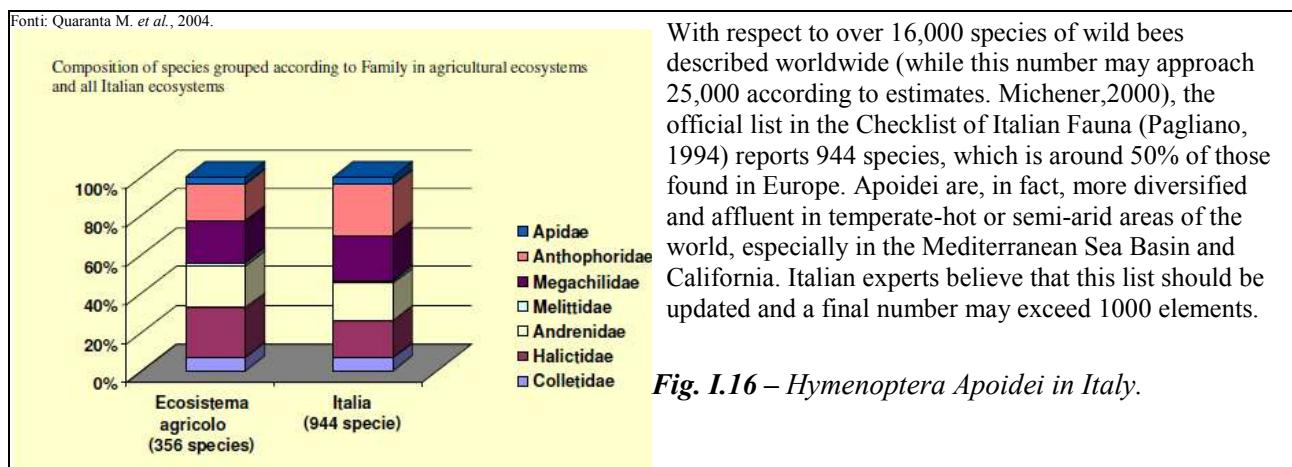
Source: ISPRA analyses.

This semi natural farmland is unique in harbouring numerous habitat types from Annex 1 of the Habitats Directive, ranging from hay meadows to wood pastures and heaths. Meadow-pasture lands and extensive pastures are located in mountain areas in the Alps and in the Apennines and in some other hilly areas in Southern Italy (Islands included), while the intensive rain-fed hay meadows is almost exclusively found in the Po Valley. Land use patterns changed over the past twenty years, with a gradual increase in the proportion of arable land, largely replacing meadows and pastures: the crisis of livestock farming, greater profitability of arable land and abandonment of marginal pastures seem to be the main causes of this change. The relative decrease is more relevant in the lowlands (on average the annual decrease is -2.5%), but in absolute terms the major decrease is in the mountains and hills (Piuissi, Pettenella, 2000).

An important indicator of the damaging effects on biodiversity from simplifying cultivation is provided by a group of Insects (Hymenoptera Apoidea), which are particularly affluent in Italy and the Mediterranean in generally, but which have cause much concern over the last few years. Hymenoptera Apoidea comprises a huge group of insects of great importance in terms of conserving ecosystems. During daily food gathering tasks they carry out cross-pollination by transferring pollen from male flower parts to female flower parts of the same plant species. This “transportation service” ensures reproduction in most existing flora – both cultivated and wild.

For some time now, researchers have noticed a general decline in the populations of these organisms in various countries, even local extinction of certain species, in various areas of the European Community and other regions worldwide. These organisms are mainly rather demanding and therefore vulnerable and are currently subjected to strong negative pressure from human activities such as progressive diminution of suitable areas and habitats for their life cycle, emission of harmful or lethal substances such as pesticides used in agriculture, simplification of cultivation

with consequent loss of trophic resources in crucial moments of a life cycle, environmental fragmentation. A specific international initiative (IPI – International Pollinators Initiative - UNEP/CBD/COP/VI/5) was therefore approved during the 6th COP of Member Countries of the Rio Convention to support actions with the purpose of increasing knowledge and adopting measures to protect pollinators (Fig.I.16).



Climatic changes

The trends in climate in progress and IPCC scenarios (*Intergovernmental Panel on Climate Change*) move the climatic and environmental climatic conditions typically found in the Mediterranean to the north, to higher latitudes. The speed with which the climate is currently changing is, however, much faster than the speed at which plant species are able to colonize new spaces. This may cause progressive “disintegration” of ecosystems, with consequent amendments to the landscape and profound implications above all with respect to agriculture, tourism, free time and building homes.

There are already clear signs that climatic warming is affecting terrestrial biological systems, causing changes such as bringing forward phenological spring-time events such as blooming, migration and egg-laying by birds, and moving various animal and plant species towards higher latitudes. Studies carried out in the Central Alps demonstrate progressive moving of high-quota plant species to even higher quotas, while observations made in the Central Apennines highlight a tendency for high-quota ecosystems to adapt to an increase in arid conditions. In these cases, the specific composition has changed by 10-20% over the last ten years, with an increase in the plant species more adapted to arid conditions and stress and a decrease in those more adapted to the availability of water, low temperatures and more snow.

All European programmes for monitoring forests have indicated that the vital stages in more important forest species is brought forward by 3 days on average every 10 years (sprouting leaves, blossoming and producing fruit). Over the last 50 years, all natural forest cycles have been moved forward by around 15 days, thereby causing severe damage to the equilibrium of plants, animals and the soil in our forests.

Italy is part of a European network that monitors changes to the climate based on phenology. Project GLORIA (*Global Observation Research Initiative in Alpine Environments*) aims to establish a worldwide research network to assess the potential threats from climate changes to biodiversity in high mountain areas. The State Forestry Department CLIMECO Programme (International Programme to study the effects of CLIMatic changes on mountain ECOsystems) jointly promoted with the French Office National de Forêts to establish a Franco-Italian network of permanent long-term monitoring of climatic changes on Alpine, Sub-Alpine and Central Apennine alpine plant communities (Petriccione, 2005).

Furthermore, Italy is also involved in Project BIOREFUGE for analyzing the potential effects from climatic changes on the distribution and affluence of tree-related species and for defining possible

future scenarios in order to develop strategies to conserve ecosystems, networks and ecological corridors.

Changes in CO₂ concentrations and nitrogen deposits

Monitoring of CO₂ concentrations in the atmosphere in Italy began relatively recently. The two longest historical series regard the Monte Cimone Station (1990-1999), which discovered an average annual concentration of CO₂ in the atmosphere of 360.5 ppm and with an upward trend between 1990 and 1996 of 4%, and that on Lampedusa (1992-2001), which discovered an average of 365.5 ppm and growth of 3% (Manes & Capogna, 2005).

Nitrogen oxide emissions from industrial activities, transportation, agriculture and cattle breeding are increasing in many countries, also causing the phenomenon known as “nitrogen saturation”, in other words disturbing the nutrient content and NO₃⁻ leaching in stream waters in many forest ecosystems, whose capacity to assimilate has been well-exceeded. Mapping of the critical load for nitrogen on Italian territory illustrates widespread sensitivity and a tendency towards eutrophication, which reaches more critical levels in Alpine areas. However, nitrogen emissions, like other forms of atmospheric pollution, are difficult to assess on a national level due to long-distance hauling. In fact, 70% of nitrogen oxides and 47% of ammonia emitted in Italy are transported beyond national borders, whereas 30% of nitrogen oxides and 12% of ammonia interacting with our environment come from other countries (EMEP Estimates 1997: Programme for Cooperation in Monitoring and Assessing Long-Distance Transmission of Atmospheric Pollutants in Europe).

Analyses on the health status of woods carried out via the State Forestry Department's CONECOFOR Programme (Programma Nazionale per il CONTROLLO degli ECOSISTEMI FORESTALI – national programme for controlling forest ecosystems) (Petriccione, 2005) highlighted that defoliation occurs more in broad-leafed trees than in conifers. The most damaged species of conifer under the age of 60 is the Scots Pine (*Pinus sylvestris*), while the older species undergoing the most damage is Silver Fir (*Abies alba*). As far as broad-leafed trees are concerned, the younger exemplars of Pubescent Oak (*Quercus pubescens*) and Chestnut (*Castanea sativa*) underwent the greatest level of defoliation, whereas the most damaged species of older tree was the Beech (*Fagus sylvatica*) (Manes & Capogna, 2005).

Alien species

Biologic invasions – introduction of alien or non-native species – is another severe and increasing threat to biological diversity in Italy. Presence of alien species may derive from three main mechanisms: direct importation, accidental arrival via vectors, and/or by natural spread from neighbouring regions where they were introduced. More in detail, pathways of introduction can be classified as: intentional release, accidental escape, introduction as a contaminant of moved commodities, movement via vectors, and arrival through natural spread from other areas where species have been introduced.

From the data collected in the Delivering Alien Invasive Species In Europe (DAISIE) project, funded by the 6th Framework Programme of the European Commission (Contract Number: SSPI-CT-2003-511202) with the involvement of ISPRA, Italy appears to be one of the European countries with the highest number of alien species. At least 1,600 species have established in Italy after 1500 (<http://www.europe-aliens.org/europeanSummary.do#>).

An updated synthesis of biologic invasions was presented at the Scientific Workshop: “La sfida delle invasioni biologiche: come rispondere?” (The challenge of biological invasions: how to combat these?) held in Siena, 11-12 September 2008

(<http://www.riservenaturali.provincia.siena.it/cantieribiodiversita/>). The information presented on this occasion demonstrated that 16 alien mammals have been introduced to continental Italy after 1500 (8 of which intentionally introduced), 6 in Sardinia and 3 in Sicily.

The scientific works presented on this occasion illustrated that biological invasions in Italy are increasing at an exponential rate in all taxonomic groups and environments, due to increasing movement of trade, tourism and travel correlated to economy globalisation.

Most terrestrial alien species established in Italy are native from the Palaeartic and Nearctic regions, while the most common area of origin of alien organism for the marine environment is the indo-pacific region. However, it should be noted that the proportion of alien terrestrial species arriving from the southern area of the world is rapidly increasing, and considering the effects of the climate changes, this may lead to increasing invasion patterns in the future.

Biological impacts caused by invasions are diverse and very severe. For example, the expanding American grey squirrel (*Sciurus carolinensis*) is threatening the native red squirrel (*S. vulgaris*) with extinction, and the recent arrival of the alien species to the Central Alps confirms the concrete risk of an invasion of neighbouring countries in the near future.

Invasive Alien Species (IAS) cause damage of an ecological nature (preying and competing with indigenous organisms, cross-breeding, altering trophic chains, energy flows and physical factors, introducing parasites and other pathogenic agents), economic nature and health nature, at times very severe, as is the case with the *Aedes albopictus* (tiger mosquito) or toxic algae in the ballast water of large freight ships (*Ostreopsis* spp. and *Alexandrium* spp.).

Alloctonous species and other impacts on human health

Change to the status of biodiversity associated with man-made global environmental changes and amplified by meteorological variability and instability may affect health through impaired availability of species for research and medical treatment and, indirectly, through complex interrelationship that can increase:

- the risk of infectious diseases due to changes in growth and distribution of vector and ecosystem breakdown facilitating biota contamination,
- the risk of allergic disorders and increase of allergic population through the introduction of alloctonous, invasive and genetically modified species;
- impairment of food safety and food chemical safety;
- impairment of availability of animal and vegetable species supporting local economies.

In most cases, it is not possible to show a linear cause-effect relationship between health effects and biodiversity loss/changes but biodiversity studies are useful to identify associated emerging environmental health risks.

In relation to biodiversity-related health risks in Italy, vector disease: since 1994 the imported *Aedes albopictus* ("Tiger mosquito") shows a persistent spreading pattern all over the national territory causing nuisance and self limited lesions in urban area population. In 2007 and 2008 *Aedes albopictus* was identified as the vector of viral outbreaks, respectively *Chikungunya* virus and West Nile Fever virus.

With regard to allergic species, the introduction of non-native and invasive *Ambrosia artemisiifolia* began in northern Italian Regions such as Lombardia and Piemonte and is now rapidly spreading to other large areas of the Country. It's a species with an high allergenic potential and, in view of the effects on health (respiratory and skin allergic reactions) many local authorities adopted ad hoc control regulations.

The upward trend in alloctonous plant species invading Italian territory is obvious if we consider that 674 alien species were recorded in a census of vascular plants taken in 1974 (Viegi, 1974), becoming 782 in 2005 (Conti *et al.*, 2005) and 1023 in 2008 (Fig. I.18), 524 of which were able to establish stable populations. The latter of these were subsequently divided into 362 naturalized species and 162 invasive species (Blasi *et al.*, 2008). Neophytes are plants that were imported to

Italy following the discovery of America that prevail over species that were introduced earlier (920 and 103 respectively) and America is also the geographical area of origin for almost 38% of alloctonous plant species (Celesti-Grapow *et al.*, 2009b). These figures confirm results from the Convention “Alloctonous Flora of Italy” (Blasi 2006, 2007), which led to establishment of the first databank on Italian alloctonous flora containing information on distribution, frequency and status of naturalization for each element in governmental and biogeographic regions and in the main land use categories in Italy, paying particular attention to the situation along the coast, on 47 small islands and arcipelaghi and in the five largest Italian cities (Turin, Milan, Rome, Naples and Palermo). Throughout this Project, the elements available regarding how such species were introduced into Italy and the background regarding how they spread throughout the territory (e.g. first sightings) and information on the general impact they have from social, economic, health and ecological viewpoints were gathered. More specifically, how the diffusion of alloctonous plant species among crop infesters and allergenic plants has considerably increased over the last few years. The most frequent impacts on ecology concern direct competition with natural vegetation, which may cause local or global extinction (e.g. in the case of indigenous species), or change the original environment by altering the land chemism and pH. Natural environments most subjected to the danger of uncontrolled diffusion of alloctonous plant species are inland wetlands, river areas – especially hygrophilous woods, and both sandy and rocky coastlands (Celesti-Grapow *et al.*, 2009a).

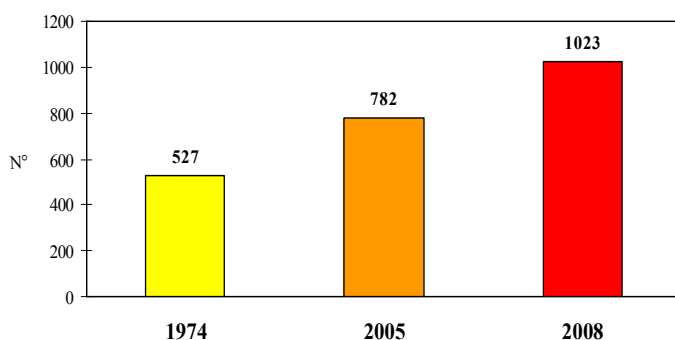


Fig. I.18 – Number of naturalized alien vascular plants found on Italian territory.

Source: Viegi, 1974; Conti *et al.*, 2005, Blasi *et al.*, 2008

There is currently no list of alloctonous animal species for Italy, although there are several partial collections of data regarding Arthropods of economic importance and Vertebrates. With regard to terrestrial fauna, solely taking into account Nematods, Gasteropods, Molluscs, Arthropods and Vertebrates, an approximate estimate – probably by defect – may be made of around 450 species introduced into Italy voluntarily or accidentally.

The freshwater alien species reported in Italy amounts to 29 (Zerunian, 2002), whereas alloctonous marine animal species as at October 2002 was estimated as 79 species of Invertebrates and 18 of Fish (Occhipinti, 2007). The Ministry of the Environment, Land and Sea renewed the convention for creating a databank of alien species identified in Italian seas with ICRAM in 2004 (<http://www.tutelamare.it/cocoon/sa/app/it/index.html>).

The main vectors for introducing non-indigenous species into aquatic environments include aquaculture (Naylor *et al.* 2001, Streftaris *et al.* 2005). The number of alloctonous species used for aquaculture or deliberately introduced for the purposes of repopulation in Italy is 117, 50 of which were introduced involuntarily as associated species and 9 of undefined origin (IMPASSE, 2008). Over 36% of overall Italian production derives from breeding non-indigenous species (ICRAM/API 2006).

Other species such as Pacific oysters (*Crassostrea gigas*), the red seabream (*Pagrus major*), Senegalise sole (*Solea senegalensis*) are minor productions or were introduced for experimentation (bastard halibut, *Paralichthys olivaceus*) or accidentally, as occurred with tilapia (*Oreochromis*

niloticus niloticus), an invasive species discovered in Lago di Lesina where it is presumed it became acclimatized due to the presence of freshwater springs with a constant temperature (Scordella *et al.*, 2003). Non-indigenous species of particular economic importance include *Tapes philippinarum*, which has a considerable ability to adapt and tends to replace populations of indigenous species such as *Cerastoderma glaucum* and *Tapes decussatus* (Occhipinti-Ambrogi 2000) (Fig. I.26). An important vector in interterritorial waters are seeds and repopulation of alien species (wells catfish, *Silurus glanis*; largemouth bass *Micropterus salmoides*; pumpkinseed *Lepomis gibbosus*) for recreational fishing.

Table I.26 – Production rates in aquaculture in Italy in 2006 and trend 2005-2006.

Non-indigenous species (1)	Production 2006 (tons)	Production 2006 (%)	Trend 2005-2006 (%)
Manila clams (<i>Tapes philippinarum</i>) (2)	45,000	18.6	12,5
Rainbow trout (<i>Oncorhynchus mykiss</i>) (2)	40,200	16.6	1,8
European sea sturgeon (<i>Acipenser transmontanus A. baerii</i> and hybrids <i>spp.</i>) (2)	1,300	0.5	8,3
Carp (<i>Cyprinus carpio</i>) (2)	700	0.3	7,7
Catfish (<i>Ictalurus punctatus</i>) (3)	600	0.2	-14.3

(1) Sentence from the Constitutional Court 30 Year 2009; (2) species pursuant to Section 2 of Regulation (EC) 708/2007 (Annex IV), amending Regulation (EC) 506/2008, for which Reg. 708/2007 does not apply. (3) Species not included Annex IV and subsequent amendments.

Agriculture and forestry

A controversial role in affecting nature is played by activities linked to agriculture. On the one hand, agricultural lands are negatively affected by other activities and production areas, as they are often subjected to town planning matters, illegal waste dumping and pollution from industry. On the other hand, uncontrolled agricultural activities are often quoted as one of the main causes of water pollution, loss of stability and pollution on land, increasing the greenhouse effect and simplifying the landscape.

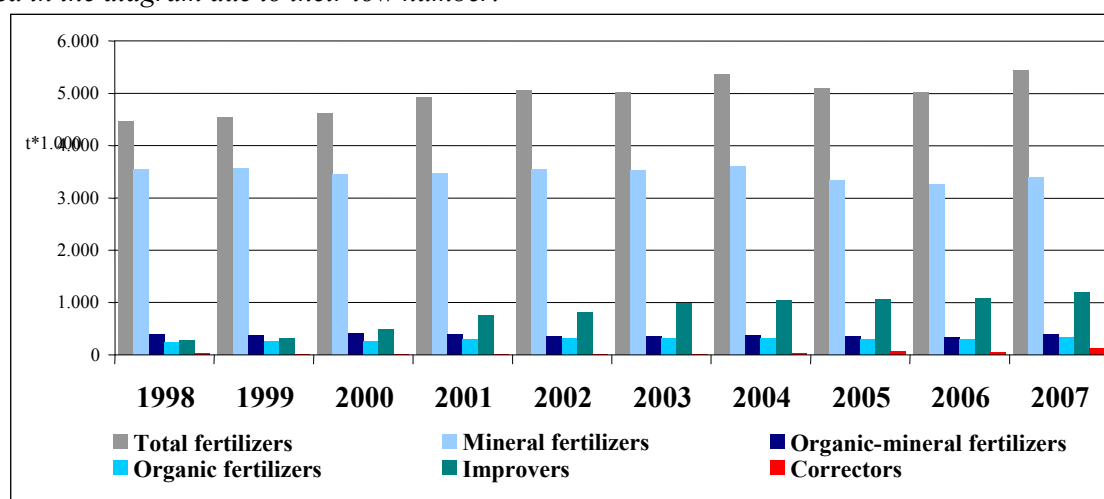
Agriculture has led to structural simplification of natural ecosystems, causing the creation of homogenous farming landscapes, loss of habitats, disappearance of wild species and genetic erosion of many valuable species.

The main threats to biodiversity linked to agricultural habitats may be attributed to two distinct phenomena: intensifying agriculture or continuing intensive agriculture; abandoning of rural areas due to the limited economic benefit deriving from their use, especially in underprivileged areas and protected areas included in the Natura 2000 Network.

The level of biodiversity in agricultural ecosystems depends on various factors, such as variety in vegetation inside and around the system, the duration of various crops, the intensity in management and the level of isolation of cultivated areas from wild vegetation.

The data and information available demonstrate that the main impact on the environment that may be directly associated with agriculture derive from use of fertilizers and similar products (ISPRA Yearbook, currently being printed). Consequent pollution and deterioration of land and surface and underground waters may affect the health of mankind, as well as flora, fauna and ecosystems. Following a slow but progressive decrease in the number of fertilizers marketed in Italy, which began in the Seventies, this trend inverted between 1998 and 2007, causing an increase of 22.1% (ISTAT Figures, 2007) (Fig. I.19). Above all in 2007, the figure in Italy exceeded 5.4 million tons, over 3 million of which were mineral fertilizers and the most popular was nitrogen-based.

Fig. I.19 – Fertilizers distributed according to type (1998-2007). The following types of fertilizers were also found as of 2006: a) cultivation groundlayers; b) products for specific action, however such types are not included in the diagram due to their low number.



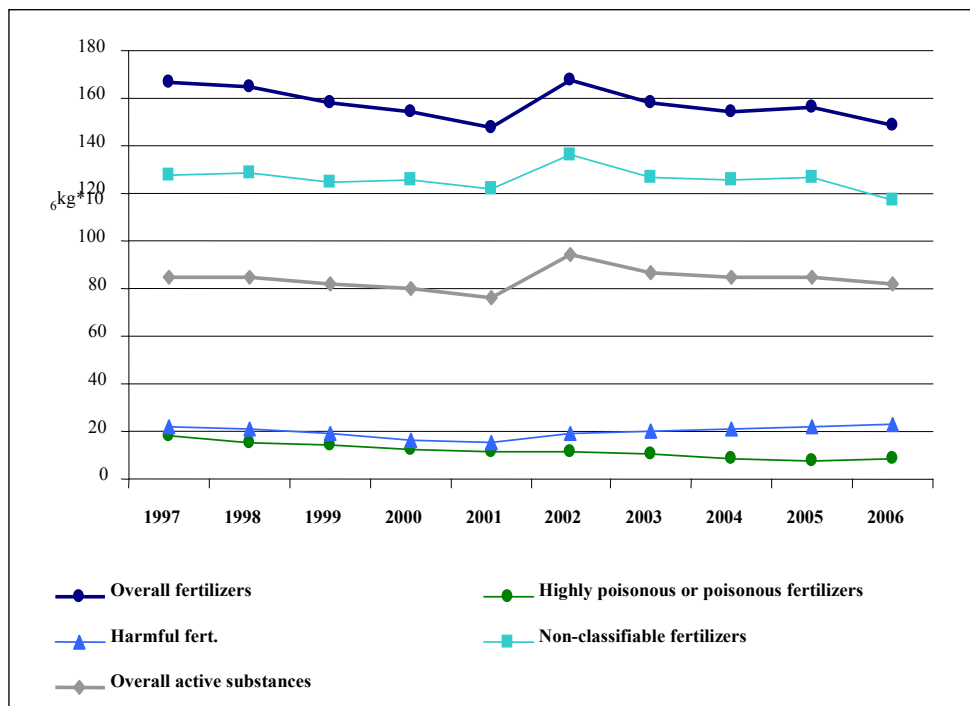
Source: ISTAT

It is worth remembering that agriculture plays an undisputed role via related activities to protect and maintain agricultural ecosystems, territories and landscapes. Agriculture in fact ensures consolidated and structured landscapes that maintain themselves and avoid degradation. The role that agriculture plays in the CO₂ cycle and that played by sustainable agriculture in the fight against land erosion and degradation are also undisputed.

Eco-compatible agriculture activities also help keep the eco-system-based balance between guests, pathogens and predators of such.

Marketing **fertilizers** between 1997 and 2006 decreased by 10.8% (Fig. I.20). Around 149,000 tons were marketed in 2006, with a reduction of over 7,000 tons with respect to 2005 – 78.8% were “non-classifiable” products and the remaining 21.2% included highly poisonous, poisonous and harmful, which are subjected to special restrictions in terms of selling and conservation as they are more harmful from toxicological, eco-toxicological and physical and chemical viewpoints. With respect to 2005, a worrying rise in the number of highly poisonous and poisonous (over 1,100 tons) and harmful fertilizers (around 1,300 tons) can be noted. The number of biological products used as an alternative to chemical products decreased for the first time beginning in 1999 (from 425 tons in 2005 to 344 tons).

Fig. I.20 – Overall active substances, overall fertilizers and divided according to type distributed 1997-2006.



Source: ISTAT.

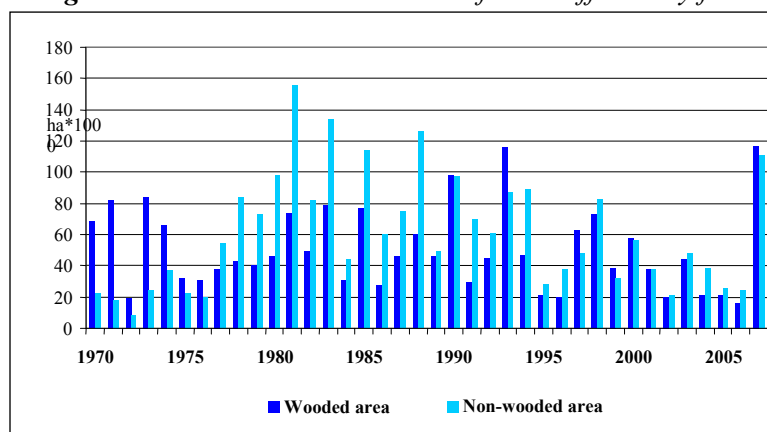
With regard to forestry, the main threats to forest habitats are: abandonment of active management and ecologically non-compatible management; forest fires and other types of damage (weather-related and biotic).

With respect to forestry, **extracting wood and non-wood products** is a particular factor of pressure on forest ecosystems. Expansion in forest lands and reduction in extraction of elements from forests (ratio between wood removed and forest land areas, thereby causing an inverted trend between 2000 (the year in which it reached 1.7 m³/ha) and 2005 (with extraction of 1.2 m³/ha). This reduction especially involved wood used for work purposes (-40% with respect to 2000 –ISTAT figures, 2006) and much less wood used as fuel, which is still over 60% of overall wood production. There was a reduction in extraction of some non-wood forest products in 2006 with respect to 2000 (ISTAT, 2007).

Fires

The expansion in forest areas underway in Italy is negatively countered by the phenomenon of forest fires, in relation to which a particularly critical period in the mid-Eighties should be observed, following which the level has remained high on the whole, with progressive decline until 2006 (Fig. I.21). A renewed outbreak occurred in 2007, with over 10,600 events involving over 227,000 hectares, almost 117,000 of which were true forests (CFS, 2007).

Fig. I.21 – Wooded and non-wooded forests affected by fire.

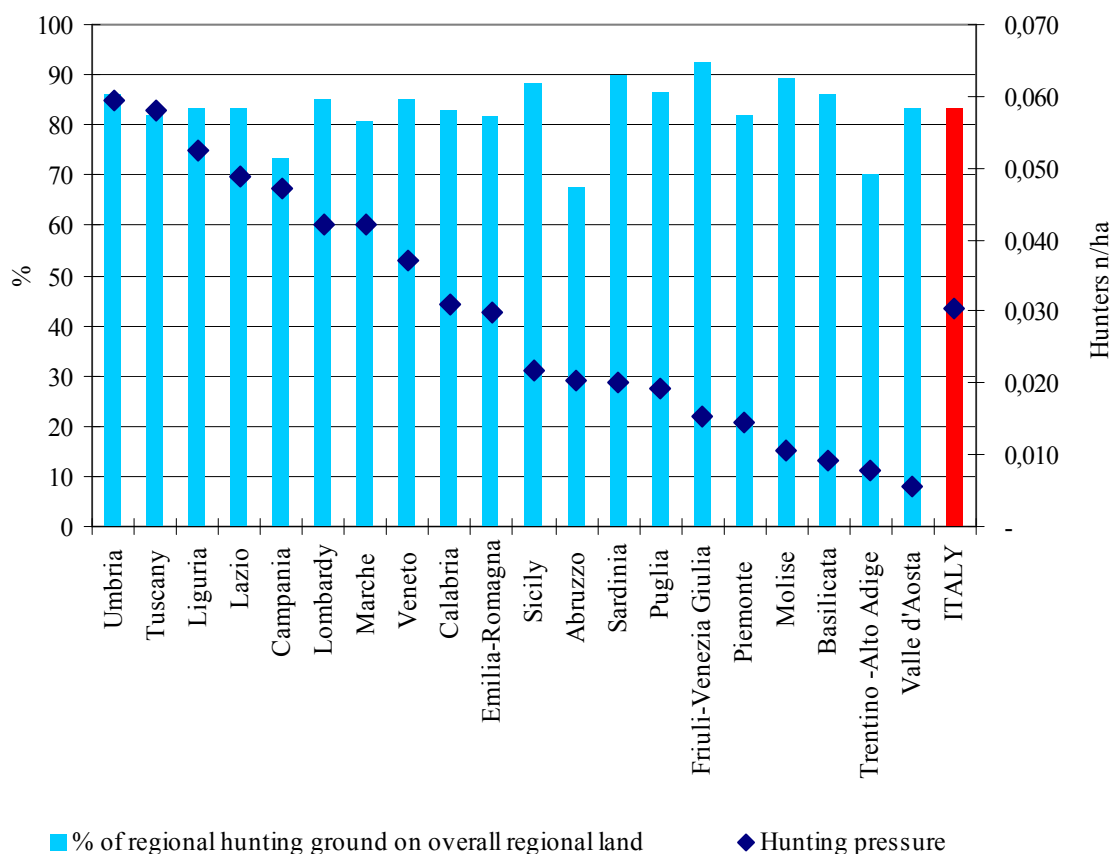


Source: State Forestry Department–archivio Servizio AIB.

Hunting

One of the main causes of effects is linked to **hunting pressure**, in relation to which it must be noted that it may be practised on over 83% of Italian territory. Hunting pressure expressed in terms of the number of hunters per hectare of land on which hunting is allowed is not the same throughout the country: in some regions, such as Umbria and Tuscany, it is considerably higher than in others (Fig. I.22).

Fig. I.22 – Hunting pressure per hunting land

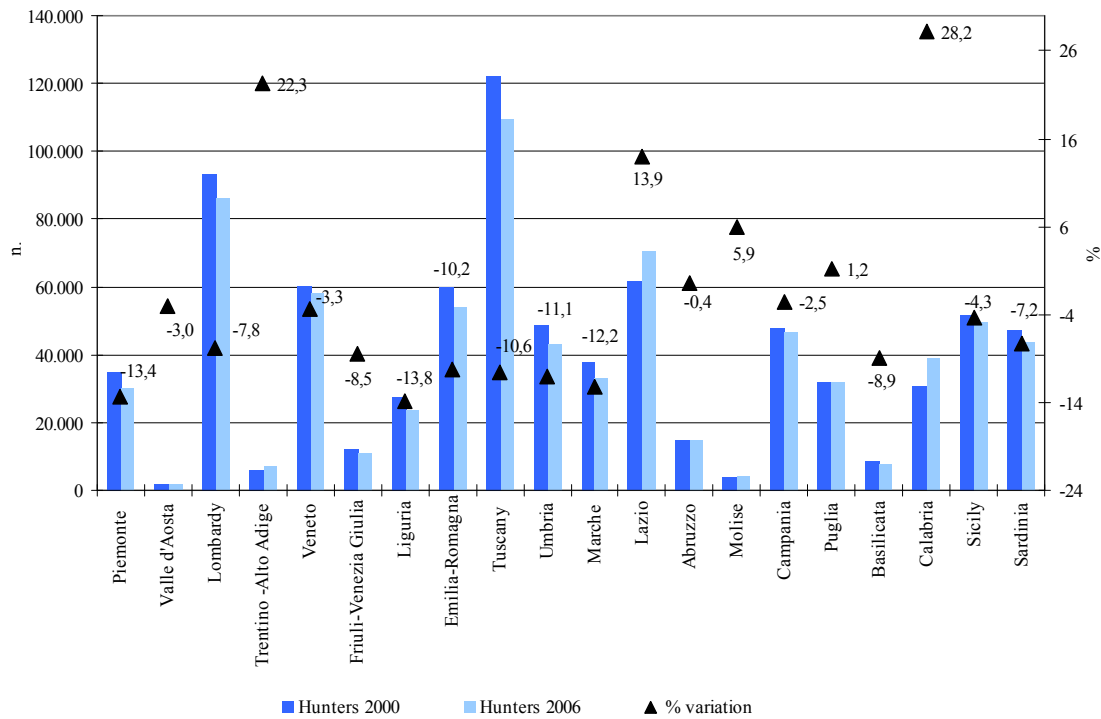


Source: Processed by ISPRA using ISTAT figures, 2006. Statistics on hunting; MATT, 2003. Elenco Ufficiale Aree Protette (EUAP – official list of protected areas), 5th update.

Under the hypothesis that the number of hunters is a primary factor in hunting pressure on a territory, it must be noted that this pressure decreased between 2000 and 2006, due to a reduction of

4.5 percent in the number of hunters at the national level. This was due to a reduction at the regional level (the number of hunters decreased in fifteen out of twenty regions) and an increase – at times considerable – in the remaining regions, as occurred in Calabria (+28.2%) and Trentino Alto Adige (+22.3%) (Fig. I.23).

Fig. I.23 – Trend in the number of hunters by region (2000-2006)



Source: ISTAT, Statistics on hunting.

Aquaculture

There are many types of interaction between aquaculture and the environment and the potential impacts of aquaculture on biodiversity (IUCN, 2007), *inter alia*: a) use of alien species (see paragraph entitled “alien species”) and/or strains of different geographic origin; b) leaks from plants; c) extraction of young elements from wild stocks d) diffusion of pathogens; e) eutrophication of waters and impact on sediments; f) release of chemotherapies.

Significant effects in breeding indigenous species (European sea bass *Dicentrarchus labrax* and Gilt-head bream *Sparus aurata*) may derive from the use of Atlantic strains in view of a high level of genetic structuring among wild populations (Allegrucci *et al.*, 1997; De Innocentiis *et al.*, 2004, 2005).

The impact from leaks in plants, especially important in the case of fish breeding in floating cages (Youngson *et al.*, 2001) may affect local co-specific populations from both the ecological and genetic viewpoints (McGinnity *et al.*, 2003). Taking into consideration the fact that over 90% of Mediterranean aquaculture productions derives from breeding in floating cages (EFSA, 2008) and that an average of 3-5 leaks a year are reported in Italy alone, with consequent involuntary release of hundreds of thousands of individuals into the natural environment (ISPRA, 2008), the long-term consequences on wild populations may have considerable effects (GenImpact, 2007. www.genimpact.imr.no).

Removing young wild individuals for the purposes of aquaculture is traditionally carried out in Italy for extensive aquaculture and “lagoon fish breeding” and for tuna breeding. In the first case, populations of gilt-head sea bream, sea bass and mullet fish (Cataudella & Bronzi, 2001) underwent a downward trend (from 25,000,000 in 1994 to 5,000,000/year over the last 3 years in Venice lagoon) (Granzotto *et al.* 2001, Silvestri *et al.* 2007); on the contrary, extraction of tuna has

increased over the last few years (although it is subject to International Commission for the Conservation of Atlantic Tuna regulations) in relation to the increasing interest from the market in this species.

Impacts deriving from the spread of pathogens between breeding species and wild species and release of chemotherapies in aquaculture are known little whereas, according to results from European Project ECASA (2008), releasing organic material from off-shore seawater cultivation does not seem to have a significant effect on the trophic status of waters and very little impact on the sediments surrounding breeding cages (Porrello *et al.*, 2005; Tomassetti *et al.*, 2009).

I.C.3 MAIN THREAT FACTORS: MARINE HABITATS AND SPECIES

Italian coastlands are characterized by strong man-made presence, as are the seas. The marine ecosystem is generally subjected to several direct and indirect threats from various activities that affect biodiversity, at times in a dramatic and irreversible manner (Bianchi & Morri, 2000): a) chemical pollution (from both coast and other settlements or from both industrial and tourist maritime traffic), acoustic pollution (caused by maritime traffic, building of industrial works, and/or drilling for mining purposes) and biological pollution (invasive alloctonous species), b) erosion of the coastline, c) destruction of habitats (due to dredging, laying marine cables or ducts, building of platforms of various natures, trawling, ghost nets, etc.), d) temporary change to habitats (waste water from heating systems and regassifiers), e) reduction in resources (professional and recreational fishing, erosion of coastline, etc.); f) direct mortality (accidental capture in fishing operations and collisions); g) changes to the climate and eutrophication.

These numerous sources of impacts may have multiple effects on biodiversity and at the level of individual species, populations, communities and ecosystems. Both marine flora and fauna *taxa* are affected (vertebrates and invertebrates) (Tunesi *et al.*, 2006). Examples of studies on the amounts involved are provided below, which highlighted the negative impacts of human action on Italian marine biodiversity.

Over-exploitation, destruction of habitats and competition with invasive species at the level of individual species has in many cases led to progressive decline of populations and in some cases even extinction. A clear example of this is provided by the progressive depletion (see FAO statistics) of stocks in many fish species of high market value (tuna, swordfish, groupers, etc.) and species captured accidentally (numerous elasmobranchii, turtles) by fishing equipment that is not over-selective. There are definite figures regarding the reduction in the number of elasmobranchii species and their affluence for the Atlantic, at least between the end of the Fifties and the end of the Nineties (Jukic-Peladic *et al.*, 2001). However there is no recent information on trends, although a number of studies on capture rates for elasmobranchii in some fishing systems are alarming (Ferretti *et al.*, 2008; Fortuna *et al.*, 2008; MEDITS figures and GRUND figures). Similar figures are provided for the rate of accidental capture of turtles in fishing equipment (Casale *et al.*, 2001; Fortuna *et al.*, 2008).

The species affected by a combination of the threats listed above includes *Posidonia oceanica*, indigenous species and creator of a habitat that is ecologically of primary importance, the grassland of which has become increasingly rare over the last few years in many of its usual habitats.

Migration from the Red Sea via the Suez Canal has brought almost 400 alloctonous species of macrophytes, crustaceans, molluscs and fish to the Mediterranean in just over one hundred years (Zenetos *et al.*, 2006). This invasion – amplified by introduction of often invasive species through loading and unloading the bilge on merchant ships and which developed in a very short time – also affects Italy.

