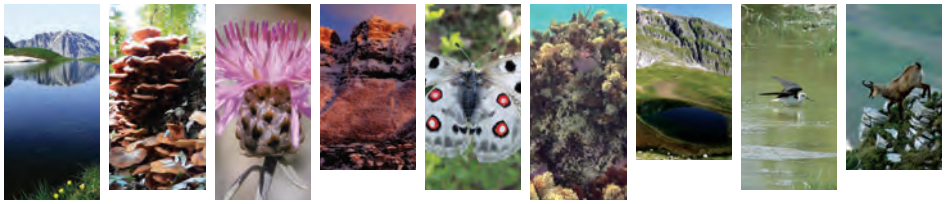
HELLENIC REPUBLIC
MINISTRY OF ENVIRONMENT, ENERGY & CLIMATE CHANGE

NATIONAL biodiversity STRATEGY & ACTION PLAN

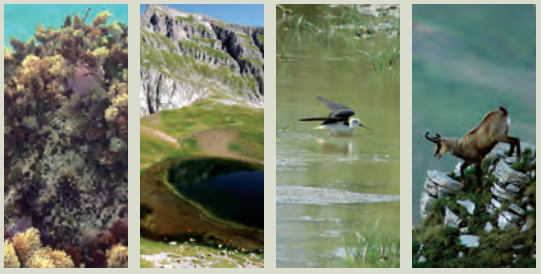


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NATIONAL BIODIVERSITY STRATEGY & ACTION PLAN





MINISTRY OF ENVIRONMENT ENERGY & CLIMATE CHANGE

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HELLENIC REPUBLIC
MINISTRY OF ENVIRONMENT, ENERGY & CLIMATE CHANGE



NATIONAL BIODIVERSITY STRATEGY & ACTION PLAN

APRIL 2014

A Coherent Biodiversity Strategy
Investing in the future

Greece is characterised as one of the most biodiverse countries in Europe and in the Mediterranean, retaining a high level of endemism. Until now, there has been no national level action framework aimed at halting the loss of biodiversity and the degradation of indispensable ecosystem services, such as the provisioning of food, pollination, water purification, protection from flooding, etc.

The conservation of our biological wealth, at the national level, is a constitutional obligation, which, even if it did not exist, we would have to invest in. Furthermore, Greece is obliged to contribute to European and Global initiatives to halt biodiversity loss.

Following these principles, and in response to our obligations according to Article 6 of the Convention on Biological Diversity, which Greece ratified, we have prepared//processed the National Biodiversity Strategy and the corresponding Action Plan in anticipation of the next 15 years.

The framework for the designation of the National Biodiversity Strategy is defined by:

1. scientific knowledge about the wealth, value-of, and pressures-to the biodiversity in Greece,
2. the legal framework – national, European and international – including International Treaties and European Directives,
3. the strategic framework, as defined by various national, European and international documents that Greece has adopted,
4. the general principles that are considered a priori acceptable, since they originate from moral values, national needs and capabilities, as well as from corresponding scientific approaches,
5. the integration of conservation and sustainable development into a national policy framework,
6. the preservation and strengthening of actions aiming to conserve biodiversity throughout the national territory, and
7. the long-term conservation of biodiversity and its function, as well as the equal distribution of its benefits.

The Greek National Biodiversity Strategy is now a fact, but it is also the culmination of a long effort starting in 1999, just five years after the ratification of the Convention on Biological Diversity by Greece in 1994. In 1999, the first draft of the National Strategy and Action Plan was proposed by the Zoological Museum of the National and Kapodistrian University of Athens to the Ministry of Environment, Planning and Public Works. In the next stage, a revised draft of

the National Strategy was prepared by the Greek Biotope Wetland Centre and the Goulandris Natural History Museum, following the directions of the Natural Environment Management Unit of the Ministry of Environment, Planning and Public Works. Then, in 2009, this text was submitted to public consultation, the outcome of which was evaluated by a group of experts and ministry representatives. The text was thoroughly revised, enriched and updated by a working group from the Ministry of Environment, Energy and Climate Change and from environmental NGOs (represented by: WWF Greece, Greenpeace, Arktouros, Hellenic Ornithological Society, Hellenic Society for the Environment and Cultural Heritage, Callisto, Mediterranean SOS Network and Archelon). Finally, the Greek Natura 2000 committee evaluated, revised and approved the text in accordance with the provisions of Greek Law 3937/2011. The final version is the result of the collaboration among the Natural Environment Management Unit, the Special Service for the Coordination of Environmental Actions and the Working Group for the Coordination of Nature Conservation and Protected Areas, and other Institutions responsible for Nature Conservation over the last 14 years.

Within the scope of this first National Biodiversity Strategy for Greece, we invite all stakeholders – central and regional authorities, local administration, productive forces, local communities, non-governmental organisations and research bodies – to actively participate in the planning, implementation and evaluation of the actions for the conservation and wise management of our biological wealth.

The Minister of Environment, Energy and Climate Change

Yannis Maniatis
March 31, 2014

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MINISTRY OF ENVIRONMENT ENERGY & CLIMATE CHANGE

PART A

NATIONAL BIODIVERSITY STRATEGY




2

Summary of the 2020 National Biodiversity Strategy for Greece

The vision for 2050

The biodiversity of Greece and the ecosystem services that it supports, are viewed as being of national importance. Natural capital is evaluated to facilitate the rational management, effective protection and restoration of its intrinsic value, due to the substantial contribution of biodiversity to the society's welfare and economic prosperity. By 2050, it is aimed to have prevented all destructive changes caused by the loss of biodiversity

General Objectives of the Strategy

Halting biodiversity loss - Promoting biodiversity as a national natural capital - Intensifying the contribution of Greece to preventing the loss of global biodiversity

13 Biodiversity Strategic Targets

1	2	3	4	5
Increasing scientific knowledge	Preservation of national natural capital	National system of protected areas	Conservation of genetic resources	Synergistic policies to conserve biodiversity

6	7	8	9	10
Conservation of landscape diversity	Biodiversity and climate change	Biodiversity and invasive alien species	International and transnational conservation	Public administration and the protection of biodiversity

11	12	13
Integrating biodiversity conservation in the value system of society	Participation of society in biodiversity conservation	Valuation of ecosystem services and promotion of the value of Greek biodiversity

Governance System
Evaluation, Monitoring of Implementation

Mechanisms of Support
Duration, National Report, Update



CHAPTER A INTRODUCTION

«Biological diversity» or «Biodiversity» refers to the diversity of all life forms. Thus, the term biodiversity engulfs all life on Earth. The realisation of the value of biodiversity, along with the scientific documentation of unprecedented loss or probable loss of biodiversity worldwide, have led to the acceptance of the need for coordinated action for biodiversity conservation on a global scale. The 1992 United Nations Conference on Environment and Development (widely known as the Rio Summit or Earth Summit) led to the Convention on Biological Diversity (CBD), which was the first official recognition of this need in international policy, and it was where the term biodiversity was established.

The objectives of this Convention, according to Article 1, are «the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources». Greece ratified the Convention with Greek Law 2204, in 1994.

Article 6 of this Convention requires each Contracting Party, in accordance with its particular conditions and capabilities to:

(a) Develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity or adapt, for this purpose, existing strategies, plans or programmes which shall reflect, *inter alia*, the measures set out in this Convention relevant to the Contracting Party concerned; and

(b) Appropriately integrate, as far as possible, the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies.

Furthermore, in 2001, the European Union (EU) set an objective to «halt the loss of biodiversity by 2010». Subsequently, in April 2002, the Parties to the Convention for Biological Diversity committed themselves to the aim to «achieve by 2010 a significant reduction of the current rate of biodiversity loss at global, regional and national levels as a contribution to poverty alleviation and to the benefit of all life on Earth». This target was subsequently endorsed by the World Summit on Sustainable Development as well as by the United Nations General Assembly.

After the international failure to meet the 2010 targets to reduce biodiversity decline, the tenth meeting of the Conference of the Parties to CBD (COP 10) was held in Nagoya, Aichi Prefecture, Japan, from 18 to 29 October 2010, and adopted the «Strategic Plan for Biodiversity 2011-2020» and the «Aichi Biodiversity Targets». The vision of this Strategic Plan is a world of

«Living in harmony with nature» where «By 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people.» The mission of the Strategic Plan is to «take effective and urgent action to halt the loss of biodiversity in order to ensure that by 2020 ecosystems are resilient and continue to provide essential services, thereby securing the planet's variety of life, and contributing to human well-being and poverty eradication». The Strategic Plan includes 20 headline targets for 2020, organised under five strategic goals. These targets became known as the «Aichi Biodiversity Targets» after the region of Japan where the city of Nagoya lies.

In May 2011, the European Commission adopted a new strategy establishing the framework for EU action intended to meet the 2020 biodiversity headline target set by the EU leaders in March 2010. According to this strategy, the EU adopted a vision for 2050 and a more immediate goal for 2020.

EU 2050 vision

By 2050, European Union biodiversity and the ecosystem services it provides – its natural capital – are to have been protected, valued and appropriately restored for biodiversity's intrinsic value and for their essential contribution to human wellbeing and economic prosperity, and so that catastrophic changes caused by the loss of biodiversity are to have been avoided.

EU 2020 headline target

Halting the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and restoring them in so far as feasible, while stepping up the EU contribution to averting global biodiversity loss.

Based on this policy, the EU has adopted the strategy: «Our life insurance, our natural capital: an EU biodiversity strategy to 2020». In this policy document, the EU set out six mutually supportive and inter-dependent targets that respond to the objectives of the 2020 headline target. All targets will help to halt biodiversity loss and the degradation of ecosystem services, with each addressing a specific issue: protecting and restoring biodiversity and associated ecosystem services (targets 1 and 2), enhancing the positive contribution of agriculture and forestry and reducing key pressures on EU biodiversity (targets 3, 4 and 5), and stepping up the EU's contribution to global biodiversity (target 6). Each target is broken down into a package of actions designed to respond to the specific challenge addressed by the target.

In June 2011, the European Union approved of and adopted the EU biodiversity strategy up to 2020[1]. This strategy is the main instrument of the EU to achieve the 2020 headline target for preserving biodiversity.

1. Council of the European Union, 3103rd Council meeting, Environment, Luxemburg 21 June 2011, Ref 11827/11

In December 2011, the EU Environmental Ministers Council[2] adopted conclusions on the implementation of the EU Biodiversity Strategy up to 2020. The ministers stated that a co-ordinated and rational approach was necessary for the implementation of the Strategy. They focused on the tangible measures required to achieve the main targets, and invited the European Commission and the EU Member States to integrate biodiversity targets into all EU and national sectoral policies.

Greek biodiversity is considered to be one of the richest in Europe and in the Mediterranean and is characterised by a high degree of endemism. However, there is no national-level framework of actions aimed to halt the loss of biodiversity. To fill this gap, and in accordance with the obligations of the Convention on Biological Diversity that Greece ratified, this National Biodiversity Strategy has been formulated. The framework for the formulation of this strategy is set by:

1. scientific knowledge about the wealth, value-of and pressures-on the biodiversity in Greece,
2. the legally binding framework – national, European and international – including International Treaties and European Directives,
3. the strategic framework, as defined by various national, European and international documents that Greece has adopted, and
4. the general principles that are considered *a priori* acceptable, because they originate from moral values, national needs and capabilities, as well as from corresponding scientific approaches.

In the formulation of this Strategy, the decisions of the Conference of the Parties to the CBD at its ninth meeting (Bonn 2008) were taken into consideration. These decisions urge Parties that have not yet done so to develop a national biodiversity strategy and action plan, with recommendations regarding: (1) meeting the three objectives of the Convention, (2) drawing up components of biodiversity strategies and action plans, (3) supporting processes, and (4) monitoring and reviewing. Moreover, the 2011 EU Biodiversity Strategy up to 2020 was also taken into consideration.

The duration of this strategy covers a 15-year period, 2014-2029; however, during this time, there will be established the foundations for further actions beyond 2029.

The present strategy is the outcome of a long process that started in 1999, when the Zoological Museum of the National and Kapodistrian University of Athens submitted the first draft of the national biodiversity strategy and national action plan to the Ministry of Environment, Planning and Public Works (as it was known then, which is today's Ministry of Environment, Energy and Climate Change). The next important step was taken when the Greek Biotope Wetland Centre and the Goulandris Natural History Museum, following the directions of the Natural Environment Management Unit of the Ministry of Environment, Planning and Pub-

2. Council of the European Union, 3139th Council meeting, Environment, Brussels 19 December 2011, Ref 18786/11

lic Works, submitted a new draft of the national biodiversity strategy. In 2009, this draft was subject to public consultation. The opinions and comments of the general public were evaluated by a group of experts and government representatives. Then, the text was thoroughly revised, enriched and updated by a working group from the Ministry of Environment, Energy and Climate Change and from various environmental NGOs (with representatives from: WWF Greece, Greenpeace, Arktouros, Hellenic Ornithological Society, Hellenic Society for the Environment and Cultural Heritage, Callisto, Mediterranean SOS Network and Archelon). The revised version was again submitted to public consultation in 2014. Finally, the Greek Natura 2000 committee evaluated, revised and approved the text in accordance with the provisions of Greek Law 3937/2011. The final version is the result of the collaboration among the Natural Environment Management Unit, the Special Service for the Coordination of Environmental Actions and the Working Group for the Coordination of Nature Conservation and Protected Areas, which was set up in 2013 by Yannis Maniatis, who was the Minister of Environment, Energy and Climate Change.

A.1. Definitions

«Biological diversity» or «biodiversity» refers to the whole range of life forms; namely, plants, animals, and microorganisms, from the genes that they contain to the ecosystems they form. Thus, the term biodiversity engulfs all life on Earth.

«Biodiversity» is usually examined at three levels: genetic diversity (within each species), species diversity, and ecosystem diversity. These three levels correspond to the three fundamental and nested levels of biological organisation.

«Biological diversity» is defined as the variability among living organisms from all sources, including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part. This includes diversity within species, between species and that of ecosystems.

«Country providing genetic resources» means the country supplying genetic resources collected from in-situ sources, including populations of both wild and domesticated species, or taken from ex-situ sources, which may or may not have originated in that country.

«Direct threats» for the conservation of species and ecosystems means the human activities that have been or are the cause of biodiversity loss or degradation or those activities that impede ecosystem functions.

«Ecosystem» means a dynamic complex of plant, animal and micro-organism communities along with their non-living environment interacting as a functional unit.

«Endemic» species means a species that only occurs in a restricted geographic range.

«Genetic material» means any material of plant, animal, microbe or of other origin containing functional units of heredity.

«Genetic resources» means genetic material of actual or potential value.



4

«Geotopes» means the geological – geomorphological structures that represent important instances in the history of Earth, which are evidence of Earth's long evolution, or demonstrate natural geological processes that continue to evolve on the surface of the planet.

«Habitat» means the place or the biotic and abiotic conditions where an organism or population naturally occurs or could potentially occur. Under this strict definition, «habitat» is defined in relation to a focal species. However, there is also the concept of «habitat types», as defined in European Directive 92/43, which means terrestrial or aquatic areas distinguished by vegetation elements, dominant flora and abiotic features.

«Invasive alien species» means a «non-indigenous» or «non-native» species that is introduced in an area outside its native range and that has the ability to settle in nature by occupying vital territory in natural ecosystems and displacing native species and biological communities.

«Protected area» means a geographically defined area, which is designated or regulated and managed so as to achieve specific conservation objectives.

The International Union for the Conservation of Nature «Red List» of Threatened Species (also known as the IUCN Red List or Red Data List), is an inventory of the global conservation status of biological species (plants, animals and fungi). A series of National Red Lists have been produced by countries or organisations, which assess the risk of extinction of species within their territories.

«Sustainable use» means the use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity; thereby, maintaining its potential to meet the needs and aspirations of present and future generations.

«Underlying or root causes» of direct threats means the social, economic, institutional, political and cultural factors that allow or contribute to the existence of direct threats.

A.2. The value of biodiversity

Biodiversity is the outcome of evolution and, thus, it is necessary for the persistence of life on Earth. Within this framework, each species holds intrinsic value, independent of its use value for mankind, for other species or for the ecosystem to which it belongs. The term «intrinsic value» is derived from the moral principle claiming that all organisms have a right to life independent of their relationship to our biological species. Therefore, mankind has the moral obligation to conserve biodiversity, especially since human activities are primarily responsible for biodiversity loss, both today and over recent millennia.

It is far from trivial to assess the economic value of biodiversity, since it is inherently linked with ecosystem services and the benefits man derives from them. The recognition of these ecosystem functions and services contributes to the efforts of the economic valuation of the benefits gained from biodiversity.

The term «ecosystem services» refers to the multitude of benefits (including goods and processes) people obtain from ecosystems. The Millennium Ecosystem Assessment[3] 2005 report distinguishes four categories of ecosystem services, as follows:

- **Supporting services**: that are necessary for the preservation of life, including nutrient cycling, soil formation and primary production.
- **Provisioning services**: that refer to the products obtained from ecosystems, such as food, water, raw materials (including lumber, fuel wood, natural fibres and fodder) and medicinal resources.
- **Regulating services**: that refer to the benefits obtained from the regulation of ecosystem processes, including ameliorating extreme weather events, flood control, carbon sequestration and climate regulation, purification of water and air, as well as pest and disease control.
- **Cultural services**: that refer to the aspects of biodiversity that have shaped human civilisations throughout our history, including nonmaterial benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation and aesthetic experiences.

According to the European Environment Agency[4], ecosystem services are classified according to their value, as follows:

- Use values:
  - Direct use (e.g. fishing, irrigation)
  - Indirect use (e.g. flood control, water purification)

3. Millennium Ecosystem Assessment. 2005. Ecosystems and Human Well-being: Biodiversity synthesis. World Resources Institute. Washington, DC.
4. EEA Technical report, No 4/2010.Scaling up ecosystem benefits – A contribution to the Economics of Ecosystems and Biodiversity, (TEEB) Study.

  - Optional use, such as services that might be useful in the future (e.g. genetic resources from crop improvement)
- Non-use values: such is the value that people assign to goods, even if they never have and will never use it. It includes basic concepts as the bequest value or existence value (e.g. ensuring the availability of biodiversity and ecosystem functioning for future generations).

Many different types of approaches have been implemented in an attempt to evaluate biodiversity in economic terms. According to an EU funded project[5], it is estimated that we lose biodiversity each year that would have produced Ecosystem Services worth around 50 billion Euros (EUR) per year, in every subsequent year. These losses mount. Taking 2000 as the baseline, by 2010 the loss «grows to» 545 billion EUR in that year compared to 2000 for land-based ecosystems alone. This value is just under 1% of world GDP. This value continues to increase and, by 2050, the cumulative losses will have been the equivalent of around 7% of global consumption.

Another approach is to estimate the direct economic value of provisional ecosystem services, i.e. the value of goods and products that we derive from biodiversity. According to such studies, the economic value of the global food market[6] for the second half of 2006 was approximately 1.2 trillion US dollars. The value of the water[7] used in 2007 was 0.5 trillion US dollars. The value of timber and related products[8] in 2005 was 0.4 trillion US dollars. The value of natural fibres[9] produced in 2009 was 0.12 trillion US dollars. The value of natural or semi-natural medicinal products[10] in 2007 was 0.5 trillion US dollars (or 75% of all medicinal products). The value of global biofuels[11] in 2010 was 0.08 trillion US dollars, estimated to have risen to 0.4 trillion US dollars by 2020. The sum of these values is 2.8 trillion US dollars, which is an indicative value of the provisioning ecosystem services. According to the Millennium Ecosystem Assessment, 60% of ecosystem services are degraded. In recent decades, mankind has greatly benefited from economic development; however, to a large extent, this development has been associated with biodiversity loss and degradation.

A main conclusion of these studies is that we are wasting Earth's natural capital and we are endangering the capacity of ecosystems to support future generations. The short-term benefits are outweighed by huge future losses. The only way to avoid this deterioration is by our making substantial changes in policy and everyday practices.

5. BraatL., ten Brink P. et al. 2008. The Cost of Policy Inaction (COPI): The case of not meeting the 2010 biodiversity target.
6. United Nations, Commodity Trade Statistics Database (UN Comtrade).
7. Wild D., Francke C.-J., Menzli P., Schön U., 2007, SAM Study «Water: a market of the future», http://www.sam-group.com/downloads/studies/waterstudy_e.pdf.
8. FAO Advisory Committee on Paper and Wood Products, Global Wood and Wood Products Flow, Shanghai, China, 6 June 2007.
9. http://www.naturalfibres2009.org/
10. http://www.prlog.org/10151247-global-pharmaceutical-market-will-reach-929-billion-in-2012-says-new-report.html
11. http://www.pikeresearch.com/newsroom/global-biofuels-market-to-reach-247-billion-by-2020-despite-near-term-challenges.

A.3. Threats to the conservation of biodiversity at global, regional and local levels

Even though biodiversity and ecosystem services are subject to changes because of natural causes, the current changes, and especially the unprecedented rate of species loss, which is estimated to be 100 to 1000 times greater than in the past[12], are mainly attributable to human activities. On a global scale, the Millennium Ecosystem Assessment[13] identifies and classifies the direct threats for biodiversity as follows:

- Habitat loss or transformation, particularly from land-use changes (primarily, but not exclusively, conversion of natural habitats to agricultural land), interruption of a river's natural flow or water withdrawal from rivers, infrastructure development (e.g. road networks and urban sprawl), loss or degradation of coral reefs, and trawling of the seabed due to destructive fishing.
- Spread of invasive alien species has increased because of increased trade and travel, including tourism.
- Overexploitation of species and natural resources through legal and illegal harvesting, e.g. unsustainable levels of hunting and fishing. More specifically, overfishing is recognised as the primary threat to marine ecosystems today.
- Spread of pathogens, which is facilitated by international travel and commerce.
- Pollution – air, water and land – from various sources and human activities, including industry, urban expansion, transportation and agriculture, in addition to accidents like oil spills or nuclear disasters.
- Climate change, which may prove the most difficult factor to predict or control.

If we explore deeper into the reasons behind these threats, then we discover the underlying or root causes. These underlying causes are the factors that allow, contribute to or cause the direct threats to biodiversity either now or in the past. According to the Millennium Ecosystem Assessment, these underlying causes could be classified into five categories: demographic, economic, socio-political, cultural-religious and scientific-technological.