Wide-scale climatic changes and changes made by Man to the physical environment have often had obvious repercussions, not only at the level of individual species, but on entire communities and eco-systems. The expansion of many thermophile species in central and northern Mediterranean areas was also favoured by progressive increase in the average water temperature over the last 20 years (Francour *et al.*, 1994). Extensive experimental evidence of this colonization by thermophile

species towards the north has been gathered in Mar Ligure (Bianchi & Morri, 1994). Due to the complex relations linking the different organisms in marine ecosystems (interaction between prey and predator, trophic chains, competing species), fluctuations in populating an individual species may have strong repercussions on many others.

Collisions caused by maritime traffic are a real problem for all the taxa that spend large parts of their lives near the surface of the sea in Italian waters too. In some cases, this impact has been quantified and illustrate an upward trend, with the number of cases doubling between the Seventies and Nineties (Panigada *et al.*, 2006).

It has been observed in Italy too that pollution from aromatic polyhalogenated hydrocarbons, TBT and POP (for example, Fossi *et al.*, 2001) alters the reproduction system of both molluscs (Terlizzi *et al.*, 2004) and predator vertebrates such as the swordfish (*Xiphias gladius* L.) (De Metrio *et al.*, 2003).

Monitoring and mitigating direct mortality caused by man (e.g. accidental capture during fishing operations and collisions with sea craft) are a priority of CBD, the Habitat Directive and Regulation (EC) 812/2004. However, no systematic monitoring is currently carried out on a national scale in Italy that can be used to assess the effects of threats to biodiversity at any level: species, population, community, ecosystem. This situation is the biggest threat to Italian marine biodiversity and has already taken some tax to the brink of extinction (Bianchi & Morri, 2000; Ferretti *et al.*, 2008).

CHAPTER II – CURRENT STATUS OF NATIONAL STRATEGY AND PLANS OF ACTION FOR BIODIVERSITY (NBSAP)

SOCIAL AND ADMINISTRATIVE FRAMEWORK

From a viewpoint of social structure, Italy has developed in a similar way to most European countries over the last few decades. There is in fact a stable situation in terms of demographic framework with few variations, usually due to an increase in immigrants and a constant tendency of population to age.

With a population of 59.6 million inhabitants and population density of 198 inhabitants per square kilometre, Italy is among the most densely populated countries in Europe. In recent years, Italy have experienced successive immigration waves especially from North Africa, Eastern Europe, Central-West Africa, Eastern Asia, and South America.

Over 70% of the population live in metropolitan and urban areas located in the plain and coastal areas. There are several high-density areas spread throughout the country: in the North-East (Venice, Padua, Verona), North-West (Turin, Milan), Centre (Tuscany: Florence, Pisa, Livorno; Rome; gulf of Naples), and North-Western Sicily. The consequence of man-made pressure with respect to the territory's environmental values in these areas is that ecosystems related to the plains and coastland are made banal and increasingly artificial, with unavailability of space and resources for wild animal and plant communities typical to these places. The tendency for the rural population to decrease and relative problems – not only of a social and economic, but also an environmental, nature - to increase due to the declining role of man in safeguarding a territory remains constant (hydrogeological instability, fires, abandoning of cultivations in less favourable areas, uncontrolled settlement of forest vegetation on former agricultural lands and pastures).

With regard to administrative organization, Italy is undergoing a period of reforms, which began in the first half of the Nineties and are leading to gradual transfer of roles and competences from the State to local government (Regions and Provinces). According to that established in Section 131 of the Constitution, there are twenty regions. Five of these have a special charter of independence and one of these (Trentino-Alto Adige/Südtirol) also comprises the only autonomous provinces in Italy, which have similar legislative powers to regions (Trento and Bolzano).

Constitutional Law 3 dated 18 October 2001 (Amendment to Section V of Part Two of the Constitution), otherwise known as the law on federalism, has amended the section of the Constitution regarding relations between State and regions, making Regions responsible for a number of fundamental competences that previously belonged to the State and keeping the State responsible for “exclusive legislation on topics of national or international importance”. This includes “Protecting the environment, ecosystem and fine arts (letter s, paragraph II, Section 117 of the Constitution).

Law 349 dated 8 July 1986 established a Ministry of the Environment (nowadays Ministry of the Environment, Land and Sea), which is responsible for ensuring promotion, conservation and recovery of environmental conditions in compliance with the fundamental interests of the general public and the quality of life, as well as the conservation and valorisation of national natural heritage and defence of natural resources from pollution.

Decree by the President of the Republic 261 dated 17 June 2003 regulating organization of the Ministry of the Environment also makes the General Administrative Office for the Protection of Nature responsible for identifying, conserving and valorising protected natural areas, as well as knowledge, monitoring and safeguarding of terrestrial and marine biodiversity.

Law 133/2008 established ISPRA – the Institute supervised by MATTM – to carry out technical and scientific tasks and activities of national interest to protect the environment.

FROM THE EUROPEAN ACTION PLAN TO NATIONAL BIODIVERSITY STRATEGY

The lack of a national strategy for biodiversity in Italy has not hindered implementation of the undertakings made with both approval of the CBD and other international Conventions and Agreements (Chap. III) despite the need to “institutionalize” coordination among the various sector policies and various levels of action throughout the territory in relation to the transversal nature of Biodiversity.

In order to summarize ongoing initiatives and actions concerning biodiversity in as organic a way as possible, the European Action Plan (see objectives in Table 2.1) has been divided and the information provided in this Chapter has been connected to that in Chapter I and Chapter III.

European Union COM(2006)216, “Halting biodiversity loss by 2010 — and beyond. Support ecosystem services for human wellbeing” (http://EC.europa.eu/environment/nature/biodiversity/comm2006/index_en.htm) testifies the importance of an inter-sector Community policy for Biodiversity based on awareness of the goods and services it offers for human wellbeing and survival of life on Earth; it also affirms the leading role that Europe intends to take at the international level to strengthen implementation of the Convention on Biological Diversity. The final section of this Communication focuses on illustrating the Action Plan for Biodiversity, which directly involves the Institutions of the European Community and individual Countries, specifying the role of both levels in relation to each action involved.

This Communication was accompanied by three documents: the Action Plan comprising strategic objectives, operational objectives and actions, an Overview of the indicators to adopt to assess fulfilment of the objectives and Assessment of the Impact of the Communication comprising six sessions.

The Action Plan identifies 4 strategic areas, 10 priority objectives and 47 operational objectives set out in 157 concrete actions.

Table II.1 – European Action Plan Overview

Policy Area 1: Biodiversity and the EU
OB. A1: To safeguard the EU’s most important habitats and species.
OB. A2: To conserve and restore biodiversity and ecosystem services in the wider EU countryside.
OB. A3: To conserve and restore biodiversity and ecosystem services in the wider EU marine environment.
OB. A4: To reinforce compatibility of regional and land development with biodiversity in the EU.
OB. A5: To substantially reduce the impact on EU biodiversity of invasive alien species (IAS) and alien genotypes.
Policy Area 2: The EU and global Biodiversity
OB. A6: To substantially strengthen effectiveness of international governance for biodiversity and ecosystem services.
OB. A7: To substantially strengthen support for biodiversity and ecosystem services in EU external assistance.
OB. A8: To substantially reduce the impact of international trade on global biodiversity and ecosystem services.
Policy Area 3: Biodiversity and climate change
OB. A9: To support biodiversity adaptation to climate change.
Policy Area 4: The knowledge base
OB. A10: To substantially strengthen the knowledge base for conservation and sustainable use of biodiversity in the EU and globally.

The Action Plan also involves regular monitoring and assessment of progress in fulfilling the objectives.

The first assessment relates to 2006-2007 and focuses on the actions promoted at the European level. The European Commission analyzed implementation of the Action Plan up to December 2008 through COM(2008)864 “Medium-term assessment of implementation of the European Action Plan”

(http://EC.europa.eu/environment/nature/biodiversity/comm2006/pdf/bap_2008_it.pdf).

The results from this analysis suggest that much effort is still required to achieve the set objectives and that the Action Plan is the indispensable backbone of the process for guaranteeing conservation of biodiversity in Europe.

At the end of 2013, all the assessments made shall become an overall assessment of the 6th Action Plan for the Environment and a review of the European policies and results in this area for the period 2007-2013.

Strategic Area A –Biodiversity in Italy

II.A.1 STRATEGIC OBJECTIVE 1: TO SAFEGUARD THE EU’S MOST IMPORTANT HABITATS AND SPECIES

Headline target: biodiversity loss of most important habitats and species halted by 2010, these habitats and species showing substantial recovery by 2013

Conserving biological diversity *in situ* (Sect. 8 of the CBD) from the level of species and communities (habitats) to that of ecosystems (landscape) is one of the main objectives Italy has identified for the purposes of achieving Target 2010.

This objective substantially includes both actions directly involving action on habitats or species considered as particularly endangered at the national level and diffused actions involving management of protected areas of national and local importance (Natura 2000 Network , Ramsar sites, ASPIM areas). General information regarding the number of protected areas in Italy is provided below; this section of the report is completed with that illustrated in **Annex III** regarding progress in the work plan for the CBD on protected areas.

Protected areas

A *Framework Law on protected areas* (Law 394/91) and the *Law for protecting the sea* (Law 979/82) and subsequent amendments and integrations respectively comprise the main regulatory principles for terrestrial and marine protected areas in Italy.

According to the 5th Update of the Official List of Protected Areas (OLPA), 772 protected areas were established in Italy in 2003, covering 2,911,582 hectares of terrestrial land surface and 2,820,673 hectares at sea, corresponding to 9.66% of the national territory.

Table II.2 – Extension of overall land areas relating to individual categories of protected areas

Protected Areas	No.	Land Area (km ²)	Sea Area (km ²)	% of Prot. Areas at Nat'l level	% national area (land)
National Parks	22 (+2) [*]	14,105.51 [*]	718.12	25.56 [*]	4.68 [*]
Marine Protected Areas ^{**}	20 ^{**}	0.00	1,900.82 ^{**}	3.28 ^{**}	0,00 ^{**}
State Natural Reserves	146	1,227.53	0.00	2.12	0,41
Other Nat. Prot. Areas	3	0.00	25,574.77	44.09	0,00
Regional Natural Park	105	11,51.11	0.00	20.26	3.90
Regional Natural Reserves	335	2,142.21	12.84	3.72	0.71
Other regional Nat. Prot. Areas	141	572.49	0.18	0.99	0.19
Total	772[*]	29,798.85[*]	28,206.73	100.00	9.89[*]

^{*} 2 national parks were recently established, however the overall land area of one of the two is not available.

^{**} In addition to the above PMA's, 2 hidden archaeological Parks and the Pelagos Sanctuary should be added.

Information up until 2009 that can be found in the 6th Update ULPA under completion illustrates an increase of around 90 protected areas for a total of around 3,100,000 land hectares and around 2,830,800 sea hectares, with 658 kilometres of coastland protected and a percentage with respect to national territory of 10.60. This percentage is expected to further increase as procedures for establishing 5 National Parks (4 of which in Sicily) and 5 Marine Protected Areas are currently underway.

In relation to Marine Protected Areas, regulatory forecasts have identified 52 areas of retrieval, whose protection through establishing Marine Protected Areas is considered a priority: provisions regarding protection have already been implemented in 28 of these Areas involving 23 marine reserves, 2 national parks extending into the sea, 2 undersea archaeological parks and the large international Sanctuary to safeguard marine mammals.

This amounts to over 270,000 hectares of protected waters and seabed, in other words over 12% of coastland, without counting the 2,500,000 hectares of national waters in the Sanctuary.

In addition to the protected areas included in the ULPA pursuant to Law 394/91, there are numerous other areas subjected to special protection, which - according to Marchetti et al. 2005 – are around 400 and cover around 430,000 hectares of national territory.

A databank of protected areas in Italy can be seen at www.parks.it.

Natura 2000 Network

According to the principle of subsidiarity, Regions and Independent Provinces are responsible for identifying and managing sites belonging to the Natura 2000 Network in Italy.

In relation to applying Directive 43/92/CEE “Habitats”, 2,284 Sites of Community Importance (SCI) and 591 Special Protection Areas (SPA) have been identified in Italy; 316 SCI coincide with SPA and therefore the overall number of areas in Natura 2000 Network are 2,559 and protect a land area of 61,891 km² (20.5% national land area).

The European Commission has adopted SCI lists according to bio-geographical region. There are three bio-geographical regions in Italy and initial site lists have been adopted for all three further to a decision from the Commission, for which relative updates shall follow:

- Alpine bio-geographical region (Decision 2004/69/EC dated 22 December 2003);
- Continental bio-geographical region (Decision 2004/798/EC dated 7 December 2004);
- Mediterranean bio-geographical region (Decision 2006/613/EC dated 14 July 2006).

According to the Habitat Directive, Special Areas of Conservation (SAC) shall be identified and the relative measures for conservation defined 6 years following selection of Sites of European Importance (SCI) by the European Commission.

With regard to the situation in Italy, SAC’s in the Alpine Region shall be designated by 2009, those in the Continental Region by 2010 and those in the Mediterranean Region by 2012. the European Action Plan also establishes 2010 as the deadline for implementing conservation measures in all terrestrial SAC’s and 2012 for marine SAC’s.

Commencing from issue of MD dated 3 September 2002, Official Journal 224 dated 24 September 2002 “Guidelines for managing Natura 2000 sites”, identification of measures for conserving and/or preparation of plans to manage Natura 2000 sites for SCI’s commenced in Italy, also thanks to the opportunities offered by European Plan 2000-2006. The table below provides a summary of the level of implementation in each region.

Table II.3 – SCI and SPA per Region and Autonomous Province

REGION	SPA			SCI			Nature 2000***		
	sites	area (ha)	% area /Region	sites	area (ha)	% area/Region	sites	area (ha)	% area/Region
** Abruzzo	5	307,921	28.5	53	252,587	23.4	57	387,076	35.9
Basilicata	14	156,282	15.6	47	55,462	5.6	50	164,774	16.5
Bolzano	17	142,513	19.3	40	149,819	20.3	40	149,819	20.3
Calabria	6	262,256	17.4	179	85,454	5.7	185	319,392	21.2
Campania	28	215,763	15.9	106	363,215	26.7	120	395,537	29.1
Emilia-Romagna	75	175,919	8	127	223,757	10.1	146	256,863	11.6
Friuli Venezia Giulia	8	116,450	14.8	56	132,170	16.8	60	149,733	19.1
** Lazio	39	408,187	23.7	182	143,107	8.3	200	441,630	25.7
Liguria	7	19,615	3.6	125	145,428	26.9	132	147,354	27.2
Lombardy	66	297,337	12.5	193	224,201	9.4	241	372,067	15.6
** Marche	29	131,013	13.5	80	102,608	10.6	102	146,213	15.1
** Molise	12	66,019	14.9	85	97,750	22	88	118,724	26.8
* Piemonte	50	307,880	12.1	122	282,345	11.1	141	396,837	15.6
Puglia	10	263,666	13.6	77	465,518	24.1	83	474,597	24.5
Sardinia	37	296,217	12.3	92	426,251	17.7	121	529,838	22
Sicily	29	387,158	15.1	217	384,065	14.9	232	568,736	22.1
Tuscany	61	192,072	8.4	123	286,839	12.5	143	362,725	15.8
Trento	19	127,133	20.5	152	151,627	24.4	156	173,411	28
Umbria	7	47,093	5.6	98	109,667	13	104	120,200	14.2
* Valle d'Aosta	5	86,315	26.5	28	71,619	22	30	98,933	30.3
Veneto	67	359,822	19.5	102	369,640	20.1	128	414,679	22.5
TOTAL	591	4,366,630	14.5	2284	4,523,129	15	2559	6,189,137	20.5

* As site IT1201000 is partly in Piemonte and partly in Valle d'Aosta, the land area was calculated by attributing each Region with the amount of the site effectively located on its territory.

** As site IT7110128 is located in Abruzzo, Lazio and Marche and site IT7120132 is located in Abruzzo, Lazio and Molise, the land area was calculated by attributing each Region with the amount of the site effectively located on its territory.

*** Number and extension of Natura 2000 sites per Region was calculated excluding overlaying of SPA's and SCI's.

Source: Report section 17 MATTM – July 2008

Table II.4 – Share of SPA's and SCI's according to bio-geographical region

Bio-geographical Region	SPA	SPA sur. area (ha)	SCI	SCI sur. area (ha)
Alpine	121	1435579	458	1290998
Continental	235	602069	560	731978
Mediterranean	238	2336921	1266	2488346

Decree by the Ministry of the Environment, Land and Sea dated 17 October 2007 identified the procedure for designating SAC's in Italy; according to Section 2, MATTM Decrees adopted in agreement with Regional and Autonomous Provincial Councils shall designate SAC's and identify the conservation measures required to maintain a satisfactory level of conservation in the habitats and species for which site was so designated.

Tools for managing Natura 2000 Network

Table II.5 – Status of implementation of tools for managing Natura Network 2000

Region or Autonomous Province	No of SCI/SPA management tools	Sources of funding for managing Natura 2000 Network	Reference Regional or Provincial provisions
Abruzzo Regional Council		ICEP 35/95, Regional funds, ICEP 19/04, DOCUP Ob. 2, PAR-FAS 2007-2013, PATOM	L.R. 05/2007
Basilicata Regional Council		ROP Basilicata 2000-2006 Meas. 1.4 ICEP 19/2004	DGR 1925 dated 28.12.2008 DPGR 65 dated 19.03.2008
Calabria Regional Council		ROP Calabria 2000-2006 Meas. 1.10	L.R. 10/03 DGR 759 dated 30.09.2003 DGR 350 dated 05.08.2008 Reg.Reg. 3 dated 04.08.2008
Campania Regional Council		ROP Campania 2000-2006 Meas. 1.9 – Meas.1.10	DGR 231 dated 21.02.2006 PD 31444 of DGR DGR 426 dated 14.03.2008 DGR 803 dated 16.06.2006 (“European Directive 79/409/EEC “Birds” - Provisions.”) DGR 23 dated 19.01.2007 (“Measures for conserving Natura 2000 sites in Campania. Areas of Special Protection (SPA) and Sites of European Importance (SCI) – With annexes”)
Emilia –Romagna Regional Council		Meas. 323 of RDP	Decision 1436/06 Decision 1224/08
Friuli - Venezia Giulia Regional Council	6, mostly under completion	Measure 323 of RDP Projects LIFE DOCUP.OB.2, area 3, meas. 3.1, action 3.1.1 PFR Interreg III	Decision 25.02.2000, no.435 DGR 1648/2008 L.R.17/2006 L.R. 9/2007 L.R. 14/2007 L.R. 6/2008 L.R. 7/2008 DGR 3497 dated 21.12.2004+ Decree 3446 dated 19.11.2007 for PACOBACE
Lazio Regional Council	82 (under examination by offices)	DOCUP Ob2 Lazio 2000 – 06 – Measure I.1. – Sub-measure I.1.2 ; APQ7 III and 5th Agreement; Life Natura Come bis coastland and marine sites; RDP 2007 _ 2013 Measures: 323, 213, 224, 216; ROP Lazio 2007 – 2013 for Natura 2000 Sites in non-protected areas (valorisation; FAS 2007 – 2013 biodiversity (entire regional territory)	L. R. no .1/2001; DGR no. 1534 dated 21.11.2002 DGR no. 59 dated 30.01.2004 DGR no. 829 dated 27.08.2004 DGR no. 418 dated 11.06.2006 DGR no. 913 dated 27.07.2005 DGR no.s. 292 and 293 dated 18.4.2008 (Indemnity for Natura 2000)
Liguria Regional Council		DOCUP Ob2 Regional Funds APQ State Funds	Reg.Reg. 5/2008 DGR 1764 dated 22.12.2003 DGR 1149 dated 15.10.2004 DGR 1623 dated 16.12.2005 DGR 1328 dated 24.11.2006 DD 4226 dated 20.12.2007 DGR 4225 dated 20.12.2007 DGR 1170 dated 22.12.2008
Lombardy Regional Council	7	Measure 323A RDP Life Natura VI PQ EU PACOBACE Life+	L.R. 86/1983 DGR 7/4345 dated 20.04.2001 DGR 6308/26 dated 26.12.2006 DGR 7884 dated 30.07.2008 L.R.10 dated 31.03.2008 DGR8/7736 dated 24.07.2008 L.R. 23/96

Region or Autonomous Province	No of SCI/SPA management tools	Sources of funding for managing Natura 2000 Network	Reference Regional or Provincial provisions
Marche Regional Council	25 management plans	Docup ob. 2 - 2000/06 sub-measure 2.3.1. Three-year Regional Programme for protected areas (planned actions) APQ State Funds	DGR 2740 dated 20/11/01 – adopting Planning Completion L.R. 15/94 Protected Areas DGR 1528 dated 18/12/2007
Molise Regional Council	12 (10 of which currently under definition involving 23 sites and 50% of regional SCI land areas)	ROP Molise 2000-2006 Meas. 1.7 Legend Project, in European PECBMP Decision ICEP 35/05 RDP – Measure 323	D.G.R. no. 1393 dated 15/12/08 DGR no. 889 dated 29/07/08 Regional Directive for Assessment of Incidence (<i>under approval</i>)
Piemonte Regional Council	21 Management Plans written and 1 Approved	Regional Funds Interreg II Life Natura Measures 214 and 323 of RDP (request for implementation of 216 and 225)	Framework Law 12 dated 22.03.1990 L.R. no. 47 dated 3.04.1995 D.G.R. no. 76-2950 dated 22 May 2006 D.G.R. no. 61-4135 dated 23 October 2006 D.G.R. no. 3-5405 dated 28 February 2007 D.G.R. no. 17-6942 dated 24 September 2007 D.G.R. no. 42-8604 dated 14 April 2008
Puglia Regional Council		ROP Puglia 2000-2006 Meas.1.6 ICEP	Reg. Reg. 28 dated 22.12.2008 DGR 145 dated 02.07.2007 PO 2007-2013 PTTA Area 2
Sardinia Regional Council	79 management plans	ROP Sardinia 2000-2006 Meas. 1.5 LIFE07 NAT/IT/000426 ROP Sardinia 2000-2006 Meas. 1.7 RDP: Meas. 323 and 2.1.4	PQ Agreement with MATTM (in 2009) Decision ICEP 99/2004
Sicily Regional Council	58 management plans for 233 Natura 2000 sites	PON ATAS ROP 2000-2006 Sicily, measure 1.11	ROP Sicily 2000-2006 DDG 502 dated 06.06.2007
Tuscany Regional Council	5	LIFE Natura - LIFE + Regional Funds ROP-CREO 2007-2013 – Lines of Action 2.2 RDP 2007-2013 APQ – ICEP State Funds	<u>L.R. no. 56 datd 6 April 2000 (BURT no. 17 dated 17/04/2000)</u> D.G.R. no. 1148 dated 21 October 2002, (BURT no. 46 dated 13.11.2002) D.C.R. no. 6 dated 21.01.2004 (BURT no. 8 dated 25/02/2004) D.G.R. no. 644 dated 05/07/2004 (BURT no. 32 dated 11/08/2004) D.G.R. no. 1175 dated 22 November 2004 (BURT no.50 dated 15.12.2004) D.C.R. no. 80 dated 24/07/07 (BURT no. 34 dated 22/08/2007) D.G.R. no. 454 dated 16 June 2008 (BURT no.56 dated 25.6.2008)
Umbria Regional Council		Docup Ob2 ROP FESR, Area II	L.R. 31/2000 L.R. 11/2005 L.R. 11/98 DGR 1274 dated 29.09.2008 DGR 5 dated 08.01.2009 DGR 139 dated 04.02.2005 DGR dated 18.10.2006
Valle d'Aosta Regional Council			

Region or Autonomous Province	No of SCI/SPA management tools	Sources of funding for managing Natura 2000 Network	Reference Regional or Provincial provisions
Veneto Regional Council	27 currently being written	Regional Funds, RDP, ROP Veneto 2007-2013, FESR, Interreg IV, private funds	Regional Ecological Network (Regional Coordination Land Plan–PTRC) DGR 2587/07; DGR 2357/08; DGR 372/09; LR 11/04 Conservation Measures and Management Plans DGR 2371/06; DGR4572/07; DGR 4058/07; DGR 4241/08 Mapping of habitats and species DGR 4110/02; DGR 4359/03; DGR3873/05; DGR 4441/05; DGR 2151/06; DGR 2702/06; DGR 2703/06; DGR 1066/07; DGR 3919/07; DGR 1125/08; DGR 4240/08 Regional Procedure for Assessing Incidence DGR 3173/06 Specific Projects for conserving species or habitats according to European Directive DGR 2131/08; DGR 3787/08; DGR 3788/08 Identifying, amending and integrating Veneto DGR 1180/06; DGR 441/07; DGR 1885/07; DGR 4059/07; DGR 4003/08 in Natura 2000 Network
Bolzano Autonomous Provincial Council	9 Natura 2000 sites with management plans approved. 1 management plan is under completion. 27 sites with basic studies. 2 sites inside Stelvio National Park – plans currently being drawn up	RDP Progetti Interreg Provincial funds	DPR 63/2001 (Assessment of incidence for projects and plans in areas belonging to the European Ecological Network, by way of implementing Directive 92/43/CEE) Decision GP 229/2008 (measures for conserving Areas of Special Protection (ASP) further to Article 4 of Council Directive 79/409/EEC dated 2 April 1979 ("Birds" Directive) and Article 6 of Council Directive 92/43/EEC dated 21 May 1992 ("Habitat" Directive) Management Plans approved: Decision GP 4643 dated 28.12.2007 Decision GP 4644 dated 28.12.2007 Decision GP 4645 dated 28.12.2007 Decision GP 230 dated 28.01.2008 Decision GP 231 dated 28.01.2008 Decision GP 3430 dated 22.09.2008
Trento Autonomous Provincial Council	Draft Management Plans for 31 sites, specific conservation measures for 107 SCI's, general conservation measures for 19 ASP's		L.P. 11/2007 Regulation 2763, dated 24.10.2008

Monitoring and assessment of conservation of habitats and species of Community interest

The 2nd National Report on the status of implementation of the Habitat Directive relating to 2001-2006 was prepared in 2007 (http://www.minambiente.it/index.php?id_sezione=669) and comprised two sections: a general section on the status of implementation of the Directive and second section comprising assessment graphs and cards on the status of conservation of species and habitats. This second section is a fundamental means of understanding the status of conservation in habitats and species, as the assessments are based on the best information available, supported by bibliographical information and the opinion of scientific experts involved in the process. The overall opinions were reviewed and updated by the Regional Administrations and main scientific companies responsible for such. This was therefore a process that provided an important overview of the status of implementation of the Habitat Directive in Italy, however it also highlighted a number of critical areas that require action.

In relation to habitats, for example, the level of knowledge is limited to information deriving from the Natura 2000 databank as, despite the fact that a number of Regions have carried out extensive monitoring beyond the Natura 2000 Network to produce maps of regional habitats, there is no map on a National scale of real distribution of habitats of Community interest; this is a priority on which to concentrate efforts over the next few years.

The bad state of conservation above all involves freshwater habitats and – even more – sand habitats, which are often in an inadequate state of conservation. These unique and particularly fragile environments are extremely threatened by an increase in tourism, building of homes, hotels and infrastructures related to mobility and by changes to the cycle of sediments and consequent erosion of sand coastlands over the last few decades. Numerous projects have been implemented over the last few years – also using LIFE funds – to restore coastal areas, most of which specifically involve dune areas to avoid swimmers walking on them and to protect coastal cordons from erosion using naturalistic engineering techniques; however, the local nature of many actions and extreme fragmentation of these environments in many areas throughout Italian territory make achievement of the objectives regarding conservation distant and the need for stronger efforts to conserve these habitats over the next few years even more urgent.

With regard to the flora species protected by the Habitat Directive, more superior flora species have a positive state of conservation; inferior plant species are not only known less than the superior species, but are also mainly found in fragile environments that are becoming degraded and rarer to find, such as humid environments, bogs and Alpine lakes. Efforts in conservation should especially focus on such species over the next few years.

Monitoring activities demonstrated that the knowledge available regarding many species is still insufficient, not implemented or diverse throughout the country. Generally speaking, it may be supposed that a lack of information may have affected assessments, pushing them towards an more positive overview with respect to the real situation on the whole.

Assessment of the state of conservation in animal species may be considered *favourable* for just 23% of the species. If we concentrate on the 16 priority animal species according to the Directive, the percentage of species in a *bad* state of conservation rises to 40% whereas the percentage of species in a *favourable* state of conservation falls to 17%.

The most critical situation in relation to individual taxa is that involving Invertebrates and inland water Fish, of which only 12% have a *favourable* state of conservation. If we also take into account the fact that 40% of freshwater habitats of Community interest are in an *inadequate* or *bad* state of conservation, then it becomes obvious that these species and their habitats must receive more specific and relevant action than that carried out until now.

Table II.6 – State of conservation of fauna groups

ASSESSMENTS	FISH	INVERTEBRATES	MAMMALS	AMPHIBIANS	REPTILES
Inadequate	46%	28%	39%	50%	17%
Bad	20%	47%	27%	5%	2%
Positive	12%	17%	20%	33%	41%
Unknown	22%	8%	14%	12%	40%

The Natura 2000 Network at sea

In order to adequately fulfil the undertakings pursuant to the “Habitat” Directive relating to marine areas and Target 2010, Italy has begun to identify sites in territorial waters and reconnaissance of extra-territorial waters on a scientific basis.

The Objective of this reconnaissance is to update the knowledge we have regarding distribution and representation of habitats and species of Community interest on a scientific basis in view of review

of existing marine SCI's and identification of new SCI's, also according to the scientific reservations made in relation to the various bio-geographical regions. Cooperation with Regional Administrations is also commencing in order to complete the process for designating SCI's in territorial waters and to establish appropriate management and conservation measures.

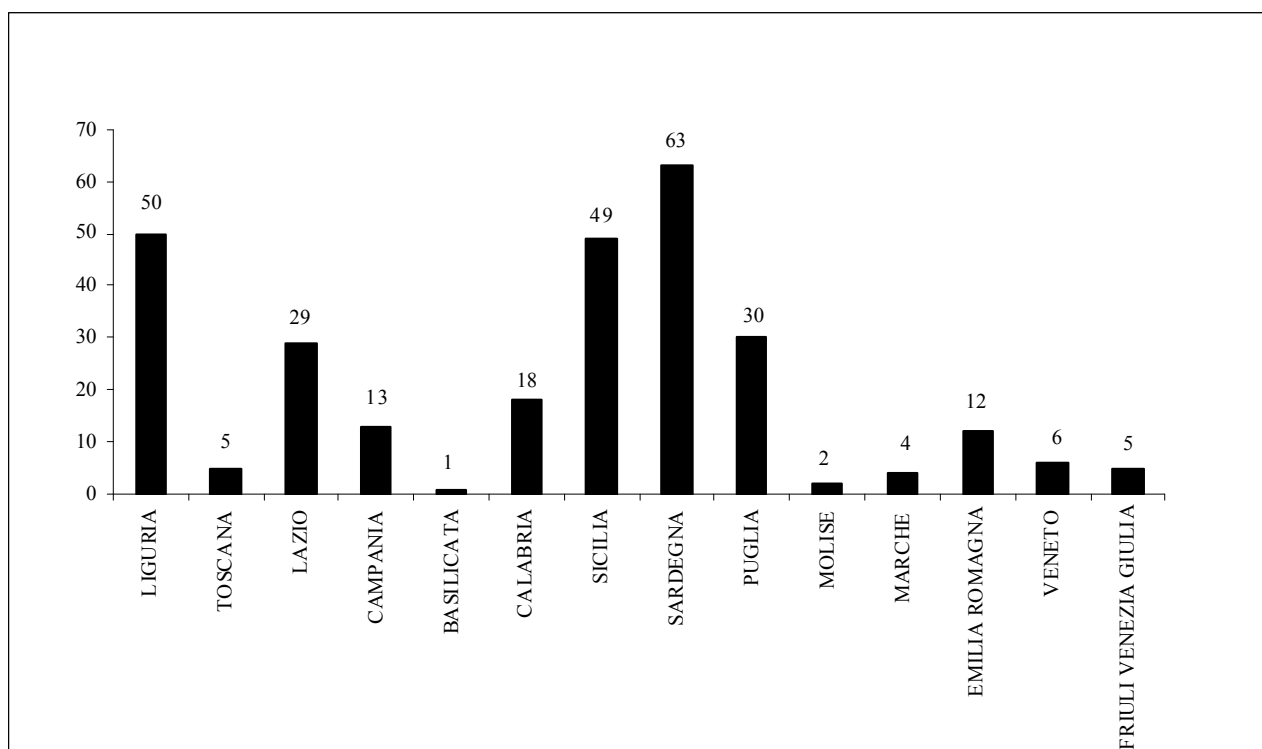


Fig. II.1 – Sites with marine habitats according to Region

Protecting marine areas outside national confines

National Law 61/2006 authorizes establishment of Areas of Ecological Protection (AEP) commencing from the outer limit of Italian territorial waters and up to the limits established according to agreements with the States whose territory is adjacent to or opposite Italian territory.

Italian Law, European Union Law and International Treaty provisions effective in Italy in relation to preventing and repressing all types of marine pollution, including pollution from ships and ballast waters, pollution from waste, pollution due to exploration and exploitation of the seabed and pollution of atmospheric origin and those concerning the protection of mammals, biodiversity and archaeological and historical heritage apply in Areas of Ecological Protection.

Fishing is excluded from this Law.

AEP's may be potential areas within which marine SCI's may be identified in the event that the biological values pursuant to the "Habitat" Directive are acknowledged therein. However, no AEP has been established as yet. A technical agreement with France has been established as part of the agreements mentioned in Law 61/2006, however this has not yet been approved by the parties in question. Other agreements with Tunisia and Spain have commenced but have been suspended for the moment.

Agreements relating to establishment of AEP's also include agreements regarding a continental platform, however these too are often not approved. The reference information overview therefore, as already mentioned, lacks information and is often not sufficiently regulated.

Wetlands according to the Ramsar Convention

Until now, 50 sites in Italy have been acknowledged and included in the list of international importance drawn up according to the Ramsar Convention. This involves acquitrinose marsh areas, fens, bogs or natural or artificial, permanent or transit waters, including marine water areas whose depth does not exceed SCI metres at low tide (www.minambiente.it/index.php?id_sezione=1350).

This thereby guarantees conservation of the more important national “wetland” ecosystems, the ecological functions of which are fundamental, both as regulators of water systems and habitats of specific flora and fauna.

During the 10th Conference of the Parties in the RAMSAR Convention (Republic of Korea, 28 October - 4 November 2008), Italy wrote its own National Report on implementation of the RAMSAR Convention (http://www.ramsar.org/cop10/cop10_nr_italy.pdf).

Taking a census of Wetlands

In order to implement the objectives of the RAMSAR Convention in the Mediterranean and participate in IUCN initiative “Countdown 2010”, Italy supports the project for creating inventories of wetlands as part of the MedWet Initiative (Mediterranean Initiative of the Ramsar Convention on Wetland). The purpose of this project is to acquire information regarding the distribution and status of such environments by 2010 by using the questionnaire prepared by MedWet technical and scientific groups for the Pan Mediterranean Wetland Inventory (PMWI) as part of the INTERREG IIC South “MedWet_CODDE Project (MedWet information and knowledge network for the sustainable development of wetland ecosystems)”. This inventory is also considered an essential tool for defining international strategy to protect the biodiversity in wetlands, in line with the objectives established by Decisions made at various Conferences involving the Parties as part of the Convention on Biological Diversity (Dec. IV/4, V/2, VI/2, VII/4, VIII/20, IX/19).

The national PMWI project underway coordinated by ISPRA involves creation of an online inventory concerning distribution and the natural and social and economic characteristics of wetlands by 2009.

Protecting species

There are numerous actions to conserve species, most of which are carried out at the local level and whose activities are therefore impossible to list. See Chapter I for the more important results produced in this context.

A number of plans of action and protocols of intent have been implemented at the national level for individual species and groups of species, including: the Action Plan for conserving the Brown Bear (*Ursus arctos arctos*) in the central Alps adopted by the Regional and Provincial Councils involved; the relative programme has been defined and initial actions have commenced; a Action Plan to protect the Marsican Brown Bear in the Central Apennines (*Ursus arctos marsicanus*) is currently being drafted; a process for establishing an Ecological Network to safeguard this Italian endemism has commenced.

The purpose of the protocol of intent is to coordinate action throughout the territory. Existing protocols of intent, such as PATOM (to draw up a Action Plan to protect the Marsican Brown Bear), PACOBACE (to draw up a Action Plan to conserve this bear in the Central Alps), PACLO (to draw up a Action Plan to conserve the otter), PACA (to update the Action Plan for the Apennine chamois), PATMA (to draw up a Action Plan for turtles), these are documents providing guidelines and coordination to commit all those signing to cooperate in matters of monitoring, conserving and managing the populations involved in the plans of action to thereby identify common and agreed strategies for action and combine the actions to undertake in the best possible way.

Transboundary cooperation initiatives to ensure a favourable conservation status and manage species such as wolves and bears have been undertaken.

A protocol of intent between Italy, France and Switzerland was signed on 26 July 2006 concerning unitary and coordinated measurement of the Alpine wolf population.

Meetings with representatives from the Swiss Federal Government have been organized to make management and conservation actions coherent in relation to the transboundary population of bears. MATTM has prepared a project with cooperation from ISPRA to monitor the health of bee populations in various environments of the natural areas protected. This project is part of a more wide-scale programme managed by MIPAF called Apenet, which involves monitoring agricultural areas throughout the national territory.

II.A.2 STRATEGIC OBJECTIVE 2: TO CONSERVE AND RESTORE BIODIVERSITY AND ECOSYSTEM SERVICES IN THE WIDER EU COUNTRYSIDE

Headline target: In wider countryside (terrestrial, freshwater, brackish water outside Natura 2000 Network), biodiversity loss halted by 2010 and showing substantial recovery by 2013

Rural development

The targets for conserving, restoring and valorising natural and landscape components in Italian agricultural ecosystems are almost exclusively carried out via application of Common Agricultural Policies (CAP's) and, more specifically, at the local level through RDP (Piani Regionali di Sviluppo Rurale – regional rural development plans) over the last few decades.

Rural Development helps implement the 6th Community Action Plan concerning the environment,; the fundamental areas of this are biodiversity and managing Natura 2000 sites. The strategic measures in rural development, above all in terms of agriculture and the environment and measures pursuant to Reg. 1698/05, provide substantial support to protecting biodiversity through aid provided to farmers and forestry workers for the purpose of more ecological management of agricultural land.