According to the European Environment Agency (2007[14]), the main pressures on biodiversity, on a European scale, are: urban expansion, infrastructure development, water and soil acidification, eutrophication, desertification, natural- resources overexploitation, agricultural intensification and land abandonment.

Even inside most protected areas, a variety of human activities ranging from environmentally-friendly touristic activities to industrial and mining activities have been re-

12. Pimm SL, Russell GJ, Gittlema JL & Brooks TM. 1995. Science 269: 347–350.
13. Millennium Ecosystem Assessment. (2005). Ecosystems and Human Well-being: Current State and Trends, Volume 1, Island Press. Chapter 4. Biological Diversity, pp.96-99
14. European Environment Agency. 2007. Europe's Environment – The Fourth Assessment. State of the environment report No 1/2007. Copenhagen.


5

corded both in Greece and in Europe[15]. Climate change has been increasingly identified as a serious threat, especially to coastal, alpine and arctic species and ecosystems.

Coastal and marine areas of the Mediterranean face further threats, as identified in the Convention for the Protection of the Mediterranean Sea Against Pollution (known as the Barcelona Convention). The relevant Action Plan underlines the threats imposed by coastal development without planning (including tourism), fishing in fragile ecosystems (e.g. Neptune's sea grass *Posidonia oceanica* beds and coral reefs), illegal fishing, overfishing, lack of monitoring, spread of alien invasive species, construction of dams, pollution, global-scale phenomena (like desertification, soil erosion, sea level rise, increased salinity and sea warming) and the trade of endangered species.

A.4. The global response to biodiversity threats

In the 1970s, the international community began to realise the value of biodiversity, and started taking actions that, directly and indirectly, led to the conservation of natural areas and biodiversity. As a result, several international environmental treaties were signed and ratified, including the 1971 Convention on Wetlands of International Importance (called the Ramsar Convention), the 1973 Convention on International Trade in Endangered Species of Wild Fauna and Flora (known as CITES), the 1979 Convention on the Conservation of Migratory Species of Wild Animals (also known as the CMS or Bonn Convention) and the 1979 Convention on the conservation of European wildlife and natural habitats (called the Bern Convention).

In 1987, the United Nations World Commission on Environment and Development (WCED) published their findings in a report titled «Our Common Future», also known as the Brundtland Report. This report introduced the term «sustainable development». Its definition of sustainable development, which has been the most frequently cited definition of the concept to date, aims to reconcile economic development and

15. Tsiafouli MA, Apostolopoulou E, Mazaris AD, Kallimanis AS, Drakou EG & Pantis JD. 2013. Human activities in Natura 2000 sites: a highly diversified conservation network. Environmental Management 51: 1025–1033.

environmental conservation, and is often used as a policy goal and as an assessment standard for modern societies. This report led to, and strongly influenced, the Earth Summit in Rio de Janeiro in 1992, and set the stage for a new level of environmental awareness and actions worldwide.

The 1992 Earth Summit proved to be one of the most important events in global environmental policy. One of its main achievements was the adoption of «Agenda 21», a non-binding, voluntarily implemented action plan with regard to sustainable development. Following this approach, various organisations from the United Nations, and other multilateral international organisations to national governments and even local authorities around the world planned and adopted action plans regarding sustainable development that may be executed at local, national, and global levels. Another major achievement is the Rio Declaration on Environment and Development, often called the Rio Declaration, which consisted of 27 «principles» intended to guide future sustainable development worldwide. Furthermore, important legally-binding agreements were opened for signatures, including the Convention on Biological Diversity, the Framework Convention on Climate Change and the United Nations Convention intended to Combat Desertification. Regarding biodiversity, the Rio Summit signalled the world's recognition of the need to preserve biodiversity and the political significance of the concept of biodiversity. The objectives of the CBD, according to Article 1, are «the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources».

In accordance with the CBD, other treaties and protocols were signed and ratified in the following years. An important treaty for plant genetic resources is the 2001 International Treaty on Plant Genetic Resources for Food and Agriculture – ITPGRFA, also known as the International Seed Treaty, which operates under the aegis of Food and Agriculture Organization of the United Nations (FAO). This legally-binding treaty supersedes the 1983 voluntary agreement, the International Undertaking on Plant Genetic Resources for Food and Agriculture (IU), which established the principle of genetic resources as a public good being the common heritage of humanity. The ITPGRFA harmonised the provisions of the IU with state sovereignty and the seeds of commercial value, in accordance with CBD provisions.

In implementing the ITPGRFA, the FAO established the Global Plan of Action for the Conservation and the Sustainable Utilisation of Plant Genetic Resources for Food and Agriculture (GPA), which is a framework for action at community, regional, national and international levels. GPA supports actions primarily, but not exclusively, in less developed countries, in recognition of the farmers' contribution to selecting and preserving the global pool of genetic resources until now. This contribution is recognised under the Farmers' Rights. The concept of Farmers' Rights provides a measure of counterbalance to «formal» Intellectual Property Rights and patents that compensate for the latest innovations, with little consideration of the fact that these innovations are only the most recent step of accumulative knowledge. The preservation of biodiversity

is a priority for the FAO, especially with respect to its role in world agriculture and food security.

Regarding climate change, there is a long history of international conferences. In 2009, the Copenhagen Climate Change Conference raised climate-change policy to the highest political level and underlined the long-term goal of limiting the maximum global average temperature increase to no more than 2 degrees Celsius above pre-industrial levels. Subsequent meetings include the 2010 Cancun meeting, the 2011 Durban meeting, the 2012 Doha meeting and the 2013 Warsaw meeting. Ever since these meetings, negotiations on how to deal with climate change have advanced, and several agreements have been reached, including a second commitment period of the Kyoto Protocol until 2017.

Twenty years after the landmark 1992 Earth Summit in Rio, the United Nations Conference on Sustainable Development took place in Rio de Janeiro, Brazil, in June 2012, and became known as Rio+20. At this meeting, negotiations among world leaders and other participants (like NGOs) led to the declaration titled «The Future We Want», which argues how we may reduce poverty, advance social equity and ensure environmental protection on an ever more crowded planet.

The EU landmarks of nature-conservation policies are the 1979 Directive on the conservation of wild birds Directive 79/409/EEC, as codified and amended by Directive 2009/147/EC (which is known as the Birds Directive), the 1992 Directive on the conservation of natural habitats and of wild fauna and flora, Directive 92/43/EEC (which is known as the Habitats Directive), and the 1998 European Biodiversity Strategy. In general, until the end of the 1990s, the EU nature conservation policy had been focused on the conservation of terrestrial biodiversity. Since 2000, there has been an EU policy on the aquatic environment, as signalled by the EU Water Framework Directive (2000/60/EU) establishing a framework for Community action in the field of water policy. Finally, in 2008, Directive 2008/56/EU established a framework for community action in the field of marine environmental policy (known as the Marine Strategy Framework Directive).

In 2008, the Protocol on Integrated Coastal Zone Management in the Mediterranean was signed. This protocol is part of the Barcelona Convention. The integrated management of coastal regions is an important component of the EU maritime policy, as approved by the European Council in Lisbon 2007.

The EU policy on climate-change adaptation was officially launched in 2007, when the Green Paper on Adapting to Climate Change was published. In this policy, the commission identifies four pillars of action that may be taken on a community scale: early action in the EU provided sufficient knowledge has been acquired, integrating adaptation into EU external relations, improving knowledge where there are gaps and involving all stakeholders in the preparation of adaptation strategies. Thus, highlighting that swift action to adapt the EU to climate change will prove to be much less costly than the damage resulting from this phenomenon. Action should be taken to integrate climate change adaptation into legislation and a number of policies (regarding sectors

that are or will be severely affected by climate change, such as agriculture, forestry, transport, health, water and fisheries). Member States are urged to develop national plans for climate change adaptation.

In 2009, the European Commission published the White Paper on «Adapting to climate change: towards a European framework for action». This publication is the outcome of a dialogue among the Commission, the Member States, the financial factors, and European citizens, which was based on a consultation process using the Green Paper. Due to the regional variability and severity of climate impact, most adaptation measures will be taken at national, regional or local levels. However, these measures may be supported and strengthened by an integrated and coordinated approach at an EU level, since the impact of climate change transcends the boundaries of individual countries (e.g. river and sea basins and bio-geographic regions). Adaptation requires solidarity among EU Member States to ensure that disadvantaged regions and regions most affected by climate change will be capable of taking the measures needed to adapt. Moreover, coordinated EU action will be necessary in certain sectors (e.g. agriculture, water, biodiversity, fisheries and energy networks) that are closely integrated, at an EU level, through the single market and into common policies.

The White Paper denotes how climate change affects a number of sectors, with an emphasis on the more vulnerable sectors, like agriculture and forestry, health, fisheries and aquaculture, coastal areas, terrestrial and marine ecosystems, energy, tourism, infrastructure and water resources. This approach includes disaster-risk reduction as an integral part of the adaptation strategy.

Recently, the EU has also issued a communication on the community approach to the prevention of natural and man-made disasters. In this framework, the EU has launched initiatives to coordinate relevant actions to minimise the risk of disasters and to better manage natural hazards. An example of this approach is Directive 2007/60/EU on the assessment and management of flood risks, which aims to reinforce cooperation and coordination among Member States in the field of the prevention and management of floods. Thus, Member States are urged to adopt long- term plans to prevent disasters from happening (when and where possible), and to take alternative steps to minimise impacts when and where they occur. Simultaneously, there is an ongoing debate on how to deal with drought and water shortages.

At a regional level, in 1976, the Convention for the Protection of the Mediterranean Sea Against Pollution (Barcelona Convention) was signed, which was amended in 1995 and renamed as the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean. This convention includes seven protocols addressing specific aspects of Mediterranean environmental conservation. Although the initial focus of the Barcelona Convention was aimed at marine pollution control, over the years, its mandate has widened to include integrated coastal zone planning and management, as well biodiversity conservation. In 2005, the parties of the Barcelona Convention adopted the Mediterranean Strategy for Sustainable Development. In recent years, a major achievement of this approach has been the formulation of a Stra-

tegic Action Programme, part of which is the Strategic Action Plan for the Conservation of Marine and Coastal Biodiversity in the Mediterranean (SAP BIO). Furthermore, under the aegis of the Ramsar Convention, the Mediterranean Wetlands Initiative (MedWet) operates as a long term collaborative initiative that supports the conservation and wise use of Mediterranean wetlands.

In 2002, the sixth Conference of the Parties (COP) of the Convention on Biological Diversity (CBD) decided on the 2010 Biodiversity Target, which aims to have achieved «by 2010 a significant reduction of the current rate of biodiversity loss at global, regional and national levels as a contribution to poverty alleviation and to the benefit of all life on Earth». The 2010 Biodiversity Target was subsequently endorsed by the United Nations General Assembly at the 2005 World Summit, highlighting the political significance attached to biodiversity issues. One year earlier, in June 2001, the EU Heads of State at the EU Summit in Gothenburg, Sweden, decided that «biodiversity decline should be halted with the aim of reaching this objective by 2010». In 2006, the European Commission issued a communication regarding the progress towards achieving the EU's 2010 biodiversity target, entitled «Halting the loss of biodiversity by 2010 – and beyond: Sustaining ecosystem services for human well–being», which describes what had been achieved until then, how effective it was and what needed to be done. In 2010, the European Commission reported the assessment of implementing the EU Biodiversity Action Plan to the Council and the European Parliament, which concluded that, despite the important progress that had been made, the overall goal of halting biodiversity loss in the EU by the end of 2010 had not been achieved, nor had the global target. Europe's ecosystem services are judged to be of mixed status or degraded, while the global situation is even more alarming, particularly as pressure on biodiversity continues to intensify. Such pressures include land-use changes, pollution, spread of invasive alien species and climate change. Still, significant progress has been made in the selection of and more effective protection of Natura 2000 sites, in improving the knowledge base and establishing further linkages between biodiversity and climate change. The findings of this 2010 assessment will provide valuable information to ensure the successful delivery of the 2020 target at EU and global levels. The EU 2010 biodiversity target has already been amended by the EU 2020 headline target and the EU 2050 vision for biodiversity.

Moreover, there is an increasing number of texts, decisions, and resolutions from international, European and national sources regarding biodiversity that Greece has adopted, and which have been taken into consideration in the formulation of the Greek Biodiversity Strategy and Action Plan. These items include international treaties, amendments to international conventions, European Directives and European and international strategies.

CHAPTER B

BIODIVERSITY IN GREECE

B.1. Spatial data and special features of the abiotic environment in Greece

Greece occupies an area of 132,000 km^2 and is inhabited by 10,500,000 people (according to the 2011 census). The country lies in the southern part of the Balkan Peninsula and belongs to the Mediterranean zone of the Palearctic biogeographic region. It contains a variety of climatic conditions (29 climatic classes according to the Thornwaite classification scheme), a fact attributable to its geographic location, terrain ruggedness and the presence of the sea. However, most of Greece has a Mediterranean climate, with mild – wet winters and warm – dry summers. The terrain is rugged, with two thirds of the territory being mountainous with a mean altitude of 1500 m elevation above sea level (a.s.l.). In addition, the country has a long and highly indented coastline (approximately 16300 km) and a large number of islands in both the Aegean and Ionian Archipelagos.

Greece lies at the intersection of three continents (Europe, Asia and Africa), and is characterised by high topographic variability (large number of islands, large variation in the landscape from marine to mountainous over short distances, many rivers, gorges, valleys, peninsulas, etc.). Greece has complex geological and geomorphological structures (including caves). It has a wide array of soil orders (entisols, inceptisols, alfisols and vertisols). In addition, during its long history and until recently, the human interaction with the natural environment has been minor and sustainable, and has shaped today's seminatural vegetation structure.

The combination of all these factors has contributed to the country's high level of biodiversity.

B.2. The present status of biodiversity in Greece

B.2.1. Introduction

Greece is characterised by rich fauna and flora, a high number of fungi species, and a wide array of ecosystems and landscapes. What is more, a high proportion of the country's species are unique worldwide, i.e. there is high endemism.

According to the most recent surveys[16], Greek flora includes 5752 species and 1893 subspecies of vascular plants, which cumulatively represent 6600 taxa that belong to 1072 genera and 185 families. Greece is also one of the world's hotspots for endemic plants, with 1278 endemic species (22.2% of all species present) and 452 endemic subspecies, which cumulatively represent 1461 taxa (22.1% of all taxa present in Greece).

Regarding Greece's fauna, until now 23130 animal species have been recorded in the country's terrestrial and freshwater ecosystems[17], of which 3956 are characterised as Greek endemics[18]. Furthermore, 3500 animal species have been recorded in the Greek marine environment.

Many Greek endemic species have restricted geographic ranges (e.g. single island endemics) and, thus, are considered vulnerable to disturbance. Because of its high level of endemism, Greece is the only European country to host a large number of species considered threatened or extinct in other European regions. Consequently, Greece is of considerable importance for the conservation of European and Mediterranean flora and fauna. Out of the Greek native species, 60 mammal species, 48 reptile species, 12 amphibian species, 62 fish species, 49 invertebrate species, 63 plant species and 85 habitat types are designated of community interest[19].

Greece is also characterised by a rich diversity of ecosystems and habitat types. The ecosystems range from the semi-desert, like the Vai palm forest of Crete, to the cold-climate mountain forests of birch, Scotch pine, and spruce. There is also a large variety of landscapes in Greece, which might be attributed to the same factors that favour the high genetic diversity, species richness and ecosystem diversity, including the long history of human presence and civilisation. This array of landscapes include the semi-arid ones from southeastern Crete, the mountainous forests and plateaus of Mt Olympus and the Pindus range (in the central region of Greece), to the central and north European landscapes of Rodopi.

16. Strid A, Tan K. 1997. Flora hellenica 1.Königstein: Koeltz Scientific Books.
Strid A, Tan K. 2002. Flora hellenica 2. Ruggell: Koeltz Scientific Books.
Tan K, Iatrou G. 2001. Endemic plants of Greece, the Peloponnese. Copenhagen: Gads Publishers.
Dimopoulos P., Raus Th., Bergmeier E., Constantinidis Th., Iatrou G., Kokkini S., Strid A. Tzanoudakis D. (2013). Vascular plants of Greece: An annotated checklist. – Englera 31: 1-372.
Georgiou K. & Delipetrou P. 2010. Patterns and traits of the endemic plants of Greece. Botanical Journal of the Linnean Society 162:130–422.
17. Legakis A., Maragou P. 2009. Greek Red Data book of Threatened Fauna. Hellenic Zoological Society.
18. Fauna Europaea Web Service 2004. Fauna Europaea version 1.1. available at http://www.faunaeur.org
19. According to the EU birds and habitats directive.

B.2.2. Genetic resources

Greece has rich genetic resources because of its natural capital and its long agricultural history. Because of the high variability in soil conditions and microclimates, and despite its limited area, Greece is considered to be one of the richest[20] nations in Europe with respect to its natural vegetation and cultivated species wild relatives (CWRs). However, the agricultural intensification of the 1960s and 1970s caused the abandonment of traditional agricultural practices and old cultivars, which were replaced by new cultivars produced either in Greek breeding institutes (e.g. the National Agricultural Research Foundation) or imported from abroad. This process has led to the genetic erosion of Greek plant genetic resources and, especially, of local varieties[21]. In the Second Greek Report[22] concerning the state of plant genetic resources for food and agriculture to the FAO, which was prepared in accordance with the ITPGRFA, it is reported that genetic erosion was particularly intense and rapid for cultivated cereals, where the local varieties cultivated today barely account for 1% of the total acreage. Similarly, but with a delay of 20 years compared to cereals, genetic erosion is becoming apparent for vegetable crops, tree crops and grapevines. However, since 1995 when the first national report was prepared, progress has been made in the number of germplasm accessions of the Greek Gene Bank, which have raised from 7220 in 1995 (belonging to 66 genera and 169 species of crop plants and their relatives) to 10650 in 2005, through a series of collection expeditions within the country. Yet, there is a gap in the collection of associated symbiotic strains of microorganisms (e.g. *Rhizobium*).

According to a recent study[23] that developed a framework for determining the insurance values associated with the Greek Gene Bank, this insurance value considerably exceeds the current operating cost for maintaining it.

Regarding the animal livestock of Greece, the Ministry of Rural Development and Food, in 2003, reported that: (a) there is only one native breed of pigs with a small population size remaining, (b) there are 26 recognised breeds of sheep, six of which have very few animals, 12 are threatened and only eight are considered of least concern, (c) there are five native breeds of cattle, three of which have become extinct during the last 50 years and two are considered as threatened (because they account for only 0.64% of the cattle population), (d) there is one breed of buffalos, which is considered as threatened, (e) there are six breeds of goats, just one of which is considered threatened, and (f) there are six breeds of horses, all of which are considered as threatened.

20. Stavropoulos N. 1995. Greece: First Country Report concerning the state on plant genetic resources for food and agriculture. Ministry of Agriculture and NAGREF. Athens.
21. Ministry of Agriculture. 2000. National Strategy for Genetic Resources, pp 256-368
22. Stavropoulos N., Gogkas D., Chatziathanassiou A., Zagilis E., DrakopoulosG., Paitaridou D., Trigas P., Thanopoulos R., Koutsomitros S., Perdikaris A., Lourida B., Alesta A. 2006. Greece: Second Country Report concerning the state on plant genetic resources for food and agriculture. Hellenic Democracy, Ministry of Rural Development and Food, Athens. Available at http://www.minagric.gr/greek/FitogenetiPori.html
23. Xepapadeas A, Ralli P, Kougea E, Spyrou S, Stavropoulos N, Tsiaousi V & Tsivelikas A. 2014. Valuing insurance services emerging from a gene bank: The case of the Greek Gene Bank. Ecological Economics 97: 140–149.

B.2.3. The diversity of organisms

According to the earliest classification schemes, all organisms are divided into two kingdoms, namely plants and animals. However, it became apparent that this scheme was inadequate, since it was very difficult to group some living organisms into either group; consequently, the two kingdoms were expanded into five kingdoms[24]: Protista (the single-celled eukaryotes), Fungi (fungi and related organisms), Plantae (the plants), Animalia (the animals), Monera (the prokaryotes). However, more recent phylogenetic studies have described the three-domain system[25], which adds a level of classification (the domains) «above» the kingdoms delineated in the previously used five-or-six-kingdom systems. The three-domain system divides cellular life forms into Archaea, Bacteria and Eukaryote domains. It emphasises the separation of prokaryotes (cells without nuclei) into two groups, originally called Eubacteria (now Bacteria) and Archaebacteria (now Archaea). The eukaryote domain includes organisms that contain a membrane bound nucleus; namely, the kingdoms of Protista, Fungi, Plantae and Animalia.

B.2.3.1. Archaea and Bacteria

Bacteria are microscopic single-celled prokaryotic organisms that have been recorded in large numbers in every type of habitat. The domain of bacteria is divided into phyla, one of which is the Cyanobacteria (also known as blue-green algae), which is the major photosynthetic prokaryotic clade believed to have caused Earth's oxygen-based atmosphere.

Archaea (formerly known as Archaebacteria) are also microscopic single-celled prokaryotic organisms, and were initially considered to inhabit extreme environments only. However, now, we know that they are far more widely distributed than originally thought. Furthermore, even though they were considered as a class of bacteria, phylogenetic analysis at biochemical and genetic levels has shown that they are more closely related to the eukaryotic organisms than to the bacteria.

B.2.3.2. Eukaryotes

B.2.3.2.1. Protista

Protista are a large and diverse group of eukaryotic microorganisms. Protista live in almost any environment that contains liquid water, such as freshwater or marine ecosystems. Protista include many groups of algae (such as diatoms, dinoflagellates) that are photosynthetic and are vital primary producers in ecosystems, particularly in the ocean as part of the plankton.

24. Whittaker R. 1969. New concepts of kingdoms or organisms. Evolutionary relations are better represented by new classifications than by the traditional two kingdoms. Science 163 : 150–160
25. Woese C.R., Kandler O., WheelisM.L. 1990. Towards a natural system of organisms: proposal for the domains Archaea, Bacteria, and Eucarya. Proceedings of the National Academy of Sciences (USA) 87: 4576-4579.



For Greece, there is no complete catalogue of the species of protista in either freshwater or marine environments. There are reliable surveys for protista in various ecosystems (like the lakes of Volvi, Doirani, Prespa, Vegoritida, and Kastoria or the bays of Thessaloniki, Saronikos and Amvrakikos), with information remaining fragmentary or absent for many regions.