Table II.7 – List of the key articles in Regulation 1698/05 concerning the protection of biodiversity

Article	Text
20 a)(i)	Vocational training and information actions, including diffusion of scientific knowledge and innovative practices for persons engaged in the agriculture, food and forestry sectors
20 a)(iv)	Use of advisory services by farmers and farm workers;
20 (b)(ii)	Improving the economic value of forests
20 (b)(vi)	Restoring agricultural production potential damaged by natural disasters and introducing appropriate prevention actions;
36 (a)(i)	Natural handicap payments to farmers in mountain areas
36 (a)(ii)	Payments to farmers in areas with handicaps, other than mountain areas
36 (a)(iii)	Natura 2000 payments and payments linked to Directive 2000/60/EC;
36 (a)(iv)	Agri-environmental payments
36 (a)(vi)	Support for non-productive investments;
36 (b)(i)	Afforestation of agricultural land
36 (b)(ii)	First establishment of agroforestry systems on agricultural land;
36 (b)(iii)	Afforestation of non-agricultural land;
36 (b)(iv)	Natura 2000 payments
36 (b)(v)	Forest-environment payments
36 (b)(vi)	Restoring forestry potential and introducing prevention actions;
36 (b)(vii)	Support for non-productive investments
52 (a)(i)	Diversification into non-agricultural activities
52 (a)(iii)	Encouragement of tourism activities
52 (b)(iii)	Conservation and upgrading of the rural heritage;
52 (c)	A training and information measure for economic actions operating in the fields covered by Axis 3;
52 (d)	A skills-acquisition and animation measure with a view to preparing and implementing a local development strategy.
63	Leader

Directives 79/409/EEC and 92/43/EEC are taken into account in view of the conditional nature of the CAP by including compulsory management in the standards applied for systems of direct support (Annex 3 of Reg. 1782/03).

The Ministry for Food and Agricultural and Forestry Policies prepares a National Strategic Plan (NSP) according to which Regions draw up regional planning documents, called Rural Development Plans (RDP), to implement rural development policies.

MIPAAF supported Regions for the planning period 2007-2013, by providing specific indications (also making available topical dossiers regarding: Biodiversity and rural development, Landscape, Forest and Climate Change; Water resources and rural development; Land and rural development, as references to help draw up individual measures within each RDP) and thereby strengthening orientation in relation to good practices to favour conservation of natural environments and the landscape in rural areas.

This is the first year in which these Plans are being implemented and it is therefore too early to make any assessments. However, positive results are expected given the capillary structure of the various planning levels, also in view of the important results reached during planning period 2000-2006.

Measures to conserve and restore biodiversity in ecosystem services in Italian agricultural ecosystems are mainly adopted by applying the measures established in the Rural Development Plans 2007-2013 of each Region or Autonomous Province, also via ad hoc funding (http://www.politicheagricole.it/SviluppoRurale/Programmi_2007_2013/default.htm).

Overall funds for Rural Development 2007-2013 in Italy exceeds 16 billion Euros (see Table III.2); additional resources from compulsory modulation to address new environmental challenges in Rural Development Policies – especially halting biodiversity loss – shall be added to the above according to that which recently emerged from the so-called status of CAP health at the Community level (“CAP Health Check”).

Forest fire prevention in protected areas

The Ministry of the Environment, Land and Sea's Nature Protection Directorate is directly interested in the topic of forest fires pursuant to Article 8 of Law 353 dated 21 November "Framework Law concerning forest fires "; commencing from general indications on creating regional forest fire prevention plans in the Guidelines for Civil Protection, this Department prepared a Fire Prevention Plan Outline for natural State protected areas with which the organizations responsible for management comply when drawing up their own plan. This outline is still valid for national parks, however a specific outline for State Natural Reserves was prepared in June 2006, which was simplified and more appropriate for such types of protected areas.

Still in relation to implementation of the specific regulation, the DPN supervises and supports the work of the organizations responsible in creating, approving and implementing Fire Prevention Plans, systematically implements and coordinates the procedure required to reach agreements with the regions involved to use Fire Prevention Plans in state protected areas in the corresponding regional plans, including applying for and receiving positive opinions from the State Forestry Department up to publication of the Decree adopting Fire Prevention Plans. Furthermore, since this Law became effective, the DPN has promoted and continues to promote several activities providing technical and scientific support through contact with managing organizations and agreements with scientific and environmental associations with specific objectives, such as: "check lists" to provide a knowledge basis and proposals regarding Fire Prevention Plans in National Plans; studies concerning the protection of biodiversity and post-fire recovery of forest areas in Objective 1 Regions as part of P.O. Environment - PONATAS - QCS 2000/2006; publishing a Book on Fires and Ecosystem Complexity, an online help-desk portal providing scientific support, establishing the perimeter of fires from satellite photos, etc

MATTM has Fire Prevention Plan maps for National Parks, which provide a concrete contribution to improving how forest fire prevention plans are written and managed, as this information can be overlaid with other topic-related maps, basic maps and aerial photographs from many different years; this can be done both via the GIS of the park organization and directly on the National Map Portal on the MATTM web site (http://www.pcn.minambiente.it/PCN/progetto_incendi.htm).

Drainage Basin Plans

Drainage Basin planning plays a fundamental role, as it hierarchically above other planning tools. Leg. Decree 152/2006, which implements the *Water Framework Directive* – WFD 2000/60 in Part III, identifies 8 drainage basins throughout Italy and has established that preparing district

management plans is compulsory (article 117), which are part of the basin plan and more important than other planning tools¹, by way of implementing Article 13 of the WFD.

Law 13² dated 28 February 2009 attributed specific coordination responsibilities to National Drainage Basin Authorities in order to ensure preparation of district management plans with cooperation from the regions in which Drainage Basin Region is located by 22 December 2009.

The Management plan basically contains an overview of the physical features of the Basin in question and the pressures and impacts therein, prompt definition of the environmental objectives and any exceptions, the programme of measures (basic and supplementary) and financial aspects. The programme of measures is an integral part of management plans and, taking into account results from knowledge-finding activities required pursuant to Article 5 of the Directive, identifies action to take in order to achieve the set quality objectives. The Programme of Measures comprises *basic measures* and *supplementary measures*. Basic Measures (art. 11.3) are *minimum programme requirements* and include all actions deriving from application of European regulations (including “Natura 2000” Directive) and actions to safeguard the quality and quantity of surface and underground waters from any direct or in direct impact. The basic measures of this Directive (art.11.2i) shall comprise measures aimed at guaranteeing that hydromorphological conditions of the water body achieve the set ecological status or good ecological potential for water bodies designated as artificial or highly modified. Supplementary measures (art 11.4) are provisions studied and implemented to complete the basic measures in order to achieve set targets. Annex VI, part B of the Directive contains an incomplete list of supplementary measures, which also comprise *reconstructing and restoring wetlands* (point vii) and, more generally, implementing *restoration projects* (point xiii).

Plans for safeguarding waters

Plans for safeguarding waters are planning tools that regions are required to prepare and were introduced in 1999 through Leg. Decree 152/1999 as extracts of the basin plan. Leg. Decree 152/2006 reconfirmed the obligation for regions to prepare such plans, which are niche plans for the basin plan. Plans for safeguarding waters contain the knowledge basis and measures required to protect the quality and quantity of water bodies on the regional scale. The content of plans for safeguarding water is described in Annex 4, part B of Leg. Decree 152/2006 and widely concurs with that in district management plans; they are therefore a basic tool for preparing the latter. Plans for safeguarding waters have currently been adopted or approved for 16 regions and autonomous provinces, whereas the others are under preparation.

Reducing environmental risk from chemical products

European Community provisions involving assessment of environmental risk now include, in addition to chemical substances, a large number of preparations ranging from pesticides or agricultural insecticides) to biocides (non-agricultural pesticides), additives for animal food, pharmaceuticals for human and veterinary use and genetically modified organisms.

Introducing common standards for assessing risk aims to ensure a higher level of protection for the health of mankind and the environment in all European Union Member Countries. Assessing environmental risk does not deal with the risks connected to production, movement, storage and disposal of hazardous goods, nor the risks found in workplace. The risk that is assessed in this case is that deriving from using products under normal conditions and in relation to diffusion and impact of substances contained therein on ecosystems.

Regulation (EC) 1907/2006 from the European Parliament and Council approved on 18 December 2006, called the "REACH" (**R**egistration, **E**valuation, **A**uthorisation of **C**hemicals) Regulation,

¹ “The provisions in the approved Basin Plan immediately oblige public administrations and organizations and private subjects, when declared as effective for such in the provisions. More specifically, plans and programmes for social and economic development and organizing and using territory must be coordinated with – or however not oppose – the approved Basin Plan”

² “Conversion into Law, with amendments, of Decree by Law 208 dated 30 December 2008 providing special measures concerning water resources and environmental protection”

establishes that all substances produced or imported within the Community to an amount exceeding one ton per year must be registered. According to estimates by the European Commission, this covers around 30,000 marketed chemical substances. Registering a substance involves manufacturers or importers presenting certain basic information regarding the characteristics and, in the event information is not available carrying out tests to discover the characteristics in terms of physical and chemical, toxicological and environmental properties.

The Ministry of Health under agreement with the Ministry of the Environment, Land and Sea and other central administrations ensures participation of national representatives and experts in activities carried out by the European Agency for Chemical Substances and the European Commission. Decree from the Ministry of Health dated 22 November 2007 established a Plan of Activities and Financial Resource Use pursuant Article 5-bis of Decree by Law 10 dated 15 February 2007 converted into Law with amendments through Law 46 dated 6 April 2007 to implement this Regulation at the national level.

The European Union approved the Directive establishing an action framework for sustainable use of pesticides on 13 January 2009, thereby reducing the relative risks and impact on the health of mankind and the environment and promoting use of integrated defence and alternative approaches or techniques, such as non-chemical alternatives to pesticides.

This Directive obliges Member States to adopt all the measures required to encourage protecting plants by using a low number of pesticides, thereby encouraging all the practices or products with a lower risk factor for the environment and the health of mankind while achieving the same objective to the advantage of organic agriculture, more balanced methods for fertilization and land irrigation and alternative cultivation techniques.

This Directive shall become effective at the beginning of 2011, when all Member States shall have five years to adopt a "national action plan" that establishes the quantity-related objectives for using pesticides and defines the deadlines and measures for reducing risks to and impact on the environment deriving from their emission.

Emitting extremely hazardous pesticides will be progressively banned over the space of ten years. More specifically, using pesticides in specific areas such as parks, public gardens, recreation areas, schoolyards and fun parks and areas nearby health structures shall be banned. Crop spraying shall also be banned. Finally, a number of particularly toxic substances such as carcinogens, mutations or harmful to reproduction or those that endanger the survival of bees, may only be authorized if their effects on mankind and animals may be considered negligible.

The new regulation dedicates much space to individual States adopting measures to train employees in an adequate and certified manner in order to inform and promote programmes for sensitizing consumers, focussing on the severe risk of poisoning from pesticides and the potential chronic effects on the health of mankind, as well as using non-chemical alternatives; it also strongly highlights the importance of exchanging information on the objectives and actions of Member States, who shall regularly refer to the Commission and other Member States, especially in relation to implementation and the results from their national action plans.

In order to anticipate fulfilment, for which Member States are responsible, the Ministry of the Environment, Land and Sea has commenced and coordinated an Inter-institutional Technical Table comprising central and regional administrations; this group has been working on this topic for two years now, leading to a draft strategic plan, which was written with considerable difficulty due to the different interests brought up by participants and ascending and horizontal subsidiarity established by the Italian Constitution in relation to agriculture..

This discussion should be extended to those directly involved, who are – before those on the receiving end - the necessary interlocutors capable of enriching and articulating the Plan's contents. The European Parliament has also approved the Regulation regarding authorization, release on the market, use and control over fertilizers and pesticides; this Regulation replaces Directive 91/414 and shall guarantee a much higher level of protection for the health of mankind, animals and the environment. Assessing the safety of active substances shall be based on very strict standards, in turn based on considerations related to health and effects on the environment (e.g. persistence in the environment). In line with EU strategy for sustainable use of pesticides, the target is also to

encourage replacement of more polluting products with alternative substances considered safer. The new regulation shall also strengthen measures for control. This regulation shall integrate the proposed Directive concerning sustainable use of pesticides approved by the European Parliament on 13 January 2009.

II.A.3 STRATEGIC OBJECTIVE 3: TO CONSERVE AND RESTORE BIODIVERSITY AND ECOSYSTEM SERVICES IN THE WIDER EU MARINE ENVIRONMENT

Headline target: In wider marine environment (outside Natura 2000 Network), biodiversity loss halted by 2010 and showing substantial recovery by 2013

Conserving the marine environment

The marine environment is subjected to serious threats such as biodiversity loss or degradation and alternation of its structure, destruction of habitats, contamination by harmful substances and effects from climate change. The main objective of Directive EU 2008/56 – proposed as part of the specific strategy the marine environment – involves reaching a good ecological status in the European marine environment. This provision establishes common objectives and principles at the EU level and defines a number of European marine regions. Member States shall prepare strategies for the territorial waters in each of their marine regions comprising various stages to protect the marine environment. For this reason, Governments shall adopt measures to guarantee protection and conservation of the marine environment or to allow its reclamation or, if possible, «to re-establish the functioning, process and structure of marine biodiversity and marine ecosystems». They shall also prevent and progressively eliminate pollution from the marine environment to ensure that there is no impact or significant risk to marine biodiversity, marine ecosystems, the health of mankind or legitimate use of seas. These measures should also limit use of marine services and goods and other activities carried out in the marine environment «to levels that are sustainable and do not compromise use and activities of future generations, nor the ability of marine ecosystems to react to changes caused by nature and mankind ».

In addition to defining the notions of "European marine waters", "pollution", "Marine Protected Areas" and expanding the concept of "ecological state", the politicians immediately introduce a very detailed definition of "good ecological status" and set the conditions for compliance in a new annex. Therefore, this notion means the status of the environment when the structure, function and ecosystem processes contained in the marine environment «allow said ecosystems to function in their natural completely self-regulating way». Marine ecosystems should also maintain «their natural resilience to more extensive environmental change». All human activities inside and outside the sector in question must be managed in such a way as to make their overall pressure on marine ecosystems compatible with good ecological status.

Human activities carried out in the marine environment must therefore not exceed the levels that are sustainable on a geographic scale suited to assessment, while the potential for future generations to use and carry out activities in the marine environment must be maintained. In order to guarantee this status, marine biodiversity and ecosystems must be protected and their deterioration avoided and, as far as possible, it must be possible to carry out their reclamation. Pollution and energy, including noise, in the marine environment must be constantly reduced in order to guarantee that the impact on or risk to biodiversity, marine ecosystems, health of mankind or legitimate use of the sea are kept to a minimum.

Integrated management of marine and coastland resources is at the heart of numerous EU programmes and policies.

The European Community's Sixth Action Programme for the Environment (2001-2010) acknowledges the need to fully integrate environmental matters in the Reform of Common Fisheries Policy (CFP). This also identifies further actions required to ensure a healthy marine environment, more specifically to reduce pollution and eutrophication and extend the Natura 2000 Network for

more representative natural areas and ecosystems to marine areas. In order to achieve these objectives, implementation of the Integrated strategies for Coastal Area Management has been planned.

The Communication on Integrated Management of Coastal Areas dated 2000 (COM/00/545) is a review of pilot application of this procedure and proposes that it be extended to all EU coastal areas. A Recommendation adopted by the European Council and Parliament to prepare complementary national strategies for Integrated Management of Coastal Areas followed this Communication. These strategies shall help improve problems deriving from a lack of coordination among the many existing agencies and the various interests involved in coastal areas, thereby permitting more effective action on such a transversal topic as marine biodiversity.

The MIPAF Decree including *tegnùe* as areas of biological protection is dated March 2009; areas of biological protection were immediately established via Decree by the Ministry of Agricultural Policies in agreement with various organizations and bodies responsible for this matter at both the local and national level pursuant to Law 963 of 1965 and DPR 1639 of 1968 and subsequent amendments in order to safeguard and repopulate marine resources. These areas were identified via specific scientific studies that demonstrated their importance in the reproduction and increase of marine species of financial importance. Although active management was not specifically established, development actions and compatible teaching and recreational activities may be prepared.

ARPAV – via the Alto Adriatico Observatory established by the Veneto Regional Council in 2003 – has commenced a project supported by Community funds (Interreg III A/Phare CBC Italia-Slovenia, 6th National Three-Year Plan for Fishing, Aquaculture and Leader Plus) to study a number of marine areas of particular environmental importance, which are called “*tegnùe*”. These “*tegnùe*” are rock outcrops distributed on sandy sea beds in the western section of the Upper Adriatic Sea. These are the only areas of natural solid substrata in the Western Upper Adriatic, thereby offering very special ecological features and biological communities – true oases of biodiversity due to the richness and variety of their micro-environments.

Through Regional Law 53/1998, Lazio Regional Council established a Regional Observatory of the Lazio Coastline as part of regional organizational structures, with the specific task of controlling factors affecting the dynamics of the regional coastline and monitoring authorized actions and actions: activities relating to monitoring, searching for resources, assessing impact on the environment, planning actions for the purposes of protection and other activities that are briefly illustrated on this web site were developed for this reason. All operations relating to surveying and controlling the coastline; this Observatory – which is an operational structure – refers to the Centre for Monitoring, which is a specific division that plays an important role in cataloguing the information collected,

Through Regional Law 2/2007, the Sardinia Autonomous Regional Council established a regional Conservatory for the Sardinian Coast to safeguard, protect and valorise coastal ecosystems and provide integrated management of coastal areas of particular importance in terms of landscape and environment owned by the region or placed at its disposal by public or private subjects. The objective is to commence a dynamic safeguarding, management and valorisation process that takes into account both the fragility of ecosystems and coastal landscapes and the diversity of activities and uses and their interactions and impacts.

Integrated Coastal Zone Management (ICZM)

Italy is one of the 14 Contracting Parties in the Barcelona Convention that signed (Madrid 2008) the GIZC Protocol (commonly called the ICZM Protocol - Integrated Coastal Zone Management). This ICZM Protocol plays a crucial role in the Mediterranean Action Plan – MAP, as it is a legal tool that can be used to promote an integrated management model among countries to face future challenges that the Mediterranean coastal environments will be forced to deal with in the immediate future, such as climate change and increased pressure from mankind.

The Law ratifying the Protocol is currently under definition and the measures required to implement directives aimed at protecting protected areas beyond relative boundaries are being prepared,

combining these in terrestrial and maritime planning according to that established by ICZM tools and strategic maritime planning. More specifically, two steering committees shall be established: (i) one for on-site testing of new governance models for coastal areas in line with the principles and objectives of the ICZM Protocol by implementing the Coastal Area Management Programme – CAMP Italy involving 5 Italian regions and which also covers marine-coastal protected areas, and (ii) one to prepare and implement National ICZM Strategy, which shall have to involve institutions, those directly interest and society at the various local, regional and national levels (see Chap. III.a.1, III.b.2).

The Coastal Area Management Programme – CAMP was approved during the Sixth Ordinary Meeting of the Contracting Parties in the Barcelona Convention (Athens 1989) and is of particular importance with respect to the ICZM Protocol. CAMP is the strategic activity of the Mediterranean Action Plan (MAP) for the United Nations Environmental Programme (UNEP), coordinated by Spalato agency Priority Actions Programme/Regional Activity Center (PAP/RAC) and focuses on implementing integrated pilot coastal zone management throughout the Mediterranean Basin. Its main objective is to create and implement strategies for sustainable development of coastal areas and, for this purpose, to identify and apply ad hoc procedures and tools for managing such zones in particularly significant sample areas.

Project CAMP Italia was formally approved for implementation during the fifteenth Ordinary Meeting of the Contracting Parties in the Barcelona Convention (Almeria 2008). The Priority Action Programme Regional Activity Center – PAP/RAC, which is general coordinator of CAMP projects for the Mediterranean Action Plan (MAP) of the United Nations Environmental Programme (UNEP) and supervised by MED Unit, therefore earmarked funds to help implementation of Project CAMP Italy with cooperation from the Ministry of the Environment in its budget 2009-2011. PAP/RAC showed particular interest in CAMP Italy, stating that its implementation is of particular importance in view of the fact that it is the first of a new generation of CAMP Projects that shall test specific provisions of the ICZM Protocol in situ and shall be required to show how to transfer new integrated coastal zone management models at the regional and local levels in each country. CAMP Italy shall involve various areas as it affects the territory in five Italian regions (Emilia Romagna, Lazio, Liguria, Tuscany and Sardinia) and will allow experimentation of new governance models dedicated to integrated coastal zone management for which more than one administrative authority is responsible. Work by the Ministry of the Environment, Land and Sea on this matter is mainly of a strategic nature in order to address and provide coordination for setting standards regarding identical protection throughout the country, whereas the relative operational activities are almost exclusively carried out together with Regional Councils.

Table II.8 – Measures adopted at the regional level for Integrated Coast Zone Management.

Emilia Romagna Regional Council	Guidelines for Integrated Coastal Zone Management.
Liguria Regional Council	Land Coastal Coordination Plan: tourist harbours, coastal defence, government area management, development of “Active Protection Areas”, activities supporting establishment of new Marine Protected Areas.
Lazio Regional Council	Regulations to valorise and develop Lazio coastland: this aims to promote economic and social development of the coastland through action planning.
Tuscany Regional Council	Regional Plan Integrated Coastal Zone Management for the purposes of hydrogeological reorganization: this aims to guarantee sustainable economic development of coastal zones and complies with the principles for safeguarding land and land governance.
Puglia Regional Council	L.R. 17 dated 23 June 2006 "Regulation concerning protection and use of coastland" and Regional Coastal Plan – Prepared to safeguard and protect Puglia coastal zone, this Plan involves all town councils in Puglia, which are required to comply with the standards and objectives established in the in itinere Regional Document presented in July 2008
Marche Regional Council	Plan for Integrated Coastal Zone Management: this faces the problems related to continuous and constant interaction between coastal zone and the action carried out by the sea by assessing coastal conditions in order to localize coastal erosion and receding.
Abruzzo Regional Council	Integrated Coastal Zone Management. Organic Plan concerning the risk in vulnerable areas: identifying vulnerable areas and the expected levels of risk at the regional level, feasibility projects for coastal protection, upgrading and maintenance.
Campania Regional Council	Decision by the Regional Council (DGR) 4459 dated 30 September 2002 – part B: Guidelines for Regional Land Planning.
Calabria Regional Council	Plan for Integrated Coastal Zone Management being drafted – Writing and elaboration of Plan implemented through DGR of 8 August 2006.

ASPIM Protocol

The Protocol concerning Mediterranean specially protected Areas and biodiversity (ASPIM) was implemented in Italy through Law 175 dated 25/05/1999. This tool provides initial classification of Mediterranean marine habitats, highlighting those deserving protection according to standards that take into account vulnerability, naturalistic importance, presence of endemisms and their rarity, as well as the aesthetic and economic importance a specific marine environment has assumed in the Mediterranean. The simple list provided by the Habitat Directive for marine species and habitats is considerably implemented by the ASPIM, comprising new animal and plant species worthy of attention or protection and the definition of the standards and procedures for identifying areas to protect (Ajaccio, 7-8/10/2000, document UNEP(OCA)/MED WG 172/5 del 24/11/2000).

The aforementioned lists of species need to be updated to include a more detailed list of plant species and a specific section concerning indigenous species to the Mediterranean. At the national level, a more detailed list of Italian indigenous species is currently being prepared. The following Marine Protected Areas have been registered with ASPIM: Portofino, Miramare, Isola di Tavolara-Punta Coda Cavallo, Plemmirio, Torre Guaceto and Sanctuary for Marine Mammals. The Marine Protected Areas of Punta Campanella and Capo Caccia – Isola Piana should be registered by the end of 2009.

National Monitoring Programme for marine and coastal waters

This Programme was established to comply with a precise obligation established in Law 979 dated 31 December 1982, “Provisions for protecting the sea”. This involves the Italian Government organizing a network to observe marine environmental quality through periodical checks on the sea to obtain oceanographic, chemical, biological and microbiological information.

This programme has the following priority objectives:

1. to assess the environmental quality status of both areas especially subjected to impact from Man and others that are highly natural;
2. to gather all the information gathered at the national level and place them in the Si.Di.Mar databank at the disposal of various users – under different conditions;
3. to gather and distribute reference analytical procedures for the analyses involved;
4. to apply and assess new procedures on a national scale;
5. to optimize and standardize the level of knowledge of peripheral operators via a training programme focussing on teaching new analytical procedures and ensuring inter-calibration between various laboratories.

The regions involved between 1991 and 1999 were 14 and all 15 Italian coastal regions were involved between 1999 and 2008. New survey areas were defined in 2001 by statistically analyzing the information gathered 1996-1999, which showed that most of the controlled areas provided extremely similar analytical results: in other words they had no serious pollution problems and therefore less need of control. Surveys focussed on just 81 significant polluted areas along the Italian coastline: 63 of these were chose as critical areas to compare with the quality in 18 other areas identified as control areas.

Examinations on contamination of sediments and molluscs which– contrary to water – keep a "memory" of most of the substances with which they have come into contact for months and, at times, even years, and examinations on particularly relevant ecosystems from an environmental viewpoint, such as *Posidonia oceanica* meadows, were favoured.

The control areas identified for each Region were the so-called "white areas", in other words areas as near to a natural condition as possible. These areas act as the check – or "point zero" – to assess the level that an areas at risk has effectively been compromised.

The “white areas” in the Regions comprising Marine Protected Areas or however Protected Areas with sea-related competences were established therein, whereas in other cases statistical analysis of previous information identified the least compromised areas.



Fig. II.2 – *Programme for monitoring the coastal marine environment: examination areas*

The analysis protocols were standardized to ensure the best possible comparability between results from the examinations made throughout Italian territory. As there are no “official” reference analysis procedures for marine waters, various procedures were collected, selected and subjected to

approval by National Research Organizations ICRAM, ANPA and ISS, Regions, ARPA and Universities effectively involved in the monitoring network. Publication of “reference methods” currently being carried out by ICRAM will ensure maximum diffusion among all sea-related researchers.

Over 36,000 samples were collected from all participating Regions between June 2001 and February 2005, on which over 330,000 analyses were carried out. Study and processing of the environmental information deriving from such analyses are providing important and significant results.

The Ministry of the Environment Nature Protection Division databank (Si.Di.Mar.) gathers information from regional marine environment observation networks and places them at the disposal of users via internet (http://www.sidimar.tutelamare.it/dati_ambientali.jsp).

II.A.4 STRATEGIC OBJECTIVE 4: TO REINFORCE COMPATIBILITY OF REGIONAL AND LAND DEVELOPMENT WITH BIODIVERSITY IN THE EU

Headline target: Regional and land development benefiting biodiversity, and negative impacts on biodiversity prevented and minimised or, where unavoidable, adequately compensated for, from 2006 onwards

Cohesion and Structural Funds for conserving biodiversity

This objective connects cohesion policy and EU Structural Fund programming for 2007-2013 with biodiversity conservation.

Lessons learned during 2000-2006 programming highlighted limits to prompt actions that did not involve clear conservation priorities and focussed on individual protected areas and pointed out the need to focus on identifying strategic objectives to protect species and habitats of Community interest, ecological and functional connection between protected areas under a strategy of vast areas and environmental upgrading of the entire territory.

New funds for 2007-2013 offer the possibility of earmarking considerable resources for nature-related projects. The financial needs of Natura 2000 were clearly identified in all financial regulations presented by the Commission as part of budget proposals for 2007-2013.

With regard to 2007-2013 therefore, now that the opportunity of not creating a specific Fund for Natura 2000 has been assessed, most Community joint funding for Natura 2000 will be distributed using existing funds in order to improve rural, regional and marine development throughout EU. Furthermore, both sustainable use of resources and strengthening synergies between environmental protection and economic growth are strongly encouraged by the context of the Lisbon Strategy.

National and regional development programmes supported by Community funds have been prepared for 2007-2013 and included Natura 2000 among funding strategies, above all in relation to FESR (QSN and Regional Operational Programmes) and FEASR (see Chap. III.A.3), with the opportunity of specific allowances for Natura 2000 sites (PSN and RDP).

Access to Natura 2000-related projects may also be permitted through operational Programmes involved in additional national resources (FAS Resources for underused Areas).

Actions amounting to 124.7 billion Euros shall be carried out in the period 2007-2013, with joint funding from the government and Funds for underused areas (FAS). Guidelines to using such resources are established in the National Strategic Overview. The overall content of QSN for 2007-2013 involves 10 priorities, 3 of which are strictly related to Community Policy objectives for biodiversity. Priority 3 regards developing renewable energy and energy saving, managing water resources, managing waste, recovering polluted sites, defending land and preventing natural and technological risks. Priority 6 interacts with the objectives relating to risks of fragmentation and irreversible consumption of land. Priority 5 regarding valorisation of natural and cultural resources for attraction and development directly involves biodiversity. The objective of guaranteeing ecological connection between areas of high environmental value and naturalistic

upgrading of territory also aims to encourage involvement from local interest in identifying development objectives related to environmental action. In order to achieve Priority 5 objectives, participation from local communities and various economic and social players should be strengthened in order to define action plans for vast areas; integrating ecology in landscape planning, integrating actions to protect and manage biodiversity and the landscape with valorisation policies. In order to exploit effectiveness of actions to the full, QSN explicitly indicates the need to implement National Biodiversity Strategy and relative Action Plans, which should be adequately funded. At the same time, specific guidelines to implement procedures to monitor the status of conservation of habitats and species of Community interest to implement the Habitat and Birds Directive should be defined.

Tab. II. 9

Synthesis of the global financial framework for the unitary planning 2007-2013

(Millions of Euros)

Planning 2007-2013				
	FAS (1)	FS (2)	Jointly funded FS (2)	Total
Total resources available in	53,782.050	22,992.548	24,311,049	101,085.647
South Italy				
Planning of provision and stock	16,134.615			16,134.615
Central administrations	17,817.981	6,396.148	6,398.100	30,612.229
Regions	18,069.164	15,276.931	16,593,480	49,939.575
Interregional programmes	1,760.290	1,319.469	1,319,469	4,399.228
Total resources available in	9,490.950	4,972.767	7,622.592	22,086.309
Central-North regions of Italy				
Planning of provision and stock	1,728.190			1,728.190
Central administrations (3)	2,218.779	24,856	37,544	2,281.179
Regions	5,543.981	4,947.911	7,585.048	18,076.940

- (1) Amount in Budget 2007 was 64,379 billion Euros, 1,106 of which were already earmarked to cover cuts to previous earmarkings established in the same L.F. The overall amount excluding this amount 63,273 billion Euros. The key to division among macro-level areas is 85% to the South and 15% to the Center-North.
- (2) Not including resources for the Territorial Cooperation Objective
- (3) The amount in the columns relating to Structural Funds and Structural Funds Joint Funding refers to the amount in the only NOP for the objective "Regional Competitiveness and employment implemented by Central Administrations in Central-North Regions". This amount is 13/15 of the overall amount for NOP. The remaining 2/15 (relating to Abruzzo and Molise Regions) are attributed to programmes implemented by Central Administrations in south Italy.

This objective also highlights the role of VAS in verifying impacts of various biodiversity plans and programmes. Italian and European regions tested themselves on applying VAS regulations under conditions of very diversified legislative contexts and experiences through Structural Fund Programming 2007-2013. Directive 2001/42/EC was implemented in Italy through Leg. Decree 152 of 2006, which came into effect for part II in 2007, and subsequently amended through Leg. Decree 4 of 2008. A vital role in applying VAS to National and Regional Operational Plans for Funds 2007-2013 was played by national and regional Environmental Authorities.

There are no specific funding resources for Natura 2000 in ordinary national resources. The MATTM may decide to jointly fund LIFE Plus projects of national importance. As Regional and Autonomous Provincial Councils are responsible for managing Natura 2000 sites, funds are included in regional programmes pursuant to regulations regarding national implementation of the Habitat Directive (DPR 357/97).

Contribution from European LIFE Programme in conserving nature in Italy

LIFE is the financial fund with which the European Union helps implement and develop Community environmental policies and legislation.

LIFE Natura (the Programme component used for nature conservation actions) funded 155 projects in Italy between 1992 and 2006 by contributing 76 million Euros in joint funding for overall investment of 143 million Euros.

This tool has ensured considerably decentralized access to funding. Central or regional administrations were the beneficiaries in just 18% of projects, with the remaining going to private organizations, NGO's, provincial councils, town councils and above all protected areas (http://www2.minambiente.it/pdf_www2/dpn/pubblicazioni/bilancio_life_natura.pdf).

Since 2007, this programme – now named LIFE+ - has two important new elements: a considerable increase in the available budget (2.143 million Euros for 2007-2013 compared with 1.807 million Euros between 1992 and 2006) and the possibility for States to orient funding destination towards identification “national priorities”. Italy positively exploited both these opportunities.

The Italian Natura and Biodiversity projects presented during the first year of LIFE+ received funding for over 12 million Euros.

Only four projects were funded in the newly-established Biodiversity area, one of which was Italian. This project focuses on identifying century-old olive trees as *High Nature Value Farmland* and also involves the MATTM as partner.

Finally, in 2008, Italy focussed LIFE Natura and Biodiversity projects specifically on biodiversity, indicating implementation of Community Communication for Target 2010 as a “national priority”.

Land ecological connectivity, habitat fragmentation and defragmentation

The Habitat Directive (art. 10) includes those land elements that appropriately support ecological connectivity in the indications for correct biodiversity planning. Paragraph 3, Article 3 of DPR 357/97 strengthens this concept in consideration of evolution in scientific knowledge and, in relation to this specific matter, deliberately decided to invest on ecological networks as the reference for eco-compatible planning models. On implementation in Italy, ISPRA (at the time named ANPA) commenced a national initiative for study and research on ecosystem relations entitled “Ecological networks, Plan of activity for defining tools to help ecological continuity”. This is a jointly-funded programme over several years that involves a wide number of stakeholders. The main products deriving from the activities carried out included Guidelines to managing functional ecological connection on a local scale. This work moved to other areas over the following years (wetlands, coastal zones, marine environment, relations with Assessment of Impact on the Environment, connected to new PAC agricultural and environmental regulations).

Reinforcing compatibility of regional and territorial development and biodiversity is mainly implemented through Regional Ecological Networks; Tuscany Regional Council is dealing with this matter through a specific agreement with the WWF with a Biodiversity Regional Action Plan.

Tab. II.10 – Regional ecological networks

Region or Autonomous Province	Existence of projects to create a regional ecological network	Reference regional or provincial regulation for ecological networks
Abruzzo Regional Council	RER	
Basilicata Regional Council	REB	
Calabria Regional Council		
Campania Regional Council	Specific Objective 1.c – Operational Objective 1.8	L.R. 13 of 13 October 2008 “Regional Land Plan”
Emilia – Romagna Regional Council	A Regional Ecological Network is currently under completion and shall be approved as part of the objectives in the “Regional three-year environmental protection programme” through “Programme for regional system of protected areas and Nature 2000 network sites”	L.R. 6/2005 “Regulation for creating and managing regional system for protected areas and Nature 2000 Network areas”
Friuli – Ven. Giulia Regional Council	Yes	
Lazio Regional Council	Preparation of Regional Ecological Network by Regional Agency for Parks (being drafted); Land studies and analyses to identify elements in the regional ecological	Paragraph c bis), paragraph 7 of L.R. 29/97, regional ecological network and relative protection measures pursuant to Article 3 of D.P.R. 357/1997

	network (2 nd APQ7 Agreement); Actions aimed at conserving ecological network elements (5 th APQ Agreement/ - FAS 2007 – 2013)	
Liguria Regional Council	Yes	
Lombardy Regional Council	RER Yes, for pilot SIC Val Bormina –Cima Piazzzi Glacier (Sondrio) PG	
Marche Regional Council	1 st Stage of REM project Detailed REM Project planned	
Molise Regional Council	RER- 2 nd Project “Management and assessment of incidence in SCI’s– Ecological network” involves defining 10 management plans for 23 sites that occupy 50% of SCI regional land area. Ecological connectivity elements in the territory in question are highlighted in this project	D.G.R. no. 1393 of 15/12/08
Piemonte Regional Council		
Puglia Regional Council		L. R. 54/2000
Sardinia Regional Council	RER (Nature Map)	
Sicily Regional Council	PIR – RES /Regional Integrated Project (guidelines, geometries, ecological network) Ecological corridors Nature map	D.P.Reg. no. 25 of 6.12.2004; DDG no. 1256 of 28.12.2005; DDG no. 998 of 9.11.2007;
Tuscany Regional Council	Yes	<u>L.R no. 56 dated 6 April 2000 (BURT no. 17 dated 17/04/2000)</u> D.G.R no. 1148 dated 21 October 2002, (BURT no. 46 dated 13.11.2002)
Umbria Regional Council	RERU	L.R. 11 of 22.02.2005
Valle d’Aosta Regional Council		
Veneto Regional Council	RER, 40% of regional territory	Established in Regional Land Coordination Plan: DGR 2587/07; DGR 2357/08; DGR 372/09;
Bolzano Autonomous Provincial Council	Econnect is an Alpine Space project focussing on connecting protected areas via so-called ecologic corridors, highlighting artificial barriers and legislative barriers for the Alps region. Bolzano Autonomous Province indirectly participates in this project, in other words not as an official partner of the project but as part of two pilot areas.	Decision 1 dated 18 April 2007 of the joint meeting of Bolzano Autonomous Province Land Tirolo and Trento Autonomous Province authorities and that of Vorarlberg as observer regarding promotion of a connection between protected areas and creation of ecological corridors.
Trento Autonomous Provincial Council		Provincial law 11 dated 23.05.2007 Ecological corridor forecasts

Ecological network policies are strictly connected to vast area planning and, general speaking, with land landscape planning (see Chap. I.A.1).

Landscape

Law 14 dated 9 January 2006 "*Ratification and execution of European Landscape Convention held in Florence on 20 October 2000*", establishes full and complete execution of the European Convention.

Part III of the Code for Fine Arts and the Environment issued through Leg. Decree 42 dated 22.01.2004 by the Ministry of Fine Arts and Cultural Activities regulates the matter of landscape fine arts and indicates that the national level of application of the European Convention must be

implemented according to traditional competence division in its regulation and in compliance with its basic principles and administrative organization, while respecting the principle of subsidiarity.

The current stage in preparing Regional Landscape Plans (P.P.R.) by regional administrations that propose stipulations of specific agreements to the Ministry of the Environment and the Ministry of Fine Arts and Cultural Activities is particularly important to land planning policies.

The MATTM has signed initial agreements with Regions Umbria, Friuli Venezia Giulia and Puglia and is proceeding with the various preparation stages of the Plan such as: verifying technical contents; discussions among the various General Administrations involved via a technical roundtable at the Ministry; drafting a Report with the result of such technical roundtable for each stage in product analysis; meeting with Regions and acquiring results from observations made by the various local Authorities and Administrations involved; assessing such observations; discussions to transform assessment of each element acquired into agreed decisions.

Protecting and valorising landscapes, including in relation to sustainable development, are first of all the responsibility of Regions and Autonomous Provinces in Italy. These must prepare landscape Plans (or town- and land-planning designs with specific consideration of landscape values) extended throughout the Region pursuant to Leg. Decree 42/2004.

Ministry of Fine Arts and Cultural Activities Lines of Action

General Administration for landscape, architecture and contemporary art quality and protection has implemented specific lines of action to protect and restore landscape, including the cultural value linked to biodiversity as part of its institutional activities.

This Administration has adopted a strategy for “active protection” to reconcile conservation of all landscape heritage with economic and social development needs while carrying out its tasks in compliance with the principles established in the European Landscape Convention, focussing on landscape management under awareness of the values connected thereto and the relative quality of life, also in terms of maintaining biodiversity, using the following lines of action:

1) opinions on landscape compatibility

Arriving at the expression of opinion on landscape compatibility, especially for works with a strong impact on the environment for their very nature, such as works of national public interest subjected to Assessment of Impact on the Environment, assessment of a proposed project involves both the quality of architectural and engineering works and the quality of works designed to ensure the best possible inclusion of new creations in existing landscape configurations.

An opinion of competence is only expressed when project designs guarantee that the works in question not only satisfy quality requirements, but also do not disturb land vegetation or morphological systems. Furthermore, in order to optimize introduction of new creations in the relative context, an opinion almost always includes appropriate prescriptions for blending with existing elements comprising various types of vegetation in nearby areas, including when this is wild vegetation..

The work carried out by the Administration required to give an opinion for Plans subjected to Strategic Environmental Assessment (Leg. Decree 152/2006 amended by Leg. Decree 4/2008) is even more significant, whereby proposed wide-scale action involves vast areas in which continuity with systems important to biodiversity may be identified. Assessment of Special Strategic Project “River Po Valley” proposed by the River Po Basin Authority was especially complex, receiving an opinion that was favourable but conditioned by a number of prescriptions to provide integrating designs for the documentation presented in order to provide all the guarantees required to safeguard the important landscape involve in this Plan.

These prescriptions promptly listed specific operational procedures and methods to safeguard vegetation and river vegetation, conserving the special landscape and ecosystem features to ensure that every action planned was strictly conditioned by implementation of a number of good practices and thereby ensure that they become occasions to carry out landscape restoration, upgrading and valorisation.

2) Planning and relations with Regions

The Administration carried out positive action with regard to guidelines provided in activities related to joint planning with Regions, providing a positive contribution in analysing the territory for the purposes of planning by identifying the areas in which protecting land morphological components is essential to maintaining the cultural configuration of the landscape, especially with regard to rural aspects in peri-urban areas and those in which cultivation activities tend to be abandoned.

Work in some cases led to satisfactory planning tools, whereas a number of problems in situations strongly affected by economic pressure to urbanize came to light.

3) *Diffusion of awareness of the value of landscapes*

While adopting guidelines from the European Landscape Convention, the Administration commenced a competition for the Italian candidate for the European Council Biennial Landscape Award. This procedure received 47 proposals, one of which was selected to represent Italy due to its quality design and the excellent practices it implemented.

The above procedure was followed by extensive diffusion at the National level to improve awareness of the values of the landscape via indication, that could be evinced from the applicant projects, of high-quality procedures for intervening capable of guaranteeing harmonic relations between transformation and protection, including through landscape recovery and restoration that takes into account the importance of maintaining biodiversity for eco-sustainable economic development.

II.A.5 STRATEGIC OBJECTIVE 5: TO SUBSTANTIALLY REDUCE THE IMPACT ON EU BIODIVERSITY OF INVASIVE ALIEN SPECIES (IAS) AND ALIEN GENOTYPES

Headline target: Negative impacts on EU biodiversity of IAS and alien genotypes prevented or minimized from 2010 onwards

Invasive Alien Species (IAS)

One of the most valuable actions related to implementing IAS strategy is review of the national legal framework. Decree by President of the Republic DPR 357/97 and amendment DPR 120/03 implementing the Habitat Directive are currently the most effective legal tools for conservation of habitats and species. Art. 12 of DPR 120/03 forbids introduction of any alien species.

Given that, in accordance with aforementioned Decree 357/97, guidelines for introducing fauna were published by the Italian Ministry of the Environment, Land and Sea in 2007 (http://www2.minambiente.it/pdf_www2/dpn/pubblicazioni/qcn/qcn_27.pdf). These guidelines contain specific and detailed measures for preventing and controlling IAS, nevertheless they have not been implemented yet and therefore exhaustive assessment is not possible at this moment. Following the indications in the abovementioned guidelines, Environmental and Agricultural Ministries are preparing a Ministerial Decree.

It is also important to highlight that a number of pilot projects and several studies have already been carried out in Italy regarding this topic.

Several projects regarding the impact of IAS on marine biodiversity are currently underway:

- The project for *Identifying and distributing non-indigenous species in Italian seas* was launched by ISPRA in 2002 and funded by the Italian Ministry of the Environment. This effort especially focuses on supporting adoption of the new Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean Sea in Article 13 ASPIM of the Barcelona Convention, which requires inter alia regulation for introducing non-indigenous or genetically modified species.
- The project for *Identifying and distributing non-indigenous specie in Italian seas, additional activities* was launched in 2006 by ICRAM and MATTM: this project involved updating and implementing the previous project for monitoring alien species and new IMO protocols

on ballast water impacts were tested in Trieste and Milazzo harbours. This project also launched an early warning system for dangerous marine alien species.

With these projects, the Ministry of the Environment, Land and Sea not only wanted to comply with that established in Article 13 of the new Barcelona Convention ASPIM Protocol and Biodiversity Convention, but above all to demonstrate the great attention paid to the difficult topic of diffusion of alien species in our seas and its effects not only in terms of the threat it poses on biodiversity, but also the economic problems and related risk to health from non-indigenous organisms in Italian waters. This is why an initiative to create a databank on alien species was implemented, with Italy one of the first countries worldwide to do so. This databank has now been placed at the disposal of both those who are simply curious or those involved in this sector on the Ministry of the Environment, Land and Sea, as we are sure that the availability of scientifically proven data is useful not only to the scientific world, but also to those wishing to form an opinion on this difficult and important phenomenon. This databank will also ensure availability of essential information on the extent of this phenomenon and provide the elements for national policy to deal with the consequences and mitigate their impact. <http://www.tutelamare.it/cocoon/sa/app/it/index.html> Several studies have been carried out in Italy regarding the impact of IAS on freshwater and terrestrial habitats, the results of some of which are published by the Italian Ministry of Environment and by ISPRA:

- Action plan for freshwater fish;
- Guidelines for controlling coypu;
- Guidelines for controlling the American grey squirrel (*Sciurus carolinensis*) in Italy;
- Alien Mammals and Birds of Italy: survey, impacts on biodiversity and management guidelines.

Several projects are also underway, for example:

- Study on distribution and impact of *Rapana venosa*;
- Inventory of alien species in Italian Seas;
- Inventory of alien plants in Sardinia.

There are several institutional initiatives to control IAS involving several stakeholders and different administrative regions or authorities. For example, the MATT is organizing round tables to define a strategy to control grey squirrel expansion in northern Italy.

ISPRA is developing a database of alien species in Italy and a draft national strategy on biological invasions.

The most important initiatives on the national scale also include the “Alloctonous Italian Flora” Convention (*First contribution to carrying out a census on alien flora in Italy and characterizing the extent of its invasion, especially in relation to coastal areas and small islands*) between the Ministry of the Environment, Land and Sea (MATTM) and the Inter-University Research Centre for Biodiversity, Phytosociology and Landscape Ecology from the “La Sapienza” University in Rome. This project involved a large workgroup comprising experts from each Italian region and organically gathered information currently available on alloctonous Italian flora according to standard standards and terminology, thereby leading to creation of the scientific basis required to draw up a national strategy for biological invasion and identifying priority actions.

However it is not possible to draw an exhaustive picture of the actions undertaken to prevent IAS in Italy. In fact, this matter is being managed at regional level in accordance with different regional laws. Directive 105/99/CEE, aimed at setting rules for producing and marketing forest reproductive material is effective for preventing the use of species of alien or non-local origin in afforestation and reforestation programmes. However, it is also important to point out that a number of pilot projects on eradication have already been carried out on some small Islands in the Mediterranean sea, some of them funded by LIFE.

Table II.11 – Division of the actions carried out according to player and action involved with regard to the impact of alien species

Type of player	Prevention	Localization	Monitoring	Mitigation	Total
Regions	11	10	7	24	52
Provinces	25	23	19	59	126
Towns	2	6	1	3	12
Mountain communities	6	4	1	7	18
Protected areas	51	72	52	120	295
Trade associations and freelancers	6	5	7	8	26
Environmental Associations	2	10	4	2	18
Research bodies	11	4	15	17	47
Universities	49	50	85	92	276
Natural history museums	14	18	23	7	62
Environmental Agencies	9	16	9	9	43
Inspection and supervision organizations	26	37	18	43	124
Various bodies	2	3	1	3	9
-	214	258	242	394	1108

Source: ISPRA-ARPA, in press "Survey on initiatives for the purposes of prevention, monitoring and mitigating the impact from alien species in Italy".

Italy supports several international actions on biological invasions. ISPRA is coordinating, on a contract with the European Environmental Agency, a feasibility study for developing a European early warning and rapid response framework. Furthermore, ISPRA with support from MATTM is planning to host Global Invasive Species Database (GISP <http://www.issg.org/database/welcome/>) in the near future, in order to facilitate access of Member States and practitioners to this decision tool.

Genetically Modified Organisms (GMO)

As part of the Convention on Biodiversity, a specific Protocol of Intent (Cartagena Protocol) was adopted in 2000 to protect biodiversity from potential risks from releasing genetically modified organisms into the environment through modern molecular techniques.

This protocol became effective in 2003 and was ratified in Italy in March 2004.

The main objective of this Protocol is to ensure adequate protection in relation to transboundary movement of GMO's, especially with regard to protecting biodiversity and human health. This protocol guarantees importing countries access to all the information they require to assess environmental risks related to GMO's and the possibility of making a decision prior to importing goods, according to the precautionary approach established in Principle 15 of the Rio Declaration (3-14 June 1992).

The main tool for ensuring that biosafety information is exchanged is a Biosafety Clearing-House – an online platform that organizes and makes information provided by national BCH's accessible to the general public.

The National Authority responsible for GMO's in Italy is the Ministry of the Environment, Land and Sea, which coordinates administrative, technical and scientific activities relating to Biosafety and manages the Italian BCH.

Italy enabled the Italian Biosafety Clearing House IT platform in 2005 (<http://bch.minambiente.it>). It also presented the 1st National Report on implementation of the Protocol.

Particular attention is paid to supporting training activities (Capacity Building) to develop and/or consolidate human resources and institutional abilities regarding biosafety for Developing Countries and Parties with transition economies to ensure effective implementation of the Biosafety Protocol (ICGEB and UNIDO).

Strategic Area B –Italy and global biodiversity

II.B.6 STRATEGIC OBJECTIVE 6: TO SUBSTANTIALLY STRENGTHEN EFFECTIVENESS OF INTERNATIONAL GOVERNANCE FOR BIODIVERSITY AND ECOSYSTEM SERVICES

As part of ENCORE (ENvironmental CONference of the Regions of Europe), Tuscany Regional Council has been coordinating a workgroup (Tuscany, Emilia-Romagna, Liguria, Aragona, Catalonia, Navarra Region – Spain, Vastra Gotaland Region – Sweden, Scotland and Warmia Mazury - Poland) to discuss and share good practices and regional strategies to protect biodiversity since 2007.

Furthermore, Liguria Regional Councils is cooperating with neighbouring French regions as part of the Interreg Alcotra “Natura 2000 Marine Alps” and “Testa d’Alpe”.

The Regions (Friuli – Venezia Giulia, Liguria, Lombardy, Piemonte, Valle d’Aosta, Veneto) and Autonomous Provinces (Trento and Bolzano) influenced by the Alps actively participate in the Convention for protecting the Alps, which is an agreement reached by Italy, Austria, Switzerland, France, Germany, Monaco, Liechtenstein, Slovenia and the EC since 1999. In this specific “alpine” context, Italy participates in the work carried out for the “Ecological Network Platform” established as part of the Convention by the Alps Conference and the main objective of which is to safeguard biodiversity in the Alps. The Ministry of the Environment, Land and Sea also participates in the Community “Alpine Space” Programme (ex Interreg III-B) and E-Connect Project.

Sardinia Regional Council participates in the Maritime P.O. with 2 projects: 1) GIONHA, to protect and valorise cetaceans and turtles; 2) ZOUMGEST, to identify management systems to integrate man-made activities and safeguard nature.

More detailed on international biodiversity Conventions can be found in Chap. III.B.1-2-3.

II.B.7 STRATEGIC OBJECTIVE 7: TO SUBSTANTIALLY STRENGTHEN SUPPORT FOR BIODIVERSITY AND ECOSYSTEM SERVICES IN EU EXTERNAL ASSISTANCE

Italy makes cooperation in development an integral part of its foreign policy, which goes together with objectives relating to peace, international security, economic and social development and opposing poverty. The main legislative reference regarding cooperation in development is Law 49 of 1987, which provides the general principles involved and lists the main aims of cooperation activities between Italy and Developing Countries (DC’s); conserving environmental heritage is specifically mentioned. Priorities and guidelines for external assistance are defined periodically, also taking into account the guidelines and commitments agreed on the international level (UNO, EU). The Objectives for the Millennium, especially those linked to opposing poverty and health, have inspired Italy’s actions related to cooperation in development and external assistance over the last few years, including the sustainability of development and environmental protection, which also covers conserving biodiversity and protecting ecosystems.

With regard to supporting biodiversity as part of public aid for development, Italy has continued to directly support both leading international agencies and organizations dedicated to protecting the environment (such as UNEP, FAO, IUCN) through compulsory and voluntary contributions and technical support and financial tools to support Rio Conventions and other multilateral agreements (e.g. GEF, IFAD Global Mechanism to Combat Desertification), which support actions specifically aimed at protecting biodiversity or which however have positive implication in this sense. A large part of public aid for Italian development is also channelled (as the national quota due to the European Development Fund or as the Italian contribution to ordinary activities on the Community budget for aid for development) via the European Commission, whose external assistance is explicitly addressed to protecting biodiversity and ecosystems.

Italy has also continued to directly implement and support actions and projects directly aiming at natural resource and biodiversity conservation via the numerous channels and procedures involved in development initiatives receiving public funding (bilateral, multilateral, multi-bilateral, partnerships of various types, programmes promoted by Non Governmental Organizations, etc.). Initiatives specifically focussing protecting biodiversity and ecosystems providing support in managing individual protected areas or systems of protected areas have been carried out in various countries. Support addressed both improving the ability for management of these areas (improving resources, material resources for management, providing institutional reinforcement to the agencies involved) and encouraging participation-based management approaches or developing compatible economic activities in the areas themselves (such as eco-tourism activities) or in neighbouring areas. In some cases, support was addressed to areas of particular value in terms of biodiversity, such as the Socotra archipelago in Yemen, to transboundary ecosystems, such as in southern Africa, the Amazonian Basin and the Himalayan region, or to programmes for conserving particularly important species. Considerable support with substantial implications in terms of supporting biodiversity was addressed to managing and safeguarding forest ecosystems, combating desertification and managing water resources and, finally, mitigating climate changes. Various cases of supporting biodiversity in agricultural systems also occurred as part of support activities involving the food and agricultural sectors.

Over the last few years, decentralized cooperation promoted and funded by Regional Councils and local authorities has become more important, in line with the general trends of APS, where a number of initiatives to encourage biodiversity protection have also been carried out.

II.B.8 STRATEGIC OBJECTIVE 8: TO SUBSTANTIALLY REDUCE THE IMPACT INTERNATIONAL TRADE ON GLOBAL BIODIVERSITY AND ECOSYSTEM SERVICES

Conserving and valorising biodiversity via sustainable use of the resources subject to international trade

The worrying impact of illegal trade on the environment was one of the main reasons for which the European Commission launched the FLEGT Action Plan in 2003. This Action Plan contained a number of measures to combat illegal trade both in producing countries and in the European Union as timber importer.

In 2005, the Commission adopted Regulation 2173/2005 involving Voluntary Partnership Agreements – PVAs between the European Union and individual exporting countries (or unions of exporting countries). A system of export licenses shall be introduced following economic aid to reinforce the administrations responsible for controlling forests in developing countries.

The FLEGT license shall be a standard document linked to each load of timber or individual trade subject - that can be checked but cannot be forged – referring to a load that complies with FLEGT provisions, issued and validated by the Management Authority in the partner country. This license system guarantees the legality and traceability of timber and the related products described in the Appendices to the Regulation.

Until now, Ministry of the Environment has ensured coordination between all the institutional subjects who shall be responsible for applying Reg. 2173/2005 (CFS, Customs, MAE, MATTM, MAP).

Italy has signed the CITES (Convention in International Trade in Endangered Species) and is thereby obliged to comply with the provisions of this Convention in relation to regulating trade of the species described in the relative Appendices.

Italy guarantees regular application of this Convention through certification and control carried out by an organization involving the Ministry of the Environment, the State Forestry Department (responsible for inspections and controls) and a Scientific Authority mainly comprising university professors and researchers, which also carries out activities considered as priorities at the national level.

1. amending the “Operational Manual: Customs control methods and procedures for international trade in endangered wild fauna and flora species pursuant to Regulation (EC) 338/97 and subsequent implementations and amendments”. This Manual provides a detailed and practical description of procedures and checks on CITES goods for Forest Department and Customs operators responsible for CITES inspections.
2. producing a “Manual of technical instructions on timber”. One of the more important topics on which the Authority responsible for Managing CITES in Italy has focussed over the years is conserving tropical forest resources, which are often threatened by illegal cutting for agriculture and international trade. Given the strong incidence of timber imports on the Italian market, Italy has undertaken to guarantee the legality and sustainability of imports to thereby conserve forest biodiversity. A number of activities with the purpose of assisting identification, measuring and controlling timber loads imported to Italy have been implemented to guarantee legality and discover any smuggling channels. This Manual (currently under completion and approval) provides a section focussing on sampling and measuring timber loads to support the procedures and controls already provided in the Operational Manual.
3. translating and publishing a “Canadian Guide to identifying tropical timber”. This guide was produced by the competent Canadian Authority and shall be provided as support material to reinforce the ability of operators to control timber exports.
4. participating in international workgroups on identifying and measuring timber loads as President.
5. participating in a workgroup on the possibility of adopting electronic systems to exchange information and/or CITES permits among States in the Convention with a suitable level of IT and technology. Exchanging information on exporting/importing CITES goods in real time will ensure that the time required to obtain licenses can be considerably reduced and that fake and forged licenses can be discovered.
6. participating in an international workgroup on personal and domestic objects. The CITES Regulations comprise exceptions to the ban on owning and importing/exporting or possession of licenses regarding the species listed in the Appendices with regard to objects made from exemplars included in CITES that are used for personal and not commercial reasons. In view of the peculiar nature of this regulation and the risk that it could be used to allow movement of protected goods that can then join the illegal trade circuit, an international workgroup has been established to regulate this matter.
7. issuing a ministerial decree to authorize caviar trade structures. As sturgeon and spade fish are included in CITES regulations, precise provisions for managing wild populations and aquaculture operations for the purposes of producing caviar have been established at the international and European level. For this purpose, the Italian Authority has issued a decree on “Labelling primary and secondary caviar containers and registering companies that produce or pack caviar”. Inspections at relative structures were carried out, discovering that there are currently two structures producing and three packing caviar that were properly authorized for such operations in Italy.

Over the last few years, constructive cooperation has been established between CITES Authorities and international organizations acknowledged by the CITES Secretariat, such as the TRAFFIC Network, to promote prompt projects or studies and monitoring of the national market.

The Italian Traffic Europe Office created by the WWF in 1986, which is an integral part of the Traffic Network as joint work programme promoted by IUCN and WWF International, independently monitors wildlife trade, processing national and international information available and writing specific reports placed at the disposal of state authorities, industrial sector and non-governmental organizations.

Over the last few years, the MATTM has promoted a number of projects related to CITES to support development of conservation and valorisation for species threatened by international trade as support for the Vogogna Action Plan promoted by Range Countries of species.

DNA fingerprinting

The Laboratory of genetics at ISPRA is running a long term project, financed by MATTM, supporting the enforcement of the Washington Convention (CITES) in our country. The Laboratory of genetics develops and applies a number of molecular procedures (DNA typing) used to identify animal specimens and products, and performs progeny testing on biological samples from captive-reproduced CITES mammals and birds. Molecular identifications of species and kin groups are stored in the DNA fingerprinting CITES data base that is implemented and updated at ISPRA. The Laboratory of genetics is collaborating to integrate extant European wildlife forensic resources in TRACE “The wildlife forensic network” (<http://portal.tracenet.org/>) (http://www2.minambiente.it/pdf_www2/dpn/pubblicazioni/qcn/qcn_12bis.pdf).

Strategic Area C – Biodiversity and climate change

II.C.9 STRATEGIC OBJECTIVE 9: TO SUPPORT BIODIVERSITY ADAPTATION TO CLIMATE CHANGE

Headline target: Potential for damaging impacts, related to climate change, on EU biodiversity substantially reduced by 2013

ONU Convention commitments to climate change (UNFCCC)

The Ministry of the Environment, Land and Sea (MATTM), as national Focal Point for the Climate Change Convention (UNFCCC), approves and forwards a “National Inventory of Greenhouse Gas (GHG Inventory)” to the UNFCCC I’ Secretariat once a year, which is processed by the Institute for Environmental Protection and Research (ISPRA).

Although the GHG Inventory has not yet been completed, it comprises a specific section dedicated to Land Use, Changes to Land Use and Forestry (LULUCF). In relation to the Forestry sector, a considerable part of the information included in the LULUCF section derives from the “National Inventory of Forests and Carbon Storage Tanks (INFC)” recently created by the State Forestry Department with cooperation from the MATTM.

The INFC reports that Italian forests have considerable potential to absorb carbon, as they covered a land area of 10,467,533 hectares ha 2005 and increased by around 2 million hectares over the last 20 years; forests cover around one third of national territory, but absorb over 50% of all carbon contained in terrestrial ecosystems.

The growth rate for mean temperatures in Italy is roughly double the global rate, in other words around 1.4 °C over the last 50 years. The difference between daytime and nighttime temperatures has increased, as maximum temperatures have increased more than minimum temperatures. Cold snaps have decreased, whereas heat waves in increased both in terms of intensity and duration. There has been a decline of around 5% in precipitations, above all in spring (around 9%). The general trend involves an increase in the intensity of precipitations and decrease in their duration in all Italian regions. The ice-covered land area in the Italian Alps is now under 500 km², less than one fifth of the entire alpine area, while the only glacier in the Apennines - Calderone on Gran Sasso – now has just a few and thin plates.

The latest IPCC report in 2007 illustrated that mitigation cannot be the only tool to combat climate change, as the inertia inherent to Climate System processes would still increase the mean global temperature for a certain period of time even if carbon dioxide emissions into the atmosphere were stopped.

Projects for assessing biodiversity adaptation to climate change

By way of acknowledging the urgency in dealing with biodiversity adaptation to climate change, the MATTM promotes Project “BioRefuge” created by the La Sapienza University of Rome to

complete an initial project jointly funded by the EU and the State Forestry Department. Land areas that will be able to host the main Italian forestry species subjected to stress from climate change or the areas in which niches of suitable climate will persist for the species in question were identified through the “BioRefuge” Project. Efforts in management and conservation shall be concentrated on these biorefuges via the activities established by International Conventions and management and reinforcement of the Protected Area System.

The effects of climate change on the surveyed species (27 of the tree species most commonly found in Italian woodlands) were assessed using a model with two climate scenarios created by the Intergovernmental Panel on Climate Change - B1 and A1F1 – each of which refers to the average in two thirty-year periods 2030-2060 and 2070-2100.

Geographical analysis of the BioRefuge Index can also be used to plan activities to support individual in situ adaptation abilities of species, also via actions aimed at facilitating expected migrations in search of climate conditions for the purposes of survival.

Strategic Area D – The biodiversity knowledge base in Italy

II.D.10 STRATEGIC OBJECTIVE 10: TO SUBSTANTIALLY STRENGTHEN THE KNOWLEDGE BASE FOR CONSERVATION AND SUSTAINABLE USE OF BIODIVERSITY, IN THE EU AND GLOBALLY

Technological Infrastructures and online topical Networks

The Ministry of the Environment created the first version of its Clearing House Mechanism (CHM) on its web site in 2005, as the first initiative for an Italian Biodiversity Portal (http://www.minambiente.it/index.php?id_sezione=1526). Its structure reflects the various areas of Biodiversity and offers relative links to various levels (Italian, European Community, Pan-European, Global). References to transversal topics such as access to genetic resources and fair benefit sharing and, above all, the Global Taxonomy Initiative complete this Clearing House Mechanism.

The Ministry of the Environment and the Committee of Ministries for the Information Society (House of Commons Authority) jointly funded and carried out a feasibility study between 2005 and 2007 and subsequently jointly funded start-up of a project for technological innovation entitled “Portal Environment 2010”, the technical and scientific services for which are currently being awarded.

This initiative aims to create the main national System for accessing, managing and providing Biodiversity- and Natural Protected Area-related information, applications and services to support sector policies in line with the more significant international projects.

This project specifically involves:

- Creation of a National Biodiversity Network to gather, manage and disseminate information and data on Biodiversity and Natural Protected Areas comprising a network of high-quality technical and scientific Centres of Excellence (universities and research institutes, museums, Natural Protected Areas, government agencies, etc.) to study, monitor and disseminate knowledge of biological diversity at all levels of organization (genes, species, ecosystems, landscapes, etc.), which shall operate alongside reference institutions (Ministries, Regions, local authorities);
- Definition of classification of biodiversity information according to mapped level and creation of a web platform to publish and consult information;
- Implementing the CHM according to CBD and EU standards.

ISPRA carries out technical and scientific functions for which the MATTM is responsible and acts as a link with the European Union environmental IT system (EIONET) and is therefore

experimenting a Portal Tool Kit (CHM-PTK) distributed by the European Environmental Agency (EEA).

Portal Environment 2010 shall integrate the existing initiatives and databanks at the Nature Protection Department under the logic of interoperability with other Ministry projects (General Department of Land Protection National Map Portal, SINANET and ISPRA databanks, etc.) and other public authorities of interest in order to develop an effective national Network for this sector.

The CNBF, Centro Nazionale per lo studio e la Conservazione della Biodiversità Forestale “Bosco Fontana” di Verona (National Centre for Studying and Conserving Forest Biodiversity in Verona) is a governmental division of the MiPAAF CFS, Central Biodiversity Office acknowledged through Legislative Decree 227/01. This centre deals with terrestrial Invertebrate taxonomy and fauna. It operates for the MATTM DPN in relation to CBD's to fulfil Target 2010 and develop the Global Taxonomy Initiative (GTI) through Protocol of Intent dated 30.11.2005. The CNBF has developed research for the Natura 2000 Network, the Italian Conecofor Network and I-LTER sites, reporting over 300 new species of invertebrates for Italian fauna with respect to the 1995 Checklist over the space of 5 years (Minelli et. al, 1995) and describing numerous new species for science. The results were collected in CNBF monographs (Mason et al., 2002, Cerretti et al., 2003; Cerretti et al., 2004; Nardi & Vomero, 2007). The CNBF has also developed innovative techniques to conserve the habitats and fauna of saproxylic invertebrates and monitor and limit alien species (Cavalli & Mason, 2003).

Regional experiences

Lazio Regional Council has established a Regional Biodiversity Observatory and implemented a network to monitor the Natura 2000 network and the species and habitats of interest.

Liguria Regional Council has established a technical and scientific Observatory for biodiversity structure with support from the Genoa University Dip.Te.Ris, which is an essential reference point for monitoring naturalistic values. The information gathered and validated by the Observatory is stored in the land biodiversity IT system, which is part of the regional environmental Portal (www.ambienteinliguria.it). The maps and alphanumeric information may be accessed by the general public via profiles established according to user. The section of the Liguria Regional environmental portal dedicated to Natura 2000 also contains information regarding current laws, naturalistic values safeguarded on the sites, funding opportunities and valorisation projects underway. The levels of biodiversity information may be consulted at the same time as other environmental aspects (e.g. water quality, air quality, etc.), thereby ensuring real integration of information and complete reading of the territory.

Marche Regional Council has created completely computerized maps on different scales of botanic and vegetation aspects via complex analyses and methodological definitions integrating various aspects of environmental quality in the Marche Region. Database storage logics were specifically designed for the Marche Environmental IT System and allow specific topic-related maps to be created by correlating the large variety of data entered differently, especially the Vegetation Map (phytosociology), Plant Landscape Map (integrated sinusial phytosociology), Habitat Maps.

Molise Regional Council has created an updated map of CORINE Land Cover and established the perimeters of priority habitats and those of Community interest as part of a Convention established with the Italian Botanical Society entitled “Project for CORINE Land Cover Maps and distribution of plant and animal species and habitats of Community interest in Natura 2000 sites in the Molise Region”. The map topics are: Land Cover and Use Maps; Habitat Maps and Fauna Suitability Maps.

Sardinia Regional Council has a Center for Biodiversity Conservation in the Department of Biological Sciences at the University of Cagliari.

Piemonte Regional Council Protected Area Planning Division gathers nature-related information on Protected Areas and Natura 2000 sites in this Region and organizes this in nature-related databanks as established in Regional Framework Law on Protected Areas 12 dated 22/3/1990 “New

Regulations for Protected Areas”. Ongoing scientific updating of Naturalistic Databanks occurs through acquisition of information from regional Authorities, instrumental Bodies (authorities responsible for managing Protected Areas) and other external subjects.

Considering the recent e-government guidelines from Public Administration focussing on effectiveness and efficiency of services offered to users and Directive 2003/4/EC dated 28/1/2003 concerning public access to environmental information, it was decided to provide the best possible visibility to information contained in naturalistic databanks using ICT (Information and Communication Technology Projects). Access via the Internet is provided through <http://www.sistemapiemonte.it/ambiente/bdn/> with modular access profiles according to the type of user and sensitivity of the information in question.

A “Guide to acknowledging Habitat Directive environments and species in Piemonte” was also created and provided in both hard copy and downloadable copy from the Piemonte Region website.

Information and data regarding nature conservation in Piemonte can be viewed and downloaded from the Piemonte Region site at <http://www.regione.piemonte.it/sit/argomenti/parchi/index.htm>.

At the same time, a Piemonte Region Observatory for Wild Fauna was established in 2002 as a technical and scientific tool operating in the field of fauna and hunting management and planning and, more specifically, through creation and management of a databank for wild fauna subjected to management, safeguarding and managing fauna and reports on fauna, agriculture and territory (http://www.regione.piemonte.it/agri/osserv_faun/index.htm).

Tuscany Regional Council updated terrestrial and marine naturalistic databanks - RENATO (REpertorio NATuralistico TOscano) and BioMART (Biodiversità MARina in Tuscany) – and commenced various studies to provide in-depth details of knowledge of regional biodiversity.

Campania Regional Council has commenced numerous studies concerning reinforcement of knowledge in relation to conservation and sustainable use of biodiversity; it is also part of the Italian LTER Network (Long-Term Ecological Research), which in turn is part of European and International LTER (I-LTER).

Most Regions and Autonomous Provinces have provided web access to data and news regarding Natura2000, habitats and species. For example, Veneto Regional Council has an extensive IT base on biodiversity on its territory, which shall be made accessible via a webGIS dedicated to the regional Natura 2000 Network.

CHAPTER III – SECTOR-BASED AND INTERSECTOR-BASED PLANS AFFECTING BIODIVERSITY

III.A Safeguarding biodiversity in the plans and programmes of various sectors

III.A.1 RURAL DEVELOPMENT AND AGRICULTURE

The **National Strategic Plan (NSP) for Rural Development 2007-2012** approved in July 2007 formally provides the framework for planning of agricultural and forest measures.

Transferral of competences concerning agriculture and forests in Italy generated land diversification of planning, which basically occurs through Rural Development Plans (RDP) for 2007-2013 and specific Regional Forest Plans and Programmes (PFR), often drawn up to support RDP.

Biodiversity and landscape conservation are two of the four environmental priorities identified by the Italian National Strategy Plan (NSP) for Rural Development. Three specific actions are highlighted: 1) reduction of negative environmental impacts; 2) mitigation of negative environmental impacts; and, 3) exploitation of the environmental function of agriculture. The strategy identifies, within the latter group, some key actions specifically aimed at maintaining

and/or creating those landscape features which can be termed ‘farmland features’. These refer particularly to: 1) conserving landscape and its specific features; 2) reducing habitat fragmentation ; and, 3) protecting soil (i.e. terraces).

The NSP recommends action for high nature value agro-forestry areas, particularly protected areas (including Natura 2000 sites) and less favoured areas, aimed at: a) conserving and exploiting semi-natural habitats, including natural structural features (such as hedges, rows of trees, grassy and wooded strips, ponds); b) developing ecological corridors by strengthening crucial points of the ecological network and ensuring greater connection between protected areas by safeguarding and diffusing natural features (rows, hedges and copses) and manmade features (e.g. ditches, small dry walls); and, c) restoring natural habitats and adopting appropriate eco-compatible agricultural practices. More specifically, it has been suggested that planning and management policies for protected areas should be adopted over large areas, so as to take into account the dynamics of ecosystems and their functional relationships, and to integrate their management with that of land and ecosystems outside protected areas. If appropriate measures were actually developed, they would be likely to benefit many farmland features, particularly features such as hedges and other linear features that improve habitat connectivity.

Depending on the regional context, the key actions, as mentioned above, can be implemented through different measures provided by Axis 2, particularly: agri-environmental payments; support for non-productive investments; LFA payments; Natura 2000 payments; afforestation, forest-environment payments.

Biodiversity actions contained in RDPs are also indirectly implemented via Axis 1 (Improving competitiveness in agriculture and forestry), Axis 3 and Axis 4 (Improving the quality of life in rural areas and diversifying rural economy and Leader approach) .

In order to improve action effectiveness, the NSP allows for integration of measures (included in a single Axis or as a combination of measures from different Axes). Integration can be realised around a specific strategic theme, such as environmental conservation, which may then be differentiated according to the specific objective, e.g. biodiversity or soil.

Table III.1- RDP funds and percentages per Axis and Measure

Axis	Measure/description	FEASR Total	Overall public spending	% Programme	% per Measure per Axis
1	111 Vocational training and information actions	101.183.462,00	214.305.196,00	1,3%	3,3%
	112 Setting up of young farmers	370.618.703,00	798.457.403,00	4,8%	12,4%
	113 Early retirement	28.555.304,00	59.225.909,00	0,4%	0,9%
	114 Use of advisory services	118.284.594,00	241.802.895,00	1,5%	3,8%
	115 Setting up of farm management	15.593.900,00	29.900.366,00	0,2%	0,5%
	121 Modernisation of agricultural holdings	1.117.257.025,00	2.356.444.413,00	14,2%	36,6%
	122 Improving the economic value of forests	20.597.841,00	220.701.909,00	1,3%	3,4%
	123 Adding value to agricultural and forestry products	571.002.146,00	1.194.348.372,00	7,2%	18,6%
	124 Cooperation for development of new products, processes and technologies	70.700.574,00	151.980.527,00	0,9%	2,4%
	125 improving and developing infrastructure related to the development and adaptation of agriculture and forestry	361.540.835,00	719.038.131,00	4,3%	11,2%
	126 Restoring agricultural production potential damaged by natural disasters	20.597.841,00	46.323.945,00	0,3%	0,7%
	131 Adapting to demanding standards based on Community legislation	26.331.215,00	54.604.313,00	0,3%	0,8%
	132 Supporting farmers who participate in food quality schemes	78.561.090,00	164.156.149,00	1,0%	2,6%
	133 Information and promotion activities	87.369.041,00	183.223.805,00	1,1%	2,8%
Total Axis 1		3.071.052.397,00	6.434.513.333,00	38,8%	100,0%
2	211 Natural handicap payments to farmers in mountain areas	387.917.724,00	815.990.299,00	4,9%	11,7%
	212 Payments to farmers in areas with handicaps, other than mountain areas	128.138.109,00	265.671.522,00	1,6%	3,8%
	213 Natura 2000 payments and payments linked to Directive 2000/60/EC	10.713.567,00	23.121.744,00	0,1%	0,3%
	214 Agri-environmental payments	1.914.686.852,00	3.709.709.043,00	22,3%	53,1%
	215 Animal welfare payments	131.648.294,00	290.386.547,00	1,7%	4,2%
	216 Support for non-productive investments	124.156.906,00	236.713.531,00	1,4%	3,4%
	221 First afforestation of agricultural land	403.390.847,00	750.301.637,00	4,5%	10,7%
	222 First establishment of agroforestry systems on agricultural land	4.873.111,00	8.186.161,00	0,0%	0,1%
	223 First afforestation of non-agricultural land	84.362.451,00	132.400.933,00	0,8%	1,9%
	224 Natura 2000 payments	6.285.091,00	13.057.025,00	0,1%	0,2%
	225 Forest-environment payments	22.447.681,00	44.048.373,00	0,3%	0,6%
	226 Restoring forestry potential and introducing prevention actions	233.655.351,00	431.690.963,00	2,6%	6,2%
	227 Non-productive investments	136.602.569,00	260.173.209,00	1,6%	3,7%
Total Axis 2		3.588.878.553,00	6.981.450.987,00	42,0%	100,0%
3	311 Measures to diversify the rural economy	285.207.274,00	588.042.742,00	3,5%	41,6%
	312 Creating and developing micro-enterprises	47.414.068,00	90.880.669,00	0,5%	6,4%
	313 Encouragement of tourism activities	59.727.895,00	118.574.971,00	0,7%	8,4%
	321 Basic services for the economy and rural population	97.024.677,00	196.762.200,00	1,2%	13,9%
	322 Village renewal and development	106.758.127,00	207.208.652,00	1,2%	14,7%
	323 Conservation and upgrading of the rural heritage	78.415.188,00	158.886.635,00	1,0%	11,2%
	331 Training and information	17.649.147,00	34.260.145,00	0,2%	2,4%
	341 Skills-acquisition and animation to implement local development strategy	9.524.550,00	19.521.705,00	0,1%	1,4%
Total Axis 3		701.720.926,00	1.414.137.719,00	8,5%	100,0%
4	411 Local development strategies. Competitiveness	43.381.722,00	94.094.898,00	0,6%	7,0%
	412 Local development strategies. Environment/land	36.824.940,00	74.473.504,00	0,4%	5,5%
	413 Local development strategies. Quality of life	444.725.592,00	885.112.059,00	5,3%	65,8%
	421 Implementing cooperation projects	45.727.686,00	91.644.460,00	0,6%	6,8%
	431 Managing local action group, acquiring competences and animating territory pursuant to the Rural Development Programme	102.728.069,00	200.646.916,00	1,2%	14,9%
Total Axis 4		673.388.006,00	1.345.971.837,00	8,1%	100,0%
5	511 Technical assistance	215.510.118,00	428.400.788,00	2,6%	100,0%
Total Axis 5		215.510.118,00	428.400.788,00	2,6%	100,0%
Overall total		8.250.550.000,00	16.604.474.664,00	100,0%	100,0%

Source: MIPAAF

Rural Development Programmes are funded by the **European Agricultural Fund for Rural Development (EAFRD)** with joint funding from the State. Table III.2 illustrates percentage distribution of the funds available for 2007-2013 between the various rural development Axes. At the national level, measures that may positively affect biodiversity (Axis 2) have received 42% of overall funding. Considerable variation can be seen at the regional level – from 20% for Liguria to 69% for Valle d'Aosta – due to the varying importance attributed by regional governments with respect to environmental integration.