B.2.3.2.2. Fungi

The fungi are a large group of eukaryotic organisms that includes microorganisms such as yeasts, moulds, and mushrooms. The fungi encompass an enormous diversity of taxa (approximately 100,000 taxa) with varied ecologies, life cycle strategies, and morphologies.

The diversity and distribution of fungi in Greece are less well known than those of plants or animals. However, in 1973 the first list of fungi and hosts was published[26], including 1950 species of fungi that had been recorded in Greece to that date. Since then, there has been a number of publications and, in recent years, new species have been recorded in Greece. Currently, the Institute of Forest Research of the National Agricultural Research Foundation keeps a database, which contains 11000 records from approximately 3000 fungi species. So far, there has been no Greek red data book for fungi. However, a recent publication[27] has identified 150 fungi taxa (either species or subspecies) as threatened.

B.2.3.2.3. Plants

A. Algae. Most species of sea algae are multicellular organisms that produce energy through photosynthesis. In Greece, there are records of more than 503 taxa of algae recorded in coastal regions[28], including 313 taxa of red algae (or Rhodophyta), 103 taxa of brown algae (or Phaeophyceae) and 87 taxa of green algae (or Chlorophyta).

26. Pantidou M. 1973. Catalogue of fungi and hosts of Greece. Benakio Phytopathological Institute. (in Greek)
27. Diamandis S. 2000. List of threatened Macrofungi in Greece. European Council for the Conservation of Fungi Newsletter 10: 12
28. Haritonidis S., Orfanidis S., Lazaridou Th. 1992. Preliminary results of a checklist of the benthic marine algae of the Greek

B. Mosses. Mosses are non-vascular plants that are small (a few centimetres high) herbaceous (non-woody) plants that absorb water and nutrients mainly through their leaves and harvest sunlight by photosynthesis. In Greece, there are 750 recorded taxa[29], which represent 39% of the European diversity of mosses. The taxa include: 4 taxa of Anthoceratophyta, 155 taxa of Marchantiophyta, and 590 taxa of Bryophyta.

C. Vascular plants (or tracheophytes) . Greek flora includes 6600 taxa[30] (5752 species) of vascular plants, out of which 1461 taxa (1278 species) are endemics in Greece, i.e. have not been observed anywhere else. The endemic diversity as a proportion of the entire flora (22%) is one of the highest proportions of any Mediterranean or European nation. Among the regions of Greece, the highest percentages are observed in the southern areas of Greece (Peloponnese, Crete and Sterea Ellada).

Of the endemic flora in Greece[31], 258 species (or 18% of all endemics) are considered threatened, i.e. are classified in one of the IUCN categories: critically endangered, endangered or vulnerable. Two of the endemic species are considered as extinct. Until now, there have been two editions of the Greek Red data book for plant species[32] published in 1995 and 2010. In these two lists, 460 species have been evaluated (which correspond to approximately 8% of the Greek flora). Moreover, in Greece, there are 58 plant species of community interest according to the Habitats Directive Annexes. According to the most recent national report, for five of these species, the Conservation Status is considered as «favourable»; for 19 species, the Conservation Status is considered as «unfavourable–inadequate»; for 2 species, the Conservation Status is considered as «unfavourable–bad»; while for 32 species, we have insufficient data to assess their Conservation Status. Since the accession of new Member States to the EU, the list of species of community interest has increased, with Greece containing a total of 63 such species at present.

Our knowledge gaps about the distribution and ecology of Greek flora are considerable. Especially for mosses and pteridophytes, we lack any systematic surveys.

B.2.3.2.4 Animals

A main feature of Greek fauna is the high level of endemicity and the geographic differentiation of most animal groups of species. The hotspot of endemicity in Greece for most animal

coasts (Aegean and Ionian Seas). CIESM 33:5.

29. Tsakiri E. 2009. Bryophyte flora of Greece: A phytogeographic and ecological study of bryophytes in the aquatic ecosystem of Ano Aliakmonas. PhD Thesis. Aristotle University of Thessaloniki.
30. Dimopoulos P., Raus Th., Bergmeier E., Constantinidis Th., Iatrou G., Kokkini S., Strid A. & Tzanoudakis D. 2013. Vascular plants of Greece: An annotated checklist. – Englera 31: 1-372.
    Strid A, Tan K. 1997. Flora Hellenica 1.Königstein: Koeltz Scientific Books.
    Strid A, Tan K. 2002. Flora Hellenica 2. Ruggell: Koeltz Scientific Books.
    Tan K, Iatrou G. 2001. Endemic plants of Greece, the Peloponnese. Copenhagen: Gads Publishers.
31. Georgiou K. Delipetrou P. 2010. Patterns and traits of the endemic plants of Greece. Botanical Journal of the Linnean Society 162:130–422
32. Phitos D. Strid A. Snogerup S. & Greuter W. 1995. Red Data Book on Rare and Threatened Plants of Greece.
    Phitos D. Constantinidis T. & Kamari G. 2010. The Red Data Book of Rare and Threatened Plants of Greece

groups is Crete, followed by the Cyclades and the mountains of continental Greece. However, there are groups of species that have higher endemic rates in other regions, like the Peloponnese and Ionian islands. It should be pointed out that cave formations are extremely important features for endemics, and only a small proportion of caves has been surveyed in Greece. Still, our knowledge gaps about fauna patterns are significant. Only for few invertebrate and vertebrate groups is there satisfactory coverage.

For vertebrates, the total number of species in Greece, as well as their classification according to their conservation status, is presented in Table B.1. Overall, approximately 15% of vertebrate species are considered threatened (i.e. classified as critically endangered, endangered or vulnerable according to the IUCN criteria). For some groups of species (like fishes and mammals) there is a considerable lack of data and so the estimates are rather uncertain.

Animal diversity in Greece is protected under several laws, most important of which is the European Habitats Directive. In 2007, 182 species of community interest (in accordance with the annexes of Directive 92/43/EEC) were recorded in Greece. Out of these, 14% were classified as being of «favourable» conservation status, 14% as «unfavourable–inadequate», 7% as ««unfavourable–bad», and for 65% the status has failed to be determined. Bird diversity is primarily protected under the provisions of the Birds Directive, which includes 286 species observed in Greece (147 resident species and 139 migratory ones). The avifauna in Greece includes 37 species that are considered as globally threatened, mainly from wetland birds and birds of prey[33].



33. Legakis A., Maragou P. 2009. Greek Red Data Book of Threatened Fauna. Hellenic Zoological Society, pp 213-352.

Table B1. Total number of threatened vertebrate species in Greece according to IUCN conservation status[34]

ΚΑΤΗΓΟΡΙΑ	Regionally extinct (RE)	Critically endangered (CR)	Endangered (EN)	Vulnerable (VU)	Near Threatened (NT)	Least Concern (LC)	Data Deficient (DD)	Not Evaluated (NE)	Total number of species in Greece	% of species threatened (CR,EN,VU) out of the total number of species
Marine fishes	0	5	4	5	0	0	0	453	476	2,9
Freshwater fishes	5	14	12	23	3	60	15	0	154	31,8
Amphibians	0	1	2	3	3	13	0	0	22	27,3
Reptiles	0	2	4	6	6	46	0	0	64	18,8
Birds	1	14	17	31	16	26	17	227	442	14,0
Mammals	0	3	12	13	11	10	20	69	115	24,3
TOTAL	**6**	**39**	**51**	**81**	**41**	**159**	**45**	**718**	**1273**	**13,4**



34. According to Legakis A., Maragou P. 2009. Greek Red Data Book of Threatened Fauna. Hellenic Zoological Society.

Table B2. The total number of species and endemic species for the most well-known groups of invertebrates in Greece.

Taxonomic group	Total number of species	Number of endemic species
Echinodermata	108	0
Trichoptera (caddis flies)	288	71
Siphonaptera (fleas)	59	1
Neuroptera (lacewings)	162	49
Lepidoptera (butterflies and moths)	3.197	251
Hymenoptera (bees)	2.800	236
Diptera (flies)	2.857	274
Coleoptera (beetles)	6.863	1.329
Psocoptera	73	3
Heteroptera (true bugs)	973	87
Homoptera (true bugs)	919	97
Plecoptera (stoneflies)	73	24
Phasmatidae (stick insects)	3	0
Embioptera, (web spinners)	3	0
Isoptera (termites)	2	1
Dictyoptera	33	3
Dermaptera (earwigs)	16	1
Orthoptera (grasshoppers, crickets)	346	124
Ephemeroptera (mayflies, shade flies)	67	12
Odonata (dragonflies)	69	5
Archaeognatha	17	5
Thysanura (Zygentoma)	20	3
Collembola (springtails)	134	39
Diplura	58	30
Protura	14	1
Diplopoda (millipedes)	148	86

Taxonomic group	Total number of species	Number of endemic species
Chilopoda (centipedes)	102	27
Symphyla	7	1
Pauropoda	33	5
Crustaceans isopoda terrestrial	233	153
Crustaceans decapoda	231	1
Other crustaceans	~600	29
Acari (mites)	383	111
Araneae (spiders)	915	236
Opiliones (harvestmen)	100	
Galeodes (sun spiders)	10	5
Palpigradi	3	2
Amblypygi	1	0
Pseudoscorpionida (pseudoscorpions)	120	55
Scorpiones (scorpions)	10	2
Gastropoda (snails and slugs) terrestrial	754	486
Gastropoda (snails and slugs) freshwater	93	12
Bivalvia	308	1
Other marine molluscs	~700	0
Bryozoa (moss animals)	200	0
Oligochaeta (earthworms)	98	9
Hirudinea (leeches)	18	0
Tardigrada	58	5
Nematodes	64	5
Platyhelminthes (flatworms)	165	15
Cnidaria	91	3
Porifera (sponges)	132	0

Invertebrate biodiversity in Greece is also quite rich, with approximately 27000 recorded species, including 4000 species that are Greek endemics. It should be pointed out that of most invertebrate groups our knowledge is limited, and thus it is speculated that there are still thousands more species to be recorded. Table B2 shows the total number of invertebrate species and endemics of the most well studied groups of invertebrates. Table B3 presents the data for the groups of species that have been evaluated according to IUCN criteria for their conservation status.

Table B3. Total number of threatened invertebrate species in Greece according to IUCN conservation status.

ΚΑΤΗΓΟΡΙΑ	Regionally extinct (RE)	Critically endangered (CR)	Endangered (EN)	Vulnerable (VU)	Near Threatened (NT)
Porifera				10	
Cnidaria			2	28	
Polychaete			1	3	
Polyplacophora				1	
Bivalvia			1	4	
Gastropoda (marine)				10	
Gastropoda (terrestrial)	70	28	63		211
Cephalopods				1	
Aranea	20	9	4		
Amphipoda				3	
Isopoda	41	2	4		
Decapoda		1		11	
Chilopoda	3	3			
Odonata	2		5		
Orthoptera	1		1		
Lepidoptera	4	19	16		
Coleoptera		2	3		
Echinodermata			1	4	
Ascidiacea				1	
TOTAL	**141**	**64**	**99**	**76**	**211**

B.2.4. Invasive alien species

We do not have a comprehensive picture of the status and distribution of invasive alien species in Greece. However, there is a number of studies from different research groups highlighting aspects of the current conditions regarding invasive alien species.

Marine invasive alien species. The Hellenic Centre for Marine Research (HCMR) maintains a relevant database. For the purposes of research on this issue, a network of nine research institutes and universities has been established, involving more than 34 researchers, named 'ELNAIS' (Ellenic Network on Aquatic Invasive Species). Furthermore, researchers from HCMR participated in the European project SEBI 2010 (Streamlining European Biodiversity Indicators, 2010).

Terrestrial invasive alien species. Relevant research has been conducted by individual scientists, with no national network having been established to date. There is a research team of 21 members participating in the European project 'DAISIE' (Delivering Alien Invasive Species Inventories for Europe), which has improved our understanding on this issue. In this project, an initial study was performed, but an exhaustive study has yet to be completed. Thus, it is estimated that 60% of the terrestrial invasive species are plant species, 38% are invertebrates and 2% are vertebrates[35].

There are two estimates for the alien flora ~~of~~ in Greece. In an initial attempt, 343 alien taxa were identified[36]. However, a more recent study[37] has identified just 250 alien taxa, because it identified only non-native species that have established populations in Greece, and excluded species that are only occasionally observed and mainly associated with human activities..

B.2.5. Soil biodiversity

Soils are inhabited by over one fourth of all living species on earth. Soil diversity mainly consists of bacteria, fungi and protozoans. The main ecosystem function of soil is the decomposition of soil organic material. This process converts dead organic matter into nutrients that are readily available for use by plants and other organisms. Soils also comprise a large variety of small microscopic invertebrates, such as nematodes, worms, springtails and mites. The diversity of these taxa is relatively unknown. For example, about 50000 mite species are known, but it has been estimated that this group could have a species richness of up to 1 million species. These taxa are relatively unknown to a wider audience, contrary to the larger invertebrates (such as insects, earthworms, ants and termites, ground beetles) and small

35. Hatzilacou, D. & Arianoutsou, M. 2010. Fact sheet for EEA. Theme: Nature Protection and Biodiversity Driver: Invasive (terrestrial) alien species in Greece (GR- SEBI2010- 010) 19.2.2010
36. Hatzilacou, D. & Arianoutsou, M. 2010. Fact sheet for EEA. Theme: Nature Protection and Biodiversity Driver: Invasive (terrestrial) alien species in Greece (GR- SEBI2010- 010) 19.2.2010
37. Dimopoulos P., Raus Th., Bergmeier E., Constantinidis Th., Iatrou G., Kokkini S., Strid A. Tzanoudakis D. 2013. Vascular plants of Greece: An annotated checklist. – Englera 31: 1-372.

mammals (such as moles and voles), which show fantastic adaptations to living in a dark belowground world.

The activity and diversity of soil organisms are regulated by both abiotic and biotic factors. The main abiotic factors are: climate (temperature and moisture), soil texture and soil structure, salinity and pH. Soil organisms influence plants and organisms that live entirely aboveground, with these influences being reciprocal. For instance, plants influence the activity and community composition of organisms, while, in turn, these soil organisms may regulate (limit or promote) plant growth.

Many of the functions performed by soil organisms provide essential services for human society. These services include nutrient cycling, soil formation and primary production. In addition, soil biodiversity influences all of the main regulatory services; namely, the regulation of atmospheric composition and climate, water quantity and quality, pest and disease incidence in agricultural and natural ecosystems, and human diseases. Soil organisms might also control (promote or reduce) environmental pollution. Finally, the genetic resources of soil microorganisms may be used for developing novel pharmaceuticals.

Summing up, soil biodiversity plays a crucial role in shaping soil structure, soil organic matter and fertility, regulating carbon flux and climate control, regulating the water cycle, assisting decontamination and bioremediation and controlling pests. In an attempt to assess the economic value of ecosystem services delivered by soil organisms, it has been estimated that the consequences of soil biodiversity mismanagement cost in excess of 1 trillion dollars per year worldwide[38].

38. Anne Turbé, Arianna De Toni, Patricia Benito, Patrick Lavelle, Perrine Lavelle, Nuria Ruiz, Wim H. Van der Putten, Eric Labouze, and Shailendra Mudgal. 2010. Soil biodiversity: functions, threats and tools for policy makers. Bio Intelligence Service, IRD, and NIOO, Report for European Commission (DG Environment). Available at http://ec.europa.eu/environment/soil/pdf/biodiversity_report.pdf

B.2.6. Ecosystems

B.2.6.1 Introduction

In Greece, there is a wide variety of natural ecosystems – terrestrial, freshwater and marine. The main feature of these ecosystems is their rich biodiversity.

B.2.6.2 Wetlands

Wetlands are one of the most valuable resources of our planet, second only to tropical rain forests, as far as biodiversity and productivity are concerned. Wetlands are areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine waters, the depth of which at low tide does not exceed six metres. A fundamental characteristic of the transitional zone between permanently flooded and strictly terrestrial areas is the presence of hydromorphic soils and hydrophytic vegetation.

In 2000, the first inventory of Greek wetlands by the Greek Biotope Wetland Centre reported 411 wetlands, most of which are located in Northern Greece[39]. Recently, WWF Greece has completed a new inventory of wetlands on Greek islands by fieldwork[40]. In total, the organisation recorded 803 natural and artificial wetlands with areas greater than 0.1 ha on 75 islands (194 on Crete, 100 on eight Ionian Islands, and 511 on 64 Aegean Islands). Most of these wetlands (80%) cover an area of between 0.1 and 8 ha, which is a sign of their vulnerability to deterioration. Ten of these wetlands are characterised as Wetlands of International Importance according to the 1971 Ramsar Convention on Wetlands. Seven of these wetlands are included in the Montreux Record, which highlights sites with an adverse change in ecological characteristics, and which are, therefore, in need of priority conservation attention.

Despite the services that wetlands provide, wetlands worldwide continue to be subject to many pressures from human activities occurring either in the wetlands or in the wider watershed. Human activities mostly have a negative impact on these ecosystems. Such activities include pollution (e.g. from surrounding factories and intensive agricultural development), loss of wetland surface (e.g. drainage for human health, for the conversion and expansion of fields or urban areas into agricultural land, water removal for irrigation or human consumption, changes in vegetation types, and the modification of wildlife. Recently, it has been shown that the diversity of habitats in Greek protected wetland

39. Fytoka E, Partozis T, Houvardas D, Gerakis PA, Carteris M 2000. Inventory of Wetlands in the framework of «update and enrichment of national wetlands database». Greek Biotope Wetland Centre and Aristotle University.
40. Katsadorakis G, Paragamian K. 2007. Inventory of Greek island wetlands. WWF Greece, Athens. For more information please see http://www.oikoskopio.gr/ygrotopio/index.php?lang=en_US

areas is associated with climate[41], and the list of pressures ~~to~~ on wetlands has been appended to include climate change[42].

According to the first Greek wetland inventory, 42% of wetlands are subject to pollution from agriculture, while 20% are affected by drainage and wetland conversion into agriculture fields. Irrigation infrastructures affect 14% of wetlands, while water removal for irrigation affects 15% of wetlands. Approximately 36% of wetlands receive urban wastewater, while 28% receive wastewater from industries. Conversion into urban areas and tourism infrastructures affects 26% and 13% of wetlands, respectively. For island wetlands, the conditions are likely to be more adverse, because these wetlands tend to be small and positioned near to coastal tourist regions. Land reclamation is a common occurrence in these areas and poses a major threat to such vulnerable ecosystems. According to the WWF Greece inventory, 63% of island wetlands have been modified by land reclamation, 55% of wetlands have shrunk due to urban development, 57% of wetlands have been fragmented by road construction, and 45% of wetlands are threatened by the expansion of agricultural fields. More than 35% of wetlands receive wastewater from cities and villages. Based on the data from the island wetlands inventory, 50% of the wetland areas have been significantly disturbed, while 43 sites (about 5%) have significantly deteriorated to the point of losing their ability to function.

Even though our knowledge about island wetlands is detailed and could be considered marginally sufficient, our knowledge about continental wetlands remains limited to the large wetlands, leaving an important information gap. Because of the current status of our knowledge, and in combination with changes in human activities and the climate affecting hydrological conditions, it is deemed necessary to update and enrich the geographic datasets about Greek wetlands, so as to better plan their conservation.

B.2.6.3 Agro-ecosystems

The variability of abiotic conditions in Greece, in combination with the long history of traditional agriculture, has contributed to the high diversity of agricultural ecosystems. The ecological value of Greek agro-ecosystems is evidenced by the high proportion of cultivated land classified as High Nature Value[43] (HNV) farmland. Within the framework of the Rural Development Plan of Greece 2007–2013 and in implementing actions for axes 2 & 3, HNV agricultural and forest lands have been identified. In Greece, HNV cultivated land covers an area of 2.423.186 ha[44]. This coverage accounts for approximately two thirds (67.6%) of the total cultivated land in Greece, which, according to the 2000 census, covers 3.583.185 ha. Among the Greek regions,

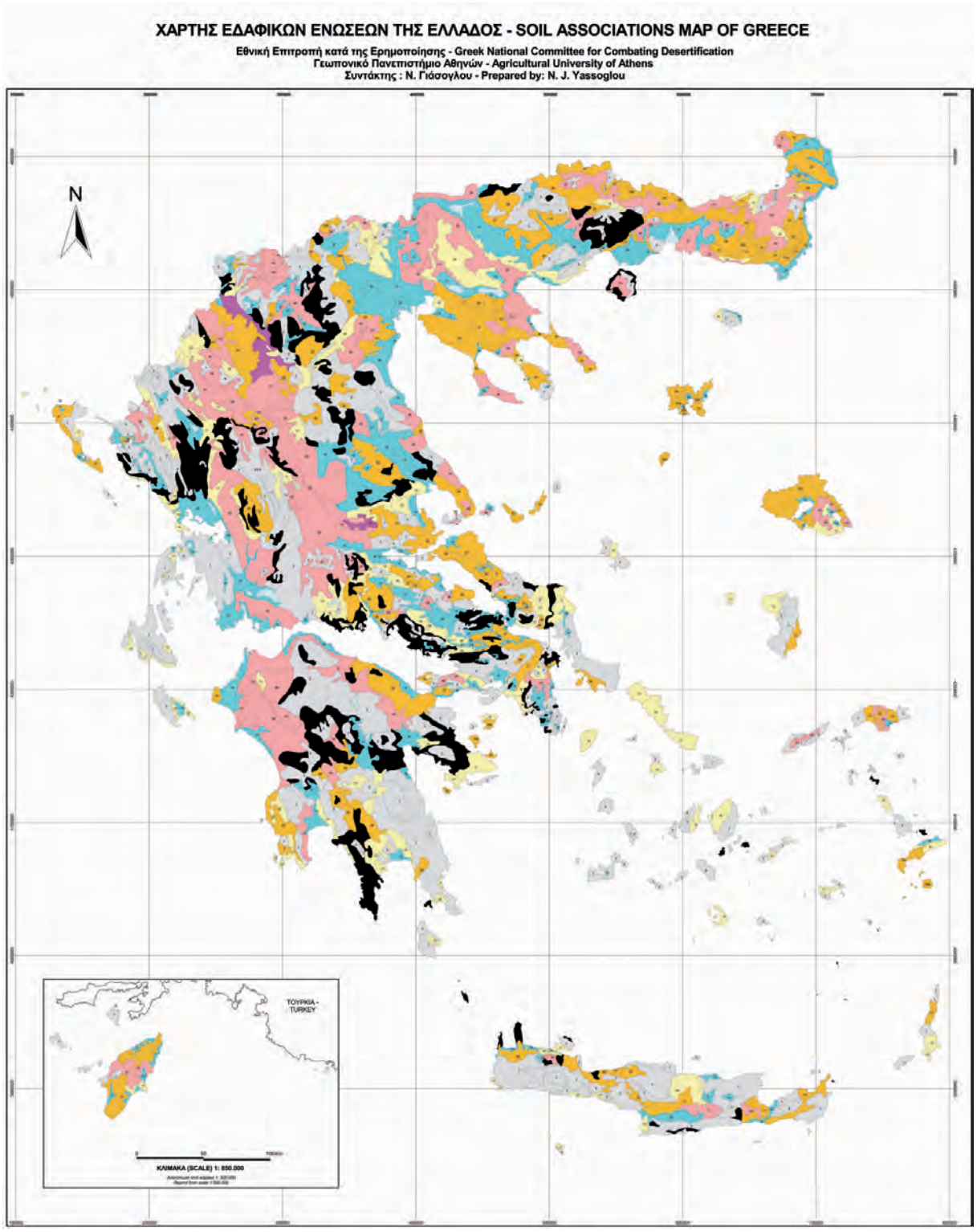
41. Drakou EG, Kallimanis AS, Mazaris AD, Apostolopoulou E & Pantis JD. 2011. Habitat type richness associations with environmental variables: a case study in the Greek Natura 2000 aquatic ecosystems. Biodiversity and Conservation, 20: 929-943.
42. which, among other sources, has even been documented by the Bank of Greece (please see http://www.bankofgreece.gr/BogEkdoseis/Πλησης_Εκθεση.pdf).
43. The term High Nature Value farming was first coined in the early 1990s, in recognition of the fact that certain types of farming – typically low intensity, low input farming systems, often with high structural diversity – are extremely valuable for biodiversity.
44. Hellenic Ornithological Society 2008. Identification of High Nature Value agricultural and forest lands.

the Peloponnese is the highest ranking HNV farmland, perhaps due to the large extent of olive groves, followed by Western Greece and then Crete. Perhaps this explains the extensive presence of cultivated lands in protected areas of the Greek Natura 2000 network[45].

However, not all agricultural trends are as optimistic. Agricultural production has intensified. Traditional agricultural practices have been abandoned. Traditional cultivars and breeds continue to be replaced. Mixed cultivations are being replaced by monocultures. All of these trends modify cultivated landscapes to simpler and less variable structures. Such trends degrade both agro-ecosystems and the natural and semi-natural ecosystems of the surrounding landscapes. More alarmingly, local varieties of cultivated species that are adapted to the unique features of the Greek environment are becoming extinct. Thus, ultimately, biodiversity is being lost in the whole process. On the positive side, extensive traditional animal breeding practices continue to take place in the montane areas and on less favourable farmlands; thus, contributing to the conservation of biodiversity in these marginal lands, and to reducing agricultural abandonment and desertification.

Soil is the surface layer of the Earth's crust. It is the product of the influence of the climate, relief, biotic activities and chemical processes having acted over extended periods of time, and is an integral part of terrestrial ecosystems. Soil continually undergoes development through numerous physical, chemical and biological processes, which include weathering with associated erosion. According to the Greek Action Plan for Combating Desertification[46], soil is severely stressed by agricultural intensification. The priorities of the National Strategy for Biodiversity include the completion of the soil map of Greece in fine scale (1:20000) based on the soil map produced by the National Committee to Combat Desertification, as well as the continuation of scientific research on soil biodiversity.

45. Kallimanis AS, Tsiafouli MA, Pantis JD, Mazaris AD, Matsinos Y & Sgardelis SP. 2008. Arable land and habitat diversity in Natura 2000 sites in Greece. Journal of Biological Research 9: 55-66
46. http://www.minagric.gr


ΧΑΡΤΗΣ ΕΔΑΦΙΚΩΝ ΕΝΩΣΕΩΝ ΤΗΣ ΕΛΛΑΔΟΣ - SOIL ASSOCIATIONS MAP OF GREECE
Εθνική Επιτροπή κατά της Ερημοποίησης - Greek National Committee for Combating Desertification
Γεωπονικό Πανεπιστήμιο Αθηνών - Agricultural University of Athens
Συντάκτης : Ν. Γιάσογλου - Prepared by: N. J. Yassoglou
N
ΤΟΥΡΚΙΑ - TURKEY
ΚΛΙΜΑΚΑ (SCALE) 1: 850.000

B.2.6.4 Forest ecosystems

In 2005, forests[47] and other wooded lands were documented to cover 6.532.000 ha, or 51%, of Greek territory according to the report on Europe's State of Forests 2007[48]. More specifically, forests cover 29.1% of Greece, while other wooded lands cover 21.6%. According to this report, the coverage of forests and other wooded lands appeared to be stable over the 1990–2005 period (6.511.000, 6.525.000 and 6.532.000 ha for 1990, 2000 and 2005, respectively). During this period, forest coverage increased from 3.299.000 ha in 1990 to 3.750.000 ha in 2005. In contrast, the coverage of other wooded lands decreased (from 3.212.000 ha in 1990 to 2.780.000 ha in 2005). The more recent report on Europe's State of Forests 2011 showed that these trends are continuing, with forests and other wooded lands, in 2010, occupying a total area of 6.539.000 ha, out of which forest coverage increased to 3.903.000 ha and other wooded lands decreased to 2.636.000 ha.

Similar results were obtained in a study by WWF Greece and the Department of Forestry and Natural Environment of Aristotle University of Thessaloniki[49]. This study verified that areas of low vegetation coverage declined during the period from 1987 to 2007 (shrublands decreased by 6%, while grasslands decreased by 12%). Most of this area was converted into cultivated land and artificial surfaces.

The increase of forest coverage is mainly attributable to agricultural abandonment in mountainous areas, which has allowed the encroachment of forests on cultivated fields and grasslands following the ecological succession process. In contrast, wildfires have led to the loss of mature forests.

Sustainable forest management practices have been introduced into the Greek law progressively since 1920. Consequently, at present, there is strong legal protection of forests and wooded lands. Characteristically, more than one third of Sites of Community Interest in Greece are forests. Today, biodiversity conservation should be a major component of any forest management plan. Greek forests, like the forests of the rest of the Mediterranean area, have been affected by human activities for millennia. As a result, lowland forests are mainly degraded because of land conversions into cultivated fields and artificial surfaces. Currently, the greatest threats and pressures to Greek forests are:

- Conversion of forests or other wooded lands (often illegally) into human dominated land uses, like cultivated fields and artificial surfaces.
- Repeated wildfires, especially wildfires of areas undergoing forest regeneration. Climate change scenarios highlight the possibility that this phenomenon will intensify in the foreseeable future.

47. for the purposes of this document, forest area is estimated based on Forest Europe (The Ministerial Conference on the Protection of Forests in Europe), and not on the definition of forests in the Greek Law.
48. available at http://www.foresteurope.org/
49. Liarikos K, Maragkou P & Papagiannis T. 2012.Greece then and now: mapping of land covers 1987-2007. WWF Greece, Athens. Available in Greek at http://issuu.com/wwf-greece/docs/diahroniki-hartografisi

- Wood harvesting in an unenvironmentally friendly way (e.g. the use of heavy machinery)
- The lack of sustainable management of forest production (regarding either wood or other products). Sustainable management would deter excessive biomass accumulation and retain human presence in the forests, thus increasing public awareness and preserving the knowledge of local environmental issues.
- Forest pests and diseases. Indicatively, such pressures include chestnut blight, Cypress canker and palm infestations by *Rhynchophorus ferrugineus*.
- Climate change. Climate change is predicted to affect the spatial distribution of most ecosystems and species, as well as the temporal timing of phenological events. Similar findings have been reported regarding Greek systems[50]. Thus, the Ministry of Environment Energy and Climate Change is expected to issue relevant guidelines for the adaptation of forest management plans to take climate change into account during 2014[51].

These pressures sometimes act in combination. For example, low altitude conifer forests, especially those close to the sea, are subject to water stress and, thus, are more vulnerable to pests (like bark infesting insects). This problem is likely to be exacerbated by climate change.

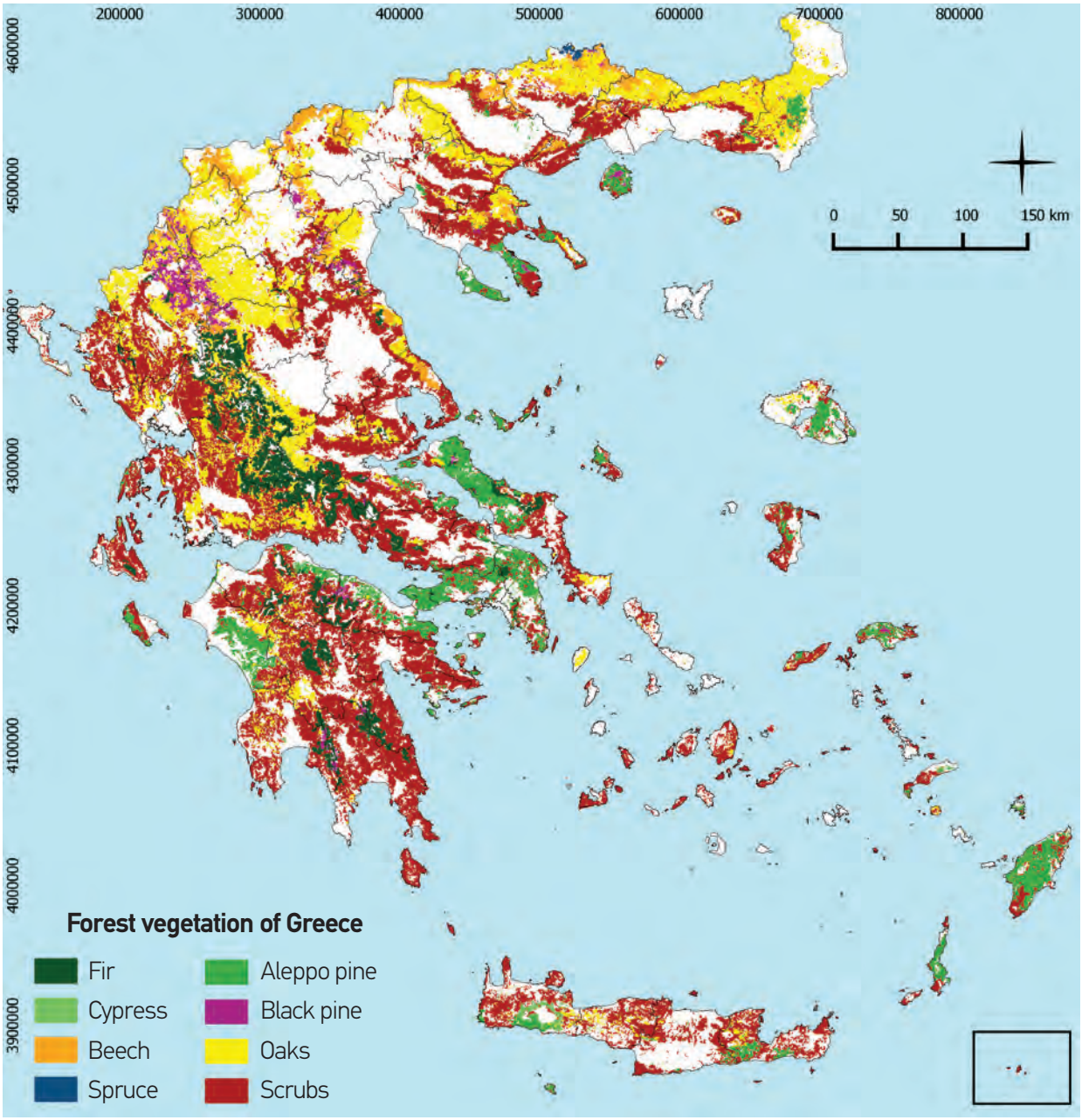
The fighting of forest wildfires and forest restoration are critical components of any efficient forest management in the Mediterranean.

Forest fire fighting. This issue has three distinct stages: (a) the first stage is prevention; it is economical and efficient, (b) the second stage is early detection; the sooner the fire is detected the lower the damage caused, and (c) the third stage is firefighting *per se*, which is the most difficult and expensive part.

Post-fire forest restoration. Forests of *Pinus halepensis* and *Pinus brutia*, evergreen broadleaved forests, chestnut forests and oak forests do not require reforestation after fire, because they have the potential for natural regeneration. For other forest types, reforestation should be performed under the supervision and responsibility of the relevant forest services, in accordance with scientific principles.

The most current forest map of Greece is presented next (map B1).

50. Chrysopolitou V., Apostolakis A., Avtzis D., Avtzis N., Diamandis S., Kemitzoglou D., Papadimos D., Perlerou C., Tsiaoussi V. & Dafis S. 2013. Studies on forest health and vegetation changes in Greece under the effects of climate changes. Biodiversity and Conservation 22 (5): 1133-1150.
51. www.adaptfor.gr



MAP B1: Map of the forest vegetation of Greece (Greek Geodetic Reference System , EGSA '87, Ministry of Agriculture, unpublished data)

B.2.6.5 Highland ecosystems above the tree line

These ecosystems are located at high altitudes above the tree line[52]. These ecosystems are considered to be biodiversity reserves, because they host rare and diverse species assemblages. Greece has a rugged geomorphology, with large areas at mountains; 230 mountain peaks are at altitudes above 2000 m a.s.l. These conditions lead to isolation and, thus, favour endemism. Above the tree line in Greece, vegetation is shrubland or grassland. The main pressure on these ecosystems is due to grazing, which is a severe threat to other similar ecosystems in southern Europe. Besides grazing, these ecosystems are threatened by various human activities, like tourism and touristic infrastructures (such as ski resorts), as well as by the deliberate removal of plants. These highland ecosystems are particularly threatened by climate change. Thus, it is necessary to adopt and promote actions that conserve these ecosystems and their biodiversity, while simultaneously preserving the montane landscape.

B.2.6.6 Mediterranean type ecosystems (garrigue and maquis)

Maquis and garrigue (which is also known as phrygana) are typical Mediterranean type ecosystems that cover a large proportion of Greece.

The term maquis vegetation refers to formations of evergreen sclerophyllous shrubs that form dense patches with a height of up to two metres. These plants are usually located in areas of low altitude (below 700 m a.s.l.). Maquis is associated with siliceous soils. These formations are often considered as forests.

The term garrigue (or phrygana) refers to a type of low, soft-leaved scrubland with an open canopy, and is located at low altitudes. This type of habitat usually contains low-growing shrubs with small hard leaves that are adapted to high temperatures and low humidity. They include many aromatic plants with medicinal properties. Phrygana species is typically associated with the Mediterranean climate. It mainly develops on rocky soils with low concentrations of organic matter and nutrients, or on disturbed areas. It is often considered to arise as a result of the degradation of pre-existing vegetation (either maquis or forests). Garrigue is an important habitat for biodiversity, because it is home to many species of reptiles, in addition to many rare plant species. Dominant plant species in this type of formation include thyme, origanum, cistus and lavender.

The main threats to Mediterranean type ecosystems are overgrazing, increased frequency of wildfires and land use changes (mainly for touristic development or urban expansion).

52. The tree line is the altitudinal range at which trees are capable of growing. Above the tree line, trees cannot tolerate the environmental conditions (usually cold temperatures or lack of moisture). In Greece, the tree line is usually between 1800 and 2000 m a.s.l.

B.2.6.7 Marine and coastal ecosystems

The coastal and marine environment of Greece is characterised by its important ecosystems and high level of biodiversity, including numerous rare species of community interest. These ecosystems include many important habitat types, including wetlands (see section B.2.6.2 for more detailed information), but also sea meadows (e.g. Neptune's sea grass Posidonia oceanica meadows), reefs, marine caves, and rocky shores, among others. Because of the importance of these habitats for biodiversity and because of their vulnerability to environmental threats and pressures, Greek coastal and marine areas are protected by both European Directives and International Treaties (e.g. Ramsar Convention, Habitats Directive). In addition, according to the European Regulation concerning management measures for the sustainable exploitation of fishery resources in the Mediterranean Sea[53], habitats other than Posidonia sea grass beds are considered to be equally important for conservation, including mäerl beds and coralligenous habitats.

The Greek coasts are of high biological, geophysical, aesthetic, cultural and economic value, while, at the same time, they constitute a natural resource and a common heritage of Mediterranean/European and often International importance, which should be safeguarded for present and future generations.

The Greek seas, as part of the Mediterranean Sea, are oligotrophic and have the physical characteristics of semi-closed seas. Therefore, they are more vulnerable to human pressures compared to the open ocean. The coastal waters are renewed quite quickly (80 years is required for the entire Mediterranean), while the vertical mixture is renewed within a 250-year period. Greece has a coastline of more than 16300 km, which is the longest compared to any other Mediterranean country. A little more than half of this coastline corresponds to the archipelagic complexes of the Aegean and Ionian Seas (about 3000 islands, few hundreds of which are inhabited – or more than 9800 islands, if we also include all rocky formations protruding from the sea)[54]. The coastal systems in Greece are classified into three main categories: rocky beaches, sandy beaches and coastal wetlands (estuaries, lagoons etc.; for more information see section B.2.6.2).

In Greece, coastal and marine areas are subject to many problems because of the high concentration of human activities and land use types (which are often incompatible with the natural landscape), the lack of political will and lack of comprehensive planning for the preservation and management of these areas, the deficiency of control mechanisms and the lack of coordination of the relevant authorities. The main issues include:

- Inadequate planning. Most coastal regions are granted no planning or definition of waterside, which confers legal protection status under Greek Law.

53. COUNCIL REGULATION (EC) No 1967/2006
54. Ministry of the Environment, Physical Planning and Public Works. 2006. Report of Greece on Coastal Zone Management. Available at http://www.minenv.gr/4/42/00/094%20GR%20Report%20CZM-full%20version-4-final.pdf

- Loss and degradation of natural habitats. This is caused by a multitude of parameters, such as coastal building and infrastructure construction, wildfires and the deforestation of coastal forests, destructive fishing methods, such as bottom trawling. In Greece, the coastal region is home to 85% of the human population, 80% of all industries, 90% of the tourist activities, almost all fishing and aquaculture, 35% of cultivated fields, and a significant percentage of infrastructure (including ports, airports, and roads).
- Pollution. This issue is mainly associated with the accumulation of nutrients originating from industry, urban wastewater and sea transportation. Typically, pollution is localised, but there have been examples of extensive damage.
- Overexploitation of natural resources (mainly overfishing). According to a recent estimate, 65% of Greek fisheries are overexploited[55]. The pattern of this problem varies, with the areas of the Corinthian Gulf, the Dodecanese and the Saronic Gulf being subject to the greatest fishing pressure.
- Coastal Erosion. Approximately 29% of Greek coasts are subjected to this problem, which ranks Greece in fourth place of the relevant list of the 25 EU countries[56].
- Marine alien invasive species. This is a major issue for the Eastern Mediterranean Sea, including Greek Seas. Invasive marine species arrive via ship ballast water, accidental release, aquaculture, etc. A major pathway for the arrival of invasive species is migration through the Suez Canal (a phenomenon termed «Lessepsian migration»). There are several studies documenting the presence of alien species in Greek seas. In 2009, it was estimated that more than 195 alien species inhabited Greek waters[57]. A study in 2006 identified the 100 most dangerous invasive species of plants and animals in the Mediterranean[58].

Climate change. Almost all climate change scenarios predict a rise in sea level, which is expected to raise major issues around coastal ecosystems. These systems are considered to be more vulnerable and less easy to adapt to new conditions. Furthermore, climate change is expected to act synergistically with current problems and exacerbate the threat.

55. Tsikliras A.C., Dinouli A., Stergiou K.I. 2010. Exploitation pattern of the Mediterranean fisheries. Rapport du 39e Congrès de la Commission Internationale pour l'Exploration Scientifique de la Mer Méditerranée 39: 683.
56. European Commission, Directorate General Environment 2004. Coastal erosion-Evaluation of the need for action
57. Zenetos, A., Pancucci-Papadopoulou, M., Zogaris, S., Papastergiadou, E., Vardakas, L., Aligizaki, K., & Economou A. 2009. Aquatic alien species in Greece (2009): tracking sources, patterns and effects on the ecosystem. Journal of Biological Research 12: 135-172.
58. Streftaris N.,Zenetos A.2006. Alien Marine Species in the Mediterranean - the 100 'Worst Invasives' and their Impact. Mediterranean Marine Science 7: 87-118.