At the national level, the National Rural Network (NRN) 2007-2007 managed by the Ministry for Agricultural, Food and Forestry Policies and funded by EAFRD aims to establish an important opportunity within rural development to better integrate actions concerning the competitiveness of agriculture, forestry and the environment (biodiversity, safeguarding waters, climate change) and those focussing on the quality of life and economic diversification, reinforcing its effectiveness.

The general objectives of the NRN – including in relation to protecting biodiversity – may be summarized as follows:

- Improving national and regional governance of environmental policies;
- Reinforcing national and regional planning and management abilities in favour of biodiversity;

- Encouraging a process to diffuse information and knowledge regarding planning and the dynamics in rural areas related to biodiversity.

Table III.2 – Public resources for RDP per Region and per Axis, 2007-2013

	Public spending					Line percentage	
	total ⁵	in %	Axis I	Axis II	Axis III	Axis IV	Technical assistance
Piemonte Valle d'Aosta	896,591	5.4	38.2	44.5	7.4	6.5	3.4
Lombardia	118,684	0.7	10.2	69.4	10.4	7.5	2.6
A.P. Bolzano	899,757	5.4	32.4	51.6	8.9	4.0	3.0
A.P. Trento	312,670	1.9	23.9	62.0	9.0	5.0	0.0
Veneto	256,153	1.5	34.1	47.3	11.5	6.7	0.4
Friuli-Venezia Giulia	914,675	5.5	44.1	36.9	5.0	11.0	3.0
Liguria	247,211	1.5	43.0	37.0	10.0	6.5	3.5
Emilia-Romagna	276,562	1.7	51.9	20.2	5.5	19.7	2.7
Tuscany	934,661	5.6	41.0	42.5	10.4	5.1	1.0
Umbria	839,114	5.1	38.5	40.0	10.5	10.0	1.0
Marche	760,068	4.6	40.0	43.0	9.0	5.0	3.0
Lazio	459,818	2.8	42.2	38.8	9.0	6.0	4.0
Abruzzo	655,418	3.9	47.0	32.0	11.3	6.0	3.8
Molise	383,889	2.3	43.0	37.0	11.0	5.0	4.0
Campania	194,977	1.2	44.1	33.8	14.1	5.0	3.0
Puglia	1,882,346	11.3	40.0	36.0	15.0	5.0	4.0
Basilicata	1,480,569	8.9	40.4	35.1	2.7	18.8	3.0
Calabria	648,087	3.9	26.5	54.0	10.0	6.0	3.5
Sicily	1,084,071	6.5	41.0	41.0	10.0	6.0	2.0
Sardinia	2,106,312	12.7	42.4	42.1	7.5	6.0	2.0
Italy	1,252,841	7.5	28.0	56.0	1.4	13.6	1.0
Italy	16,604,475	100.0	38.8	42.0	8.5	8.1	2.6

Axis I = Improving competitiveness in agriculture and forestry.

Axis II = Improving the environment and rural areas.

Axis III = Quality of life and diversifying rural economy.

Axis IV = Local development strategy - Leader.

The overall number comprising FEASR and joint funding.

Source: processed by INEA using MiPAAF figures

With regard to agriculture, in view of the obvious direct impact of agricultural practices on biodiversity, the Ministry of Agricultural, Food and Forestry Policies (MiPAAF) published the “National Plan for biodiversity of agricultural interest”³ in February 2008. This Plan stresses that local varieties can only be conserved in the bioterritory⁴, using traditional local rural techniques, in an extremely close relationship based on reciprocal dependency between those carrying out “*ex situ*” conservation and those carrying out “*in situ*” conservation.

The Plan is based on analyzing the strengths and weaknesses in plant and animal resource management. It directs all available resources towards conserving agricultural genetic diversity to

³ <http://www.politicheagricole.gov.it/download/20080313/SR/Piano/nazionale/biodiversita/agricoltura.pdf>

⁴ Bioterritory: the place in which local varieties adapted and characterized themselves over time thanks to the action of local farmers.

thereby effectively restore most of the lost or endangered biodiversity on a territory to safeguard the environment, sustainable agriculture and rural development.

Finally, this Plan identifies priority initiatives to implement in the medium-long term at the national level:

- Defining reference quality standards, risks of extinction or genetic erosion;
- Identifying common index terms;
- Identifying, assessing and experimenting “in situ” conservation systems for local varieties (local farmer networks) and relative national guidelines;
- Defining a common procedure for identifying and characterizing indigenous genetic resources of agricultural interest;
- Defining general and agreed guidelines to valorise local varieties and re-introducing these – where possible – to the territory, above all those at risk of extinction;
- Implementing communication in order to encourage awareness of genetic resources and ensure synergies among the various territories involved.

Numerous initiatives have also been adopted to implement international regulations, such as⁵:

- Actions to safeguard national animal and plant genetic heritage (MIPAAF) with the Council for Research and Experimentation in Agriculture (CRA) and the Consortium for Experimenting, Divulging and Applying Innovative Biotechniques (ConSDABI);
- Conserving forest genetic heritage, coordinated by the State Forestry Department;
- Numerous initiatives regarding both legislation and research and protection for indigenous genetic resources of agricultural, zootechny and forestry interest carried out by the Regions and Autonomous Provinces.

In addition to rural development measures, a number of interesting actions to conserve genetic resources *ex situ* are now operational in Italy. These include the activity carried out by MIPAF Experimental Institutes, which conserve over 350 species totalling over 21,000 accessions. According to the Ministry of the Environment, Land and Sea, at least 15 institutions operate in Italy and conserve over 69,000 accession of cultivated species and their wild relatives. Seed conservation is widely practiced in relation to grass species, whereas fruit species are mainly conserved in collection fields. *Ex situ* conservation of animals of zootechny interest mainly involves cryoconservation of genetic material.

Italy also actively participates in actions coordinated at the European level on this matter. As part of the European Agricultural Biodiversity Plan, 17 projects jointly funded by the European Commission commenced in 2007, which implement the measures indicated in this plan, defined according to Regulation (EC) 870/04. These projects last 4 years and involve collecting, characterizing and cataloguing plant and animal genetic resources and project partners and public and private subjects that have promoted the various initiatives jointly funded by EU diffusing information. Italy participates in 15 projects via numerous research centres, universities and foundations, 6 of which are coordinated by an Italian organization. The overall cost of these projects is around 19 million Euros, with joint Community funding of 45% on average.

III.A.2 FORESTS

Rural development policies are also responsible for forestry policies; in fact most of the resources available for this sector derive from Pillar II of the PAC.

⁵ Source: URL: <<http://www.reterurale.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/639>>

Forestry measures are planned as part of the National Strategic Plan (NSP) for Rural Development and specific Regional Forestry Plans and Programmes (RFP); these are often drawn up to support Rural Development Plans.

The forestry measures (www.reterurale.it) implemented by Regions and A.P. involve a wide range of actions funded in various ways and comprise requirements relating to the beneficiaries and priority areas for action specified differently. This situation derives from the specific natures found in regions that which may define different priorities, thereby making comparison of the actions planned to protect biodiversity and landscapes on a systematic basis difficult and highlighting scarce horizontal connection in regional planning. For example, a number of regions are interested in expanding forest areas or safeguarding forest resources from outside disturbance (fires, illegal sheep farming, etc.) whereas others pay more attention to the economic role of forestry.

Table III.3 – *Main actions in favour of forestry pursuant to Regulation (EC) 1698/2005 and that regions can implement in RDP*

	Measure	Code
Art. 21	Vocational training and information actions, including diffusion of scientific knowledge and innovative practices for persons engaged the agricultural, food and forestry sectors;	(111)
Art. 24	Use of advisory services by farmers and forest holders	(114)
Art. 25	Setting up of farm management, farm relief and farm advisory services, as well as forestry advisory services	(115)
Art. 26	Modernisation of agricultural holdings	(121)
Art. 27	Improving the economic value of forests	(122)
Art. 28	Adding value to agricultural and forestry products	(123)
Art. 29	Cooperation for development of new products, processes and technologies in the agriculture and food sector	(124)
Art. 30	Improving and developing infrastructure related to the development and adaptation of agriculture and forestry	(125)
Art. 43	Afforestation of agricultural land	(221)
Art. 44	First establishment of agroforestry systems on agricultural land	(222)
Art. 45	Afforestation of non-agricultural land	(223)
Art. 46	Natura 2000 payments	(224)
Art. 47	Forest-environment payments	(225)
Art. 48	Restoring forestry potential and introducing prevention actions	(226)
Art. 49	Support for non-productive investments	(227)
Art. 53	Diversification into non-agricultural activities	(311)
Art. 54	Support for the creation and development of micro-enterprises	(312)
Art. 55	Encouragement of tourism activities	(313)
Art. 57	Conservation and upgrading of the rural heritage	(323)
Art. 58	A training and information measure for economic actors operating in the fields covered by Axis 3	(331)
Art. 59	A skill-acquisition and animation measure	(332)

Source: MIPAAF Forestry Framework Programme

Public spending for forestry measures amounts to 1.861 million Euros, which is 11.2% of public spending for RDPs. If we add forestry-related actions included in “mixed” measures, overall funding for this area amounts to around 16.661 million Euros, which is 14.3% of overall public spending for RDPs (see Paragraph III.e).

Axis 2, in other words improving the environment and the countryside, is the heart of all planning for sustainable development of agricultural and forest lands and involves most of the financial resources for RDPs. Afforestation and reforestation activities for Axis 2, include conserving biodiversity and protecting forest systems with a high natural value, safeguarding surface and underground water resources and encouraging maintenance of agricultural activities in areas with handicaps.

The main actions concerning forests indicated by Regions for Axis 2 regard ex-novo creation of small grasslands/pastures to ensure biodiversity, restoration of more mature and natural woods, management of forest heritage to restore natural cenosi and improved specific and structural diversification; returning wood ecosystems to more natural conditions to make them more resistant and resilient to phenomena such as fires and invasion by parasites and alloctonous species; diversification of wood structure/composition, eradicating alloctonous species, re-naturalizing

wooded areas mainly created for the purposes of anti-erosion; involving farmers and forest holders in monitoring Natura 2000 site biodiversity; improving management of the sites identified by regions to gather propagation material.

Non-productive investments may, for example, be used to fund actions on the water network to restore habitats or to purchase mobile enclosures to manage pasture grounds. Investments used to minimize conflict between agricultural activities and wild fauna may also be required (for example, purchasing sheepdogs to protect herds of sheep, protecting bee hives from intrusion by wild animals, etc.).

The Framework Programme for Forestry (PQSF) was approved by the State and Region Conference at the end of 2008, which was drawn up according to Law 296 dated 27 December 2006 and in compliance with institutional competences to fulfil Community (more specifically, it is based on SCI standards for sustainable forest management deriving from Ministerial Conference on the Protection of Forests in Europe) and international obligations and offers support to individual regions in planning and establishing laws on safeguarding, conserving, valorising and developing forests.

The PQSF identifies four priority objectives to reach over a 10-year period (beginning from 1st January 2009), including territory and environment protection: maintaining and improving protection for forestry formations and defending these from natural and man-made adversities; maximizing the fixative ability of carbon; conserving the integrity and health of forest ecosystems; safeguarding biodiversity and landscape diversity.

The last of the above aspects receives substantial attention in the PQSF. The concrete actions contained therein include maintaining woods in the best possible condition in terms of both structure (encouraging floral diversification and increasing biomass) and functions (maintaining and/or restoring their status of conservation and ability for renewal and controlling the conditions in woods).

Specific reference is made to the need to conserve areas for typical indigenous bee populations or those from neighbouring areas and the Italian bee (*Apis mellifera ligustica* Spinola), both in order to conserve forest biotypes in honey production and for the fundamental pollination processes for woods and meadows.

Italy's participation in the European EUFORGEN programme according to Resolution S2 of the First MCPFE Conference in Strasbourg (1990) concerning conservation of forest genetic resources in Europe should be highlighted. This programme involves the need to adopt national strategies to conserve forest seeds.

Various regions have implemented Leg. Decree 386 dated 10 November 2003, "Implementation of Directive 1999/105/EC concerning the sale of forest materials deriving from multiplication", which adopted Community Directive 105/99 requesting Member States to identify the areas in which propagation material can be gathered for forestry purposes. This Directive requires full application by many other Italian regions.

III.A.3 FISHING

Amendments to Common Fisheries Policy (CFP) implemented through Reg. (EC) 2371 concerning conservation and sustainable use of fishery resources within CFP focuses on exploiting live aquatic resources under sustainable conditions from both economic and environmental-social viewpoints.

For this purpose, the Community take a careful approach by adopting measures aimed at protecting and conserving live aquatic resources, guaranteeing sustainable exploitation and reducing impact from fishing on marine ecosystems. The objective is to progressively manage fishing while safeguarding ecosystems.

A new funding tool – European Fisheries Fund (EFF) focuses on sustainable use of fish resources through tools such as biological rest, using selective systems and reducing fishing efforts. The main changes in the EFF include a long-term approach establishing objectives to achieve and/or maintain

fish stocks, a new policy for reducing fleets, standardizing systems of control and further involving those involved in the Common Policy.

Five of the seven macro-objectives in the EFF listed in Article 4 of Reg. (EC) 1198/06 mention or focus on conserving fish biodiversity and relative habitats:

- a) supporting common fisheries policy to ensure exploitation of live aquatic resources and supporting aquaculture for the purposes of sustainability from economic, environmental and social viewpoints;
- b) encouraging sustainable balance between resources and the fishing capacity of the Community fishing fleet;
- c) encouraging sustainable development of fishing in internal waters;
- d) [...]
- e) reinforcing environmental and natural resource conservation and improvement when connected to fishing;
- f) encouraging sustainable development and improvement of the quality of life in fishing areas;
- g) [...]

The CFP also involves measures to develop aquaculture while conserving resources through structural and infrastructural actions involving partnership between State, Region, operators and producers.

The Ministry for Agricultural and Forestry Policies (MIPAAF) drew up an Operational Fisheries Programme 2007/2013 for Italy in line with EFF macro-objectives, which was approved by the EU Commission on 19 December 2007 together with Strategic Environmental Assessment (VAS) of the PO.

Both the PO and the VAS were drawn up involving all economic, social and environmental partners.

In addition to integrating VAS programming documents, the Environmental Report and Summary Declaration, the European Union CFP includes among its priorities the essential conservation of fish stocks and their natural habitat, whether this be marine or inland water.

The measures jointly funded by the European Fisheries Fund are divided into 5 priority Axes covering 5 “topic areas” of action. A rapid excursus among the Axes and EFF measures illustrates how environmental protection and fish biodiversity are primary and of absolute importance:

Axes I : Adapting Community Fleet

This comprises several measures to conserve fishery stocks by reinstating, managing and disarming, providing aid to temporarily halt fishing activities and replacing equipment with other more selective equipment with less impact.

Axis II : Aquaculture, fishing in territorial waters, transformation and marketing

This Axis also includes measures that directly or indirectly conserve the quality of the environment and aquatic stock: investments in aquaculture, hydro-environmental measures, veterinary measures, fishing in internal waters and measures for transforming and marketing fishing and aquaculture products.

More specifically, the most sensitive objectives in the aquaculture measure concern applying techniques that reduce impact or increase the positive effects on the environment, forms of aquaculture that allow conservation and improvement of the environment and natural resource and genetic diversity.

Axis III : Measures of Common Interest

The third Axis includes measures of environmental and fauna-related interest, such as: protecting and developing aquatic flora and fauna, collective actions, measures for fishing ports, landings and shelters, pilot projects.

Axis IV : Sustainable Development of Fishing Zones

The fourth Axis totally concentrates on the social, economic and environmental sustainability of development in fishing zones. A bottom-up approach is adopted, in other words the subjects proposing and implementing measures (borrowed from other Axes) in a geographic context that can

be localized belong to the local private and public sector and form “Groups” with sufficient administrative capacities to carry out sustainable development in that specific area. Conserving the environment and aquatic stocks is one of the primary objectives in sustainable development strategy.

Axis V : Technical Assistance

Contributions for technical assistance may be provided to fund preparation, implementation, supervision and control over EEF measures. This may also include studies, inspections, gathering statistics, divulging information and establishing national and transnational networks among those engaged in sustainable development of fishing zones.

Two new Community regulations – to which Italy is required to adapt - became effective in 2008 in order to regulate two important problems and thereby ensure and extend the objective of sustainable fishing activities outside Community waters and however to non-EU fishing vessels operating in Community waters:

- Preventing and discouraging illegal, undeclared and unregulated fishing activities (INN) (Reg. 1005/2008 EC), and
- Regulating fishing by Community fishing vessels outside Community waters and access for the ships of other countries to Community waters (Reg. 1006/2008 EC).

With regard to aquaculture, the MiPAAF prepared indications for implementing Community Regulation 708/2007 concerning the introduction of alien species for aquaculture and established a national register of alien species⁶.

Aquaculture for conservation purposes

Reproducing and breeding aquatic organisms for the purposes of repopulation are an important tool for conserving aquatic species (FAO, 1997), especially threatened species and populations or those under extinction. Various projects for recovering fauna to thereby conserve the Adriatic sturgeon (*Acipenser naccarii*), an indigenous species of sturgeon classified as “vulnerable A1ac” (IUCN 2008), have been carried out in internal Italian waters over the last five years (Arlati, 2006; Arlati et al., 2007). Regarding the marine environment, the Dusky Grouper (*Epinephelus marginatus*), classified as “threatened A2d” (IUCN 2008) recently benefited from two repopulation programmes for the purposes of conservation (G. Marino, 2006; G. Marino, 2008). The “responsible repopulation” approach was adopted, thereby complying with practical and theoretical principles aimed at ensuring the best possible overall benefits while avoiding impact on the environment and biodiversity.

III.A.4 QUARRIES AND MINES

Hypogean sites such as quarries and mines that are habitats for the species protected by the Habitat Directive, including Bats, are protected according to aforementioned Directive by D.P.C.M. 357/97 and subsequent amendments. These habitats are also safeguarded by European Agreement EUROBAT defined as part of the CMS (Convention to Conserve Migratory Species, Bonn, 1979 – implemented through Law 42 dated 25/1/1983), which was implemented in Italy through a Law published in Official Journal 138 dated 16-6-2005 - S.O. no. 109, safeguarding bat species⁷ reported in Italy and their habitats.

⁶ ISPRA is responsible for managing this register.

⁷ 32 species of Bats in eleven genera and four families, to which two species whose presence has not been confirmed recently (*Rhinolophus blasii* e *Myotis dasycneme*) and one species - Steppe Whiskered Bat (*Myotis aurascens*) –

In view of the importance – also with respect to for conserving the biodiversity therein -, mine sites were involved in a project in which they were inventoried. A census of Italian mine sites (from 1870 to 2006) illustrated the presence of 2,990 sites (300 of which are still operating)⁸. “Guidelines for conserving, managing and valorising sites and Geomining parks for the purposes of culture, teaching and tourism” propose the standards and methods to adopt to conserve mining sites, highlighting the main technical and regulation-related problems and describing the main initiatives involving valorisation of Geomining Sites and Parks.

In order to fulfil the aforementioned objectives, especially identification and solution for existing technical and regulation-related problems, a precise definition of the juridical nature of existing geomining parks or those under establishment should be made in the near future.

For this purpose, the terms for possible coexistence between geomining park and mining activities should be defined in order to avoid any inappropriate interference between these two realities.

Existing Italian mine sites and possible lines of future development in mining activities – both on land and at sea - should therefore be constantly updated and the regulation gap in State legislation should be filled, above all in relation to the latter activities.

Another problems to face concerns appropriate safety regulations for persons and environmental protection, as existing mining safety regulations can obviously not be applied in the event of activities other than mining.

Another aspect to mention concerns exploring for oil, especially in the Adriatic Sea, and relative installation of drilling platforms (there are currently 101 platforms whose location and characteristics are well known), around which a no-fishing zone has been created, thereby favouring a habitat for numerous aquatic species finding shelter there. As most reserves have almost terminated, removing the relative platforms on completion of activities shall have potentially negative repercussions on aquatic fauna.

III.A.5 TOURISM

Biodiversity conservation is the core of the European Charter for Sustainable Tourism in Protected Areas (ECST). The ECST is a voluntary tool specially addressed to link the biodiversity/environmental conservation with sustainable human activities, with special reference to tourism. The main objective of ECST is to change the approach to conservation of local stakeholders making them aware of the importance of nature conservation as reason for their economic development.

The ECST asks protected areas managers to create a network with local tourism businesses in order to share strategies and plan actions to combine conservation and development. The relative methodology is provided by Europarc Federation (www.europarc.org) and at now roughly 60 parks around Europe have been awarded the Charter. Currently only 3 parks in Italy have joined ECST, but many others are working on it, including parks in Southern Italy (<http://infosig3.frascati.enea.it/archicharter>). Future improvements shall include the best indicators for monitoring the trend in relationships between biodiversity and pressure from tourism.

The “Second International Conference on Sustainable Tourism” promoted by Rimini Provincial Council with cooperation from the World Tourism Organization – UNWTO, the European Commission, the Italian House of Commons Authority – Department of Tourism, the Ministry of the Environment, Land and Sea and ICLEI - Local Governments for Sustainability was held in Rimini in November 2008. Various sustainable initiatives for competitive tourism were presented at the Conference, thereby determining stipulation of the “Second Charter for sustainable tourism”, the so-called “Rimini Charter” ratifying the Aalborg Commitments of 2004 concerning Sustainable Tourism and implementing the guidelines from the World Tourism Organization for affirming

solely identified on a morphological basis and whose validity has not yet been confirmed through molecular analysis, should be added.

8 ISPRA www.apat.gov.it/site/_Files/SitiMinerariItaliani1870_2006.pdf

sustainable tourism. More specifically, the need to ensure the best possible use of environmental resources, which are a key element to developing tourism, which maintaining essential ecological processes and contributing towards conservation of natural heritage and biodiversity is also highlighted.

Furthermore, many local Italian Administrations (including Chioggia town council, Giovo mountain community, Rimini provincial council, S. Benedetto del Tronto town council, Venice) have become members of the *International Network of cities for sustainable tourism*, which was created during the International Conference for Sustainable Tourism held in Rimini in 2001 and under the aegis of the ICLEI.

Italy participated in Project EDEN - European Destinations of Excellence, which was dedicated to "Tourism and Protected Areas" for 2008-2009. The purpose of this was to promote the tourist destinations in which economic growth objectives are in harmony with social, cultural and environmental sustainability.

The National Assessment Committee selects the winning destinations among those participating in competition according to the following standards:

- a) Valorisation of the protected area for tourism purposes
- b) Communication and new forms of tourism to promote protected areas
- c) Social responsibility in businesses operating in the area
- d) Involvement from local communities
- e) Accessibility and quality of offer

III.A.6 HUMAN HEALTH POLICIES RELATED TO BIODIVERSITY

Health policies related to biodiversity include regulation on genetically modified organisms and the prevention of vector born diseases⁹.

The recently adopted EU legislation on GMOs (Regulation EC 1829/2003 and 1830/2003) introduced more rigorous procedures for the authorisation, labelling and analytical control of food and feed consisting, containing or derived from GMOs.

In the framework of food quality assurance, as required from EU and national regulations, a 2006-2008 National Plan was adopted by the Ministry of Health, regarding the implementation of a control network to detect genetically modified organism in food to harmonize inspection and food-control programme done by local public health authorities and ensure centralised information flow.

The Ministry of Labour, Health and Welfare controls and coordinates the administrative and technical-scientific activities related to National and European regulations concerning the use of genetically modified micro-organisms in confined areas (GMMO) (Leg. Decree 206 dated 12 April 2001 – Implementing Council Directive 98/81/EC amending Directive 90/219/CEE concerning use of genetically modified micro-organisms in confined areas).

Applications using GMMOs above all involve research for new "biotechnological" medicines and new therapy for patients using "gene therapy".

More specifically, the Ministry of Health has established an Interministerial Assessment Commission comprising representatives and experts from all the institutions engaged in this area, whose job is to assess and express an opinion on applications for authorization for systems and confined use of GMMOs in risk categories I to IV, which is the classification used in Europe.

⁹ According to Directive 2001/18/EC of the European Parliament on the deliberate release into the environment of genetically modified organisms, a genetically modified organism (GMO) means "an organism, with the exception of mankind, in which the genetic material has been altered in a way that does not occur naturally by mating and/or natural recombination".

The main objective in assessing confinement measures is to protect human health and the environment from risk of contamination that using GMMO may present and, therefore, to constantly contribute towards conserving biodiversity.

The health situation in Italian zootechny may be considered under control further to eradication and supervision plans implemented for a number of years, especially in relation to new “emerging” illnesses linked to climate change and the effects of globalization, although there are some critical situations in some parts of the territory relating to combating and eradicating certain zoonotic diseases.

All actions and activities implemented comply with the new European Union strategy for animals’ health 2007-2013): “Prevention is better than cure”. Ensuring a high level in public and food health by reducing the rate of biological and chemical risks to mankind and promoting animals’ health by preventing/reducing the rate of sickness are among the pillars of this policy.

In addition to ordinary activities, this area involves research projects including one entitled “Vectors of innovative expression for the Blue tongue virus” for which the Istituto Zooprofilattico Sperimentale of the Abruzzo and Molise Regions is responsible.

Other projects concerning the relationship between vectors/zoonotics are under definition.

The Ministry of Labour, Health and Welfare Health Department is responsible for issuing regulations concerning the prevention and control of zoonosis caused by Culicid (mosquitoes) through the Directorate general of Animal Health and Veterinary Drugs and carrying out laboratory surveys on vectors for the purposes of veterinary health together with the National Experimental Zoo-prophylactic Institutes located throughout the country.

III.A.7. FOOD SECURITY

Biodiversity is a key factor in food security. In Italy, the implementation of specific measures for biodiversity protection related to food is left under the responsibility of individual bodies (municipalities, provinces, regions, ...) but is not managed at the national level through a specific regulation. The main strategies implemented so far to raise awareness on the need of biodiversity protection are:

- several researches and awareness campaigns implemented¹⁰, including the Ethnic foods study¹¹;
- various projects for nutritional education in schools, including school gardens, the ethnic menus in public schools or the new project “*Intergustando*”¹². The aim of those projects is to develop children knowledge on food variety and to raise awareness of the importance of complementarity in nutrition;
- promotion of traditional farming under the protection of Slowfood¹³ for biodiversity protection and traditional processing conservation to preserve small local producers and to carve-out a role in the market for traditional farming;
- initiatives to promote fair trade in some municipalities.

¹⁰ Ministry of Labour, Health and Welfare – Obesity and overweight: a public health emergency - <http://www.ministerosalute.it/dettaglio/pdPrimoPianoNew.jsp?id=188&sub=1&lang=it> and INRAN http://www.inran.it/pubblicazioni_divulgative/dossier.pdf

¹¹ <http://www.fao.org/agris/search/display.do?f=/2008/IT/IT0709.xml;IT2007600438>

¹² National Institute for Health, Migration and Poverty (NIHMP) with University of Rome "La Sapienza", Animal and Human Biology Department and Lazio Regional School Office.

¹³ <http://www.fondazioneSlowfood.it/>

III.B International Biodiversity Agreements at the global, regional and European level

III.B.1 GLOBAL BIODIVERSITY TOOLS

In addition to CBD, other International Conventions (CITES¹⁴, Convention on Migratory Species, Ramsar and the World Heritage Convention) are directly involved in conserving biodiversity.

<p>CITES - Washington Convention</p>	<p>The Convention on International Trade of Endangered Species (CITES) aims to control international trade of wild animal and plant species threatened with extinction and is currently the most important existing treaty concerning the conservation of wild species threatened with extinction from international trade.</p> <p>The main tool available for implementing CITES is Decree 176 dated 8 July 2005: the Ministry of the Environment, Land and Sea – Nature Protection Directorate, the State Forestry Department, the Ministry of Productive Activities and the Customs and Excise Agency have implemented regulations concerning controls on international trade of wild animal and plant species threatened with extinction (CITES) establishing the procedures for customs checks and an Operational Manual with all the procedures to implement in customs areas is also adopted.</p>
<p>Ramsar Convention on Wetlands</p>	<p>The RAMSAR Convention aims to conserve what are called “humid” areas by identifying them and setting their confines, studying their characteristic aspects – especially avifauna – and implementing programmes to ensure their conservation and valorisation. The Ramsar Convention was one of the first inter-governmental treaties to deal with conserving biodiversity and the only to focus on one habitat – wetlands.</p> <p>This Convention was ratified and brought into effect by Italy through DPR 448 dated 13 March 1976 and subsequent DPR 184 dated 11 February 1987. Italy is currently a Member of the MEDWET Committee.</p>
<p>Convention on Migratory Species (CMS) (Bonn Convention)</p>	<p>The Convention on Conserving Migratory wild fauna Species approved by the European Community Council through Decision 82/461/CEE dated 24/6/1892 and implemented in Italy through Law 42 dated 25/1/1983 aims to encourage Parties to sign agreements to ensure that migratory species are protected throughout their area of distribution, especially those listed in Annex I (threatened migratory species). Appendix II lists the migratory species in a bad state of conservation and that require international agreements for their conservation and management. Italy has signed the following international agreements concerning the CMS:</p> <ul style="list-style-type: none"> • ACCOBAMS for conservation of cetaceans in the Black Sea, Mediterranean Sea and the neighbouring Atlantic Area • EUROBAT European agreement on conservation of bats and their habitats • AEWA for conserving migratory aquatic avifauna.
<p>World Heritage Convention (UNESCO)</p>	<p>Further to the Convention on Conserving Global Heritage – cultural and natural – adopted in 1972, UNESCO has recognized 878 sites until now (679 fine arts, 174 natural and 25 mixed) in 145 countries worldwide. Italy is currently the country with the highest number of sites included in the list of World Heritage Sites. The Convention indicates physical, biological and geological features and the habitat of endangered animal and plant species and areas of particular scientific and aesthetic</p>

¹⁴ Ratified through law 874 dated 19/12/1975 in Italy

	value as “Natural heritage”. There are currently 44 UNESCO sites in Italy (44 of which entirely within national boundaries and two of which also in the Holy See and Switzerland respectively).
--	---

III.B.2 REGIONAL TRANSNATIONAL BIODIVERSITY TOOLS

Convention on the Alps	The Italian Republic acknowledged, through the protocol of implementation of 1991, preparation of landscape programmes and/or plans, preventing and re-balancing compromises in nature and the landscape, functional effectiveness of ecosystems, systematic observation of nature and the landscape, scientific research, any other measure to conserve wild animal and plant species, their diversity and habitats and definition of the relative comparable standards as fundamental commitments due to their essential and functional nature.
Barcelona Convention	The Barcelona Convention is the juridical and operational tool for the UN Mediterranean Action Plan (MAP). This Convention was signed in 1976 and became effective in 1978. Italy ratified it in 1979 through Law 30/1979. It was amended in 1995, also in order to implement indications from in Agenda 21 produced in Rio in 1992. All countries overlooking the Mediterranean currently adhere to this Convention, of which the European Union has also become a Member. This Convention is currently implemented through a number of technical Protocols PELAGOS Agreement France, Italy and Monaco have signed an Agreement for the Pelagos Sanctuary (ASPIM area for the Barcelona Convention) to create a Sanctuary for Marine Mammals in the Mediterranean to conserve a pelagica area (Mar Ligure and north Tyrrhenian Sea) comprising numerous species of cetaceans, especially the common fin whale and sperm whale.

III.B.3 EUROPEAN AND PAN-EUROPEAN TOOLS

As Member State of the European Union, Italy is obliged to comply with and implement Directives and all relative relevant regulation and juridical tools.

Birds Directive	The objective of Directive 79/409/CEE is to conserve all wild species of birds. More specifically, it involves specific conservation measures for certain species and their habitats; various management measures are also included, including exploitation of species that can be hunted. It involves special protection measures for the habitats of species listed in Annex I, for which Special Protection Zones are established (ZPS). See Chap. II.A.1
Directive 92/43/CEE on “Habitats”	The purpose of this Directive is to “contribute towards safeguarding biodiversity by conserving natural habitats, as well as wild flora and fauna (...)” (art. 2). In addition to rigorous protection of certain flora and fauna species, it introduced the concept of protecting natural habitats as an essential means of maintaining or restoring a satisfactory status of conservation in the fauna and flora species of Community interest. See Chap. II.A.1
WFD-Water Framework Directive 2000/60/EC	The Water Framework Directive (WFD), implemented through Leg. Decree 152/2006 states establishment of a framework of actions to safeguard waters (inland surface, transition, coastal and underground) in order to protect and improve the status of aquatic, terrestrial and marine-coastal ecosystems, as well

	<p>as the wetlands directly dependent on aquatic environment as some of its main objectives. The main special feature of the WFD is that it proposes an ecosystem overview of water bodies, defining actions to implement to ensure sustainable management of waters at the hydrographical district level. The ultimate objective of this Directive is to achieve a “good” ecological status for waters by 2015.</p> <p>The WFD also involves establishment of one or more protected area registers for each hydrographical district and achieving a “satisfactory” state of conservation for the species and habitats that depend on the aquatic environment, are protected by the Habitat and Birds Directive (see Habitat Directive art. 1 lett. e, i) and are included in the aforementioned register of protected areas by 2015. The WFD involves inclusion of Natura 2000 sites and Ramsar Zones in the register of protected areas, for which the best possible integration among the three Directives exists. In order to achieve environmental objectives, the River Basin Management Plans (RBDP) must involve characterization of the river district and protection measures, as well as economic analysis of water use (integrated with those established in the Birds and Habitat Directive).</p> <p>Application of the WFD regards marine-coastal waters with respect to the marine environment.</p>
<p>Marine Framework Directive 2008/56/EC</p>	<p>The recent framework Directive on European Marine Strategy (MSD) (Dir 2008/56) further incorporated and developed the subject of sustainable development by promoting an ecosystem approach and proposing actions to take on a regional or sub-regional marine scale. The European Union is also committed to developing a Maritime Policy, for which the Commission has currently adopted a Green Book (COM(2006)275). The MSD is the “environmental pillar” of this Maritime Policy and is particularly important for protecting the marine environment. It aims to contribute towards making the various environmental problems in various policies, agreements and legislative measures that affect the marine environment coherent and integrate these. It will be possible to ensure more systematic and comprehensive knowledge of the state of European marine waters to thereby improve and make more effective the actions assumed through Regional Marine Conventions and existing European policies in the area, such as the Common Fisheries Policy (CFP) through its application. Italy is required to implement the contents of this Directive in its own legislation by 2010. Subsequently, following an initial assessment and monitoring, Member States shall be required to develop programmes containing measures to achieve or maintain a good environmental status for their marine waters for each marine region or sub-region involved by 2016.</p> <p>The ambitious objective of the MSD, in other words achieving a “good environmental status” for all European marine waters by 2020, involves an innovative and holistic approach that takes into account all those uses for the sea that are also the key elements required for an effective marine environment policy as part of the Convention on Biological Diversity.</p> <p>The MSD has commenced its process of implementation and, under some aspects, plays a determining role in integrating the commitments undertaken by Italy with CBD and for development of a National Biodiversity Strategy.</p>
<p>VIA, VAS - Environmental Assessment (SEA, EIA)</p>	<p>The Italian Legislative framework relating to Environmental Assessment (SEA, EIA) establishes general principles of an Environmental Assessment System that is developed along the entire decision-making process from strategic planning on the making project of works, contributing significantly to the choice of measures to be undertaken in compliance with the carrying capacity of ecosystems and</p>

	<p>resources and the preservation of biodiversity.</p> <p>Strategic Environmental Assessment¹⁵ (SEA) concerns plans and programs which are likely to have significant impacts on the environment, including issues such as biodiversity, flora and fauna, in order to ensure sustainable development. This Assessment procedure is systematically carried out for plans and programs which have been determined to require an appropriate assessment procedure on Natura 2000 sites (art. 6 of 92/43/CEE Directive) according to Decree (DPR) 357/97.</p> <p>Biodiversity conservation is a key issue included in Environmental Impact Assessments (EIA) as indicated by current Italian legislation¹⁶. This procedure describes and assesses the possible effects of the proposed project on vegetation, flora, fauna and ecosystems, in the site and the surrounding area concerned.</p> <p>Art. 5 of DPR 357/97 (implementation of 92/43/CEE Directive) establishes that evaluation of the ecological elements in Natura 2000 Sites is an important requirement for land planning. The purpose of the assessment procedure established in art. 6 “Habitat Directive” is to identify and to assess potential impacts of plan or project on the sites concerned, with regard to their conservation objectives. In particular, the potential effects on species and habitats of community interest, especially priority ones, must be evaluated.</p> <p>In the context of the aforementioned assessment procedures, mitigation and compensation measures are included to reduce biodiversity loss.</p>
--	--

As Member of the Council of Europe (CoE), Italy has signed the relative biodiversity Conventions.

<p>Berne Convention</p>	<p>The Berne Convention on conserving wildlife and the natural environment in Europe adopted in Berne in 1979 was ratified by Italy through Law 503 dated 5 August 1981. This is a framework convention originating both the main Community tools for conserving protected species and their habitats and the vast and articulated Convention on Conserving Biological Diversity.</p>
<p>European Landscape Convention</p>	<p>This Convention was signed by Italy and another 26 Member States in Florence on 20 October 2000 and applies to the entire territory of the signing States, with the objective of encouraging public authorities to adopt policies to conserve, manage and plan landscapes and to organize European cooperation in relative policies.</p> <p>The European Landscape Convention was ratified and implemented in Italy through Law 14 dated 9 January 2006. This Law implicitly refers to conserving and safeguarding biodiversity at the landscape level, which leads to creation of local cultures and represents a fundamental component of European cultural and natural heritage, thereby contributing towards the wellbeing and satisfaction of human beings and consolidation of the European identity.</p> <p>The first effect of this Convention in Italy was stipulation of an agreement between the Ministry of Fine Arts and Cultural Activities, Regions and Autonomous Provinces of Trento and Bolzano in 2001 to review landscape plans according to the standards established in the Convention.</p>

¹⁵ The SEA process, introduced in Europe through Directive 2001/42/EC, was implemented in Italy through Legislative Decree 152/06, as amended by Legislative Decree 4/08.