B.2.7. Habitat types of community interest

Greece currently has 85 habitat types that are included in Annex I of the Habitats Directive, which belong to the following general categories:

1. Coastal and Halophytic Habitats
2. Coastal Sand Dunes and Inland Dunes
3. Freshwater Habitats
4. Temperate Heath and Scrub
5. Sclerophyllous Scrub (Matorral)
6. Natural and Semi-Natural Grassland Formations
7. Raised Bogs and Mires and Fens
8. Rocky Habitats and Caves
9. Forests

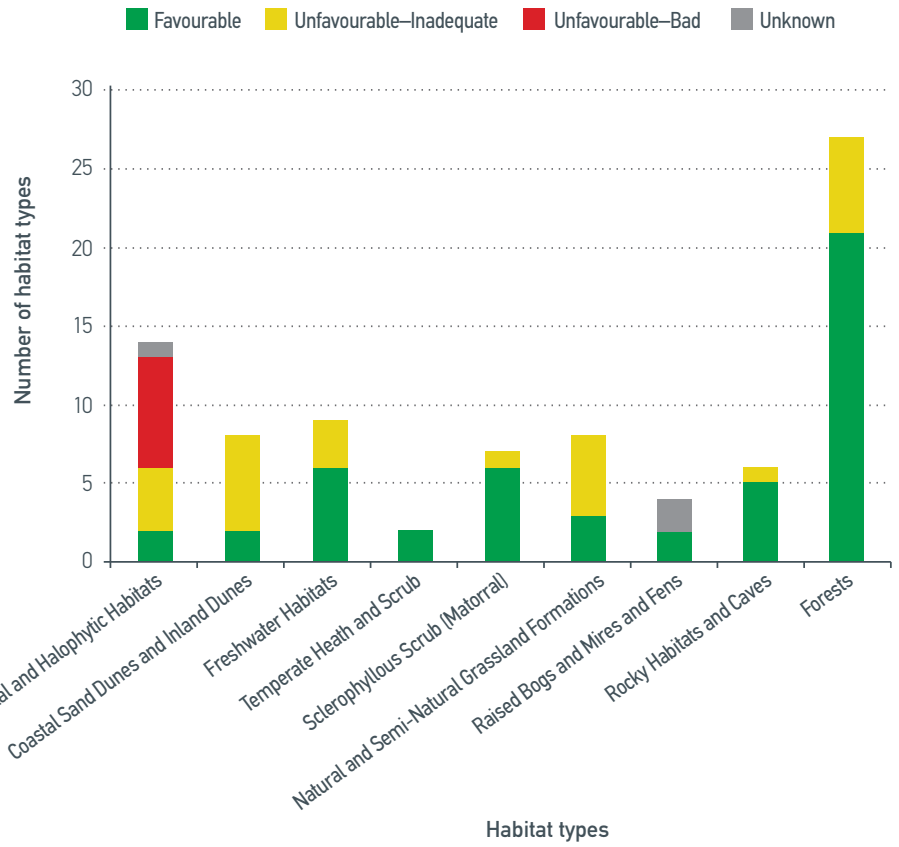


DIAGRAM 1: Conservation status of the habitat types of Community Importance in Greece.

According to the 2nd National Report on Implementation Measures (as stated by Article 17 of the Habitats Directive) for the period 2001 to 2006[59], 49 habitat types (60% of the 82 habitat types reported in Greece at that point) have «favourable» conservation status, 26 habitat types (32%) have «unfavourable–inadequate» conservation status, and 7 habitat types (8%) have «unfavourable–bad» conservation status. Figure 1 presents the conservation status for the different habitat types in relation to the habitat category under which each type is classified.

B.3. Pressures on and Threats to Biodiversity in Greece – Main Challenges

B.3.1. Direct Threats to and Pressures on Biodiversity

Many threats to and pressures on species conservation exist in Greece; yet, there has been no comprehensive record of these issues or systematic form of ranking to date. Habitat loss, due to a plethora of causes, is considered by far the most dangerous threat to species conservation. Based on a review of the relevant literature, here, we attempt to summarise the threats and pressures on plant and vertebrate species (Table B4), which we then rank to prioritise the proposed actions and conservation measures.

Plant species in Greece face many direct threats and pressures. Based on the number of species that appear to be influenced by these threats, issues are ranked as following: residential & commercial development (often illegal and without planning), infrastructure development (including tourist infrastructure in coastal regions and road construction in mountainous areas), overgrazing, agricultural intensification, mining and the gathering of terrestrial plants (either by experts or by lay people).

Similarly, **bird** species face various threats and pressures in Greece. The main issues are: residential & commercial development (often illegal and without planning), infrastructure development, agricultural intensification and expansion, hunting and the killing of birds (either intentionally or unintentionally), disturbances (like logging and hunting) and wetland drainage. In Greece, we lack plans for the sustainable management of game birds. Thus, it is proposed that a national level policy should be formulated for managing game birds and hunting activities.

Amphibian species are more threatened by modifications of natural systems, such as water removal, wetland drainage, extreme drought events (which seem to be associated with and intensified by climate change), fires, agricultural intensification and expansion, residential development, recreational activities, the collection of animals and pollution (from industry, agriculture and urban areas). In Europe, one third of amphibians are endangered because of the infectious disease chytridiomycosis, which is caused by the non-hyphal zoosporic fungus *Batrachochytrium dendrobatidis*, making it the number one threat to amphibians in Europe. In Greece, there is a lack of data about the spread of this disease. Given the severity and ur-

59. Available at the European Environment Agency site at: http://cdr.eionet.europa.eu/gr/eu/art17/envrfzupg

gency of this threat, it is highlighted that this disease is also a threat to amphibians in Greece, which requires further investigation.

Reptile species are also threatened by: residential development (often illegal and without planning), agricultural intensification and expansion, road mortality, wildfires, and the collection of animals. More specifically, regarding the loggerhead sea turtle, the main threats originate from tourist development, interaction with fishing activities, marine pollution (mainly from plastics and agricultural runoff), the killing of animals (e.g. after accidental capture in fishing nets), the destruction of the sand dunes and coasts that serve as their breeding grounds, light pollution, predation and climate change.

Mammal species also face many diverse threats, among which the most pressing are: residential development (often illegal and without planning), agricultural intensification and expansion, infrastructure development (for tourism and transportation), recreational activities (including hunting), the collection of animals, wildfires and agricultural pollution. Marine mammals face different threats of different ranking, namely: marine pollution (from sources like industries, agriculture and urban wastewater), the intentional killing of animals, accidents (e.g. collisions with boats), disturbance (e.g. noise pollution), solid wastes in the sea, pollution from xenobiotic substances, bioaccumulation, oil spills and pollution, ecosystem modifications, habitat degradation and climate change. An especially important threat is fishing, which directly results in the killing of marine mammals or indirectly affects their food chain (reducing the availability of food).

For **marine fishes**, the main threat is overfishing, followed by all of the threats that affect marine mammals. For freshwater fishes, the main threats include water removal, wetland drainage, water pollution, extreme drought events (which seem to be associated with and intensified by climate change) and residential and industrial development.

Table B4. Threats to and pressures on Greek species

Threat categories[60]	Number of species							
	Plants[61]	Birds[62]	Amphibians[63]	Reptiles[64]	Terrestrial mammals[65]	Marine mammals[65]	Marine fishes[65]	Freshwater fishes[65]
1. *Residential & commercial development*								
Urban expansion and industrial development	6	60	6	6	14			26
Development of coastal tourist infrastructure	33	30	5	5	2	1		
Development of other types of tourist infrastructure	11				13			5
2. *Agriculture & aquaculture*								
Agricultural intensification and expansion	16	89	7	6	9			
Forest plantations		11		3	6			
Animal husbandry (overgrazing)	50	39	1		2			
Aquaculture		4				1		
3. *Energy production & mining*								
Mining	11	16	1	2	2			3
Renewable energy (except hydroelectric)	17[66]	23						
4. *Transportation & service corridors*								
Roads	21	45	1	8	13			
Utility & service lines		23						
5. *Biological resources use*								
Hunting and the collection of animals	-	85	8	14	17	-	-	-

60. The classification follows that of the IUCN Threats Classification Scheme (Version 3.0), for the 11 main threat categories, and is adjusted to the Greek framework to provide a more detailed threat description.
61. Adjusted from Phitos et al. (eds.) 1995: The Red Data Book of Rare and Threatened Plants of Greece, WWF. Only 263 taxa were evaluated.
62. Data from: Determination compatible activities in relation to the bird species used for designation of SPAs. 2009, which evaluated 201 bird species.
63. Adjusted from Legakis A., Maragou P. 2009. Greek Red Data Book of Threatened Fauna. Hellenic Zoological Society. The authors evaluated 11 amphibian species, 17 reptile species, 61 mammal species andι 45 freshwater fish species.
64. Ministry of the Environment, Physical Planning and Public Works. 2006. Report of Greece on Coastal Zone Management. Available at http://www.minenv.gr/4/42/00/094%20GR%20Report%20CZM-full%20version-4-final.pdf
65. Available at the European Environment Agency site at: http://cdr.eionet.europa.eu/gr/eu/art17/envrfzupg
66. Renewable energy production was not evaluated for most species, because it was not considered a major threat when the red data books were prepared.

Threat categories[60]	Number of species							
	Plants[61]	Birds[62]	Amphibians[63]	Reptiles[64]	Terrestrial mammals[65]	Marine mammals[65]	Marine fishes[65]	Freshwater fishes[65]
Use of poisoned bait to control pests	-	18			3			
Plant collecting	39	-	-	-	-	-	-	-
Logging & wood harvesting	3	23	2	1	8			
Fishing	-	-	-	-	-	-	12	4
Fishing (bycatch)		18		3		10	11	2
6. *Human intrusion & disturbance*								
Recreational activities	1	45	8	2	26	2		3
Other activities (e.g. military exercises)		100						
7. *Natural system modifications*								
Fires	15	31	8	6	12			
Dams (including small hydroelectric units)		31		1	5			8
Land use change: reforestation, agricultural abandonment	8				3			
Land reforms		25						
Water removal, wetland drainage		99	8	1	2			34
8. *Invasive Species*		9	1	3	8			11
9. *Pollution*								
Urban wastewater		27	7	1	2	11	1	31
Industrial waste		23	5	1	3	16	2	19
Agricultural pollution		113	8	1	16	19	1	34
Solid waste		19	9					1
Atmospheric pollution			10			1		
10. *Geological events*						1		
11. *Climate change and severe weather*		51	10	4	7			14

There are no reliable estimates for the pressures on and threats to all **terrestrial invertebrates**. However, from the fragmentary information available, we may argue that, in general, many invertebrate species are threatened by: deforestation, residential development (often illegal and without planning), habitat fragmentation, human disturbances, agricultural intensification and expansion, the collection of animals, wildfires, desertification and agricultural pollution. However, it is difficult to reach clear conclusions, since invertebrate extinctions are hard to document (on the one hand, invertebrates do not leave fossils, while, on the other hand, we have yet to identify a large proportion of the invertebrate species that inhabit Greece).

For some of the more well studied groups, like butterflies, we know that they are threatened by the reduction in the area of grasslands and forest clearings, because of the reduction in extensive animal stock raising and agricultural abandonment. For saproxylic beetles, the main threat arises from the reduction of old forests and from the lack of forest management measures for dead wood. For dragonflies, the main threat is the reduction of wetlands.

The main threats to **fungi** include soil pollution, habitat loss, and the collection of edible mushrooms, especially when conducted for commercial purposes without any form of control.

Currently, the main threats to and pressures on **soil biodiversity** and soil ecosystem functioning include soil erosion and degradation, land use changes and soil pollution. However, climate change, invasive alien species and genetically modified organisms may prove significant threats in the foreseeable future.

From the preliminary analysis, it became apparent that ranking threats according to the number of species they affect is just one approach, and that it does not provide the big picture for the role of each threat. Some factors appear to affect a large number of species in various ways. Thus, we have attempted to provide an overall assessment of the effect of the various threats to biodiversity.

- **Residential development** (which, in Greece, is often done illegally and without planning) along with its accompanying infrastructure (road construction, utility and service lines) converts large areas of land from natural vegetation coverage into artificial surfaces, and thus leads to habitat loss and fragmentation, and the consequent loss of natural capital. The effect of this threat is exacerbated in Greece, where residential construction is still taking place in areas that fall outside of city planning.
- **Intensive agriculture** demands large quantities of water for irrigation (and thus causes wetland areas to shrink), degrades and pollutes soil, leads to water pollution and eutrophication, converts land (especially productive land) and thus decreases habitat area, releases dangerous chemicals into the food chain (e.g. pesticides), and consumes large amounts of energy. Furthermore, land reforms lead to the homogenisation of the landscape and the further loss of diversity. In contrast, traditional agricultural practices and organic farming have many beneficial effects on biodiversity.
- Excessive development of **tourist infrastructure** (including large hotels, golf courses, ski centres) affect both coastal and mountainous areas, by removing large amounts of water, causing soil and water pollution, consuming energy, and altering the landscape.
- The **construction of roads** without planning causes the fragmentation of natural habitats, enables people to access natural areas for poaching and illegal logging, causes soil erosion and indirectly pollutes water courses, increases the mortality rate of mammals and reptiles, and reduces the amount of suitable areas for sensitive species. Furthermore, the existence of roads alters the landscape, while road infrastructure allows other detrimental activities to occur, such as the construction of residences, even inside protected areas.
- **Accidental or intentional killing of animals**, including poaching and the use of poisonous bait, are responsible for the reduction of the populations of many bird and mam-

mal species. This issue represents the main threat to the survival of the populations of certain species of large carnivores, marine mammals, large birds of prey and even sea turtles.

- **Recreational activities**, like off road vehicle driving in coastal areas (dunes/beaches), or the illegal use of speedboats, may damage or destroy natural habitats or disturb sensitive species and even the visitors to protected areas.

Another approach is to assess the threats to and pressures on habitat types[67]. This approach highlights that:

a. the most severe effect of tourism and recreational activities is on sand dunes and halophytic habitats
b. the strongest effect of agricultural activities is on sclerophyllous scrub and grasslands
c. forestry activities occur almost exclusively in forests
d. residential and infrastructure development primarily affect sclerophyllous scrub, coastal habitats and halophytic habitats
e. water management activities mainly affect freshwater habitats and some types of forests, and, finally,
f. the most significant biological threats are to coastal and halophytic habitats and forests.

B.3.2. Underlying or root causes of biodiversity loss

If we search for the reasons behind the threats to biodiversity, then we discover the underlying or root causes. These underlying causes are:

- A **lack of knowledge** about the various facets of biodiversity and their trends; knowledge that is necessary for the formulation of efficient management measures and practices, like the design of networks of protected areas or the selection of corridors for the dispersal of species.
- The **delay in the completion and application of national spatial and urban planning** for the conservation of biodiversity, with the consequence of increasing pressure at a local level regarding both residential development and the location of various activities, without the overall strategy and assessment of existing or potential environmental impacts.
- The **non-implementation or the partial implementation of the existing institutional framework**, which enables various illegal activities to occur, such as: poaching, illegal logging, overfishing, excessive sand extraction, uncontrolled release of pollutants, soil water and air pollution, illegal building construction, mining and the use of poisonous baits.
- The **lack of environmental awareness and education** leads to non-environmentally friendly processes for production and consumption.

67. Dimopoulos P., Bergmeier E., Fishcer P. 2006. Natura 2000 habitat types of Greece evaluated in the light of distribution, threat and responsibility. Biology and Environment 106B: 175-187.

- The **underfinancing** of actions and programmes for the conservation of genetic resources.
- The **underfinancing and lack of personnel** for the efficient operation of the national gene bank**.**
- The **underfinancing** of research focused on the preservation and utilisation of genetic resources (of cultivated varieties, animals, cultivated species wild relatives, etc.) that could contribute towards halting biodiversity loss and genetic erosion, and thus contribute to food security.
- The **partial integration of the sustainability principles in productive activities** (like agriculture, fishing, tourism, mining) contribute to the existence of many biodiversity threats and pressures.
- The **overregulation,** the **splitting of responsibilities** and, often, the **ambiguity of the institutional framework,** along with the lack of adequate control mechanisms, result in the ineffective implementation of environmental legislation and, simultaneously, result in civil servants being uninformed and unwilling to act.
- The **lack of stable funding and specialised personnel** for protected area management at a local level (e.g. management bodies).
- The **lack of qualified and adequately** (qualitatively and quantitatively) **staffed services** for biodiversity conservation and protected areas management at central and regional levels.
- The implementation of **developmental and resource management models**, which are designed to fulfil a single main goal (and more often than not, this dominant goal is economic and short term)
- The **ignorance or lack of awareness** of the value of biodiversity and, specifically, its contribution to human well-being and prosperity.

B.4. The national institutional framework for biodiversity

B.4.1. Legislation

The main legal instrument that covers biodiversity is Law 2204/1994, which ratified the Convention on Biological Diversity, along with the relevant European Council Decision 93/626/EC. Besides Law 2204/1994, the national institutional framework includes a plethora of provisions governing the conservation of biodiversity, the sustainable use of its components and the sharing of benefits from the utilisation of genetic resources. In addition, the first international agreement that regulates access to plant genetic resources for food and agriculture was the International Undertaking of the FAO, a non-compulsory international agreement developed by the FAO in 1983. Under this International Undertaking (and until then), plant genetic resources were considered "a public good" and "a common heritage of mankind" that were freely accessible for the benefit of global agriculture. In 2001, the revision of the International Undertaking, in line with the CBD, led to the adoption of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA). An advantage of ITPGRFA over the Convention on Biological Diversity (CBD) is that, instead of the bilateral agreements favoured by the CBD, which may result in discriminations or exclusions, the ITPGRFA favours multilateral agreements through a Multilateral System of Access and Benefit-sharing. Within this Multilateral System, access is granted under certain conditions, the most important of which are:

- Access is provided for the sole purpose of the utilisation and conservation for research, education and improvement of food and agriculture, provided that this purpose does not include chemical, pharmaceutical and/or other industrial uses not related to food or agriculture.
- Beneficiaries cannot claim copyright or other rights that limit the access to PGR or components thereof for food and agriculture, in the form they are accepted by the Multilateral System.
- Access will be provided under the Standard Material Transfer Agreement (SMTA).

The Multilateral System does not cover all crops, only crops that are important in agriculture. The System is applied only to the crops listed under Annex I of the ITPGRFA. This Annex was established in accordance with criteria relevant to food security, and included all of the basic food crops and many wild relative species. The minor crops and their relative species are not listed, and are governed by the rules of access and benefit sharing of the CBD.

Article 24 of the Greek Constitution stipulates that the protection of the environment is the responsibility of the State and the right of each citizen. It also points out that the State has an obligation to take preventive or repressive measures within the framework of sustainability.

Law 1650/1986, as amended by Law 3937/2011, is considered to be the framework law for the protection of the environment and biodiversity in Greece. Besides, the forestry legislation (and mainly the Forest Code 86/1969 and Laws 996/1971 and 998/1979, as amended by Law 3028/2003) and Law 2971 / 2001 play an important role in nature conservation. The conser-

vation of the marine environment is governed by Law 743/1977, as codified by Presidential Degree 55/1998 on the "protection of the marine environment" and Law 1269/1982 on "the prevention of marine pollution from ships", which ratified the international treaty MARPOL. In addition, the legal framework includes Laws 2252/1994, 3100/2003 and Presidential Decree 11/2002 for issues of preparedness and cooperation in dealing with oil pollution in the sea, hazardous and dangerous substances, including the National Emergency Plan in accordance with the above PD and implementation of local emergency plans.

The main European Directives for nature conservation are the Birds and the Habitats Directives. Joint Ministerial Decision 33318/3028/1998 achieved the harmonisation of Greek legislation with the Habitats Directive (92/43/EEC). The purpose of this Directive is to achieve "favourable conservation status" for habitat types and species of Community interest, and is the legal basis for the designation of the European network of protected areas "Natura 2000". This directive is complementary with Directive 2009/147/EC (which amends Directive 79/409/EEC) on the conservation of wild birds. The Birds Directive was incorporated in the national legislation with Joint Ministerial Decision 414985/1985 and later amendments. The aim of the Birds Directive is the conservation of wild birds.

Furthermore, there are the provisions of Law 1650/1986 on "Spatial Planning and Sustainable Development and other provisions", which set the framework for the creation and operation of the management bodies of Protected Areas. According to these provisions, later law established 25 Management Bodies, which together with two earlier management bodies (for the National Marine Park of Zakynthos and for the National Park of Schinia – Marathon), and the later established Management Agency for the National Park of Tzoumerka, are responsible for managing the Protected Areas that encompass a large proportion of Greek biodiversity.

The implementation of these laws does not invalidate previous or subsequent legislation enacted to protect species (e.g. PD 80/1990 on the protection of plant germplasm, PD 67/1981 on the protection of native flora and wildlife, PD 434/30/1995 for the conservation and protection of indigenous livestock breeds and habitats or landscapes, Law 1469/1950 regarding "historical sites and places of special beauty", LD 996/1971 on "national forests, aesthetic forests and conservation of monuments of nature", and Law 2637/98 for wildlife sanctuaries).

Moreover, issues of biodiversity are also regulated by the laws that ratified the following international conventions: the Berne Convention on the conservation of European wildlife and natural habitats (ratified by Law 1335/1983), the Bonn Convention on the Conservation of Migratory Species of Wild Animals (ratified by Law 2719/1999), the Barcelona Convention for the Protection of the Mediterranean Sea Against Pollution (ratified by Law 855/1978) and its relevant protocols (Law 1634/1986) and the Ramsar Convention on Wetlands of International Importance (Legislative Decree 191/1974, as amended). In addition, biodiversity issues are covered by the Framework Convention on Climate Change, ratified by Law 2205/1994, the Convention to Combat Desertification, which was ratified by Law 2468/1997, the international CITES Convention on International Trade in Endangered Species of wild fauna and flora, which was ratified by Law 2055/1992 and the revised Convention on the protection of plants ratified by Law 3495/2006.

Regarding agriculture, European Council Regulation 73/2009 is applicable, which aims to avoid agricultural land being abandoned and to ensure that it is maintained in good agricultural and environmental condition. Moreover, the Joint Ministerial Decision 262385/2010 regulates the "application of the cross-compliance status and other additional measures in implementation of Regulation 73/2009 and Regulation 1698/05", which, *inter alia,* defines the practices of agriculture and animal husbandry that are in accordance with European legislation.

With respect to genetic resources, at an international level, in 2010, the 10th Conference of Parties to the Convention on Biological Diversity adopted the Nagoya Protocol to "access to genetic resources and the fair and equitable sharing of the benefits arising from their utilisation". Besides, according to a report from the European Commission, the FAO International Treaty on Plant Genetic Resources for Food and Agriculture is the only specialised international treaty established to access and share the benefits of plant genetic resources. Furthermore, in Oman in 2013, the Governing Body of this Treaty[68] adopted a resolution and signed a Memorandum of Cooperation between ITPGRFA and the Convention on Biological Diversity[69].

At a national level, until the ratification of the above Protocol by Greece, the existing legal framework for genetic resources had consisted of PD 80/1990 on the protection of the country's plant germplasm, PD 434/1995 which adopted measures for the conservation and protection of indigenous breeds of livestock. The implementation of the Nagoya Protocol requires the existing institutional framework to be updated on access to genetic resources and the establishment of a national institutional framework for the fair and equitable sharing of the benefits arising from their utilisation. Moreover, the Nagoya Protocol does not affect the International Treaty on Plant Genetic Resources for Food and Agriculture, in accordance with Article 4 of the Protocol[70].

Issues concerning the import of timber are governed by Regulations 2173/2005 and 1024/2008, which establish a voluntary licensing scheme for forest law enforcement, governance and trade in the European Community. The aim of these regulations is to reduce the consumption of illegally logged timber and to contribute to the sustainable forest management in timber-producing countries.

Regarding fishing, there is Regulation 1967/2006 for the sustainable exploitation of fishery resources in the Mediterranean Sea, while there is an ongoing discussion on the revision of the fishing regulations for the next period of time. In addition, according to Greek Law 3937/2011, destructive fishing (e.g. by trawling) over mäerl beds and coralligenous habitats is prohibited. Moreover, the establishment and operation of aquaculture units over *Posidonia* meadows are prohibited. Furthermore, for the protection of the marine environment, there is Directive 2008/56/EC on maritime strategy, which is incorporated in Greek legislation by

68. http://www.planttreaty.org/content/governing-body
69. http://www.cbd.int/abs/about/default.shtml#coverage
70. http://www.cbd.int/abs/text/articles/default.shtml?sec=abs-04

Law 3983/2011 "National Strategy for the protection and management of the marine environment – Alignment with Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 and other provisions". This Directive is the environmental pillar for future EU policy in this field.

The aim of Directive 2008/56/EC is to achieve or maintain the marine environment in good environmental status, which is determined on the basis of the qualitative descriptors listed in Annex I of the Directive. These descriptors include the maintenance of biological diversity (1), the control of non-indigenous species (2), the sustainable management of fisheries (3), the conservation of marine food webs (4) and sea-floor integrity (6). All of these descriptors are directly or indirectly related to the conservation of biodiversity. More specifically, Annex I of Directive 2008/56/EC reads:

(1) Biological diversity is maintained. The quality and occurrence of habitats and the distribution and abundance of species are in line with prevailing physiographic, geographic and climatic conditions.

(2) Non-indigenous species introduced by human activities are at levels that do not adversely alter the ecosystems.

(3) Populations of all commercially exploited fish and shellfish are within safe biological limits, exhibiting a population age and size distribution that are indicative of a healthy stock.

(4) All elements of the marine food webs, to the extent that they are known, occur at normal abundance and diversity and levels capable of ensuring the long-term abundance of the species and the retention of their full reproductive capacity.

(6) Sea-floor integrity is at a level ensuring that the structure and functions of the ecosystems are safeguarded and benthic ecosystems, in particular, are not adversely affected.

Furthermore, the reformed Common Fisheries Policy (CFP) of the EU applies, in accordance with Regulation 1380/2013, to the "Common Fisheries Policy, amending Council Regulations (EC) No 1954/2003 and (EC) No 1224/2009 and repealing Council Regulations (EC) No 2371/2002 and (EC) No 639/2004 and Council Decision 2004/585/EC". This regulation explicitly states that "the CFP should ensure that fishing and aquaculture activities contribute to long-term environmental, economic, and social sustainability". Moreover, there is Regulation 708/2007 "concerning the use of alien and locally absent species in aquaculture", along with its amendments and revisions (Regulations 506/2008, 535/2008, 304/2011). For the incorporation of these directives into Greek Law, there is the Decision of the Minister of Rural Development and Food (165837/2009) and its amendment Ministerial Decision 1639/2013.

Regarding the environmental impact assessment, and the general environmental licensing of projects and activities, the legal framework consists of relevant EU Directives, which have been incorporated into Greek law, initially by Law 3010/02 and recently by Law 4014/2011, and their enabling provisions. The Strategic Environmental Impact Assessment has applied to Greece since September 2006.

A number of legal instruments are in place for the protection of water resources. Directive 2000/60/EC was incorporated into national law by Law 3199/2003 on the "Protection and

management of water" and PD 51/2007 "Establishment of measures and procedures for integrated protection and management of water, in compliance with the provisions of Directive 2000/60/EC". A national network for monitoring the quality and quantity of water has been in operation in Greece since 2012 (JMD 140384/B/2011).

Regarding wetlands, Law 3937/2011 on biodiversity includes specific provisions (Article 20) for both small (<8 ha) and large wetlands. Small island natural wetlands are protected by PD 229/AAP/2012 "Approval of inventory of small island wetlands and defining the conditions and restrictions for the protection and promotion of small coastal wetlands included therein".

Directive 76/160/EEC "concerning the quality of bathing water" is valid until 2014, which is being gradually replaced by Directive 2006/7/EC "concerning the management of bathing water quality" (which adopts new microbiological indicators). The new Directive has been incorporated into Greek law by JMD H.P.8600/416/E103, and is closely related to Directive 2000/60/EC, because, in essence, it addresses one specific category of water (bathing water) and regulates the monitoring of water quality in bathing areas and deals with sources of pollution.

Directive 91/271/EEC "concerning urban waste-water treatment" was amended by Directive 98/15/EC, and has been transposed to Greek law with JMD 5673/400/1997 "measures and conditions for urban waste-water treatment". This Joined Ministerial Decision has been amended by JMD 19661/1982/1999 and subsequently by JMD 48392/939/3-2-2002, which established the list of sensitive areas.

Directive 2007/60/EC on the assessment and management of flood risk was incorporated into national legislation by JMD H.P. 31822/1542/E103.

Directive 2008/56/EC on Marine Strategy was incorporated into national law by Law 3983/2011 "National Strategy for the protection and management of the marine environment - Compliance with Directive 2008/56/EC of the European Parliament and of the Council of June 17, 2008 and other provisions".

Moreover, Law 2425/1996, which ratified the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention) is still in force.

Furthermore, Greece has signed the Cartagena Protocol on Biosafety at the Convention on Biological Diversity and ratified it by Law 3233/04. In addition, Greece has issued Ministerial Decisions 11642/1943 and 38639/2017, which are incorporated into our national law Directives 98/81 and 2001/18, respectively.

Directive 2004/35/CE on "environmental liability with regard to the prevention and remedying of environmental damage" has been transposed to Greek legislation with PD 148/09.

Directive 2008/98/EC, which concerns the protection of the environment through criminal law, has been harmonised with and incorporated into national law by Law 4042/2012.

Biodiversity issues are also regulated by the general framework for spatial planning and sustainable development, which has been adopted by the Greek Parliament. Later, specific planning frameworks were issued for tourism, renewable energy (for which Law 3851/2010 was also issued), industry and aquaculture. Regional frameworks for spatial planning and

sustainable development specify, at the level of each region, the directions of the general framework. There are spatial plans for the 12 regions of the country (while for the Attica region, the Master Plan of Athens applies). Currently, there have been ongoing studies for the Evaluation and Review of Regional Frameworks. One important policy tool, on a local scale, is Urban Planning. Law 2508/1997 includes provisions on the designation of special protection areas that are not intended for residential development, such as coastal or riverine areas, natural habitats and sites of high aesthetic value, such as forests and wooded lands.

Greece has also ratified the European Landscape Convention by implementing Law 3827/2010. The Convention was adopted in 2000, in Florence, Italy, and was ratified by the Council of Europe in 2004. The objective of this Convention is to further the protection, management and planning of European landscapes, and to organise European co-operation for these purposes.

A considerable part of the legislation about the protection of the natural environment had been issued in the past, before the relevant EU Directives and Regulations came into force, and remain in force. In addition, there are several laws and scattered provisions in other laws that have led, in several cases, to ill-defined or conflicting legal commitments and jurisdictional overlaps.

B.4.2. Protected Areas

In Greece, natural areas are designated as protected areas either through their status under pre-existing national legislation or by their inclusion in international conventions or treaties that have been ratified, including international or European initiatives. Further, the protected areas of the Natura 2000 network are designated for the conservation of habitat types and species of Community interest. Their institutional status is certified by Law 3937/2011.

National Level

Until 1986, the legal framework for the designation and management of protected areas relied on the provisions of the Forest Code. The National Forests, Aesthetic Forests and Natural Monuments were described in Law 996/1971, which is part of the implementation of Law 86/1969 "on the Forest Code". The Wildlife Refuges and the Areas of Controlled Hunting and Breeding of Game Species are designated according to Law 177/75, as amended by Law 2637/1998. Within the Framework Law on the Environment (Law 1650/86), five categories of protected areas are recognised: (a) areas of absolute nature protection, (b) nature conservation areas, (c) national parks, (d) protected natural formations and protected landscapes, and (e) areas of eco-development. According to the more recent Law 3937/2011, the defined categories of protected areas are: areas of absolute nature protection, nature conservation areas, natural parks (national or regional), Special Areas of Conservation, Special Protection Areas, Wildlife Refuges, protected landscapes and landscape elements or protected natural formations.

The total coverage of nationally protected areas, without overlaps, according to the spatial data of the Common Database on Designated Areas (CDDA), amounted to 2,500,000 ha in 2011. In this estimate, the cover of the protected areas designated only in the Natura 2000 network is not included. The Wildlife Refuges account for a remarkable percentage, while the percentage of National Parks is also important. The marine part of the protected areas is limited in relation to the extent of the terrestrial part of the protected areas. The number of sites with protected area status designation in Greece has gradually increased since 1980 (Figure 2). Before 1980, only a few sites had been designated as protected.

Finally, landscapes of exceptional natural beauty are also protected by Law 1465/1950, which complements Law 5351/1932 "On antiquities". The jurisdiction for the landscapes of exceptional natural beauty was initially with the Ministry of Culture, but is currently with the Ministry of Environment, pursuant to Presidential Decree 161/1984.

In accordance with Laws 1650/1986, 2742/1999 and 3044/2002, twenty-eight Management Agencies have been established and authorised to manage a total of 90 areas of special community interest (SCI) within the national protected areas of the Natura 2000 network. The function of these agencies has been to implement management programmes required for the conservation and sustainable management of their areas of responsibility. During the first phase of operations until 2009, these Management Agencies were financially supported

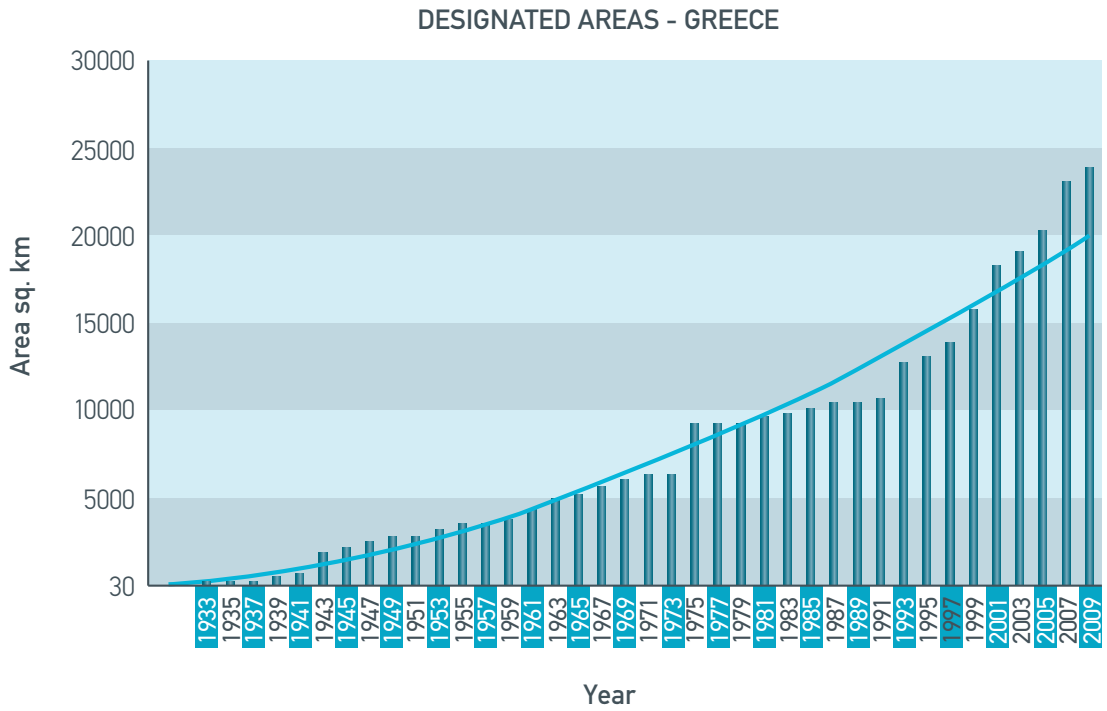


DIAGRAM 2: The area covered by nationally designated protected areas since 1938 (Source: Ministry of the Environment, Energy and Climate Change. Status, Response: Nationally designated protected areas / GR - SEBI 2010 07)

by appropriations of the Operational Programme for the Environment 2000–2006, Measure 8.1. During that first phase of operations, the Management Agencies encountered serious problems, with most of their funding being allocated to operating expenses. During the next period, 2007–2013, the agencies were financially supported by the Ministry of Environment and, in particular, by the Operational Programme Environment and Sustainable Development. Moreover, they were funded by the Green Fund, which aimed to secure stable funding for additional activities and other costs (e.g. for administrative duties, subcontractor fees and maintenance materials) that could not be covered by the Operational Programme Environment and Sustainable Development.

For supervising the protected areas, the Natura 2000 National Committee was established. This committee consists of experts, representatives of the administration and NGOs.

International Level

Besides national legislation, International Conventions and Treaties, which Greece has ratified, provide specific requirements for the protection of nature. Besides, Greek participation in international organisations, such as the Council of Europe and UNESCO, claims the protection of the natural environment. The international designations for protected areas implemented in Greece are: Wetlands of International Importance (Ramsar Convention), the World Heritage sites (UNESCO), the Biosphere Reserve (UNESCO, Man and Biosphere Programme), Special Protected Areas (Barcelona Convention), Biogenetic Reserves (Council of Europe), and areas that have been awarded European Diploma of Protected Areas (Council of Europe). The total area covered by these sites, without overlaps, is 457.216 ha, of which 200.734 ha is terrestrial and 256.482 ha is marine.

European Level

A considerable part of the national territory is designated as protected areas of the European ecological network "Natura 2000". In Greece, the network includes 202 Special Protection Areas (SPAs - Directive 2009/149/EU) and 241 Sites of Community Importance (SCI - Directive 92/43/EC). Two-hundred and thirty-nine of the SCIs have been designated as Special Areas of Conservation (SACs). The two categories of protected areas appear to overlap. The area coverage of the Natura 2000 network in Greece, excluding overlaps, is currently approximately 4.300.000 ha and covers 27.3% of the land mass and 6.1% of the territorial waters. This network includes 10 National Parks, Wetlands of International Importance under the Ramsar Convention, and other important areas, such as Aesthetic Forests and Natural Monuments. The list of SCIs in the terrestrial part of Greece is considered to be almost complete. In the marine area, there are still issues pending, both for SCIs and SPAs (not only for Greece, but throughout the European Union).

B.4.3. Administration

The Ministry of Environment, Energy and Climate Change is the main sector of the administration that is responsible for the coordination and implementation of all actions necessary to maintain the biological diversity of the country, especially after the Special Secretariat of Forests has been incorporated into it.

The conservation and sustainable use of components of biodiversity and the sharing of benefits from the utilisation of genetic resources, are also included in the responsibilities of the Ministry of Rural Development and Food.

The Greek Coast Guard, which belongs to the organisational structure of the Ministry of Marine and the Aegean, assists the Ministry of Environment, Energy and Climate Change in the implementation of actions for the conservation of biological diversity within their responsibilities. The responsibilities of the Ministry of Foreign Affairs include, among other items, the negotiation, ratification, monitoring and implementation of international treaties and other international agreements. In addition, there are other ministries responsible for issues relevant to biodiversity. Namely, the Ministry of Interior has a coordinating role for local authorities, and the Ministry of Education, Lifelong Learning and Religious Affairs also influences by means of environmental education programmes. The Ministry of Development and Competitiveness regulates many of the productive activities considered to be threats to or pressures ~~to~~ on biodiversity.

At a regional level, the authority of each Region (second level of local authorities in Greece) has the relevant administration authority, namely: the General Directorates of Planning and Environmental Policy, the General Directorates of Forestry and Rural Affairs, and the General Directorates of Development Planning, Environment and Infrastructure with responsibility for the environment.

For the management of protected areas, twenty-eight Management Agencies have been established as legal entities that are active in their areas of responsibility. For supervising the protected areas at a national level, the National Committee "Natura 2000" has been established by JMD 33318/3028/98.

Universities, research institutes and non-governmental organisations are actively engaged in the scientific research and monitoring of biological diversity. However, currently, there has been no up-to-date inventory of research projects, biodiversity collections or databases kept by these research foundations. In 2000, a preliminary inventory recorded 13 databases to a nationwide extent and continuous updates and 12 databases with occasional or no updates[71]. Moreover, there are biodiversity actions supported by private companies within the framework of corporate social responsibility programmes.

71. Information from the "Inventory of databases on the Greek natural environment" in the framework of collaboration between the National Biotope Wetland Centre and the Ministry of Environment, Planning, and Public Works 1997-1998.

B.4.4. Main challenges

Greece is a country that has great biological wealth and, thus, it has a significant degree of responsibility for conserving biological diversity and halting biodiversity loss. The main challenges that the country's administration must face to achieve this objective are the following:

1. To codify and update legislation for biodiversity conservation, so as to respond to contemporary global and EU trends and prospects with the aim to remove ambiguities, inconsistencies and overlaps.
2. To strengthen public administration to implement and coordinate policies, measures and legislation for biodiversity protection. Within this framework, it is necessary to upgrade the administrative mechanisms on issues of the natural environment, i.e. to provide relevant resources, including adequate and efficient staffing, ongoing training, the necessary scientific data and technical tools, as well as adequate financial funds.
3. To secure the compatibility of economic developmental plans and programmes with biodiversity conservation.
4. To increase knowledge through scientific programmes that monitor the status and trends of biodiversity components (including genetic resources, species, habitat types, ecosystems) and facilitating access to relevant information.
5. To accelerate and complete the process of selecting the protected areas of the Natura 2000 network, especially for the marine environment.
6. To accelerate and complete the process of institutional consolidation of the Natura 2000 network and the designation process for protected areas.
7. To improve the management of protected areas by developing and implementing management plans, operationally supporting management agencies and to improve their supervision and coordination.
8. To protect and manage agricultural biodiversity.
9. To protect and manage landscapes.
10. To conserve, manage and restore biodiversity outside the protected areas.
11. To protect biodiversity from the impacts of invasive species.
12. To adapt to climate change and take action to reduce its impact on biodiversity
13. To prepare the forest maps of Greece, to complete the Soil map of Greece, to prepare the land use map and to complete the National Cadastre.
14. To prevent and address threats resulting from natural disasters, such as wildfires and natural habitat destruction.
15. To control the construction of buildings and other infrastructure outside the City Planning limits.
16. To efficiently deal with illegal activities.
17. To improve measures for preventing and restoring environmental damage in the context of biodiversity conservation.

18. To improve public education, training, communication, environmental awareness and participatory processes in regard to biodiversity issues.
19. To provide economic incentives for the protection of biodiversity and provide compensation for damage caused by protected animal species.
20. Compliance with the provisions of the Directive 92/43/EEC on the spatial arrangement of the anthropogenic activities within the Natura 2000 protected areas, while guaranteeing the conservation and restoration of the natural environment



CHAPTER C

VISION, AIM AND TARGETS OF THE NATIONAL BIODIVERSITY STRATEGY

C.1. Vision for Biodiversity

According to the United Nations, 2010 was the year for Biodiversity. In this context, it is a landmark year to take action for biodiversity. In that year, the EU set its long term vision for biodiversity, which Greece adopted, and it lies at the heart of the National Biodiversity Strategy.

The 2050 vision for Biodiversity: By 2050, biodiversity in Greece and the ecosystem services it provides – the country's natural capital – are protected. This protection is warranted because of the intrinsic value of biodiversity, along with its essential contribution to human well-being and economic prosperity, and aims to avoid catastrophic changes caused by the loss of biodiversity. In this context, the value of ecosystem services and functioning are highlighted and the functions that have been degraded are restored.

C.2. Aim and Targets for Biodiversity

The **Aim of the Biodiversity Strategy** is to halt the loss of biodiversity and the degradation of ecosystem services in Greece by 2026, and restore them, as far as it is feasible, while communicating the value of biodiversity as our national capital, and stepping up the Greek contribution towards averting global biodiversity loss.

The implementation period of the Strategy on Biodiversity is 15 years, namely from 2014 up to 2029.

The Strategy consists of 13 General Targets, which are separated into specific targets that will become increasingly specialised in the Action Plan for the first five-year period, i.e. 2014–2019.

C.2.1. General Target 1: Increasing knowledge about the assessment of biodiversity status

The protection of biodiversity is directly related to scientific research. Therefore, it is necessary to increase and update relevant knowledge, so that, through scientific analysis and studies, the public may be appropriately informed and appreciate the status and trends of the natural environment, the functioning of natural systems and the interaction between biotic and abiotic parameters. This knowledge base is bound to enhance the design of targeted actions for the

conservation of biodiversity. In particular, the support of applied research on the management of species and habitats will contribute to the more efficient planning of the necessary actions for the protection of biodiversity in Greece. At the same time, support for research and dissemination will fulfil the legal obligations of the country with regard to monitoring the conservation status of species and habitat types.

At present, there is a major gap on how the biodiversity knowledge generated to date is organised and how to facilitate access to it. It is necessary to create a central repository where existing knowledge is collected and maintained and new knowledge produced is also deposited, so as to become available and accessible to all interested parties (the scientific community and the wider public). The creation of national databases that include basic data on Greek biodiversity will provide an essential tool in creating and maintaining an effective management and monitoring system.

General Target 1 includes Specific Targets 1.1 and 1.2:

1.1 Facilitate access to scientific knowledge (regarding Greek flora and fauna) and fill in the gaps in scientific data.

1.2 Facilitate access to information on actions for biodiversity conservation and monitoring, as well as for the implementation of the National Strategy.

C.2.2. General Target 2: Conservation of national natural capital and ecosystem restoration

The implementation of national, European and international environmental legislation and the coordinated protection of the components of biodiversity require planning and prioritisation that will determine the priorities of actions for the next 15 years. The existing institutional arrangements governing protected species are old, and the list of protected species needs to be updated based on the latest scientific literature and new versions of the Red Book for plants and animals. As a first step, it is necessary to select species and habitats that require increased protection, management or restoration based on specific criteria. The criteria may include: (a) the species designated as protected or endangered, (b) their rarity (e.g. endemics), (c) their importance in the context of Greek biodiversity, (d) their conservation status, (e) their risk of genetic erosion, and (f) the severity or importance of the threats they face. Therefore, beyond the species and habitat types already included in the EU and international commitments, other species and habitat types may be listed and ultimately become designated as being of EU and international interest.