¹⁶ Environmental Impact Assessments were introduced in Europe through Directive 85/337/CEE and 97/11/EC and in Italy is actually restricted by Leg. Decree 152/06, as modified by Leg. Decree 4/08 and DPR dated 12 April 1996 regarding regional legislation.

III.C Other conventions affecting biodiversity

III.C.1 THE OTHER RIO CONVENTIONS

Conserving biodiversity is explicitly or implicitly covered in United Nations Conventions created as principal mechanisms also with juridical effect through the Rio Summit in 1992 and subsequently implemented in Italy through specific legislative tools. First of all, there is the Biodiversity Convention whose implementation was mentioned in Chapter 2 and the so-called “sister” Conventions, in other words United Nations Conventions to Combat Desertification and the Effects of Drought (UN CCD)¹⁷ and the Framework Convention to Combat Climate Change (UN FCCC)¹⁸.

At the international level, these three Conventions have also created tools to ensure synergy, in other words to ensure implementation of integrated actions, as well as effectiveness of both different specific objectives and shared objectives, thereby maximizing relative results and integrating relative effects. More specifically, a Joint Liaison Group comprising three Executive Secretaries and other high officers from the subsidiary bodies of the three Rio Conventions that was established and meets periodically to report decisions made to the executive bodies of the Conventions, in other words the COPs.

Integration at the level of concrete local or national actions proved more difficult, although some positive elements are contained in national implementation strategies. More specifically, actions to conserve forest, agricultural and land water resource ecosystems explicitly or implicitly have obvious connections to conserving biodiversity.

UNFCCC	The National Strategy to Implement the Kyoto Protocol established in Decision ICEP 123/2002, when mentioning afforestation or reforestation, forest management and agricultural land management and re-vegetation clearly define objectives not only in terms of fixing atmospheric carbon for the purposes of mitigating emissions and their storage, but also for the purposes of combating drought and desertification and conserving biodiversity.
---------------	--

UNCCD	By way of implementing the UNCCD Convention, the Italian Government issued the National Action Plan through Decision ICEP 299/1999 to combat drought and desertification. Development of research programmes for this purpose is supported as a primary tool (art. 3, paragraph b). Protecting land and sustainable management of water resources are also indicated as part of the four priority topics, thereby contributing towards indicating the need to safeguard all biotic components in ecosystems, all be it implicitly.
--------------	--

¹⁷ Implemented in Italy through Law 170 of 1996.

¹⁸ Implemented in Italy through Law 874 dated 19 December 1975.

III.C.2 OTHER GLOBAL AND REGIONAL TRANSNATIONAL TOOLS THAT AFFECT BIODIVERSITY

Global Ballast Water Convention (IMO-GW)	<p>Ballast water on board ships contains a large number of living organisms, including fungi, bacteria, larvae and adult specimens of numerous marine species (plants and animals). Most of these organisms cannot survive in the place that ballast water is discharged, whereas others actually manage to proliferate, multiplying excessively in their new habitat up to the point of threatening its integrity. The introduction of non-indigenous species is one of the main threats to biological diversity. In order to reduce the danger from introduction of non-indigenous and potentially dangerous species in different marine habitats, the International Maritime Organization (IMO) has developed an ad hoc legislative tool: the International Convention for Controlling and Managing Ballast Water and Sediments (BW Convention). This BW Convention was adopted in February 2004 and is expected to come into force twelve months after the date on which the 30 States representing at least 35% of global tonnage have ratified it. Only fourteen of the Member States representing 3.55% of the global tonnage ratified this Convention by 31 August 2008. Italy has still not ratified this Convention; the only EU Member States to ratify the Convention are Spain and Norway. With specific regard to the Mediterranean area, developing a strategy to deal with transferring alien species via ballast water was discussed by an assembly comprising eighteen riverine Mediterranean States and the European Commission during a meeting held in Dubrovnik in Croatia on 11-12 September 2008. This Assembly decided to establish a regional task force to develop such strategy and encourage implementation of the 2004 international convention. The Assembly unanimously agreed that Croatia should lead the task force for its first mandate, in other words until the second meeting of the Task Force to be held in 2010. It was also decided that an action plan comprising operational procedures should be developed as part of the strategy. In order to ensure the success of the process, four groups – each led by a Mediterranean coastline country – will be established to work on specific topics such as: risk assessment (Turkey), juridical aspects (Croatia), reinforcing capacities (Cyprus) and control policies (Italy).</p>
Aarhus Convention	<p>Italy implemented Directive 2003/4/EC on regulating access to environmental information in compliance with indications from the Aarhus Convention through Leg. Decree 195/2005.</p>

Cotonou Agreement, EC-DG Development	<p>The Cotonou Agreement mainly aims to reduce and, in the long-term, eliminate poverty and progressively integrate countries in Africa, the Caribbean and the Pacific (ACP) into the global economy, in compliance with objectives for sustainable development.</p> <p>The Cotonou Agreement inaugurates a new approach to cooperation following the limited success of the main procedure for managing non-reciprocal trade preferences in previous conventions and the need to adapt to international developments, such as globalization and technological evolution, as well as profound social changes in ACP countries. This new approach aims to reinforce the political dimension to guarantee new flexibility and provide more responsibilities to ACP States.</p> <p>The new partnership is based on five inter-dependent pillars:</p> <ul style="list-style-type: none"> • Reinforcing the political dimension of relations between ACP States and the EU; • Encouraging participation-based approaches, opening up to the civil society, the private sector and other non-governmental organisms; • Development strategies and focussing on reducing poverty; • Introducing a new framework for economic and trade cooperation; • Reforming financial cooperation.
Convention on the Protection and Use of Transboundary Watercourses and International Lakes (UNECE)	<p>The Helsinki Convention (UN ECE) of 17 March 1992 on protecting and using transboundary watercourses and international lakes became effective on 6 October 1996 and was ratified by Italy through Law 171 dated 12/03/1996. The objectives linked to conserving biodiversity include:</p> <ul style="list-style-type: none"> ➤ Achieving levels of quality in underground and surface waters without effects or significant risks to human health and the environment, guaranteeing that the rate of extraction of water resources is sustainable in the long-term ➤ Guaranteeing a high level of all surface and underground water bodies, preventing pollution and promoting sustainable use of water resources. ➤ Guaranteeing a high level of protection for bathing waters and revising the directive on bathing waters.
Espoo Convention (UNECE)	<p>The 1991 ONU/CEE Convention on assessing the environmental impact in a transboundary context (Espoo Convention), taking advantage of current VIA legislation, established advisory procedures for Parties that may be subjected to transboundary environmental impact due to the projects proposed. The Espoo Convention became effective in 1997, the European Community signed it on 26 February 1991 and it was ratified in Italy through Law 640 dated 3 November 1994. The Espoo Convention (26-27 February 2001) decided to commence negotiations to prepare a juridically obliging tool in the form of a Convention Protocol regarding strategic environmental assessment, which establishes detailed requirements in order to assess and notify its environmental and health-related effects, which means any effect on the environment, especially on human health, flora, fauna, biodiversity, land, climate, air, water, landscape, natural sites, material goods, cultural heritage and interaction among these factors.</p>

III.D Biodiversity in other national and sub-national strategies and programmes

III.D.1 NATIONAL SUSTAINABLE DEVELOPMENT PLANS AND ACTIVITIES.

Italy does not have a National Sustainable Development Plan to embrace all the so-called “pillars” of sustainability, in other words environmental, economic and social sustainability, although there is a section in the ICEP at the institutional level called the “Sustainable Development” Commission whose task is to make related provisions operational. Following the Johannesburg Summit in summer 2002, Italy approved an Environmental Action Strategy for Sustainable Development focussing on the definition of strategies and tools, including indicators, relating to environmental aspects. Conserving biodiversity is one of the primary components of the environmental “pillar” in sustainable development.

<p>The Environmental Action Strategy for Sustainable Development.</p>	<p>Concern for biodiversity is integral to sustainable development not just because of the important intrinsic value of nature but also because it results in a decline in services, such as provision of food, re-cycling of nutrients, etc. which are provided by natural systems. The conservation of biodiversity is therefore one of the main objectives set out by the Italian “Environmental action strategy for sustainable development” (ICEP Deliberation No. 57/2002), which also defines specific targets, instruments and indicators aimed at achieving this general objective.</p> <p>To monitor the Strategy, ten priority indicators were selected by the Strategy itself; ISPRA is charged with the yearly updating of the relevant data. This set of indicators does not include any indicator relevant to biodiversity. Moreover, all these indicators address the environmental dimension of sustainability, without including its economic, social and institutional dimensions.</p> <p>A suitable revision of the Italian strategy, following the revised EU sustainable development strategy, would solve both these problems. In the reviewed list of sustainable development indicators (EUROSTAT, “Measuring progress towards a more sustainable Europe – 2007 Monitoring report of the EU sustainable development strategy”, 2007), two out of 11 core indicators proposed are relevant to the key SDS challenge “Conservation and management of natural resources”: “Common Bird Index” and “Fish catches taken from stock outside safe biological limits”.</p>
--	---

III.D.2 LOCAL ACTION FOR ENVIRONMENTAL SUSTAINABLE DEVELOPMENT

Sustainability projects have been promoted at the local, regional, provincial, town council, mountain community, association, park, etc. level in compliance with Agenda 21 deriving from the Rio Summit and updated by an Implementation Plan approved ten years later, which gives local action a role of prime importance in achieving sustainable development.

These local projects have often derived from an integrated approach to sustainability, generally conjugated as environmental sustainability, therefore explicitly and implicitly taking into account biodiversity conservation, including together with other objectives.

CHAPTER IV – CONCLUSIONS: PROGRESS TOWARDS THE 2010 TARGET AND IMPLEMENTATION OF THE STRATEGIC PLAN

IV.A. Progress Towards the 2010 Target

Mid-term revision of the European Biodiversity Action Plan presented at the European Parliament in December 2008, highlighted the fact that achieving Target 2010 is extremely difficult and is unlikely to be achieved with the current level of commitment in Italy and the other European countries. This general prospect, which requires a considerable increase in efforts to halt biodiversity loss, has some positive experiences.

Examination of the information provided in Chapter 1 and the actions and policies analyzed in chapters 2 and 3, the following basically emerges:

1. although the system of protected areas and Natura 2000 Network require improvement, they make a considerable contribution to conserving biodiversity and are a strength for conserving biodiversity, supplying ecosystem services in Italy and adapting and mitigating climate change;
2. there are different results regarding the state of conservation in different groups of species, however many situations are positive and there is a tendency towards improvement; there is still much to do in relation to conservation and for an effective monitoring mechanism;
3. while genetic diversity has been studied, it still has not been appropriately dealt with in terms of conservation;
4. sustainable use of resources is a topic requiring more effort; although there are some positive experiences from agriculture, there is still a lot to do concerning inland waters and sea-related resources;
5. while application of Community Directives such as VAS and VIA help deal with threats to biodiversity deriving from habitat loss and changes in land use, there is still much to do in relation to planning vast areas, conserving landscapes and guaranteeing adequate ecological networks;
6. the problems deriving from invasive alien species are increasingly evident; there is currently an acceptable knowledge base although the ability to act to prevent and combat biological invasions is insufficient;
7. perception of the strong inter-dependence between climate change and biodiversity is expanding and the topic should be developed extensively in the future both in terms of mitigating impacts and adapting to effects;
8. efforts to improve provision of ecosystem services must also be considerably increased, although there are already some positive experiences, above all in protected areas and agriculture;
9. the considerable Italian socio-cultural richness and diversity are an important element in biodiversity conservation strategies and protected areas play an important role from this viewpoint;
10. although there are some specific experiences, accessing and sharing genetic resources is one of the topics that require development of a clear and coherent approach at the national level;
11. Italy has always been committed to supporting developing countries, however the recent economic crisis risks substantially affecting this area negatively.

IV.B. Progress Towards the Goals and Objectives of the Strategic Plan of the Convention

The aforementioned lack of a National Biodiversity Strategy makes analysis of the contribution provided to the CBD Strategic Plan particularly difficult, however some considerations have already been expounded during verification of the progress made towards Target 2010, presented in the previous paragraph.

In addition to this, the commitment to full application of the Cartagena Protocol - for which there is a specific report -, but above all the strong commitment to supporting implementation of the CBD Strategic Plan by the European Union and consequently Italy through application of shared environmental policies based on the intersector-based nature of plans, programme and policies are worth mentioning.

IV.C. Conclusions

The content in the previous three chapters provides an analysis of the knowledge and activities regarding Biodiversity and its wider meanings and applications that Italy has promoted with considerable efforts in synthesis and flexibility.

The general overview that emerged in Chapter I most certainly is that of a country that has – at all levels, from genetic- to ecosystem and landscape-related - a high level of Biodiversity thanks to its physical, geographical and historical characteristics. This is demonstrated by the numerous studies and research activities that exist in this country – at times achieving excellence - and are the vital presupposition for future choices and actions relating to environmental sustainability. In relation to Italian knowledge of Biodiversity, one of the main obstacles at the national level was bringing together the numerous sources of information available throughout the territory for various reasons (academic, agency, public, private, local and central).

In order to overcome this problem and achieve Target 2010 through a National Biodiversity Strategy according to that established in Article 6 of the CBD, the Ministry of the Environment, Land and Sea's Nature Protection Directorate - as *National Focal Point* of the CBD - commissioned a publication entitled "*Status of Biodiversity in Italy – Contribution to National Biodiversity Strategy*" in 2005. This report was written by over 100 researchers and experts (botanists, zoologists, forestry officers, etc.) illustrates the status and trend of Biodiversity in Italy, providing a basic scenario in line with the ecosystem approach. A CD entitled "GIS Natura" comprising maps and databanks of national value was produced the same year.

In addition to the two tools, created for the purposes of national implementation of Target 2010 in the Strategic Plan, further efforts and specific detailed works regarding taxonomy and distribution of animal and plant species, identifying communities, habitats and landscapes have been carried out since 2005, both to comply with that established by European Regional Strategy through COM 216 (2006) and to refine national and local knowledge in order to produce appropriate tools for identifying national targets.

Chapter I of this Report provides additional update and completion of that produced in 2005 both in terms of content and expanding the subjects involved. "National Strategy" that actually began in 2005 and was implemented over the following years, also in view of the aforementioned European Strategy, was based on this knowledge.

Extensive cooperation between the various players involved in preparing this report is another element of progress in implementing National Biodiversity Strategy. According to that indicated by the guidelines from the Secretariat, an attempt was made to combine scientific knowledge with that of sector-based institutional policies from the local to the national level in each chapter herein.

Considerable efforts were made to summarize considerations, problems and needs deriving from the different local and sector-based situations both using indicators known and adopted at the national and international level and adopting the various existing approaches.

Starting from the widely-held supposition that the knowledge base and ongoing monitoring of the status and trend of biodiversity elements are a fundamental and vital element in National Strategy made it possible to identify a number of stakeholders to involve in developing National Strategy, above all in consideration of its real implementation on the territory. As highlighted in Chapters II and III, current lack of a national strategy has not hindered implementation of the commitments made through ratification of International Conventions and Agreements although, in relation to the transversal nature of Biodiversity, the need to “institutionalize” coordination among the various sector-based policies and among the various levels of action on the territory strongly emerged and from all sectors. This is almost certainly derives from the need to implement a Community Action Plan by deploying mechanisms for integration that can be used to conserve Biodiversity through Target 2010 and implementing the Strategic Plan, as required by the three CBD objectives.

Italy wishes to leave behind a period in which more conflict than synergy emerged, which is why implementing a National Biodiversity Strategy by 2010 would be a real achievement with respect to the commitment to halt biodiversity loss, despite the delay.

Despite initial difficulties found in terms of both terminology and competences that characterized past experience and hindered the success of previous attempts at a National Biodiversity Plan and however implementing Strategic Lines which, while promptly identified two years after signing the CBD (1994 ICEP Deliberation), have never been shared and implemented, debate and activities have carried on.

1994 Strategic Lines have now been overcome by new international objectives and the path taken has ensured identification of the presuppositions and steps required to ensure that Italy has a tool to implement that established in Article 6 of the CBD and Decisions by the COP by 2010.

In April 2009, Italy shall host the G8 Environment Summit in Siracusa, which will have a session dedicated to post-2010 Biodiversity as a new prospect to State and Government policies. This new prospect derives from the awareness gained on the way to achieving *Millennium Development Goals* and political desire to acknowledge that the importance of ecosystem services to human welfare is still underestimated and not acknowledged by all.

Biological diversity is the basis of life and the economy. Each future political action – both short- and long-term – needs to recognize the economic value of ecosystem services in achieving sustainable development and human wellbeing.

Dealing with matters relating to biodiversity offers new opportunities to businesses and to promoting conservation and sustainable use of biological resources. There are numerous possible applications for recognizing the economic value of ecosystem services, however greater efforts are required to establish effective connection and implement control mechanisms (feedback) between progress in scientific biodiversity knowledge (status and trends = monitoring) and the areas responsible for political decision-making on the territory.

Italian experience based on solid and independent scientific information on matters related to biodiversity has led to the acknowledgement that the factors affecting ecosystems are such that a pure approach focussing solely on biodiversity is no longer sufficient; the analytical process must taken into account social, cultural and economic factors: integrated examination of conservation and development needs is the key to a new approach to sustainability in which economic, biological and cultural diversity play an essential role.

Post-2010 National Biodiversity Strategy shall be built on this multi-disciplinary approach involving strong cooperation between political decision-makers, administrations, agencies,

academic world and stakeholders to thereby achieve social, cultural and economic objectives that reciprocally contribute towards improving the quality of life of citizens over the next few years and for generations to come.

A valid contribution in defining National Biodiversity Strategy will always be represented by the results from technical-scientific documents drawn up as part of a specific Convention between the MATTM and WWF Italia.

There is a strong awareness of the fact that training, information, communication and sensitizing public opinion are essential ways to involve local communities and all stakeholders in programmes and political actions.

Citizens should be informed of what Biodiversity is and how ecosystem services at the basis of survival must no longer be threatened by human actions.

In order to implement a virtuous mechanisms to involve all citizens and make them conscious participants in national commitment to conserving Biodiversity, a substantial part of National Strategy shall be based on including Biodiversity-related topics in wide-scale training, information and communication programmes.

By way of conclusion to this chapter of the Report dedicated to assessing actions undertaken at the national level to achieve Target 2010 and the objectives in the *Strategic Plan*, it is opportune and significant to note that the work already commenced in 2005 is materializing effectively and according to expectations.

Despite the fragmentary nature of biodiversity initiatives that have been carried out over the last few years - which made it difficult to draw up the outline presented in this Report -, many actions have been taken at various levels allowing us to reach and involve political decision-makers, players and stakeholders in the common objective of defining National Strategy and thereby fulfil that required by CBD, including beyond 2010.

In order to achieve these objectives, Italy has undertaken a direction in line with the federalism process underway, whereby Regional councils are responsible for governing their territories and the State is responsible for Biodiversity. The State-Region Conference is the institutional office in which the National Biodiversity Strategy will be approved by 2009 and officially presented during the First National Biodiversity Conference, an important opportunity to raise awareness of the year 2010 – the World Biodiversity Year.

BIBLIOGRAPHY

- AA.VV., 2005. Stato della biodiversità in Italia. Ministero dell'ambiente e della tutela del territorio - DPN, SBI. Palombi Editore.
- AA.VV., 2007. Dominio Pelagico. Il Santuario dei cetacei "Pelagos". Quaderni Habitat. MATTM e Museo Friulano di Storia Naturale – Comune di Udine: Graphic linea print factory – Udine: 158pp.
- Aleffi M., 2005. Briofite. In: Blasi C., Boitani L., La Posta S., Manes F., Marchetti M., 2005. Stato della biodiversità in Italia. Contributo alla strategia nazionale per la biodiversità. Ministero dell'Ambiente e della Tutela del Territorio, Direzione per la protezione della natura; Società Botanica Italiana. Palombi Editore, Roma. Pagg.162-171.
- Aleffi M., Schumacker R., 1995. Check-list and red-list of liverworts (Marchantiophyta) and liverworts (Anthocerotophyta) of Italy. *Fl. Medit.*, 5: 73-161.
- Allegrucci G., Fortunato C., Sbordoni V. 1997. Genetic structure and allozyme variation of sea bass (*Dicentrarchus labrax* and *D. punctatus*) in the Mediterranean Sea. *Mar. Biol.*, 128: 347-358.
- APAT, 2003. Il Progetto Carta della Natura alla scala 1:250.000. Metodologia di realizzazione. APAT, Manuali e linee guida 17/2003.
- APAT, 2004. Carta della Natura alla scala 1:50.000. Metodologia di realizzazione. APAT, Manuali e linee guida 30/2004
- APAT, 2005a. La realizzazione in Italia del progetto europeo Corine Land Cover 2000. APAT, Rapporti 36/2005.
- APAT, 2005b. Carta della Natura e Biodiversità nelle Aree Naturali Protette: il Parco Naturale Panaveggio - Pale di S. Martino. APAT, Rapporti 56/2005.
- APAT, 2007. Annuario dei Dati Ambientali.
- APAT, 2009. Il progetto Carta della Natura. Linee guida per la cartografia e la valutazione degli habitat alla scala 1:50.000. (in stampa)
- Associazione Micologica Bresadola, 1957-2009. Rivista di Micologia, Trento.
- Avena G., Blasi C., Caporali F., Dall'Aglio M., De Lillis M., Dowgiallo G., Mazzoleni S., Nimis P., Pacini E., Paoletta A., Pedrotti F., Piussi P., Salleo S., Venanzoni R., Virzo De Santo A., Pignatti S. (Ed.), 1995. Ecologia vegetale. UTET, Torino.
- Bailey R.G. 1996. Ecosystem Geography. Springer-Verlag, New York.
- Bianchi N., Morri C. 2000. Marine Biodiversity of the Mediterranean Sea: Situation, Problems and Prospects for Future Research. *Marine Pollution Bulletin* 40(5):367-376.
- Bianchi, C.N., Morri, C., 1994. Studio bionomico comparativo di alcune grotte marine sommerse: definizione di una scala di confinamento. *Mem. Ist. It. Speleol.* 6(II):107-123.
- Blasi C., 2007. Valutazione dello stato di conservazione dei Parchi Nazionali e dei paesaggi d'Italia. Convenzione tra il Ministero dell'Ambiente e della Tutela del Territorio - Direzione per la Protezione della Natura e il Centro di Ricerca Interuniversitario Biodiversità, Fitosociologia ed Ecologia del Paesaggio. Roma.
- Blasi C., Guida D., Siervo V., Paolanti M., Michetti L., Capotorti G., Smiraglia D. 2007. An integrated, hierarchical, multiscale, gis-based approach to defining and mapping the landscape of Italy. European Geosciences Union Assembly. Vienna, Austria. Poster, abstracts vol. 9: 10822.
- Blasi C., Capotorti G., Frondoni R. 2005. Defining and mapping typological models at the landscape scale - *Plant Biosystems*, 139(2): 155-163.
- Blasi C., Carranza M.L., Frondoni R. & Rosati L. 2000. Ecosystem classification and mapping: a proposal for Italian Landscape. *Applied Vegetation Science*, 3: 233-242.
- Blasi C., Michetti L. 2005. Biodiversità e clima. In: C. Blasi; L. Boitani; S. La Posta; F. Manes & M. Marchetti (Eds). Stato della Biodiversità in Italia, Palombi Editori, Roma, pp.57-66.
- Blasi C., 2005. Biodiversità e paesaggio. In: Blasi C., Boitani L., La Posta S., Manes F., Marchetti M., 2005. Stato della biodiversità in Italia. Contributo alla strategia nazionale per la biodiversità. Ministero dell'Ambiente e della Tutela del Territorio, Direzione per la protezione della natura; Società Botanica Italiana. Palombi Editore, Roma. 97-103.
- Blasi C., Michetti L., 2005. Biodiversità e clima. In: Blasi C., Boitani L., La Posta S., Manes F., Marchetti M., 2005. Stato della biodiversità in Italia. Contributo alla strategia nazionale per la biodiversità. Ministero dell'Ambiente e della Tutela del Territorio, Direzione per la protezione della natura; Società Botanica Italiana. Palombi Editore, Roma. 57-66.
- Blasi C., Pretto F., Celesti-Grappo L., 2008. La watch-list della flora alloctona d'Italia. Atti del Convegno: Le specie alloctone in Italia: censimenti, invasività e piani di azione. Memorie della Società Italiana di Scienze Naturali e del Museo Civico di Storia Naturale di Milano Volume XXXVI – Fascicolo I. PP. 7-8.
- Bulgarini F., Calvario E., Fraticelli F., Petretti F., Sarrocco S., (Eds.), 1998. Libro rosso degli Animali d'Italia – Vertebrati. WWF Italia, Roma
- Casale P., Laurent L., De Metrio G. 2004. Incidental capture of marine turtles by the Italian trawl fishery in the north Adriatic Sea. *Biological Conservation* 119:287–295.
- Cataudella S, Bronzi P. 2001. Acquacoltura Responsabile: verso le produzioni acquatiche del terzo millennio. Unimar – Uniprom, 683 p.

- Conti F., Abbate G., Alessandrini A., Blasi C., 2005. An annotated checklist of the Italian vascular flora. Ministero dell'ambiente e della tutela del territorio, Direzione per la Protezione della Natura, Dip. Biologia Vegetale, Univ. di Roma la Sapienza. 420 pp.
- Conti F., Manzi A., Pedrotti F., 1992. Libro Rosso delle Piante d'Italia. Ministero dell'Ambiente, WWF Italia.
- Conti F., Manzi A., Pedrotti F., 1997. Liste Rosse Regionali delle Piante d'Italia. WWF Italia, Società Botanica Italiana, Università di Camerino.
- Cortini Pedrotti C., 1992. Check-list of the Mosses of Italy. *Fl. Medit.*, 2: 119-221.
- Cortini Pedrotti C., 2001. New Check-list of the Mosses of Italy. *Fl. Medit.*, 11: 23-107.
- Cortini Pedrotti C., Aleffi, 1992. Lista rossa delle briofite d'Italia. In: Conti, Manzi, Pedrotti, 1992. Libro Rosso delle Piante d'Italia. Ministero dell'Ambiente, WWF Italia.
- De Innocentiis S., Lesti A., Livi S., Rossi A.R., Crosetti D., Sola L. 2004. Microsatellite markers reveal population structure in gilthead sea bream *Sparus auratus* from the Atlantic Ocean and Mediterranean Sea. *Fish. Sci.*, 70(5): 852-859.
- De Innocentiis S., Miggiano E., Ungaro A., Livi S., Sola L., Crosetti D. 2005. Geographical origin of individual breeders from gilthead sea bream (*Sparus auratus*) hatchery broodstocks inferred by microsatellite profiles. *Aquaculture*, 247: 227-232.
- De Metrio G., Corriero, A., Desantis, S., Cubani, D., Cirillo, F., Deflorio, M., Bridges, C.R., Eicker, J., de la Serna, J.M., Megalofonou, P., Kime, D.E. 2003. The first evidence of the presence of intersexuality in a wild population of Mediterranean swordfish (*Xiphias gladius* L.) is reported. *Marine Pollution Bulletin* 46:358-361.
- Dudgeon D., Arthington A.H., Gessner M. O., Kawabata Z., Knowler D.J., Lévêque C., Naiman R.J., Prieur-Richard A., Soto D., Stiassny M. L.J. and Sullivan C. A., 2006. Freshwater biodiversity: importance, threats, status and conservation challenge. *Biol. Rev.* (2006) 81, pp. 163-182. 2005
- EFSA Scientific Report 2008. Animal welfare aspects of husbandry systems for farmed European seabass and gilthead seabream, Annex I to the EFSA Journal (2008) 844, 1-89.
- Felicioli A., Quaranta M., 2000. Alcune possibili prospettive future per l'apicoltura italiana. In: "Api e impollinazione" a cura di M. Pinzauti, Regione Toscana, Edizioni della Giunta Regionale, Firenze: 233-243.
- Ferretti F., Myers R.A., Serena F., Lotze H.K. 2008. Loss of Large Predatory Sharks from the Mediterranean Sea. *Conservation Biology*, in press.
- Forcada J., Notarbartolo Di Sciara G., Fabbri F., 1995. Abundance of fin whales and striped dolphins summering in the Corso-Ligurian Basin. *Mammalia*/ 59 (1):127-140.
- Fortuna C., Canese S., Giusti M., Revelli E., Consoli P., Florio G., Greco S., Romeo T., Andaloro F., Fossi M. C. and Lauriano G. 2007. An insight into the status of striped dolphins (*Stenella coeruleoalba*) of the southern-Tyrrhenian sea. *J. Mar. Biol. Ass. U.K.* 87:1321-1326.
- Fortuna C.M., Filidei E.jr, Vallini C., Di Muccio S., Tarulli E., Gion C., Giovanardi O., Ruffino M., Consalvo I., Scacco U., Mazzola A. 2008. Catture accidentali di specie protette e vulnerabili nelle "volanti" dell'Adriatico: considerazioni sulla valutazione e la gestione degli impatti. VI Convegno Nazionale per le Scienze del Mare "Quali Mari Italiani?", CoNISMa, Lecce 4-8 novembre 2008.
- Fossi M.C., Casini S., Ancora S., Moscatelli A., Ausili A., Notarbartolo di Sciara G. 2001. Do endocrine disrupting chemicals threaten Mediterranean swordfish? Preliminary results of vitellogenin and Zona radiata proteins in *Xiphias gladius*. *Marine Environmental Research* 52:477-483.
- Fossi M.C., Lauriano G. 2008. Impacts of shipping on the biodiversity of large marine vertebrates: persistent organic pollutants, sewage and debris. In: A. Abdulla and O. Linden (editors). 2008. Maritime traffic effects on biodiversity in the Mediterranean Sea: Review of impacts, priority areas and mitigation measures. Malaga, Spain: IUCN Centre for Mediterranean Cooperation. 184 pp.
- Franchi P., Giovannetti M., Gorreri L., Marchetti M., Monti G., 2006. La Biodiversità dei Funghi del Parco. Inventario della Flora Micologica del Parco Naturale Migliarino San Rossore Massaciuccoli. FELICI EDITORE. 360 pp.
- Francour P., Boudouresque C.F., Harmelin J.G., Harmelin-Vivien M.L., Quignard J.P. 1994. Are the Mediterranean waters becoming warmer? Information from biological indicators. *Marine Pollution Bulletin* 28 (9):523-526.
- Furnari G., Giaccone G., Cormaci M., Alongi G., Serio D., 2003. Biodiversità marina delle coste italiane: catalogo del macrofitobenthos. *Biol. Mar. Mediter.*, 10(1): 484pp.
- Géhu J.M. & Rivas-Martinez S., 1981. Notions fondamentales de Phytosociologie. *Berichte der Internationalen Symposien der Internationalen Vereinigung für Vegetationskunde. Syntaxonomie*: 5-33. Vaduz Ed.
- Giovi E., 2005. Gli Habitat della Direttiva Europea in Italia. In: Blasi C., Boitani L., La Posta S., Manes F., Marchetti M., 2005. Stato della biodiversità in Italia. Contributo alla strategia nazionale per la biodiversità. Ministero dell'Ambiente e della Tutela del Territorio, Direzione per la protezione della natura; Società Botanica Italiana. Palombi Editore, Roma. 220-237.
- Granzotto A., Franzoi P., Longo A., Pranovi F., Torricelli E.P. 2001. La pesca nella laguna di Venezia: un percorso di sostenibilità nel recupero delle tradizioni Lo stato dell'arte. Fondazione Eni Enrico Mattei, Rapporti sullo sviluppo sostenibile N 2 61 p.
- Hulme P.E., 2007. Biological invasions in Europe: a framework for Best Practice. *Environmental Science and Technology*, n.25. Biodiversity under Threat. Ed. by RE Hester and RM Harrison. The Royal society of Chemistry, 2007.
- IAEG - UNESCO 1976. Engineering geological maps. A guide to their preparation, UNESCO Press, Paris.

- IMPASSE Environmental impacts of non-native species in aquaculture. 2008. Coordination Action Priority FP6 2005-SSP-5A. Periodic Activity Report 1,
- ISPRA, 2008. Relazione Gruppo di lavoro per la valutazione delle calamità naturali o avversità meteomarine. Fondo di solidarietà nazionale della pesca e dell'acquacoltura presso il MiPAAF D.lgs. 154/2004.
- ISPRA, 2009. Annuario dei dati ambientali 2008 (in stampa)
- ISTAT, Statistiche congiunturali sulla caccia.
- IUCN, 2007. Guide for the Sustainable Development of Mediterranean Aquaculture. Interaction between Aquaculture and the Environment. IUCN, Gland, Switzerland and Malaga, Spain. 107 pages. Jukic-Peladic S., Vrgoc N., Krstulovic-Sifner S., Piccinetti C., Piccinetti-Manfrin G., Marano G., Ungaro N. 2001. Long-term changes in demersal resources of the Adriatic Sea: comparison between trawl surveys carried out in 1948 and 1998. *Fisheries Research* 53:95-104.
- IUCN, 2008. 2008 IUCN Red List of Threatened Species. <www.iucnredlist.org>. Downloaded on 26 February 2009.
- Jenness J. 2006. Topographic Position Index (tpi_jen.avx) extension for ArcView 3.x, v. 1.3a. Jenness Enterprises. Available at: <http://www.jennessent.com/arcview/tpi.htm>.
- Klijn F., Udo de Haes H.A. 1994. A hierarchical approach to ecosystems and its implications for ecological land classification. *Landscape Ecology*, 9: 89-104.
- La Posta A., E. Duprè (Resp.), 2008. La fauna italiana. Dalla conoscenza alla conservazione. Ministero dell'ambiente e della tutela del territorio, Direzione per la protezione della natura.
- Lauriano G., P. Mackelworth, C.M. Fortuna, G. Moltedo, G. Notarbartolo Di Sciara. 2003. Densità e abbondanza del tursiopo (*Tursiops truncatus*) nel Parco Nazionale dell'Asinara, Sardegna. *Biol. Mar. Medit.*, 10 (2):717 – 720.
- Manes F., Capogna F., 2005. Cambiamenti nella concentrazione di CO₂ e deposizioni azotate. In: AA.VV., 2005. Stato della biodiversità in Italia. Ministero dell'ambiente e della tutela del territorio - DPN, SBI. Palombi Editore.
- MATT, 2003. Elenco Ufficiale Aree Protette (EUAP), 5° aggiornamento.
- MATT, 2005. GIS NATURA - Il GIS delle conoscenze naturalistiche in Italia. Ministero dell'ambiente e della tutela del territorio, Direzione per la protezione della natura, Politecnico di Milano.
- MATTM, 2001. Mappatura delle praterie di Posidonia oceanica lungo le coste della Sardegna e delle piccole isole circostanti. Rel. finale. MATTM, Servizio Difesa Mare. Roma, 1-261.
- MATTM, 2004. Mappature delle praterie di Posidonia oceanica e di altre fanerogame marine lungo le coste della Campania e della Calabria e delle isole minori circostanti. Rel. finale. MATTM-DPN, Convenzione np. 105 del 13/05/2002, 1-203.
- McGinnity P., Prodohl P., Ferguson A., Hynes R., Maoileidigh N.O., Baker N., Cotter D., O'Hea B., Cooke D., Rogan G., Taggart J., Cross T. 2003. Fitness reduction and potential extinction of wild populations of Atlantic salmon, *Salmo salar*, as a result of interactions with escaped farm salmon. *Proc. R. Soc. Lond. (B)*, 270: 2443-2450.
- Médail F., Myers N., 2004. Mediterranean Basin. In: R.A.Mittermeier, P.R.Gil, M.Hoffmann, J.Pilgrim, T.Brooks, C.Goettsch Mittermeier, J.Lamoreux and G.A.B. Da Fonseca (Eds.). *Hotspots Revisited: Earth's Biologically Richest and Most Endangered Terrestrial Ecoregions*. Cemex Books on Nature. CABS.
- Michener C.D., 2000. *The Bees of the world*. Johns Hopkins University Press.
- Minelli A., 2007. Fauna: stato attuale delle conoscenze. In: *Biodiversity in Italy*. Blasi C., Boitani L., La Posta S., Manes F. e M. Marchetti (Eds.). Palombi Editore.
- Minelli A., Ruffo S., La Posta S. (Eds), 1993-1995. *Check-list delle specie della fauna italiana*. Calderini Ed., Bologna. 24 volumi.
- Ministero dell'ambiente e della tutela del territorio, direzione per la protezione della natura, Politecnico di Milano, 2005. GIS NATURA Il GIS delle conoscenze naturalistiche in Italia
- Myers N., Mittermeier R.A., Mittermeier C.G., Da Fonseca G.A.B., Kent J., 2000. Biodiversity Hotspots for Conservation Priorities. *Nature* 403: 853–858.
- Naylor R.L., Williams S.L., Strong D.R. 2001. Aquaculture-A Gateway for Exotic Species. *Science* 294: 1655-1656
- Nimis P.L., 1992. Lista rossa dei licheni d'Italia. In: Conti, Manzi, Pedrotti, 1992. *Libro Rosso delle Piante d'Italia*. Ministero dell'Ambiente, WWF Italia.
- Nimis P.L., Martellos S., 2002. ITALIC – the information system on Italian lichens. *Bibliotheca Lichenologica*, 82: 271-283.
- Nimis P.L., Martellos S., 2005. Licheni. In: Blasi C., Boitani L., La Posta S., Manes F., Marchetti M., 2005. Stato della biodiversità in Italia. Contributo alla strategia nazionale per la biodiversità. Ministero dell'Ambiente e della Tutela del Territorio, Direzione per la protezione della natura; Società Botanica Italiana. Palombi Editore, Roma. 182-186.
- Nimis P.L., Martellos S., 2008. ITALIC – the information system on Italian lichens. Version 4.0. Univ. Trieste, Dep. Biology, IN4.0/1 (<http://dbiodbs.univ.trieste.it/>).
- Occhipinti-Ambrogi A. 2000. Biotic invasions in a Mediterranean lagoon. *Biol. Invasions*, 2: 165-176.
- Occhipinti-Ambrogi A., 2007. Marine alien species. In: Blasi C., Boitani L., La Posta S., Manes F., Marchetti M. (eds.). *Biodiversity in Italy - Contribution to the National Biodiversity Strategy*: 136-139.
- Onofri S., Bernicchia A., Filipello Marchisio V., Padovan F., Perini C., Ripa C., Salerno E., Savino E., Venturella, G., Vizzini A., Zotti M., Zucconi L., 2005a. Checklist dei funghi italiani. *Basidiomycota*. Carlo Delfino Ed., Sassari.
- Onofri S., Bernicchia A., Filipello Marchisio V., Perini C., Venturella G., Zucconi L., Ripa C., 2005b. Funghi. In: Blasi C., Boitani L., La Posta S., Manes F., Marchetti M., 2005. Stato della biodiversità in Italia. Contributo alla strategia