Prioritisation for the conservation of species and habitat types will only be effective if accompanied by specific actions, which should not be *ad hoc* or fragmentary, but should be based on new, updated or existing action plans. Action plans define the management actions necessary for the protection and/or recovery of species or habitat types, and may be specified by either region or species.

The monitoring of the conservation status of species and habitat types is a national legal obligation that arises from European environmental legislation. In parallel, it is an important tool for the inventory and management of the state of biodiversity in Greece. Therefore, the development and application of scientific monitoring plans for species and habitat types of community importance are required. Among these, particular emphasis should be placed on the monitoring and assessment of the conservation status of species and habitats listed in the annexes of Directives 92/43/EEC and 2009/147/EC, since the current status for the monitoring of these species is far from ideal. This issue was revealed by a recent assessment of the conservation status of species of Community interest, which was performed in the context of the second national six-year report in accordance with article 17 of Directive 92/43/EEC.

General Target 2 includes Specific Targets 2.1 and 2.2:

2.1 Conservation of species and habitat types in Greek terrestrial and marine ecosystems, to promote the goal of sustainability.

2.2 Restoration of important species and habitat types.

C2.3. General Target 3: Organisation and operation of a National System of Protected Areas and enhancement of the benefits from their management

The institutional reinforcement of protected areas in Greece is a decisive step towards biodiversity conservation. Today, there are several areas where necessary designations are still pending, despite the fact that they meet all the necessary requirements specified in the relevant legislation. The incorporation of these areas in the national system of protected areas and the resolution of the organisational and operational issues are among the objectives of this Strategy.

Regarding the Natura 2000 network, the selection and designation of more marine protected areas are deemed as a priority action that is pending at European and national levels. Sites of Community Importance that are already approved by the European Commission for the Mediterranean biogeographical zone are mostly classified as Special Areas of Conservation. The institutional fortification of these areas should be accompanied by the adoption of institutional, administrative and management measures to maintain or restore the species and habitat types that have justified the designation of these areas.

Habitat fragmentation is one of the major threats to biodiversity. Species need adequate space within which they may move and feed, so that their populations can maintain good conservation status. The successful management of individual protected areas is not sufficient to achieve the conservation objectives of certain species (usually large predator species), unless there are ecological corridors that allow local populations to interact and persist. To delineate ecological corridors, it is necessary to identify species that have such needs, study their ecological requirements, and then map and identify areas where specific conservation and management measures are needed. Ecological corridors serve several purposes at the same time. Such corridors are able to: (1) maintain an area of good ecological status,

(2) offer the opportunity to continue to provide ecological functions, and (3) help species and habitat types to adapt to climate change.

General Target 3 includes Specific Targets 3.1 - 3.3:

3.1 Effective organisation of the administration and management of protected areas and the implementation of preventive measures in protected areas.

3.2 Application of exemplary and innovative practices in the productive sectors and tourism based on the management plan of each area for biodiversity conservation and management.

3.3 Design, and possible integration, of ecological corridors of special designation status and their effective management.

C.2.4. General Target 4: Conservation of the genetic resources of Greece – Facilitating access to genetic resources – Fair and equitable sharing of the benefits arising from their utilisation

The three objectives of the Convention on Biological Diversity are: the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of benefits arising from the utilisation of genetic resources. The three objectives of the International Treaty on Plant Genetic Resources for Food and Agriculture are the conservation, the sustainable use of plant genetic resources for food and agriculture and the fair and equitable sharing of benefits arising from their use, in accordance with the Convention on Biological Diversity for sustainable agriculture and food security. Genetic diversity is a level of biodiversity; therefore, genetic resources are included in the objectives of both of these international agreements.

In Greece, the existing institutional framework includes provisions for the protection of the country's plant germplasm and the conservation and protection of indigenous breeds of livestock (PD 80/1990 and PD 434/1995). In the context of the National Biodiversity Strategy, priority is given to the continuing registration, characterisation and evaluation, as well as the conservation of plant genetic resources, forest genetic resources and the genetic resources of livestock. In addition, priority is given to the conservation of genetic resources *in situ* (on the farm) or *ex situ* (in institutes, such as gene banks and botanical gardens), particularly for genetic resources of economic importance to the country. Special care should be taken to prevent the potential impacts of genetically modified organisms on biodiversity.

Genetic resources are part of the sovereignty of each state and, thus, institutional protection and regulation are required. This institutional framework should cover issues of access and equitable sharing of the benefits arising from their utilisation. Regarding these issues, an institutional framework is lacking, with the exception of the International Treaty on Plant Genetic Resources for Food and Agriculture (in which access to and the distribution of the benefits are realised by the Standard Material Transfer Agreement), which should be addressed

as soon as possible. This need is even more urgent today, by following the adoption of the Nagoya Protocol on access to genetic resources and the fair and equitable sharing of the benefits arising from their utilisation. Moreover, the implementation of the Nagoya Protocol should take into account the impact it will have on the rights of breeders, farmers and local communities that have contributed to the conservation and utilisation of genetic resources.

General Target 4 includes Specific Targets 4.1 - 4.4:

4.1 Ensuring access to scientific records of genetic resources and filling in the gaps in scientific data.

4.2 In situ and/or ex situ conservation of Greek genetic resources.

4.3 Facilitating access to genetic resources and the fair and equitable sharing of the benefits arising from the utilisation of these resources.

4.4 The study, prevention and reduction of the impact of Genetically Modified Organisms on biodiversity.

C.2.5. General Target 5: Enhancing the synergies among the main sectoral policies for the conservation of biodiversity. Establishing incentives

Biodiversity is an issue that transcends typical sectoral policies and demands a multi-layer approach. Thus, it is necessary to integrate nature conservation into all other sectoral policies.

Spatial and urban planning policies coordinate the location of all activities in space and, therefore, may decisively contribute to protecting natural habitats, in the proper location of human activities, and to avoiding habitat fragmentation and, thus, ultimately contribute to conserving biodiversity, both in rural and urban areas.

Planning policy is based on the General Framework for Spatial Planning and Sustainable Development. The general framework is, by law, the reference basis for the coordination and harmonisation of policies, programmes and developmental projects that have significant impact on national cohesion and economic development. There is a need to strengthen the connection of the developmental planning of sectoral policies with spatial planning. Therefore, the priorities and strategic directions of the General Framework for Spatial Planning and the Special Frameworks for Spatial Planning and Sustainable Development should improve the integration of the needs of biodiversity conservation and landscape protection (in accordance with the European Landscape Convention as ratified by Law 3827/10), while taking into account the new circumstances and the significant consequences that climate change might have (like fires, floods, erosion, drought, desertification, etc.) and trying to adapt existing plans to integrate these issues.

Despite their usefulness, the strategic directions of the above projects are not sufficient to prevent local pressures within the boundaries of protected areas and within the limits of human settlements. Therefore, it is necessary to produce or improve land-use plans at a local

level, which are presented through the local spatial plans of municipalities (General Urban Plans and/or the City Master Plans).

This target aims to integrate biodiversity conservation into various sectoral policies, such as infrastructure, residential and industrial development, tourism, the primary productive sector (agriculture, livestock, fisheries and forestry), the sector of energy production from renewable sources, mining, and the collection of biological and other natural resources.

General Target 5 includes Specific Targets 5.1 - 5.8:

5.1 Effective integration of biodiversity conservation at all levels of spatial planning.

5.2 Minimising the impacts of large infrastructure projects.

5.3 Ensuring the compatibility of residential and industrial development activities (including conventional energy production) with biodiversity conservation.

5.4 Ensuring the compatibility of tourist activities with biodiversity conservation.

5.5 Ensuring the compatibility of agricultural, fisheries and forestry activities with biodiversity conservation.

5.6 Ensuring the compatibility of energy production activities and infrastructure (including renewable energy) with biodiversity conservation.

5.7 Ensuring the compatibility of mining activities with biodiversity conservation.

5.8 Ensuring the compatibility of other activities (like hunting, the collection of plants and animals) with biodiversity conservation.

C.2.6. General Target 6: Conservation of landscape diversity

The number of types of natural and man-made ecosystems, their distribution in space, and the area they occupy define the characteristics of landscapes. According to the European Landscape Convention (which Greece ratified with Law 3827/2010), landscape is defined as a natural area, as perceived by people, whose character is the result of the action and interaction of natural and/or anthropogenic processes. It is a definition that conveys modern notions of the landscape, including its cultural, ecological and social dimensions. Therefore, the European Landscape Convention is an important forward step towards the sustainable management and protection of the landscape throughout Europe. The multidimensional nature of landscape highlights the need for a holistic approach to its study and effective management.

Due to its geomorphological and climatic heterogeneity and its rich biodiversity of species and ecosystems, Greece is characterised by a wide diversity of landscapes. The protection and preservation of many different types of landscapes depend on the protection and conservation of the ecosystems that compose them, and, thus, depend on the protection and conservation of their biological diversity.

Landscape composition includes not only natural features and ecosystems, but also elements that are the result of human presence and activities, such as agro-ecosystems, set-

tlements, etc. Therefore, landscapes reflect the interaction of man and nature and contribute towards defining local identity through their specific features, becoming a key component of European natural and cultural heritage. Greece is a place where culture dates back millennia and has coevolved with the surrounding landscape. This phenomenon signifies the importance of Greek landscapes as components of national and European cultural and natural heritage. Finally, landscape is an important part of the quality of people's lives and contributes to their well-being, both in urban and rural areas.

Human activities often exert pressures on landscapes, degrading their biological diversity, which ultimately results in their deterioration. Therefore, it is necessary to formulate Landscape policy, which should be based on an integrated approach and be in accordance with the European Landscape Convention. According to the European Landscape Convention, landscape policy relies on competent authorities formulating general principles, strategies and guidelines for taking specific measures designed to protect and manage landscapes.

This policy has been incorporated into regional spatial planning. However, it must be integrated into all sectoral policies and all levels of spatial planning. The landscape policy should also be in accordance with the principles, objectives and actions of the Biodiversity Strategy. To maintain the diversity of landscapes in terms of biodiversity, it is very important to maintain the history of biodiversity as evidenced in many historical landscapes.

General Target 6 includes Specific Targets 6.1 - 6.3:

6.1 Completion of the integration of conservation landscape diversity policy into all sectoral policies.

6.2 Maintaining the diversity of the landscape both inside and outside of protected areas.

6.3 Conservation of unique landscapes.

C.2.7. General Target 7: Prevention and minimisation of the impacts of climate change on biodiversity

Climate change is recognised as an additional threat to biodiversity, both in terms of habitats and the ability of species to persist. It is obvious that the ecosystems in Greece will be significantly affected, because of the expected increase in average temperatures, more frequent extreme weather events and changes in precipitation and the possible reduction of available water quantity. When formulating management plans for biodiversity, it is important to take the impacts of climate change into consideration, to assess the species and habitats at risk from climate change and their ability to adapt to the new conditions it will bring, while enhancing, where possible, the possibility for biodiversity components to respond and effectively adapt. The consensus of relevant research is that it is possible for species and habitats to shift their geographical distributions in response to climate change[72]. A result of this shift in

72. Araujo et al. 2011 Climate change threatens European conservation areas. Ecology letters 14: 484-492

the geographical range of species and habitats is the probability that a proportion of species that are of conservation interest will be driven outside the boundaries of existing protected areas. Therefore, management measures should not only plan for the maintenance and restoration of healthy ecosystems, but also for enhancing the ability of these ecosystems to withstand the pressure of climate change and thereby avoid biodiversity loss as a result of this phenomenon.

The actions and measures to conserve biodiversity promoted in this National Biodiversity Strategy may also contribute towards addressing climate change, because healthy ecosystems may perform functions related to the regulation of the climate. More specifically, forests, seas and wetlands contribute to carbon sequestration and, thus, help to reduce concentrations of carbon dioxide and other greenhouse gases in the atmosphere.

However, actions to address climate change may have an impact on biodiversity conservation. Therefore, and in the context of integrating biodiversity conservation in all sectors of the economy, care should be taken that the various climate adaptation projects and their related infrastructure avoid or reduce their negative impacts on biodiversity. This integration is most effective if achieved during the planning stage of projects, plans and programmes to address climate change, and in the process of environmental impact assessment of the projects, so that these mitigation measures will be operational during implementation or construction and operation, as is the legal provision for all infrastructure that may have negative impacts on biodiversity.

General Target 7 includes Specific Targets 7.1 - 7.4:

7.1 Studying the effects of climate change on biodiversity and ecosystem functions.

7.2 Taking action so that the components of biodiversity will be able to adapt to climate change.

7.3 Reducing the impact of actions established to address climate change on biodiversity.

7.4 Enhancing the role of forests in mitigating the effects of climate change.

C.2.8. General Target 8: Protection of biodiversity from invasive alien species

Invasive species are alien species with the ability to spread in areas away from their typical distribution range, provided that they are dispersed in the new areas. Internationally, invasive alien species are considered as one of the major threats to biodiversity in terrestrial, freshwater and marine ecosystems. In Greece, invasive species that have created problems to native species and biodiversity have already been documented. This fact makes the adoption of preventive measures a critical priority, starting from the study and detection of invasive alien species already present in the country, as well as examining the way that they were introduced, so as to take the necessary steps to prevent the further invasion and spread of these species. Their invasion starts with intentional or accidental introduction and escape in

the terrestrial, freshwater or marine environment. Therefore, it is absolutely necessary to raise public awareness about the threat presented by alien species invasions.

Dealing with invasive species impacts on biodiversity requires early detection, continuous monitoring, measures to limit their consequences to biodiversity, and the effective implementation of the CITES Convention. In cases where biodiversity has been affected by invasive species, action is required to restore the system. The first step towards an action plan depends on the identification and mapping of species invasions in Greece.

General Target 8 includes Specific Targets 8.1 - 8.2:

8.1 Prevention, early detection and control of the introduction and spread of invasive species.

8.2 Taking action to restore the impacts of invasive alien species on biodiversity.

C.2.9. General Target 9: Enhancing international cooperation for biodiversity conservation

The cooperation regarding biodiversity management at international, regional and transnational levels has often proved effective for the conservation of biodiversity and ecosystem services. Promoting international cooperation on such issues should be an integral part of all bilateral relations of Greece and should be incorporated into development aid programmes between Greece and other countries.

The implementation of Greek obligations in the context of the international and regional environmental conventions that it has ratified, rely on effective international, regional and transnational cooperation between Greece and other countries. At the same time, through its participation in international forums and promoting the development and implementation of international environmental law, Greece will promote the synergy between international conventions related to biodiversity conservation, such as the United Nations Framework Convention on Climate Change and the United Nations Convention to Combat Desertification.

An additional way to promote international cooperation is the formulation and implementation of international programmes to transfer the know-how onto issues related to biodiversity conservation.

In addition to enhancing existing transboundary cooperation, such as the Transboundary Park of Prespa, priority should be given to the designation of new transboundary natural parks. However, international cooperation is not only limited to the creation of transboundary protected areas or areas in which common management actions may be applied, but it also includes programmes for the conservation of species and habitats whose ranges (and corresponding threats) transcend national borders.

General Target 9 includes Specific Targets 9.1 - 9.2:

9.1 Substantially enhancing the effectiveness of international, regional and transnational cooperation for the conservation of biodiversity and ecosystem services.

9.2 Enhancing transboundary cooperation for biodiversity conservation.


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C.2.10. General Target 10: Upgrading the quality and efficiency of public administration on biodiversity conservation

Progress in the implementation of the actions for biodiversity conservation, or lack of, is evidenced by the need to upgrade the quality and efficiency of public administration, both at an institutional (level) and at a scientific level. The complexity of the relevant regulations, the need for the integration of biodiversity conservation into all state policies, and the requirement for implementation and enforcement of environmental law require modern, appropriately staffed, coordinated and effective administration.

If the administration is to coordinate, formulate and implement policies and measures for biodiversity conservation (especially after the establishment of the Ministry of Environment, Energy and Climate Change), it is necessary to restructure institutional structures and to ensure their support with appropriate infrastructure and the necessary human resources, both at a central and a regional level. Furthermore, to address the problems of non-compliance and the inadequate enforcement of environmental legislation, it is essential to modernise and codify existing legislation and the establishment and enhancement of environmental control mechanisms.

Biodiversity issues are mainly overseen by the Ministry of Environment, Energy and Climate Change; however, other Ministries and Agencies are also involved. The issues that need to be addressed include: lack of coordination of actions by the competent authorities, staffing with qualified scientific personnel and shortfalls in training and providing incentives. With the aim to integrate biodiversity considerations into all sectoral policies, the Ministry of Environment, Energy and Climate Change will take the initiative to coordinate other Ministries and Agencies for the implementation of this strategy and achievement of its goals.

Biodiversity conservation requires resources that represent society's investment for the future, as they maintain the country's natural capital. Until today, the protection of biodiversity has been largely financed by EU funds and limited by nationally funded actions. To achieve the objectives of this Strategy, the country must ensure the national resources necessary for maintaining biodiversity. National resources should be allocated for the stable, permanent and adequate funding of the operation of the national system of protected areas, covering both their operating costs and the necessary actions to fulfil their roles, with these actions being implemented by the protected areas management agencies and/or other management institutions. Furthermore, community resources should be used to fund initiatives focused on protecting biodiversity.

General Target 10 includes Specific Targets 10.1 - 10.2:

10.1 Improving public administration in organisational issues, scientific issues and decision-making processes for the effective implementation of policies, measures and legislation on biodiversity.

10.2 Ensuring adequate funding for biodiversity conservation.

C.2.11. General Target 11: Integration of biodiversity conservation into the value system of society

Education and training are major factors that shape the values of society. For the integration of biodiversity conservation in society's value system, we should integrate biodiversity into all forms of formal and non-formal education. The value of biodiversity could be promoted by teaching issues regarding biodiversity and ecosystem protection through the curricula of primary and secondary education, by producing appropriate and attractive educational material, and by training teachers about biodiversity and its value. Since, the education of future generations is a priority for modern society, it is necessary to integrate the value of biodiversity conservation into education, training and lifelong-learning programmes. To achieve better and more effective integration of biodiversity conservation policies into all areas, it is essential to educate specific groups of the productive sector. Education, training and awareness of biodiversity require an interdisciplinary approach, since biodiversity is associated with all aspects of human life. Biodiversity is not only part of Biology, Physics and other related sciences, it is also part of History and Humanities.

An example of good practice, with a relevant educational programme for students of Primary and Secondary Education has been developed by the Environmental Education Centre of Kastoria since 1999[73]. In parallel, since 2003, this organisation, with the approval of the Ministry of Education, has coordinated the National Network of Schools (of both primary and secondary education) for Biodiversity under the title "Biodiversity Workshop Life"[74].

If we wish to promote the conservation of the national capital, which is the natural environment of the country, systematic communication and public awareness about biodiversity issues has to be an obligation. To ensure that the public becomes aware of the importance of conserving biodiversity and its benefits to the citizen from the ecosystem services provided by biodiversity, it is crucial to design and implement relevant action plans on the communication strategy for biodiversity and to use tools appropriate to the country's economic and social reality. There are many ways to communicate this message; however, in our digital era, the primary role will be of a special web portal for biodiversity, which will be regularly enriched and updated. Moreover, the media and other news outputs could play an important role. At the same time, the role of volunteers in actions designed to protect biodiversity should be encouraged, since they can contribute to biodiversity protection, in addition to changing the value system of our society.

General Target 11 includes Specific Targets 11.1 - 11.2:

11.1 Integrating biodiversity issues into formal and non-formal education, and promoting the value of biodiversity.

11.2 Promoting environmental awareness of biodiversity conservation.

73. For educational materials please see http://kpe-kastor.kas.sch.gr/ biodiversity_site/cgomain1.html
74. More information about the National Network of Schools for Biodiversity is available at: http://kpe-kastor.kas.sch.gr/biodiversity_net/index1.htm

C.2.12. General Target 12: Inspiring citizen participation in biodiversity conservation

Biodiversity conservation is a multi-layered and multidimensional problem; consequently, everyone must contribute. Therefore, citizen participation is a critical component towards the successful realisation of this Strategy and the achievement of its targets. In this context, it is necessary to institutionally establish the cooperation of citizens, social groups, scientists and public administration in the decision making process and in the monitoring of its implementation. Enhancing the implementation of laws arising from the Aarhus Convention and related EU directives, facilitates and safeguards citizens access to environmental information. Public consultation and participation in the decision making processes will contribute to social acceptance of measures and policies to protect biodiversity. Given the experience and the know-how of environmental non-governmental organisations, educational and research institutions, we should determine their role as social actors that may greatly contribute to biodiversity conservation.

The business sector has an important role to play, since its activities may affect biodiversity conservation. The relationship between businesses and biodiversity is twofold. On the one hand, firms may assist in promoting biodiversity conservation actions by developing and supporting Corporate Social Responsibility programmes, investing part of their profits in social projects that promote biodiversity conservation either within or outside the corporation concerned. On the other hand, equally important is their contribution through their investment choices and every day activities. Understanding that all actions have impacts, companies are encouraged to choose methods, practices and activities that have a beneficial impact on biodiversity and, simultaneously, mitigate their negative consequences. A key and decisive role in this decision is the integration of biodiversity into the design and appraisal of investment projects of enterprises.

General Target 12 includes Specific Targets 12.1 - 12.2:

12.1 Establishing cooperation among citizens, scientists and public administration in the decision making process and monitoring its implementation.

12.2 Promoting the accountability of companies in the context of biodiversity conservation.

C.2.13. General Target 13: Gaining appreciation of ecosystem services and promoting the value of Greek biodiversity

The value of biodiversity is granted, and so is the requirement for maintaining it. However, the value of biodiversity is more easily understood when it is described in terms of the vital functions of the planet and services that ecosystems provide to mankind.

The value of biodiversity and ecosystem services is not limited to valuation based on economic terms alone. An alternative approach is possible; an approach that is not limited to utilitarian valuation and that recognises the multiple values of nature, such as ecological, cultural, religious and aesthetic components. Economic value is only one aspect among many. Therefore, natural capital cannot be measured by a single criterion. Thus, we need the multi-criteria valuation of ecosystem services.