- nazionale per la biodiversità. Ministero dell' Ambiente e della Tutela del Territorio, Direzione per la protezione della natura; Società Botanica Italiana. Palombi Editore, Roma:172-181.
- Pagliano G., 1994. Hymenoptera: Apoidea. In: Minelli A., Ruffo S., La Posta F., (a cura di). Check-list delle specie della fauna italiana, 106. - Officine Grafiche Calderini, Bologna. 25 pp.
- Panigada, S., Pavan, G., Borg, J.A., Galil, B.S., Vallini, C. 2008. Biodiversity impacts of ship movement, noise, grounding and anchoring. In: A. Abdulla and O. Linden (editors). Maritime traffic effects on biodiversity in the Mediterranean Sea: Review of impacts, priority areas and mitigation measures. Malaga, Spain: IUCN Centre for Mediterranean Cooperation. 184 pp.
- Panigada, S., Pesante, G., Zanardelli, M., Capoulade, F., Gannier, A., Weinrich, M.T. 2006. Mediterranean fin whales at risk from fatal ship strikes. *Marine Pollution Bulletin* 52:1287–1298.
- Pèrès J. M. & J. Picard, 1964. Nouveau manuel de bionomie benthique..Recueil des Travaux de la Station marine d'Endoume, 31 (47), 5-137.
- Perini C., Venturella G., 2008. Funghi. In: Flora da conservare. Iniziativa per l'implementazione in Italia delle categorie e dei criteri IUCN (2001) per la redazione di nuove liste rosse. *Inf. Bot. Ital.*, 40 (1), Luglio 2008: 149-153.
- Petriccione B., 2005:Reti di monitoraggio coordinate dal Corpo Forestale dello Stato. In: Blasi C., Boitani L., La Posta S., Manes F., Marchetti M., 2005. Stato della biodiversità in Italia. Contributo alla strategia nazionale per la biodiversità. Ministero dell' Ambiente e della Tutela del Territorio, Direzione per la protezione della natura; Società Botanica Italiana. Palombi Editore, Roma. 445-449.
- Pignatti S., 1982, Flora d'Italia. Voll. I-III. Edagricole, Bologna
- Pignatti S., 1994. Ecologia del paesaggio. UTET, Torino.
- Pignatti S., Menegoni P., Giacanelli V., 2001. Liste rosse e blu della flora italiana. ANPA, Agenzia Nazionale Protezione ambiente, Roma. 299 pp.
- Pinchera F., Boitani L. & F. Corsi, 1997. Application to the terrestrial vertebrates of Italy of a system proposed by IUCN for a new classification of national Red List categories. *Biodiversity and Conservation* 6, 959-978.
- Piussi P., Pettenella D. (2000) Spontaneous afforestation of fallows in Italy. In N.Weber (ed.), NEWFOR-New forests for Europe: afforestation at the turn of the century. *EFI Proceedings* (35), 2000.
- Porrello S., Tomassetti P., Manzueto L., Finoia M.G., Persia E., Mercatali I., Stipa P. 2005. The influence of marine cages on the sediment chemistry in the Western Mediterranean Sea. *Aquaculture*, 249: 145-158.
- Quaranta M., S. Ambroselli, P. Barro, S. Bella, A. Carini, G. Celli, P. Cogoi, L. Comba, R. Comoli, A. Felicioli, I. Floris, F. Intoppa, S. Longo, S. Maini, A. Manino, G. Mazzeo, P. Medrzycki, E. Nardi, L. Niccolini, N. Palmieri, A. Patetta, C. Piatti, M.G. Piazza, M. Pinzauti, M. Porporato, C. Porrini, G. Ricciardelli D'albore, F. Romagnoli, L. Ruiu, A. Satta, P. Zandigiacomo, 2004 – Wild bees in agroecosystems and semi-natural landscapes. 1997-2000 collection period in Italy. *Bulletin of Insectology* 57 (1): 11-61
- Reeves R., Notarbartolo di Sciarra G. (compilers and editors). 2006. The status and distribution of cetaceans in the Black Sea and Mediterranean Sea. IUCN Centre for Mediterranean Cooperation, Malaga, Spain. 137 pp.
- RIPO, 2002. Rivisitazioni di alcune Praterie di Posidonia oceanica lungo le coste delle regioni: Liguria, Toscana, Lazio, Basilicata, Puglia. MATT e CONISMA ed.. Roma, 1-220.
- Rivas-Martinez S., 1976. Sinfitosociologia, una nueva metodologia para el estudio del paisaje vegetal. *Anal. Inst. Bot. Cavanilles* 33: 79-188.
- Ruffo S., Stoch F. (eds.), 2005. Checklist e distribuzione della fauna italiana. Memorie del Museo Civico di Storia Naturale di Verona, 2.serie, Sezione Scienze della Vita 16.
- Scoppola A., Caporali C., 2005. Le specie vulnerabili, endemiche e rare della flora vascolare italiana. In: AA.VV., 2005. Stato della biodiversità in Italia. Ministero dell'ambiente e della tutela del territorio - DPN, SBI. Palombi Editore.
- Scoppola A., Spampinato G., 2005. Atlante delle specie a rischio di estinzione (CD-ROM). Ministero dell'ambiente e della tutela del territorio, Direzione per la Protezione della Natura, Società Botanica Italiana, Univ. della Tuscia, Univ. di Roma la Sapienza. CD-Rom allegato a: Scoppola A. & Blasi C. Stato delle conoscenze sulla flora vascolare d'Italia. Palombi Editore, Roma.
- Scordella G., Lumare F., Conides A., Papaconstantinou C. 2003. First Occurrence of the Tilapia *Oreochromis niloticus niloticus* (Linnaeus, 1758) in Lesina lagoon (Eastern Italian coast). *Mediterranean Marine Science*, Vol 4/1:41-47.
- Silvestri S., Boatto V., Pellizzato M. 2007. Fishing across the Centuries: What Prospects for the Venice Lagoon? *Fondazione Eni Enrico Mattei Working Papers. Working Paper* 115.
- Società Botanica Italiana onlus, 2008. Flora da conservare - Iniziativa per l'implementazione in Italia delle categorie e dei criteri IUCN (2001) per la redazione di nuove Liste Rosse. *Informatore Botanico Italiano*, vol 40, suppl. 1.
- Streftaris N., Zenetos A., Papatthanassiou E. 2005. Globalisation in marine ecosystems: the story of non-indigenous marine species across European Seas. *Oceanography and Marine Biology: An Annual Review*, 43, 419-453
- Terlizzi, A., Delos A.L., Garaventa F., Faimali, M., Geraci, S.2004. Limited effectiveness of marine protected areas: imposex in *Hexaplex trunculus* (Gastropoda, Muricidae) populations from Italian marine reserves. *Marine Pollution Bulletin* 48:164-192.
- Tomassetti P., Persia E., Mercatali I., Vani D., Marusso V., Porrello S. 2009. - Effects of mariculture on macrobenthic assemblages in a western mediterranean site. *Marine Pollution Bulletin* (2009), doi:10.1016/j.marpolbul.2008.11.027.

- Tunesi, L., Agnesi, S., Clò, S., Di Nora, T., Mo, G. 2006. La vulnerabilità delle specie protette ai fini della conservazione. *Biol. Mar. Medit.* 13(1):446-455.
- Weiss A. 2001. Topographic Position and Landforms Analysis. Poster presentation, ESRI User Conference, San Diego, CA.
- Venturella G., Perini C., Barluzzi C., Pacioni G., Bernicchia A., Padovan F., Quadraccia L., Onofri S., 1997. Towards a Red Data List of fungi for Italy. *Boccone*, 5: 867-872.
- Venturella, G., Bernicchia A., Filipello Marchisio V., Laganà A., Onofri S., Pacioni G., Perini C., Ripa C., Saitta A., Salerni E., Savino E., Zotti M., Zucconi L., 2003. Harmonization of Red Lists in Europe: some critical fungi species from Italy. In: De Jongh H.H., Bank O.S., Bergmans W., Van der Werfften Bosch M.J., (Eds.). The harmonization of Red Lists in Europe. *Proc. Intern. Seminar Leiden.* 27 and 28 November 2002, IUCN: 195-204.
- Youngson A.F., Dosdat A., Saroglia M., Jordan W.C. 2001. Genetic interactions between marine finfish species in European aquaculture and wild conspecifics. *J. Appl. Ichthyol.*, 17(4), 153-162.
- Zenetos, M., Cinar, E., Pancucci, M., Papadopulo, A., J.G. Harmelin, Furnari, G., Andaloro, F., Bellou, N., Streftaris, N., Zibrowius, H. 2006. Annotated list of marine alien species in Mediterranean with records of the worst invasive species. *Mediterranean Marine Sciences* 6:63-118.
- Zerunian S., 2002, *Condannati all'estinzione? Biodiversità, biologia, minacce e strategie di conservazione dei Pesci d'acqua dolce indigeni in Italia.* Edagricole.

SITOGRAPHY

Accademia dei Lincei

www.lincei.it

Associazione Ambientalista CTS

www.cts.it

Associazione Ambientalista LEGAMBIENTE

www.legambiente.eu

Associazione Ambientalista LIPU

www.lipu.it

Associazione Ambientalista MAREVIVO

www.marevivo.it

Consiglio Nazionale delle Ricerche

www.cnr.it

Convention on Wetlands

www.ramsar.org

Corpo Forestale dello Stato

www.corpoforestale.it

Dipartimento di Biologia della Università degli studi di Trieste

<http://dbiodbs.univ.trieste.it>

Invasive Species Specialist Group

www.issg.org

Istituto Nazionale di Statistica

www.istat.it

Istituto Ricerche Economiche per la Pesca e l'Acquacoltura

www.irepa.org

Istituto Superiore di Sanità

www.iss.it

Istituto Superiore per la Protezione e la Ricerca Ambientale (ISPRA): www.apat.gov.it;

<http://annuario.apat.it/>

Ministero degli Affari Esteri

www.esteri.it

Ministero del Lavoro, della Salute e delle Politiche Sociali

www.lavoro.gov.it

Ministero dell'Ambiente e della Tutela del Territorio e del Mare

www.minambiente.it

**Ministero dell'Ambiente e della Tutela del Territorio e del Mare - Direzione Protezione
Natura – Tutela del Mare**

www.tutelamare.it

Ministero dell'Istruzione, dell'Università e della Ricerca

www.miur.it

Ministero delle Infrastrutture e dei Trasporti

www.infrastrutture.gov.it

Ministero delle Politiche Agricole, Alimentari e Forestali

www.politicheagricole.gov.it

Ministero dello Sviluppo Economico

www.sviluppoeconomico.gov.it

Ministero per i Beni e le Attività Culturali

www.beniculturali.it

Portale dei Parchi Italiani

www.parks.it

Presidenza del Consiglio dei Ministri

www.governo.it

Provincia di Bolzano

www.provincia.bz.it

Provincia di Trento

www.provincia.tn.it

Regione Abruzzo

www.regione.abruzzo.it

Regione Basilicata

www.regione.basilicata.it

Regione Calabria

www.regione.calabria.it

Regione Campania

www.regione.campania.it

Regione Emilia Romagna

www.regione.emilia-romagna.it

Regione Friuli Venezia Giulia

www.regione.fvg.it

Regione Lazio

www.regione.lazio.it

Regione Liguria

www.regione.liguria.it

Regione Lombardia

www.regione.lombardia.it

Regione Marche

www.regione.marche.it

Regione Molise

www.regione.molise.it

Regione Piemonte

www.regione.piemonte.it

Regione Puglia

www.regione.puglia.it

Regione Sardegna

www.regione.sardegna.it

Regione Sicilia

www.regione.sicilia.it

Regione Toscana

www.regione.toscana.it

Regione Umbria

www.regione.umbria.it

Regione Valle d'Aosta

www.regione.vda.it


Regione Venetowww.regione.veneto.it**Rete Rurale Nazionale**www.reteruralenazionale.it**Società Botanica Italiana**www.societabotanicaitaliana.it**Società Italiana Biologia Marina**www.sibm.it**Società Italiana di Ecologia**www.societaitalianaecologia.org**Unione Zoologica Italiana**www.uzi.unito.it

ABBREVIATIONS AND ACRONYMS

ABD	Agricultural Biological Diversity
APAT	<i>Agenzia per la Protezione dell'ambiente e per i Servizi Tecnici</i> (Environmental Protection and Technical Service Agency - now ISPRA)
CFS	Corpo Forestale dello Stato – State Forestry Department
CLC	CORINE Land Cover
CONECOFOR	Controllo Ecosistemi Forestali, Rete Nazionale di Monitoraggio (Forest Ecosystem Control, National Monitoring Network)
CNBF	Centro Nazionale per la Biodiversità Forestale “Bosco Fontana” Verona (national forest biodiversity centre)
CORINE	Coordination of Information on Environment
D.Lgs.	Decreto Legislativo (Leg. Decree)
DD	Data Deficient
DOP	<i>Denominazione di Origine Protetta (protected designation of origin)</i>
EN	Endangered
ETM	Enhanced Thematic Mapper
EUROSTAT	Statistical Office of the European Communities
IBE	Indice Biotico Esteso (extended biotic index)
ICRAM	<i>Istituto Centrale per la Ricerca Applicata al Mare</i> (Central Institute for applied research - now, ISPRA)
IFA	Important Faunal Area
IGP	<i>Indicazione Geografica Protetta (protected geographical indication)</i>
I-LTER	Italian Long Term Ecological Research
INFS	<i>Istituto Nazionale per la Fauna Selvatica</i> (national institute for wild fauna - now, ISPRA)
ISPRA	Italian Institute for Environmental Protection and Research
ISTAT	Istituto nazionale di statistica (national institute for statistics)
LC	Least Concern
MATTM	Ministero dell’Ambiente, della Tutela del Territorio e del Mare (Ministry of the Environment, Land and Sea)
MiPAAF	Ministero per le Politiche Agricole, Alimentari e Forestali (Ministry of Agricultural, Food and Forestry Policies)
NT	Near Threatened
Reg.	Regulation
SAU	<i>(superficie agricola utilizzata)</i> Utilised Agricultural Surface
SCAS	<i>(stato chimico delle acque sotterranee)</i> Chemical State of Ground Waters
SEL	<i>(stato ecologico dei laghi)</i> Ecological State of Lakes
SINAB	Sistema unico nazionale agricoltura biologica (Unique national biological agriculture system)
UNEP	United Nations Environment Programme
VU	Vulnerable

APPENDIX I– INFORMATION REGARDING REPORTING PARTY PRODUCER AND NATIONAL REPORT PREPARATION

A. REPORTING PARTY

Contracting Party	
NATIONAL FOCAL POINT	
Full name of the institution	<i>Ministry of the Environment, Land and Sea</i>
Name and title of contact officer	<i>Dr. Aldo Cosentino Director General</i>
Mailing address	<i>Via Capitan Bavastro, 174 - 00154 Rome ITALY</i>
Telephone	<i>+39 06 57228701</i>
Fax	<i>+39 06 57228707</i>
E-mail	<i>dpm-dg@minambiente.it</i>
CONTACT OFFICER FOR NATIONAL REPORT (IF DIFFERENT FROM ABOVE)	
Full name of the institution	
Name and title of contact officer	
Mailing address	
Telephone	
Fax	
E-mail	
SUBMISSION	
Signature of officer responsible for submitting national report	 <small>DIREZIONE GENERALE PER LA PROTEZIONE DELLA NATURA DIRETTORE GENERALE</small>
Date of submission	- 1 APR. 2009

B. PROCESS OF PREPARATION OF NATIONAL REPORT

The Ministry of the Environment, Land and Sea, Nature Protection Directorate prepared this National Report with technical and editing support from ISPRA (which has consulted several national and regional Agencies) and advisory and contributions from:

- ISPRA;
- General Department for the Quality of Life, General Department for Environmental Research and Development and General Department for Environmental Conservation and Ministry of the Environment, Land and Sea General Department for Land Conservation;
- Ministry for Agricultural, Food and Forestry Policies: General Department for rural development, infrastructures and services, General Department for sea fishing and aquaculture, State Forestry Department;
- Ministry of Fine Arts and Cultural Activities: General Department for landscape quality and conservation, architecture and contemporary art;
- Ministry of Foreign Affairs: General Department for Cooperation in Development;
- Ministry of Education, Universities and Research: General Department for International Affairs;
- Ministry for Economic Development: Department for Economic Development and Cohesion, Department for Energy;
- Ministry for Infrastructures and Transport: General Planning Department, General Department for Land Development;
- Presidenza del Consiglio dei Ministri: Department for tourism development and competitiveness;
- Ministry of Labour, Health and Welfare Policies: Department for public and veterinary health, nutrition and food, Department for prevention and communication;
- Health Authority;
- Environmental Council Departments in Regions (Abruzzo, Basilicata, Calabria, Campania, Emilia-Romagna, Friuli Venezia-Giulia, Lazio, Liguria, Lombardy, Marche, Molise, Piemonte, Puglia, Sicily, Sardinia, Tuscany, Umbria, Valle d'Aosta and Veneto) e and Autonomous Provinces (Trento and Bolzano);
- Environmentalist Associations: WWF Italia, LIPU, Legambiente, Marevivo, CTS;
- Research Bodies and Scientific companies: National Lincean Academy, Italian Botanical Society, Italian Zoology Union, Italian Society for Marine Biology, Italian Society for Ecology, CNR (National Research Council).

APPENDIX II – ADDITIONAL SOURCES OF INFORMATION

As mentioned in chapter 2 there are increasing roles and competences transferred to the Regions and a strong relationship of these competences with the environment protection which belongs to the Ministry of the Environment. Due to this organisation fundamental contributions for the fourth National Report came from the Regions, which reported on their engagement for biodiversity conservation in relation to the European Action Plan for the Biodiversity. Even if it was not possible to translate the 21 contribution coming from the 19 Regions and the 2 Autonomous Provinces, it was considered useful to give full access to these in a separate document.

APPENDIX III – PROGRESS TOWARDS TARGETS IN THE GLOBAL PLANT CONSERVATION STRATEGY AND WORK PROGRAMME FOR PROTECTED AREAS

Progress towards Targets in the Global Plant Conservation Strategy

Premises

While Italy has not formally adopted a National Plant Conservation Strategy, it has undertaken several activities relating to GPCS Targets. It also contributes to *Planta Europa* at the regional level, which recently produced a document entitled *A Sustainable Future for Europe: the European Strategy for Plant Conservation 2008-2014* (UNEP/CBD/COP/9/INF/31) together with the Council of Europe as regional contribution to GPCS.

The following are currently Italian members of *Planta Europa*:

- Botanical Garden, University of Siena (Conservation of indigenous species- Taxonomy and capacity building)
- Department of Botany and Plant Ecology, University of Sassari (Research on botany and plant ecology)
- Italian Botanical Society, Florence (Research on plant sciences and conservation- Public awareness raising)
- Trento Natural History Museum (Seed bank management - Plant conservation)
- Operative Centre for the Environmental Protection and Restoration (CODRA), Pignola (National centre for the study and conservation of forest biodiversity)
- Inter-University research centre "Biodiversity, plant sociology and landscape ecology" - University of Rome "La Sapienza" (Conservation of biodiversity at species, community and landscape scale, Landscape planning and management, Phytosociology and geosinphytosociology studies, potential natural vegetation assessment, National Team for Important Plant Areas, First contribute to the census of alien flora in Italy)
- Department of Botany, University of Catania (Plant science research, Biodiversity in situ and ex situ conservation, Seed bank management, Public awareness raising)

Target 1

A WIDELY ACCESSIBLE WORKING LIST OF KNOWN PLANT SPECIES, AS A STEP TOWARDS A COMPLETE WORLD FLORA

That reported with regard to this Target completes that reported in Chapter I; it should be pointed out that this Target is strictly associated to the Global Taxonomy Initiative work programme (GTI) for which Italy already provided an initial progress report in 2005 (Bombi et al 2005).

Assessment according to individual taxonomy group is provided below:

Vascular plants. Over the last few years, various flora-related documents illustrating knowledge on Italian vascular flora have been written. These documents have published in a collection (Scoppola & Blasi, 2005). The main tool used to determine plant samples is still *Flora d'Italia* (Pignatti, 1982), although important revisions and updates were subsequently published in niche magazines for various families, genres and species.

A checklist of Italian vascular flora was recently published (Conti et al., 2005), which provides indications regarding revised names, distribution in individual administrative regions, indigenous nature (if applicable), exclusive nature in each region and those of particular interest in terms of conservation as well as the overall number of species and sub-specific entities acknowledged for Italy. This checklist was slightly updated subsequently (Conti et al., 2007). The overall number of entities indicated for Italy currently stands at 6,711. SBI recently launched a new project entitled

“Flora critica dell’Italia” (Critical flora in Italy), which should produce a detailed and in-depth flora overview over a fair number of years. A prototype has been produced (Pignotti, 2006). An initial contribution to this was published by Foggi et al. (2007, a, b).

Lichens. Italy is one of the countries most famous in terms of lichen in Europe. The Italian Lichen Society was founded in 1987 and now has over 500 members. Publication of a catalogue raisonne for lichens in Italy was fundamental (Nimis, 1993; 1995), reporting 2,145 infrageneric taxa. Subsequent update (Nimis 2003; Nimis & Martellos, 2003) reported 2,345 infrageneric taxa, due to consistent increase in flora exploration throughout all Italian regions. Despite the satisfactory current situation, exploration of lichens in Italy can still not be considered complete.

Bryophytes. The more important and complete documents currently available in Italy regarding this group of plants are the floras and checklists written by (1992, 2001a, 2001b, 2005), by Aleffi (2001, 2005) and by Aleffi and Schumacker (1995).

Fungi. Mycological knowledge is not standard throughout the country, however programmes to carry out censuses and mapping at provincial, regional and national level over the last few years have done a lot to fill part of this gap. The “Checklist of Italian fungi, Basidiomycetes” (Onofri et al., 2005) is currently the most complete document available.

Freshwater algae. There are currently no figures updated to such an extent as to be used to make a complete list of the species in this taxonomical group on a national scale.

Target 2

A PRELIMINARY ASSESSMENT OF THE CONSERVATION STATUS OF ALL KNOWN PLANT SPECIES, AT NATIONAL, REGIONAL AND INTERNATIONAL LEVELS

Vascular plants. Two publications were written in the Nineties that were – and still are – the only national and regional Red Lists for vascular plants, although they did not fully use the procedures established by IUCN (Conti et al., 1992; 1997).

At the beginning of the Twentieth century, a publication providing detailed information on the status of knowledge of species considered threatened on a national scale (Pignatti et al., 2001) and a list of the species protected according to international and national laws (AA.VV., 2001) were published.

Recently, all known information regarding species considered at risk from extinction were included – with appropriate updates - in a publication that emphasized distribution of these species (Scoppola e Spampinato, 2005) using data from between 1950 and 2005 without recent on-site verification.

Lichens. There is no information complete enough as to be used to define the national status of the species in this taxonomical group.

Bryophytes. Useful though partial indications regarding this taxa are included in the two Red Lists published until now (Aleffi & Schumacker, 1995; Cortini Pedrotti & Aleffi, 1992).

Fungi. There is currently no global or European checklist for fungi, however a workgroup has been established in the European Mycological Association (EMA), which is completing a European map of 50 species and is cooperating in production of a Red List of Macromycetes. The only species that is among the “*Top 50 Mediterranean Island Plants*” according to IUCN standards (de Montmollin & Strahm, 2005) is the indigenous Sicilian *Pleurotus nebrodensis*, indicated as *critically endangered*.

With regard to Italy, two publications were produced by the Italian Botanical Society Mycology Workgroup listing threatened species, however they have not been classified in any IUCN category as they are **Data Deficient** (Venturella et al., 1997; Venturella et al., 2002). Of the 33 species proposed by the ECCF (European Council for the Conservation of Fungi) for the Berne Convention, 26 can be found in Italy (Perini, 2003).

Freshwater algae. No information is updated and complete enough to define the national status of the species in this taxonomical group. Despite such limits, around 400 are desmidioids and diatoms that may be considered as candidates for a national Red List according to that obtained through application of the IPAs Programme in Italy (Blasi, 2008), to which species in the Characeae family should be added, as these are rapidly declining due to transformation in habitat, making them excellent bio-indicators.

Target 3

DEVELOPMENT OF MODELS WITH PROTOCOLS FOR PLANT CONSERVATION AND SUSTAINABLE USE, BASED ON RESEARCH AND PRACTICAL EXPERIENCE

In relation to the species threatened with extinction, the Workgroup for Conservation of Nature, Mycology, Bryology, Lichenology and Flora at the Italian Botanical Society recently implemented a project to write new Red Lists using solely procedures established by the IUCN (Rossi et al., 2008).

This project shall lead to definition of the 100 species most at risk from extinction in Italy in the near future and subsequently to a complete review of the Red Lists published previously.

Target 4

AT LEAST 10% OF EACH OF THE WORLD'S ECOLOGICAL REGIONS EFFECTIVELY CONSERVED

Ecological regions have not yet been completely defined on maps in Italy, although this target is about to be reached through the project implemented to identify and assess Italian Landscapes (Blasi, 2007).

In order to reply to this Target, maps produced as part of the project entitled "Completing the Naturalistic Knowledge Base" (Blasi, 2003) – in other words the Map of Vegetation Series in Italy or of Potential Natural Vegetation – may be considered valid, as each series of vegetation characterizes a homogeneous land area on national scale from climate, lithological, morphologic and phytogeographical viewpoints (Blasi et al., 2004), which is why the land domain may be considered an ecoregion.

Rosati et al. (2007; 2008) recently carried out a Gap Analysis to check how far the specific domains of the various series of vegetation were represented in Protected Areas and Natura 2000 Network while discovering which series were totally ignored by any conservation institution. The results from work clearly indicate how the land area for most mountain vegetation series (both Alpine and Apennine) exceeded 10% (at times exceeding 60%). Vice-versa, the threshold of 10% protection for many coastal, plain and low-hill series living in areas more affected by transformation from by mankind 10% has not yet been reached. The natural and semi-natural surfaces areas for some of these have now almost completely disappeared.

Target 5

PROTECTION OF 50 % OF THE MOST IMPORTANT AREAS FOR PLANT DIVERSITY ASSURED

With regard to application of the *IPAs* Programme in Italy (Blasi C., 2008), the relationship between Areas that are important due to plant diversity and different types of land and nature conservation implemented in Italy was assessed in order to provide an assessment of its current level of protection and, on the other hand, the land area not subjected to any form of conservation.

Protected Areas comprise 45% of the land area in *IPAs* (*sensu* Law 394/91). The land area falling within the Natura 2000 Network is considerably higher.

Taking into consideration all Protected Areas and the Natura 2000 Network, around 17% of the land areas in *IPAs* fall outside any system of conservation, which are mainly portions of *IPAs* and rarely entire *IPAs*.

At the national level, results from the analysis demonstrate that the Target for protection of at least 50% of *IPAs* has already been reached.

Target 6

AT LEAST 30% OF PRODUCTION LANDS MANAGED CONSISTENT WITH THE CONSERVATION OF PLANT DIVERSITY

Forests are the most diffused type of natural vegetation in Europe and offer such a wide variety of habitats for plants, animals and micro-organisms that they host most terrestrial species globally. Forests not affected by mankind are a mosaic of the various dynamic stages of regeneration,

particularly diverse in terms of structure, ecology and composition. These ecological systems have been subjected to numerous scientific studies and indicated as one of the priorities for conservation in numerous international conventions, mostly for two reasons: they are of fundamental importance in assessing the effects caused by mankind on forest ecosystems and as a reference for sustainable forest management. They have high level of biological diversity associated with highly-specialized organisms and with the ecological and structural diversity of the mosaic of stages determined by nature.

These are the reasons behind the project entitled “Old Forests in National Italian Parks” (Blasi, 2008), whose objective was to identify a network of old forests in National Parks as representative as possible of the ecological and phytogeographical diversity of Italian forests on which to concentrate for further surveys that may be used to define guidelines for sustainable development. More specifically, 68 woods with age characteristics in 38 different phytosociological associations were identified and characterised via structural and floristic-vegetation analyses.

This work is one of the few studies carried out in the Mediterranean Basin and the first organic work on forests in our country that have remained undisturbed for a long time, thereby becoming the starting point for more detailed analyses at both the local level (Burrascano et al., 2008; Burrascano et al., in press (a); Ricotta & Burrascano 2008; Ricotta & Burrascano in the process of being printed) and national level (Blasi, 2008; Burrascano et al., in press (b)). This methodological approach takes into account the difference in forest types and is innovative and practical to conservation of the plant diversity in Italian forests.

In relation to this Target, that set forth in section II.A.3 of this Report concerning the National Rural Network (RRN) should be taken into consideration.

Target 7

SIXTY PERCENT OF THE WORLD’S THREATENED SPECIES CONSERVED IN SITU

According to that obtained by applying the IPAs Programme in Italy (Blasi C., 2008), 197 (64%) of the 310 vascular plants complying with standards A of the Programme - in other words species threatened at global, European or national level – have populations in the Protected Areas established pursuant to Law 394/91.

With regard to other taxa that contribute towards plant diversity, populations of 41 of the 78 species of bryophytes (53%), 23 of the 36 species of fungi (64%) and 28 of the 68 species of lichens (41%) complying with aforementioned standards A are located in Protected Areas. However, it must be remembered that the information available regarding such taxa is still rather limited, therefore the above percentages may increase as knowledge is enhanced.

Although there is no detailed information regarding local management of all these species, it may be considered that – generally speaking – their populations are provided a sufficient level of protection.

Target 8

SIXTY PER CENT OF THREATENED PLANT SPECIES IN ACCESSIBLE EX SITU COLLECTIONS, PREFERABLY IN THE COUNTRY OF ORIGIN, AND 10 % OF THEM INCLUDED IN RECOVERY AND RESTORATION PROGRAMMES

In order to reply to these Targets, various seed banks have been established in Italy, mostly belonging to University Institutes and Botanical Gardens, as well as to regional and provincial administrations.

In order to manage the activities of such banks in a coordinated manner, an Italian Seed Bank Network was established in 2005 to conserve spontaneous flora ex situ, which is known under its acronym of RIBES (Bedini et al., 2005; Rossi et al., 2006; Bonomi et al., 2006, 2008). RIBES comprises 18 institutions in 13 Regions and is a partner in ENSCONET (European Native Seed Conservation Network), while three RIBES Partners (Trentino Seed Bank – The Tridentine Museum of Natural Science, the Pisa Botanical Garden Seed Bank, Indigenous Flora Centre - Lombardy) are to all effects partner.

Many local administrations (e.g. Piemonte Regional Council, Lombardy Regional Council, Trento Autonomous Provincial Council, Tuscany Regional Council, Sicily Autonomous Regional Council, etc.) have passed laws over the last few years encouraging the establishment of seed banks to conserve biodiversity *ex situ*.

A number of Italian Seed Banks have also adhered to European Interreg GENMEDOC, a network of centres conserving genetic flora material from Western Mediterranean regions. This project was designed to encourage the exchange of technical information and to adopt common work protocols concerning conservation of genetic resources from Mediterranean flora tax and, above all, those living in the habitats (priority or otherwise) included in Directive 92/43/CEE (Habitat Directive).

During the initial years of activity in this network, batches of seeds from 338 taxa in 45 Mediterranean habitats were collected and conserved in the seed banks of the various partners. Furthermore, batches of seeds from 75 taxa conserved in the seed banks of the various partners were duplicated to ensure more effective conservation. Effective germination protocols were developed for 66 of the species collected in order to guarantee production of plants for possible future actions to reinforce or reintroduce populations into the natural environment.

The main result from this project was reinforcement of cooperation among the various scientific centres and the administrations responsible for managing the natural environments in the regions involved. The results and innovation deriving from GENMEDOC are therefore practical and can easily be transferred to those responsible for managing biodiversity. This project has now terminated and continues through a new project entitled SEMCLIMED.

There are many examples of species that were once threatened with extinction and which *ex situ* conservation strategies have made it possible to save being reintroduced into their natural habitat in Italy, however there is not enough information to assess whether or not the percentages indicated in this Target have been reached. An initial census concerning reintroduction was carried out by the Italian Botanical Society Nature Conservation Group (www.societabotanicaitaliana.it), which highlighted 50 cases of reintroduction, many of which occurred through LIFE projects.

A number of regions are legislating relocation of spontaneous species (reintroduction and reinforcement). More specifically, Lombardy Regional Council has passed a new law on spontaneous flora conservation (LR 10/2008), with regulations on this matter.

A report was presented at the Planta Europa Conference to review the ESPC of September 2007 (Rossi e Bonomi, 2007, in press).

Target 9

SEVENTY PER CENT OF THE GENETIC DIVERSITY OF CROPS AND OTHER MAJOR SOCIO-ECONOMICALLY VALUABLE PLANT SPECIES CONSERVED, AND ASSOCIATED INDIGENOUS AND LOCAL KNOWLEDGE MAINTAINED.

An overview of the current status of *ex situ* plant biodiversity conservation for both spontaneous and cultivated species is currently at an advanced stage of preparation as part of preparation of the National Biodiversity Strategy, which is the basic tool for identifying the main problems involved, above all in relation to the priorities to establish in relation to short-term actions.

The main types of plants conserved *ex situ* in Italy are: spontaneous (threatened species, indigenous species, wild flowers), agricultural (above all cereals, horticultural, fruit, ornamental, fodders, leguminosae, officinal, industrial crops, olive, vine) and forestry (conifers, broad-leafed trees, shrubs, alien).

Further to Leg. Decree 227 dated 18 May 2001, MIPAAF and MATTM acknowledged C.F.S. from Pieve S. Stefano, di Peri, the Fontana Wood Biodiversity laboratory and the Operational Centre for Environmental Defence and Recovery (Codra Mediterranea s.r.l.) as national centres for the study and conservation of forest biodiversity.

See that described in section II.A.3 of this Report concerning the National Plan for Biodiversity of agricultural interest written by MIPAAF in February 2008 for other activities related to this Target.

Target 10

MANAGEMENT PLANS IN PLACE FOR AT LEAST 100 MAJOR ALIEN SPECIES THAT THREATEN PLANTS, PLANT COMMUNITIES AND ASSOCIATED HABITATS AND ECOSYSTEMS

The “Indigenous Flora of Italy” project (Blasi, 2007; Blasi et al., 2008; Celesti-Grappo et al., 2009a, 2009b), which involved a large number of regional experts and organically gathered the information currently available concerning the indigenous component in Italian flora, illustrated the presence of 1,023 alien entities in Italy, 103 of which are archeophytes, in other words introduced prior to 1500, whereas 920 are neophytes (introduced after 1500).

Only 162 of the 1,023 aforementioned entities are really considered invasive, although no management plan has been drawn up until now.

Target 11

NO SPECIES OF WILD FLORA ENDANGERED BY INTERNATIONAL TRADE

Please refer to that illustrated in section II.B.8 of this Report concerning CITES (Convention on International Trade of Species Threatened with Extinction for this Target .

Target 12

THIRTY PER CENT OF PLANT-BASED PRODUCTS DERIVED FROM SOURCES THAT ARE SUSTAINABLY MANAGED

Target 13

HALTING THE DECLINE OF PLANT RESOURCES AND ASSOCIATED INDIGENOUS AND LOCAL KNOWLEDGE, INNOVATIONS AND PRACTICES THAT SUPPORT SUSTAINABLE LIVELIHOODS, LOCAL FOOD SECURITY AND HEALTH CARE

No information is currently available for these two Targets, which are partly covered by Target 9.

Target 14

THE IMPORTANCE OF PLANT DIVERSITY AND THE NEED FOR ITS CONSERVATION INCORPORATED INTO COMMUNICATION, EDUCATIONAL AND PUBLIC-AWARENESS PROGRAMMES

Italy participates in the initiative promoted by Planta Europa “Wake up call for plants” aimed at informing the Authorities involved and the general public of the need for more protection from European spontaneous plants via local and national promotional activities.

<http://www.societabotanicaitaliana.it/detail.SPA?IDN=425&IDSezione=2>

Target 15

THE NUMBER OF TRAINED PEOPLE WORKING WITH APPROPRIATE FACILITIES IN PLANT CONSERVATION INCREASED, ACCORDING TO NATIONAL NEEDS, TO ACHIEVE THE TARGETS OF THIS STRATEGY

The Italian Botanical Society’s Workgroup for Botanical Gardens and Historical Gardens translated into Italian and published the European Union Action Plan for Botanical Gardens established in 2000 by Botanical Gardens Conservation International (BGCI) in the social magazine called *Informatore Botanico Italiano* (Vol. 33 suppl 2) in 2001 and the European Plant Conservation Strategy (UNEP/CBD/COP/6/INF/22) in 2004 (Vol. 36 suppl. 1).

The MATTM-DPN promotes numerous scientific and divulgation activities to diffuse knowledge of Italian flora and vegetation; in addition to that reported in Chapters I and II of the Report, a number of national publications are available at http://www.minambiente.it/index.php?id_sezione=714. The web sites for Protected Areas, Regions and Trento and Bolzano Autonomous Provinces provide information of a regional nature.

Target 16

NETWORKS FOR PLANT CONSERVATION ACTIVITIES ESTABLISHED OR STRENGTHENED AT NATIONAL, REGIONAL AND INTERNATIONAL LEVELS

See above Premises and Targets.

Bibliography

- Aleffi M., 2001. *Checklist of Italian Liverworts*. (<http://dbiodbs.univ.trieste.it/web/myxo/epat1#init>)
- Aleffi M., 2005. *New Checklist of the Hepaticae and Anthocerotae of Italy*. *Flora Mediterranea*, 15: 485-566.
- Aleffi M. & Schumacker R., 1995. *Check-list and red-list of the liverworts (Marchantiophyta) and hornworts (Anthocerotophyta) of Italy*. *Flora Mediterranea* 5: 73-161.
- AA.VV., 2001. *Repertorio della flora italiana protetta*. Ministero dell'Ambiente, Servizio Conservazione della Natura (http://www.minambiente.it/index.php?id_sezione=714).
- Bedini G., Rossi G. e Bonomi C., 2005. *RIBES, la Rete Italiana di Banche del germoplasma per la conservazione ex situ della flora spontanea*. *Inform. Bot. Ital.*, 37 (1). Atti 100° Congresso della Società Botanica Italiana (Roma).
- Blasi C. (Ed.), 2003. *Conoscenze naturalistiche in Italia/Ecological information in Italy*. Ministero dell'Ambiente e della Tutela del Territorio – Società Botanica Italiana.
- Blasi C., 2007. *Valutazione dello stato di conservazione dei Parchi Nazionali e dei paesaggi d'Italia*. Convenzione tra il Ministero dell'Ambiente e della Tutela del Territorio - Direzione per la Protezione della Natura e il Centro di Ricerca Interuniversitario Biodiversità, Fitosociologia ed Ecologia del Paesaggio. Roma.
- Blasi C., 2007. *Primo contributo al censimento della Flora Esotica in Italia e caratterizzazione della sua invasività con particolare riferimento alla fascia costiera marina e alle piccole isole*. Convenzione tra il Ministero dell'Ambiente e della Tutela del Territorio - Direzione per la Protezione della Natura e il Centro di Ricerca Interuniversitario Biodiversità, Fitosociologia ed Ecologia del Paesaggio. Roma.
- Blasi C., Filibeck G., Frondoni R., Rosati L. & Smiraglia D., 2004. *The map of the vegetation series of Italy*. *Fitosociologia*, 41 (1) suppl. 1: 21-25.
- Blasi C., 2008. *Primo contributo alla definizione delle IPAs (Important Plant Areas - aree importanti per le piante) in Italia*. Convenzione tra il Ministero dell'Ambiente e della Tutela del Territorio - Direzione per la Protezione della Natura e il Centro di Ricerca Interuniversitario Biodiversità, Fitosociologia ed Ecologia del Paesaggio. Roma.
- Blasi C., 2008. *Le foreste vetuste nei Parchi Nazionali d'Italia. Caratterizzazione floristica, vegetazionale, strutturale e linee guida per la conservazione e la gestione*. Convenzione tra il Ministero dell'Ambiente e della Tutela del Territorio - Direzione per la Protezione della Natura e il Centro di Ricerca Interuniversitario Biodiversità, Fitosociologia ed Ecologia del Paesaggio. Roma.
- Blasi C., Celesti-Grappo L., Pretto F., 2008. *La watch-list della flora alloctona d'Italia*. *Memorie Soc. It. Sc. Nat. Mus. Civ. St. Nat. Milano*, 36 (1): 7-8.
- Bonomi C., Rossi G., Bedini G., 2006. *Una rete nazionale per coordinare la conservazione del germoplasma delle piante a rischio ("RIBES")*. In: Di Cecco M., Andrisano T. (a cura di). *La biodiversità vegetale nelle aree protette in Abruzzo: studi ed esperienze a confronto*. Tratto da Atti del convegno "La biodiversità vegetale nelle aree protette in Abruzzo: studi ed esperienze a confronto".
- Bonomi C., Rossi G., Bedini G., 2008. *A National Italian Network to Improve Seed Conservation of Wild Native Species ("RIBES")*. In: Maxted N., Ford-Lloyd B.V., Kell S.P., Iridondo J.M., Dulloo M.E., Turok J. (Eds) *Crop Wild Relative Conservation and Use*.
- Bombi P., Duprè E., La Posta A., Stoch F. and Tartaglini N. (2005), *Global Taxonomy Initiative in Italy: a support to the 2010 goal in Secretariat of the Convention on Biological Diversity (2005). SUCCESS STORIES IN IMPLEMENTATION OF THE PROGRAMMES OF WORK ON DRY AND SUB-HUMID LANDS AND THE GLOBAL TAXONOMY INITIATIVE*. Abstracts of Poster Presentations at the 11th Meeting of the Subsidiary Body on Scientific,

- Technical and Technological Advice of the Convention on Biological Diversity. Montreal, Technical Series no. 21, 189 pages.
- Burrascano S., Lombardi F., Marchetti M., 2008. *Old-growth forest structure and deadwood: Are they indicators of plant species composition? A case study from central Italy*. Plant Biosystems 142: 313-323.
- Burrascano S., Rosati L., Blasi C., in stampa (a). Plant species diversity in Mediterranean old-growth forests: a case study from central Italy. Plant Biosystems 143. Burrascano S., Rosati S., Blasi C., in stampa (b). Le foreste vetuste nei Parchi Nazionali d'Italia. Natura Bresciana.
- Celesti-Grapow L., Alessandrini A., Arrigoni P. V., Banfi E., Bovio M., Brundu G., Cagiotti M., Camarda I., Bernardo L., Conti F., Fascetti S., Galasso G., Gubellini L., La Valva V., Lucchese F., Marchiori S., Mazzola P., Peccenini S., Pretto F., Poldini L., Prosser F., Siniscalco C., Villani M. C., Viegi L., Wilhalm T. & Blasi C., 2009a. *The inventory of the non-native flora of Italy*. Plant Biosystems, 143.
- Celesti-Grapow L., Alessandrini A., Arrigoni P.V., Assini S., Banfi E., Barni E., Bovio M., Brundu G., Cagiotti M., Camarda I., Carli E., Conti F., Del Guacchio E., Domina G., Fascetti S., Galasso G., Gubellini L., Lucchese F., Medagli P., Passalacqua N., Peccenini S., Pretto F., Poldini L., Prosser F., Vidali M., Villani M.C., Viegi L., Wilhalm T. & Blasi C., 2009b. *Non native flora of Italy: distribution and threats*. Plant Biosystems, 143.
- Conti F., Manzi A. & Pedrotti F. (Eds.), 1992. *Libro Rosso delle Piante d'Italia*. WWF Italia, Roma.
- Conti F., Manzi A., Pedrotti F. (Eds.), 1997. *Liste rosse regionali delle piante d'Italia*. WWF Italia – Società Botanica Italiana, Camerino
- Conti F., Abbate G., Alessandrini A. e Blasi C. (Eds), 2005. *An annotated Checklist of the Italian Vascular Flora*. Università di Roma “La Sapienza”, Dip.to di Biologia Vegetale – Ministero dell’Ambiente e della Tutela del Territorio, Direzione Protezione della Natura. Palombi Editori, Roma.
- Conti F., Alessandrini A., Bacchetta G., Banfi E., Barberis G., Bartolucci F., Bernardo L., Bonacquisti S., Bouvet D., Bovio M., Brusa G., Del Guacchio E., Foggi B., Frattini S., Galasso G., Gallo L., Gangale C., Gottschlich G., Grünanger P., Gubellini L., Iiriti G., Lucarini D., Marchetti D., Moraldo B., Peruzzi L., Poldini L., Prosser F., Raffaelli M., Santangelo A., Scassellati E., Scortegagna S., Selvi F., Soldano A., Tinti D., Ubaldi D., Uzunov D. & Vidali M., 2007. *Integrazioni alla Checklist della flora vascolare italiana*. Natura Vicentina, Vicenza, 10 (2006): 5-74.
- Cortini Pedrotti C., 1992. *Check-list of the Mosses of Italy*. Flora Mediterranea 2: 119-221.
- Cortini Pedrotti C., 2001a. *New check-list of the Mosses of Italy*. Flora Mediterranea 11: 23-107.
- Cortini Pedrotti C., 2001b. *Flora dei muschi d'Italia*. A. Delfino Editore, Roma.
- Cortini Pedrotti C., 2005. *Flora dei muschi d'Italia. Bryopsida (II parte)*. A. Delfino Editore, Roma.
- Cortini Pedrotti C. & Aleffi M., 1992. Lista rossa della briofite d'Italia. In: Conti F., Manzi A. & Pedrotti F. (eds.), *Libro rosso delle piante d'Italia*. Associazione Italiana per il World Wildlife Fund, Roma.
- de Montmollin B. & Strahm W. (Eds), 2005. *The Top 50 Mediterranean Island Plants: Wild plants at the brink of extinction, and what is needed to save them*. IUCN/SSC Mediterranean Islands Plant Specialist Group. IUCN, Gland, Switzerland and Cambridge, UK. x + 110 pp.
- Foggi B., Rossi G., Parolo G., 2007a. *Il genere Festuca e i generi affini per la nuova “Flora critica d'Italia”*. Introduzione. Inf. Bot. Ital., 39 (1): 193-197.
- Foggi B., Rossi G., Parolo G., Wallossek C., 2007b. *Il genere Festuca e i generi affini per la nuova “Flora critica d'Italia”*. I. Festuca sect. Eския Willk. (Poaceae). 39 (1): 199-232.
- Nimis P.L. 1993. *The lichens of Italy. An Annotated Catalogue*. Mus. Reg. Sci. Nat. Torino, Monografie, XII, 897 pp.
- Nimis P.L. 1995. *I Licheni in Italia*. Atti Conv. Acc. Naz. Lincei, 115: 119-131.
- Nimis P.L., 2003. *Checklist of the Lichens of Italy 3.0*. University of Trieste, Dept. of Biology, IN3.0/2 (<http://dbiodbs.univ.trieste.it/>).

- Nimis P.L., Martellos S., 2003. *A second checklist of the Lichens of Italy with a thesaurus of synonyms*. Museo Reg. Sci. Nat. Saint Pierre-Aosta, Monografie IV.
- Onofri S., Bernicchia A., Filipello Marchisio V., Padovan F., Perini C., Ripa C., Salerni E., Savino E., Venturella G., Vizzini A., Zotti M., Zucconi L., 2005. *Checklist dei funghi italiani*. C. Delfino Editore, Sassari. 380 pp.
- Perini C., 2003. *Activities in mycology in Italy*. ECCF Newsletter 13: 11-12.
- Pignatti S., Menegoni P., Giacanelli V. (a cura di), 2001. *Liste rosse e blu della flora italiana*. Forum Plinianum – ANPA, Stato dell’Ambiente 1. Alcagraf, Roma.
- Pignatti S., 1982. *Flora d’Italia (3 voll.)*. Edagricole, Bologna.
- Pignotti L. (a cura di), 2006. *Progetto per una Flora critica dell’Italia*. Società Botanica Italiana.
- Ricotta C., Burrascano S., 2008. *Beta diversity for functional ecology*. Preslia, 80:61-71.
- Ricotta C., Burrascano S., in stampa. *Testing for differences in beta diversity with asymmetric dissimilarities*. Ecological Indicators.
- Rosati L., Marignani M. & Blasi C. 2007. *Vegetazione Naturale Potenziale e Gap analysis della Rete Natura 2000 in Italia*. Fitosociologia, 41 (1) suppl. 1: 21-25.
- Rosati L., Marignani M., Blasi C. 2008. A Gap analysis comparing Natura 2000 vs National Protected Area network with potential natural vegetation. *Community Ecology*, 9(2):147-154.
- Rossi G., Bonomi C., Bedini G., 2006. *Conservazione ex situ della flora spontanea italiana: RIBES, una nuova iniziativa nazionale*. Inform. Bot. Ital., 38 (1) 2006: 236-247
- Rossi G., Bonomi C., 2007. A review of plant reintroduction practice. Atti della conferenza di Planta Europa, Romania, 5-9 Settembre 2007 (in press).
- Rossi G., Gentili R., Abeli T., Gargano D., Foggi B., Raimondo F.M., Blasi C., 2008. *Flora da conservare. Iniziativa per l’implementazione in Italia delle categorie e dei criteri IUCN (2001) per la redazione di nuove Liste Rosse*. Inf. Bot. Ital., 40 (suppl. 1).
- Scoppola A. & Blasi C. (Eds), 2005. *Stato delle conoscenze della flora vascolare d’Italia*. Università della Tuscia, Dip.to di Agrobiologia e Agrochimica – Ministero dell’Ambiente e della Tutela del Territorio, Direzione Protezione della Natura. Palombi Editori, Roma.
- Scoppola A. & Spampinato G., 2005. *Atlante delle specie a rischio di estinzione*. CD allegato a: Scoppola A. & Blasi C. (Eds), Stato delle conoscenze sulla flora vascolare d’Italia. Palombi Editori, Roma.
- Venturella G., Perini C., Barluzzi C., Pacioni G., Bernicchia A., Padovan F., Quadraccia L., Onofri S., 1997. *Towards a Red Data List of fungi for Italy*. *Bocconea*, 5: 867-872.
- Venturella G., Bernicchia A., Filipello Marchisio V., Laganà A., Onofri S., Pacioni G., Perini C., Ripa C., Saitta A., Salerni E., Savino E., Vizzini A., Zotti M., Zucconi L., 2002. *Harmonisation of Red Lists in Europe: some critical fungi species from Italy*. Proceedings of an International Seminar in Leiden 27 and 28 November 2002. The Harmonisation of Red Lists for threatened species in Europe. Edited by H.H. de Jongh, O.S. Bánki, W. Bergmans and M.J. van der Werff ten Bosch: 195-204.

Progress towards Targets of the Programme of Work on Protected Areas

Goals

1.1. To establish and strengthen national and regional systems of protected areas integrated into a global network as a contribution to globally agreed goals.

As was reported in **Paragraph II.A.1 of the Report**, the total area of the Marine Protected Areas and Land Protected Areas that have been established in Italy exceeds 10 per cent of the entire country, and if the European Natura 2000 network sites area are added to this figure, it doubles to 20.5%.

As an overall indicator, in both percentage and quantitative terms, the total area of the Protected Areas in Italy has reached an impressive level. Nonetheless, work has only just started on analysing

their effectiveness in the conservation of biodiversity elements, although the fact that Italy has met GPCS Target 5 is a positive step and its reported progress in terms of GPCS Target 4 is also noteworthy.

A process has also been launched in Italy to evaluate the effectiveness of the contribution of the protected areas towards achieving the Goals and Target of the CBD Strategic Plan.

Information which, when taken as a whole, contributes to the achievement of this target can be found in the other sections of the present Annex, those which address the protected areas.

A tremendous amount of work is also under way with the aim of bringing the Italian national and IUCN classifications into line with each other (Gambino et al., 2008), to ensure that specific nomenclature is correctly assigned in recognizable categories from international identification models.

1.2. To integrate protected areas into broader land- and seascapes and sectors so as to maintain ecological structure and function.

As was stated in the previous point, the protected areas in Italy amount to slightly over 20 per cent of the entire country and, as Chapter I of the Report states, this is the sign of a high level of environmental heterogeneity and biodiversity richness. Moreover, as described in sections **II. A.1** and **II.A.3** of the Report, a variety of initiatives have been taken at both national and regional levels that are aimed at achieving this Target.

1.3. To establish and strengthen regional networks, trans-boundary protected areas (TBPAs) and collaboration between neighbouring protected areas across national boundaries.

Under the terms of an international treaty that was signed in 1999 and ratified in 2001, a Marine Mammal Sanctuary has been set up by France, Monte Carlo and Italy in a trans-boundary protected area of 87,500 sq km centred on Corsica.

The Sanctuary has been entered on the list of Specially Protected Areas of Mediterranean Importance under the Barcelona Convention for the Protection of the Mediterranean Sea Against Pollution (the Barcelona Convention). In 2002 a Steering Committee was set up for the establishment of a Sanctuary; it comprises a group of experts whose task it is to coordinate government activities within the area. The Steering Committee has a Permanent Secretariat in the Ducal Palace in Genoa.

1.4. To substantially improve site based protected area planning and management.

With regard to the effectiveness of the management of the National Parks, considerable impetus has been given in recent years to overcoming the procedural obstacles that have long stood in the way of the completion of the national road map called for by the law. By way of illustration, the approval of the planning instruments for the National Parks, especially the Plan, is currently in the definition phase, after countless delays owing among other things to the lack of procedural homogeneity and other procedural complexities deriving from the legislative framework (Framework Act No. 394/91) and from the exclusive and otherwise over-methodical powers assigned to the Park Plan in comparison with all the other land use plans. Of the twenty-four National Parks hitherto set up, two have plans that are actually in force, ten have plans that are being scrutinized by the relevant Region for approval, while the remaining plans either have been or are in the process of being drawn up.

We should point out, however, that on the request of the Territorial Authorities (i.e. the regions, provinces, communes, mountain communes and metropolitan areas) and based on the proposals of the various National Parks Management Agencies, the boundaries of the protected areas are being resurveyed. Once they have been determined accurately and have been properly drawn in on large-scale maps, the task of environmental protection will be more usefully pursued.

By contrast with the land protected areas, the management of Italy's Marine Protected Areas comes under a variety of laws and regulations. There is no Parks Agency specifically set up as a management body, since management is the responsibility of public agencies, scientific institutions and recognized environmental associations (sometimes they form consortiums amongst

themselves). The assignment of these responsibilities is done by decree of the Minister of the Environment after consulting the regions and local authorities responsible for the areas in question. Most of the Marine Protected Areas are managed by the local communes.

With regard to the Marine Protected Areas, six procedural updates based on evaluations using scientific monitoring data and managerial experience are currently under way with a view to enhancing the effectiveness of biodiversity component protection and sustainable development objectives.

As far as the other protected areas are concerned, those that do not fall within the remit of the national government, the relevant data are the responsibility of the pertinent province or autonomous region. At present no theoretical framework exists for them.

1.5. To prevent and mitigate the negative impacts of key threats to protected areas.

With regard to the Marine Protected Areas, in 2004 the Ministry of the Environment, Land and Sea introduced a new version of the decree establishing or mandating the execution of constant monitoring of the environmental and socio-economic conditions of marine protected areas in accordance with the instructions issued by the Ministry of the Environment, Land and Sea. Under the terms of this decree, each agency managing a Marine Protected Area is required to inspect it and prepare an annual report. In this way, using as a basis the data acquired through the monitoring programme, an analysis of possible threats is to be conducted and the protected areas brought up to speed in order to optimize their environmental and socio-economic management in order to pursue sustainable development in the area in question.

2.1. To promote equity and benefit sharing.

There are no summary results at present to be indicated for this Goal.

2.2. To enhance and secure involvement of indigenous and local communities and relevant stakeholders.

Under the terms of the national laws and regulations in force, the establishment of a National Park or Marine Protected Area involves a technical and administrative procedure that calls for the fullest participation by local, provincial and regional representatives and close consideration of the relevant socio-economic aspects, including technical meetings for exchanges of views to be held either at the Administration or on site. The boundary delineation, zoning and protective measures for National Parks and Marine Protected Areas are therefore determined in agreement with the pertinent regions and local agencies. National Parks are established by decree of the President of the Republic in coordination with the region and subject to the view of the Joint Conference at the Prime Minister's Office (a body that includes representatives of the national government, the regions and local autonomous bodies). Marine Protected Areas are established by decree of the Minister of the Environment after consulting the relevant region and the Joint Conference at the PMO.

3.1. To provide an enabling policy, institutional and socio-economic environment for protected areas.

Following an investigation carried out in all of the Marine Protected Areas that had then been in existence for at least two years, the Ministry of the Environment, Land and Sea is now upgrading the means and structures available to managing agencies and the main services provided to users in order to bring them into line with a series of specific quality standards with appropriate guidelines. New organization and implementation regulations covering the activities that are permitted in the area are also being developed for each MPA. The aim is to bring greater consistency to the existing regulations governing the various Marine Protected Areas.

Through these new regulations and the introduction of technical protocols for sustainable surface and underwater navigation, which have been negotiated by the occupational associations, the responsible administrations and the Marine Protected Area management agencies, a complete review has started of the regulations governing Marine Protected Areas.

3.2. To build capacity for the planning, establishment and management of protected areas.

The Ministry of the Environment, Land and Sea has frequently funded projects aimed on the one hand at developing training and refresher courses and guidelines and on the other hand promoting professional initiatives to create jobs in protected areas. Some examples are described below.

In 2002, with the technical assistance of the *Associazione ACLI Anni Verdi* (the Italian Christian Workers Associations Children's Association), the Ministry and the Nature Protection Directorate together launched the project Parks for All: Expanded Usability (*Parchi per tutti*). The aim was to disseminate project and management criteria in order to facilitate the use of protected areas by a broader spectrum of the population, including seniors, children and citizens with physical challenges. The project, which was dedicated to marine areas, contains a general overview of the project principles for expanded use and of the Ministry's strategies for protected areas, as well as management criteria for the promotion of usability and information sheets on Marine Protected Areas, specifying the rules governing access to them. (See <http://www.parchipertutti.it>.)

Work for the Environment "*Lavoro per ambiente*" was born out of a survey commissioned in 2003 by the Ministry of the Environment, Land and Sea from SCO (a company working on behalf of *Italia Lavoro*, itself an arm of the Italian Ministry of Labour). Its aim was to identify by means of a programme agreement involving the two ministries the socio-economic conditions in the areas containing Italy's Marine Protected Areas. Areas were selected in which to set up cooperatives of young entrepreneurs on an experimental basis, bearing in mind such specific criteria as location in Southern Italy, the existence of buildings needing improvement, and the presence of environmental and occupational hazards. The decision was made to set aside one-third of the available posts for young people who were already working in environmentally compatible jobs but on a non-contract basis. The activities were primarily directed towards encouraging tourism, suitability for restoration, environmental education, and local marketing, and led to the development of an exportable methodology that focussed at the same time on the requirements of the local area alone. The Ministry of the Environment funded the restoration of natural environments and existing infrastructure (such as sand dune beaches and parking lots) where sustainable entrepreneurial activity might be carried out, while the Ministry of Labour provided technical assistance to local agencies, selected and trained the young people, carried out the start-up, and dealt with the initial endowment and tutoring of the cooperatives (these tasks were done completely by *Italia Lavoro*).

In 2007, as part of the Empowerment Programme – Specialized Training for Public Administrations involved in policy development for the economic development of depressed areas, and acting in collaboration with the Nature Protection Directorate of the Ministry of the Environment, Land and Sea, the Italian Nature Reserves and Parks Federation, and the Capo Rizzuto (KR) Marine Protected Area, the Environmental Sustainability Tools and Policies Centre of FORMEZ organized an advanced training course for MPA administrators, managers, technicians and project managers. The course was mainly held in Capo Rizzuto (KR) Marine Protected Area.

3.3. To develop, apply and transfer appropriate technologies for protected areas.

In recent years, there has been increasing impetus in Italy towards developing a UNI EN ISO 14001 environmental management system in order to obtain certification or, following the environmental declaration approach, to obtain EMAS registration under Regulation (EC) No 761/2001.

The introduction of environmental management systems by the organizations responsible for local management is in fact arousing increasing interest among the managers of public assets, who wish to ensure a sound level of environmental quality.

Obviously, this is of greater relevance to those agencies that are responsible for managing protected areas of great natural value, where the use of sustained development tools contributes to achieving agency goals.

Ever since the World Sustainable Development Congress, which was held in Rio de Janeiro in 1992, numerous tools have been developed to achieve sustained environmental management.

Among the main voluntary tools available to public administrators are: Local Agenda 21, ISO 14001 environmental certification, EMAS registration, environmental accounting, and the FSC

(Forest Stewardship Council), PEFC (Pan European Forest Certification) and ISO 14061 sustainable forest management standards.

ISO 14001 and EMAS were both born out of the need to reduce the environmental impact of productive activity, and the aim of both is the continuous improvement of environmental quality.

UNI EN ISO 14001 is an international standard promoted by the International Organization for Standardization (ISO); EMAS was developed by the European Union. Since it was enacted by means of a Community Directive, it is administered by the public agencies of the Member States. In Italy, this is done by the Ministry of the Environment through the Ecoaudit Ecolabel Committee, which is based at the headquarters of the National Environmental Protection Agency, now ISPRA.

Since UNI EN ISO 14001 is a technical standard, it indicates not only the objectives to be attained but also how to do so by defining the characteristics of the environmental management system that an organization needs to adopt in order to achieve improvement in environmental quality.

EMAS, on the other hand, is a scheme and defines the objectives to be achieved. It has evolved over time: for the development of systems aspects its 2001 review (761/91 EEC) includes ISO 14001. EMAS, however, stipulates that in addition to developing an environmental management system, the organization in question must also prepare a final document, the so-called environmental statement, in which, so to speak, it reveals itself to the outside world, stating in terms of the utmost transparency its own management method and improvement objectives.

The Ministry of the Environment is currently promoting a pilot project for the application of the environmental management system in two protected areas. The project, which is being run by ENEA (the Agency for New Technologies, Energy and the Environment), has its own website: <http://qualitypark.casaccia.enea.it>. (See also Goal 4.2.)

By introducing its technical protocols for sustainable recreational surface and underwater navigation in Marine Protected Areas, the Ministry of the Environment is introducing the concept of “environmental prize-worthiness” for environmentally-friendly boats in Marine Protected Areas. This is an important innovation that needs to be consolidated in the near future so that the application of these best practices can be extended to the entire system of Marine Protected Areas.

3.4. To ensure financial sustainability of protected areas and national and regional systems of protected areas.

(See also section II.A.4 of the Report.)

For 2007, bearing in mind the funding available to the environmental administration, the normal fee to be paid to the National Parks Agency to cover administrative costs and to pursue the primary objectives of protecting nature and biodiversity and promoting the principles of sustainable development was determined by defining fee apportionment criteria.

For each Agency, the normal fee was divided into two portions, the first of which was earmarked to cover fixed costs (personnel, operating costs, etc.) and the second was calculated to take into account specific local parameters (the area occupied by the National Park, the altimetry and extent of areas of total reserve), administrative criteria (the number of communes in the protected area, the population, the distance from the Parks Agency and the communes), and efficiency criteria (both administrative and socio-economic) such as the availability of programme documentation - the Land Use Plan and Regulations, the Multi-Annual Economic and Social Plan, accounting documents, and the Accounting Regulations – cash on hand.

3.5. To strengthen communication, education and public awareness.

Inasmuch as the protected areas promote environmental protection, while at the same time supporting the economic, social and cultural development of the entire surrounding area, they play a fundamental role in pursuing sustainable development.

The strategic role played by the protected areas in managing the natural environment derives from the importance of the activities they carry out such as promoting the sustainable use of resources, protecting natural ecosystems, and exploiting the surrounding area through tourism and other recreational activities, such as scientific research and the monitoring of biodiversity components, that are compatible with the environment. More specifically, the training services provided are not

merely seminars and gatherings designed for protected area professionals to undergo refresher training. The protected areas play an important information role of their own, heightening public awareness through the communication, publication and distribution of scientific and publicity material such as environmental reports, brochures and pamphlets on outstanding native flora and fauna, and more generally through planning and implementing projects designed to incentivise the economic exploitation of Protected Areas while fostering their environmental sustainability encourage, such as sustainable tourism and the creation of guided tours.

4.1. To develop and adopt minimum standards and best practices for national and regional protected area systems.

With regard to National Protected Areas, the Ministry of the Environment has paid particular attention to the use of sustainable systems. Visitor Centres and offices must, wherever possible, use installations, equipment and devices that are designed to reduce their environmental impact and to save energy, such as solar panels, pollutant-free insulation, rainwater collection and water recycling systems, constructed wetlands, plant purification and waste sorting, while the vehicles and boats used by the managing agency must incorporate the best environmental impact reduction and containment technologies available. In particular, the Ministry decreed that the motors used on boats had immediately to comply with the emissions and noise standards set forth in Council Directive 94/25/EC, which laid down the emissions limits that would take effect in 2006.

In 2005, in order to enhance environmental protection, the Ministry of the Environment supplied the Marine Protected Areas and some National Parks with marine protection responsibilities with a total of thirty *Spazzamare* (sea-sweeper) boats. The *Spazzamare* is a general-purpose working craft. In addition to surveillance, vigilance, and buoy maintenance, it is used in the more specific environmental tasks of cleaning surface waters, collecting micro-waste and performing emergency pollution clean-ups when spills are detected.

Turning to services, in 2003, as part of the European Year of People with Disabilities, the Ministry paid particular attention to the accessibility and usability of the structures and services in protected areas provided to people with motor or sensory disabilities, and made the commitment to promote not only the implementation of a constitutional principle and legal provision, but also a concept based in common courtesy. During the course of the year, a number of initiatives in this field were taken in the Marine Protected Areas, such as the promotion of integrated sports, underwater activity and the use of accessible boats and quays, together with other activities that in one way or another enable this category of users to gain access to an ever-increasing range of services.

In 2007, the Ministry of the Environment, Land and Sea prepared its Protocol on Sustainable Navigation in the Marine Protected Areas, involving all responsible administrations, qualified users and environmental associations in the task. The aim was to introduce the concept of “environmental prize-worthiness” for boats in Marine Protected Areas by incorporating ad hoc regulations in ministerial founding and updating decrees and in the regulations governing the Marine Protected Areas. With this protocol, the parameters changed for the granting of access to Italy’s Marine Protected Areas. Henceforth, pleasure craft were to be classified mainly in terms of their potential impact on the marine environment and whether or not they met specific ecological requirements; the old classification by size will remain in cases in which it works with regard to environmental protection requirements. Boats that are eco-compatible or with minimum impact may also be eligible for relief if they use renewable energy sources or are treated with anti-fouling anti-vegetative paint.

In 2007, the Ministry of the Environment, Land and Sea also prepared the Code of Conduct for Recreational Underwater Activities, which was intended instead to cover activities carried out with and without breathing equipment, such as snorkelling, sea-watching, diving without breathing apparatus, training and practice, solo dives, guided visits, underwater photography and underwater broadcasting. The Ministry issued a set of rules common to all activities (known as the Ten Commandments) and specific rules for each one.

The “Ten Commandments” contains the following: before you enter the water, acquaint yourself with the characteristics of the dive site; do not damage or remove archaeological or geological

finds; do not alter the behaviour of marine organisms (i.e. do not touch or chase them); do not anchor on beds of coralligenous sea grass (posidonia) or other marine phanerogams; do not do underwater exercises at vulnerable sites; do not feed organisms; do not deposit material of any kind either on the surface or under the water; always keep your distance from the substrate, avoid touching the bottom, and if you are using scuba apparatus limit the time you spend in underwater grottos, both entering and staying in them, to a minimum; report any failure to comply with these rules, and the presence of refuse or hazardous substances, to the competent authorities.

4.2. To evaluate and improve the effectiveness of protected areas management.

Italy undertook to carry out a census on the areas worthy of safeguarding and the species set forth in Annexes 2 and 3 of the Protocol through the Protocol on Specially Protected Mediterranean Biodiversity Areas (ASPIM or SPAMI, Barcelona Convention 1995) – see Section II.B.3 of the Report.

The application forms for registering areas in the ASPIM list include identification of species requiring special protection, their conservation by establishing protected areas, monitoring actions and knowledge of the status of conservation of species and marine areas of particular interest, assessing the measures taken, implementing further management measure and commencing recovery plans. The Italian Marine Protected Areas currently included in the ASPIM list are: Portofino, Miramare, Isola di Tavolara-Punta Coda Cavallo, Plemmirio, Torre Guaceto and the Sanctuary for Marine Mammals. The Marine Protected Areas of Punta Campanella and Capo Caccia – Isola Piana should be included in the list by 2009.

Protected areas are sections of a territory that comprise natural heritage with a high value in terms of conservation, which therefore require special conservation measures and the correct use of which may ensure benefits to local socio-economic development.

As mentioned in Target 3.3, ISO 14001 and ISO 9001 environmental certification and EMAS registration are beginning to spread to Italian protected areas: more than one Park has began adopting an Environmental Management System (EMS) or has registered for such. Park authorities use EMS to plan their activities under the logic of a process to control impact and increase environmental performances. The Community EMAS regulation integrates EMS with an environmental Declaration for the public in which the Park authorities state their environmental performance and targets for improvement.

There are many quality standard applications in parks in Italy, however the “quality parks” pilot project promoted by the MATTM is worth mentioning as the first pilot project at the international level to apply an Environmental Management System to complex land areas such as natural parks according to UNI EN ISO 14001, with technical and scientific coordination from ENEA involving the “Parco nazionale del Circeo” (as well as the Po River Park in Piemonte).

With regard to applying EMAS registrations, numerous terrestrial and Marine Protected Areas have already operated in an innovative and profitable manner to reach institutional goals: Ente Parco Naturale Mont Avic (2003), Parco Nazionale Dolomiti Bellunesi (2004), Ente gestore della Riserva Naturale Marina di Miramare (2004), Consorzio di Gestione dell’Area Marina Protetta “Tavolara-Punta Coda Cavallo (2005), Consorzio di Gestione di Torre Guaceto (2005), Parco Nazionale del Gargano.

Procedures for European and international acknowledgements have commenced, such as the list of UNESCO World Cultural and Natural Heritage Sites, in which the “Parco Nazionale del Cilento e Vallo di Diano” and the “Parco Nazionale delle Cinque Terre” are included, the M.A.B. – UNESCO World Network of Biosphere Reserves, which includes the “Parco del Circeo”, “Parco del Cilento e Vallo di Diano” and “Parco dell’Arcipelago Toscano” and the European Diploma for Protected Areas awarded to the “Parco d’Abruzzo Lazio Molise” and to “Gran Paradiso”.

The Ministry of the Environment funded the initiative entitled “Tools for assessing the effectiveness of management and «adaptive management» for Italian Marine Protected Areas” in 2006. The objective was to provide the authorities responsible for managing Italian MPAs the tools required to assess the effectiveness of the efforts made to achieve management-related objectives. This involves a user-friendly manual entitled “How your MPA is doing?”

(<http://www.effectivempa.noaa.gov/guidebook/guidebook.html>), which has been translated into Italian and adapted to the national context (link to download at www.mei-italia.com).

The following pilot marine areas engaged this Project: Isole Ciclopi (<http://www.ampiclopi.it/>) - Penisola del Sinis - Isola di Mal di Ventre (<http://www.areamarinasinis.it/>) - Secche di Torpaterno (<http://www.ampsecchetorpaterno.it/>)- Torre Guaceto (<http://www.riservaditorreguaceto.it/>) e Miramare <http://www.riservamarinamiramare.it/>.

4.3. To evaluate and improve the effectiveness of protected areas management.

With respect to protected areas of national value, research projects that tend to measure the so-called “Reserve Effect” are funded in many marine protected areas, as well as monitoring that the Authority responsible for management is required to carry out every year (1.5).

Individual projects to assess the reserve effect on marine protected areas were funded by MATTM in Ustica, Tavolara, Capo Carbonara, Isole Ciclopi and Torre Guaceto.

4.4 To ensure that scientific knowledge contributes to the establishment and effectiveness of protected areas and protected area systems.

There is no summary for all existing national protected areas that can access funds for ad hoc research in various manners with respect to this Target.

In relation to areas of national value, MATTM substantially contributes towards funding ad hoc research programmes for individual areas with respect to biodiversity, socio-economic aspects, the stages required for their implementation and subsequent management and monitoring.

In 2003, the MATTM made CONISMA (Consorzio Nazionale Interuniversitario per le Scienze del Mare – national inter-university consortium for sea-related sciences) responsible for a project in which all the data and results from projects, activities and studies funded by MATTM in AMPs in order to prepare a valid tool to support the planning of programmes for future actions and rationalizing the resources used. The census project carried out by CoNISMa involved not only marine protected areas already established, but also national parks bordering on the sea, marine protected areas about to be established, marine shelter areas and WWF blue areas. The information gathered commencing from the beginning of the Eighties derive from three different censuses: Projects funded by the MATTM in marine protected areas (including Priority Actions and those regarding the ANCIM Programme Agreement); published materials (scientific articles and publications) ; scientific studies (surveys at Authorities, Institute and public and private research laboratories and with lecturers and researchers that have carried out research for MPAs).

The MATTM also funded implementation of knowledge on the presence and diffusion of alien species in national marine territory in agreement with ISPRA; the research programme entitled “Identification and distribution of non-indigenous species in Italian seas” was updated by monitoring national harbours comprising the highest exchange volumes of ballast water.

Finally, the MATTM funded numerous ad hoc research programmes for each marine protected areas concerning marine fauna and flora, biodiversity, etc., as well as contributing to implementation of studies required to establish marine protected area according to naturalistic and socio-economic standards.

APPENDIX IV – NATIONAL INDICATORS USED IN THIS REPORT

Information from a number of indicators in the national set of environmental indicators published by ISPRA in its “Environmental Data Yearbook” (<http://annuario.apat.it/>) was used to write this report which, together with connected publication “Topics in the foreground” (http://annuario.apat.it/annuario_en.php), provides an extensive and organic collection of environmental information and the most important document that aims to provide the technical elements required to outline the status of the environment in Italy.

The indicators used in this report, their information-related objective and a brief assessment of their quality are provided below.

Indicator name	Information-related objective	Indicator quality
Level of threat for animal species	Provide a general picture as to the level of threat to animal species (vertebrates) and taxa in greater danger of loss of biodiversity.	high
Level of threat for plant species	Provide a description as to the level of threat to which Italian plant species are subjected, especially in relation to vascular plants; identify the territories in greater danger of loss of biodiversity by analysing regional contingencies of indigenous, exclusive and naturalized alien entities and protected regional flora.	high
Hunting impact	Assess which Italian regions undergo greater pressure from hunting activities	average
Importance of fishing activities	Show sector trends paying particular attention to the fishing fleet consistency and breakdown of catches according to fishing system and region. Measure the pressure from fishing, which briefly describes use of production, quantity and quality factors used in catching marine species and fishing activity effectiveness.	high
Total protected land areas	Assess the percentage of national territory covered by protected land areas	high
Total protected marine areas	Assess the percentage of national territory covered by protected marine areas	high
Special Protection Areas (SPA)	Assess the percentage of national and regional territory covered by SPA, also according to biographic areas.	high
Sites of Community Importance (SCI)	Assess the percentage of national and regional territory covered by Sites of Community Importance (SCI), also according to biogeographical area.	high
Wetlands of international interest	Assess the areas covered by wetlands of international interest in relation to national territory and define their type of habitat.	high
Forest area: state and changes	Indicate the status and trend of forest coverage over the period in terms of typology, territorial distribution and form of government.	high
Extent of forest fires	Indicate the complex phenomenon of forest fires, highlighting event features and trend over the period.	high
Farms and utilized agricultural areas	Describe the number of farms and the total areas effectively used for agricultural purposes	high
Distribution of fertilizers for agricultural use (manure, improvers and correctors)	Analyse and show the intensity of use of various types of fertilizers (manure, improvers and correctors) emitted onto the market and the nutritional elements contained therein by hectare of fertilizable land.	high
Distribution of pesticides for agricultural use (weedkillers, fungicides, insecticides and miscellaneous)	Analyse and show the intensity of use of various types of various types of pesticides used to defend crops from parasites and pathogens in order to control development of infesting plants and to ensure fulfilment of high quality standards in agricultural products	high
Farms adopting measures with low environmental impact and practising biological farming	Provide a measure of the level to which Italian farms adopt agricultural practices with a low impact on the environment and the food and fibres produced.	high
Eco-efficiency in	Provide indications the ability of Italian agriculture to encourage economic	high

Indicator name	Information-related objective	Indicator quality
agriculture	growth while reducing pressure and impact on the environment.	
Agricultural land area involved in the deliberate planting for experimental purposes of genetically modified plants (GMP)	Provide a measure of the extension and number of experimental planting of Genetically Modified Plants (GMP) in Italy between 1999 and 2005.	high
Wood and non-wood forest products	Provide a measure of the Italian forestry sector features strictly related to production and therefore involving not only environmental but also socio-economic problems.	high
Certification of sustainable forest management	Describe certification of wood management types, on a voluntary basis.	high
Contribution from Italian forests in the global carbon cycle	Provide an estimate of the capacity of Italian forests to fix CO ₂ and the role they play in climate change mitigation strategies and achieving the commitments signed on ratifying the Kyoto Protocol.	high

Italy participates in defining and implementing European biodiversity indicators with respect to Target 2010 named SEBI 2010 (*Streamlining European Biodiversity Indicators 2010*) and helped write EEA *Technical Report No 11/2007: Halting the loss of biodiversity by 2010: proposal for a first set of indicators to monitor progress in Europe providing the results achieved by the end of the first stage (2005-2007) of the project.*

For the purposes of harmonisation with this initiative and the need to update compliance with the main environmental issues involved, the Italian biodiversity indicators are under revision and integration.