The loss of biodiversity is largely due to the notion that the irrational use of natural resources has no impact or cost. Therefore, information about socio-economic benefits enhances public awareness and highlights the challenge of biodiversity loss. In this context, a system of incentives will be organised and established so that it can reward the maintenance and improvement or adoption of environmentally-friendly practices based on expected socio-economic benefits.

Recently, and especially after the publication of the Millennium Ecosystem Assessment, the irreplaceable contribution of ecosystems to sustaining life on our planet became apparent, in addition to their importance for human well-being. In 2010 in Nagoya, the tenth Conference of the Parties of the CBD agreed that by 2020 biodiversity values will have been integrated into national and local development and poverty reduction strategies and planning processes, and are now being incorporated into national accounting, as appropriate, and reporting systems (Aichi target 2). This target is also adopted in the European Biodiversity Strategy, and the mapping of ecosystem services has already started, so that it will become feasible to incorporate them into national and European accounting systems[75]. Greece is committed to applying these strategies, but it has not yet begun evaluating and mapping its ecosystem services.

The value that biodiversity services provide for the functioning of society and the economy is critical and is directly linked to human well-being. The valuation of social and economic benefits provided by biodiversity in Greece and the costs of biodiversity loss and ecosystem processes will be an important tool for the protection of biodiversity and ecosystems. Beyond the ecological benefits, particularly important is the evaluation of socio-economic benefits provided by protected areas, e.g. as fisheries reserves in an otherwise overfished marine area. Such an assessment may contribute towards increasing public acceptance of and support for the national system of protected areas.

The concept of "natural green infrastructure" is a different approach to biodiversity conservation. This concept changes our perception of ecosystems, because it highlights the services

75. BASE 2013.Ecosystem Assessment in Europe. Available at: http://biodiversity.europa.eu/ecosystemassessments/european-level



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they provide, which might be replaced by manmade means, but with greater financial cost compared to the cost of protecting ecosystems. Essentially, it is a network of natural agricultural, freshwater and marine areas, including national parks, forests and other areas, which, as a network, regulate the water cycle, have a role in temperature regulation, decrease the risks of flooding, improve air quality, etc. In many cases, the ecosystems that could provide such functions and services have been degraded or destroyed by human activities. To promote and preserve ecosystems and the functions they provide, a national system of incentives should be established, with particular emphasis given to the mapping and preservation of natural floodplains, an obligation arising from the relevant European Directive 2007/60/EC. Furthermore, given the ecological functions associated with the green infrastructure in urban overpopulated areas, creating and maintaining biodiversity islands within the urban fabric should be considered as a priority.

General Target 13 includes Specific Targets 13.1 - 13.3:

13.1 Valuation of ecosystem functions and services in social and economic terms.

13.2 Promotion of the value of biodiversity and the services provided by biodiversity and ecosystems.

13.3 Promotion, establishment and maintenance of natural green infrastructure.

Table C1: General and Special Targets of the Strategy for Biodiversity

General Target 1: **Increasing knowledge about the assessment of biodiversity status**	1.1 Facilitate access to scientific knowledge (regarding Greek flora and fauna) and fill the gaps in scientific data.
	1.2 Facilitate access to information on actions for biodiversity conservation and monitoring, as well as the implementation of the National Strategy.
General Target 2: **Conservation of national natural capital and ecosystem restoration**	2.1 Conservation of species and habitat types in Greek terrestrial and marine ecosystems, to promote the goal of sustainability.
	2.2 Restoration of important species and habitat types.
General Target 3: **Organisation and operation of a National System of Protected Areas and enhancement of benefits from their management**	3.1 Effective organisation of the administration and management of protected areas and implementing preventive measures in protected areas.
	3.2 Application of exemplary and innovative practices in the productive sectors and tourism based on the areas management plans for biodiversity conservation and management.
	3.3 Design, and possible integration, of ecological corridors of special designation status and their effective management.
General Target 4: **Conservation of the genetic resources of Greece – Facilitating access to genetic resources – Fair and equitable sharing of the benefits arising from their utilisation**	4.1 Ensuring access to scientific records of genetic resources and filling gaps in scientific data.
	4.2 *In situ* and / or *ex situ* conservation of Greek genetic resources.
	4.3 Facilitating access to genetic resources and the fair and equitable sharing of benefits arising from the utilisation of genetic resources.
	4.4 Study, prevention and reduction of the impact of Genetically Modified Organisms on biodiversity.

General Target 5: Enhancing the synergies among the main sectoral policies for the conservation of biodiversity. Establishing incentives.	5.1 Effective integration of biodiversity conservation at all levels of spatial planning.
	5.2 Minimise impacts of large infrastructure projects.
	5.3 Ensure the compatibility of residential and industrial development activities (including conventional energy production) with biodiversity conservation.
	5.4 Ensure the compatibility of tourist activities with biodiversity conservation.
	5.5 Ensure the compatibility of agricultural, fisheries, and forestry activities with biodiversity conservation.
	5.6 Ensure the compatibility of energy production activities and infrastructure (including renewable energy) with biodiversity conservation.
	5.7 Ensure the compatibility of mining activities with biodiversity conservation.
	5.8 Ensure the compatibility of other activities (like hunting, collection of plants or animals) with biodiversity conservation.
General Target 6: Conservation of landscape diversity	6.1 Completion of integration of conservation landscape diversity policy into all sectoral policies.
	6.2 Maintaining the diversity of the landscape both inside and outside of protected areas.
	6.3 Conservation of unique landscapes.
General Target 7: Prevention and minimisation of the impacts of climate change on biodiversity	7.1 Study the effects of climate change on biodiversity and ecosystem functions.
	7.2 Take action so that the components of biodiversity will be able to adapt to climate change.
	7.3 Reduce the impacts of actions established to address climate change on biodiversity.
	7.4 Enhance the role of forests in mitigating the effects of climate change.

General Target 8: Protection of biodiversity from invasive alien species	8.1 Prevention, early detection, and controlling the introduction and spread of invasive species.
	8.2 Taking action to restore the impacts of invasive alien species on biodiversity.
General Target 9: Enhancing international cooperation for biodiversity conservation	9.1 Substantially enhancing the effectiveness of international, regional and transnational cooperation for the conservation of biodiversity and ecosystem services.
	9.2 Enhancing transboundary cooperation for biodiversity conservation.
General Target 10: Upgrade the quality and efficiency of public administration on biodiversity conservation	10.1 Improving public administration in organisational issues, scientific issues and decision-making processes for the effective implementation of policies, measures and legislation on biodiversity.
	10.2 Ensuring adequate funding for biodiversity conservation.
General Target 11: Integration of biodiversity conservation in the value system of societies	11.1 Integrating biodiversity issues in formal and non-formal education and the promotion of the value of biodiversity.
	11.2 Promoting environmental awareness in biodiversity conservation.
General Target 12: Citizen participation in biodiversity conservation	12.1 Establishment of cooperation among citizens, scientists and public administration in the decision making process and monitoring of its implementation.
	12.2 Promoting the accountability of companies in the context of biodiversity conservation.
General Target 13: Appreciation of ecosystem services and the promotion of the value of Greek biodiversity	13.1 Valuation of ecosystem functions and services in social and economic terms.
	13.2 Promotion of the value of biodiversity and the services provided by biodiversity and ecosystems.
	13.3 Promotion, establishment and maintenance of natural green infrastructure.



CHAPTER D

MONITORING AND EVALUATING THE IMPLEMENTATION OF THE NATIONAL BIODIVERSITY STRATEGY

D.1. Monitoring

The duration of the National Biodiversity Strategy is set to last for 15 years. Within this time framework, the foundations should be set for future actions beyond this time point. The successful implementation of the National Strategy requires the continuous monitoring and evaluating the implementation process. The Ministry of Environment, Energy and Climate Change is the main administrative institute responsible for implementing this strategy and for coordinating the other Ministries and Agencies involved in the process.

The National Biodiversity Strategy will be reviewed and amended every five years. To this end, the Ministry will establish a competent service that will prepare reports on the implementation process every five years. The first review is planned for 2020, so as to be combined with the corresponding review for the European Biodiversity Strategy, and the United Nations Strategic Action Plan for Biodiversity 2011–2020, which includes the Aichi targets for biodiversity. The implementation of the National Biodiversity Strategy relies on the Action Plans, which will be prepared with a five- year horizon.

There is a need to establish a monitoring system that quantifies the successful implementation of the strategy based on a set of indicators. The monitoring system will be completed with the preparation of a report to be included in the Action Plan for the first five-year period (2014–2019) under the General Target 1: "Increase of knowledge about the assessment of biodiversity status", Specific Target 1.1: "Facilitate access to scientific knowledge (regarding Greek flora and fauna) and fill the gaps in scientific data". Some preliminary indicators of the successful implementation of each target are presented in Table D1.

Table D1: Summary table of the general and specific targets of the National Biodiversity Strategy and indicative implementation indicators.

No	General Target	Specific Target
1	**Increasing knowledge about the assessment of biodiversity status**	**1.1** Facilitate access to scientific knowledge (regarding Greek flora and fauna) and fill the gaps in scientific data. **1.2** Facilitate access to information on actions for biodiversity conservation and monitoring, as well as the implementation of the National Strategy.
Implementation indicator		
	• Number of databases that operate and facilitate access to data • Number of records imported into databases • Traffic of websites providing access to these databases • Detailed information on funding to enhance the biodiversity research • Degree of completion of the national database for the Greek flora, fauna and habitat types (vegetation) • Updating of the National Red Data Books for plants and animals • Degree of completion of the national database for fungi • Degree of completion of the Soil Map of the country • Progress in defining soil quality indicators	

No	General Target	Specific Target
2	**Conservation of national natural capital and ecosystem restoration**	**2.1** Conservation of species and habitat types in Greek terrestrial and marine ecosystems, to promote the goal of sustainability. **2.2** Restoration of important species and habitat types.
Implementation indicator		
	• Abundance and distribution of selected species (SEBI 1)[76] (present situation and change in trends) • Red List Index for European species (SEBI 2) • Species of European interest (SEBI 3) • Degree of completion of the fungi list of endangered species • Degree of completion of the list of important species • Degree of completion of the list of important habitat types • Number of action plans realised for the protection of biodiversity of species and habitat types or for the restoration of fragile ecosystems (either within or outside protected areas) • Number and area covered by sites that were ecologically restored and mean duration of this restoration	

76. SEBI 2010 (Streamlining European 2010 Biodiversity Indicators) is a European initiative to develop indicators to assess Europe's success in halting biodiversity loss. The programme was implemented in a partnership among the European Environment Agency, the European Commission - DG Environment the European Centre for Nature Conservation, and the Secretariat of the UNEP / PEBLDS and UNEP-WCMC. The first phase of the programme began in 2005, and the moderation team involved more than 100 scientists and NGO representatives from European states.

No	General Target	Specific Target
3	**Organisation and operation of a National System of Protected Areas and enhancement of benefits from their management**	**3.1** Effective organisation of the administration and management of protected areas and implementation of preventive measures in protected areas. **3.2** Application of exemplary and innovative practices in the productive sectors and tourism based on the areas management plans for biodiversity conservation and management. **3.3** Design, and possible integration of ecological corridors, of special designation status and their effective management.
Implementation indicator		
	• Number of protected areas • Area covered by Protected Areas (SEBI 7) • Area occupied by habitats of European interest (SEBI 5) • Fragmentation of river systems (SEBI 14) • Degree of completion of the definition of the boundaries of important or threatened small size wetlands • Degree of completion of delineation of ecological corridors • Number of formulated management plans for protected areas • Level of implementation and success of the management plans in each protected area	

No	General Target	Specific Target
4	**Conservation of the genetic resources of Greece – Facilitating access to genetic resources – Fair and equitable sharing of the benefits arising from their utilisation**	**4.1** Ensuring access to scientific records of genetic resources and filling gaps in scientific data. **4.2** *In situ* and / or *ex situ* conservation Greek genetic resources. **4.3** Facilitating access to genetic resources and the fair and equitable sharing of the benefits arising from the utilisation of genetic resources. **4.4** Study, prevention and reduction of the impact of Genetically Modified Organisms on biodiversity.
Implementation indicator		
	• Ex situ collection of germplasm for cultivated plant species • Number of important species (endemic, threatened, rare) that are represented in *ex situ* conservation collections in Greece • Livestock genetic diversity (SEBI 6) • Number of licences to access genetic resources in the country	

No	General Target	Specific Target
5	**Enhancing the synergies among the main sectoral policies for the conservation of biodiversity. Establishing incentives**	**5.1** Effective integration of biodiversity conservation at all levels of spatial planning. **5.2** Minimise the impacts of large infrastructure projects. **5.3** Ensure the compatibility of residential and industrial development activities (including conventional energy production) with biodiversity conservation. **5.4** Ensure the compatibility of tourist activities with biodiversity conservation. **5.5** Ensure the compatibility of agricultural, fisheries and forestry activities with biodiversity conservation. **5.6** Ensure the compatibility of energy production activities and infrastructure (including renewable energy) with biodiversity conservation. **5.7** Ensure the compatibility of mining activities with biodiversity conservation. **5.8** Ensure the compatibility of other activities (like hunting and the collection of plants or animals) with biodiversity conservation.
Implementation indicator		
	• Fragmentation of natural and semi-natural areas (SEBI 13) • Degree of completion of land-use maps and evaluation of agricultural land • Degree of completion of Cadaster and Forest registry • Number and Area covered by High Nature Value lands • Number of forest management plans in the context of promoting their contribution to biodiversity conservation and climate change mitigation and adaptation • Area covered by organic farming • Area covered and number of participants in agri-environmental actions • Presence of avifauna in cultivated lands • Number of spatial plans officially adopted • Number of illegal buildings in protected areas, forests, other wooded lands, and near the sea that have been demolished. • Number of areas protected from fishing • Number of certified companies contributing to biodiversity conservation • Number of penalties (civil or criminal) enforced for the violation of environmental law	

No	General Target	Specific Target
6	**Conservation of landscape diversity**	**6.1** Completion of integration of conservation landscape diversity policy into all sectoral policies. **6.2** Maintaining landscape diversity both inside and outside of protected areas. **6.3** Conservation of unique landscapes.
Implementation indicator		
	• Number of protected agricultural landscapes • Number of protected cultural landscapes • Number of protected unique landscapes • Resources for the Green Fund derived from fines for violations of environmental legislation	

No	General Target	Specific Target
7	**Prevention and minimisation of the impacts of climate change on biodiversity**	**7.1** Study the effects of climate change on biodiversity and ecosystem functions. **7.2** Take action so that the components of biodiversity will be able to adapt to climate change. **7.3** Reduce the biodiversity impacts of actions established to address climate change. **7.4** Enhance the role of forests in mitigating the effects of climate change.
Implementation indicator		
	• Mapping high risk areas concerning climate change impacts • List of the occurrence of temperature-sensitive species |(SEBI 11)	

No	General Target	Specific Target
8	**Protection of biodiversity from invasive alien species**	**8.1** Prevention, early detection and control of the introduction and spread of invasive species. **8.2** Taking action to restore the impacts of invasive alien species on biodiversity.
Implementation indicator		
	• Inventory of Invasive alien species in Europe and of their means of entry into Europe (SEBI 10) • System of early detection and immediate response to invasive species • Information about the restoration of native biodiversity affected by invasive species	

No	General Target	Specific Target
9	**Enhancing international cooperation for biodiversity conservation**	**9.1** Substantially enhancing the effectiveness of international, regional and transnational cooperation for the conservation of biodiversity and ecosystem services. **9.2** Enhancing transboundary cooperation for biodiversity conservation.
Implementation indicator		
	• Number of bilateral and multilateral agreements on biodiversity issues at the international and regional level	

No	General Target	Specific Target
10	**Upgrading the quality and efficiency of public administration on biodiversity conservation**	**10.1** Improving public administration in organisational issues, scientific issues and the decision-making process for the effective implementation of policies, measures and legislation on biodiversity. **10.2** Ensuring adequate funding for biodiversity conservation.
Implementation indicator		
	• Fulfilment of national, European and international commitments to biodiversity conservation, such as updating strategies, completion of monitoring and submitting reports on time, etc. • Training of public servants (proportion of relevant staff trained) • Degree of integration of biodiversity conservation policy into other sectoral policies • Information about financing biodiversity management (SEBI 25) • Resources of the Green Fund made available for the management of Protected Areas	

No	General Target	Specific Target
11	**Integration of biodiversity conservation into the value system of society**	**11.1** Integrating biodiversity issues into formal and non-formal education and the promotion of the value of biodiversity. **11.2** Promoting environmental awareness in biodiversity conservation
Implementation indicator		
	• Number and budget of management plans for specific target taxa and for each geographic region • Number of TV shows focused on biodiversity • Number of environmental education projects involving the Management Agencies of Protected Areas	

α/α	Γενικός στόχος	Specific Target
12	**Citizen participation in biodiversity conservation**	**12.1** Establishment of cooperation among citizens, scientists and public administration in the decision making process and monitoring of its implementation. **12.2** Promoting the accountability of companies in the context of biodiversity conservation.
Implementation indicator		
	• Number of firms selected as candidates for the prize "Entrepreneurship and Biodiversity" • Number of firms that undertake or contribute to the awareness and protection of biodiversity through their own resources	

α/α	Γενικός στόχος	Specific Target
13	**Appreciation of ecosystem services and the promotion of the value of Greek biodiversity**	**13.1** Valuation of ecosystem functions and services in social and economic terms. **13.2** Promotion of the value of biodiversity and the services provided by biodiversity and ecosystems. **13.3** Promotion, establishment and maintenance of natural green infrastructure.
Implementation indicator		
	• Degree of completion of the economic valuation of ecosystem services of the Greek natural ecosystems	



COMPARATIVE TABLE
of Aichi Biodiversity Targets – EU Biodiversity Targets for 2020 – National Biodiversity Strategy Targets

CBD biodiversity strategy Aichi targets for 2020	EU Biodiversity Targets for 2020	National Biodiversity Strategy Targets for 2020
Target 1: By 2020, at the latest, people are to have become aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.	**TARGET 1:** To fully implement the Birds and Habitats Directives **Action 3a:** The Commission, together with Member States, will have developed and launched a major communication campaign on Natura 2000 by 2013	**Specific target 11.1** Integrating biodiversity issues in formal and non-formal education and the promotion of the value of biodiversity, and **Specific target 11.2** Promoting environmental awareness of biodiversity conservation **General Target 1:** Increase knowledge for the assessment of biodiversity status

CBD biodiversity strategy Aichi targets for 2020	EU Biodiversity Targets for 2020	National Biodiversity Strategy Targets for 2020
Target 2: By 2020, at the latest, biodiversity values are to have been integrated into national and local development and poverty reduction strategies and planning processes and are now being incorporated into national accounting, as appropriate, and reporting systems.	**TARGET 2:** To maintain and enhance ecosystems and their services **Action 5:** Improve knowledge of ecosystems and their services in the EU (Member States, with the assistance of the Commission, will have mapped and assessed the state of ecosystems and their services in their national territory by 2014, by assessing the economic value of such services, and by promoting the integration of these values into accounting and reporting systems at an EU and national level by 2020)	**General Target 2:** Conservation of national natural capital and ecosystem restoration **General Target 11:** Integration of biodiversity conservation in the value system of the society **General Target 13:** Appreciation of ecosystem services and promotion of the value of Greek biodiversity

CBD biodiversity strategy Aichi targets for 2020	EU Biodiversity Targets for 2020	National Biodiversity Strategy Targets for 2020
Target 3: By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are to have been eliminated, phased out or reformed in order to minimise or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are to be developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.	**TARGET 3:** To increase the contribution of agriculture and forestry to maintaining and enhancing biodiversity **Actions 8-12** **TARGET 4:** To ensure the sustainable use of fisheries resources **Actions 13-14**	**General Target 5:** Enhancing the synergies among the main sectoral policies for the conservation of biodiversity. Establishing incentives **General Target 7:** Prevention and minimisation of the impacts of climate change on biodiversity

CBD biodiversity strategy Aichi targets for 2020	EU Biodiversity Targets for 2020	National Biodiversity Strategy Targets for 2020
Target 4: By 2020, at the latest, Governments, business and stakeholders at all levels will have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.	**TARGET 3:** To increase the contribution of agriculture and forestry to maintaining and enhancing biodiversity **Actions 8-12** **TARGET 4:** To ensure the sustainable use of fisheries resources **Actions 13-14** **TARGET 6:** To help avert global biodiversity loss **Actions 17-20**	**General Target 5:** Enhancing the synergies among the main sectoral policies for the conservation of biodiversity. Establishing incentives **General Target 12:** Citizen participation in biodiversity conservation

CBD biodiversity strategy Aichi targets for 2020	EU Biodiversity Targets for 2020	National Biodiversity Strategy Targets for 2020
Target 5: By 2020, the rate of loss of all natural habitats, including forests, is to have been at least halved and where feasible brought close to zero, and degradation and fragmentation is to have been significantlyreduced.	All targets contribute to this international goal	**General Target 2:** Conservation of national natural capital and ecosystem restoration **General Target 3:** Organisation and operation of a National System of Protected Areas and enhancement of benefits from their management All general targets contribute to the achievement of this goal

CBD biodiversity strategy Aichi targets for 2020	EU Biodiversity Targets for 2020	National Biodiversity Strategy Targets for 2020
Target 6: By 2020 all fish and invertebrate stocks and aquatic plants are to have been managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.	**TARGET 4:** To ensure the sustainable use of fisheries resources **Actions 13-14** Targets 1 and 5 indirectly contribute to this goal **TARGET 1:** To fully implement the Birds and Habitats Directives **TARGET 5:** To control invasive alien species	**General Target 5:** Enhancing the synergies among the main sectoral policies for the conservation of biodiversity. Establishing incentives The following Targets 2, 3 and 8 indirectly contribute to this goal **General Target 2:** Conservation of national natural capital and ecosystem restoration **General Target 3:** Organisation and operation of a National System of Protected Areas and enhancement of benefits from their management **General Target 8:** Protection of biodiversity from invasive alien species

CBD biodiversity strategy Aichi targets for 2020	EU Biodiversity Targets for 2020	National Biodiversity Strategy Targets for 2020
Target 7: By 2020 areas under agriculture, aquaculture and forestry are to have been managed sustainably, ensuring conservation of biodiversity.	**TARGET 3:** To increase the contribution of agriculture and forestry to maintain and enhance biodiversity **Actions 8-12** **TARGET 4:** To ensure the sustainable use of fisheries resources **Actions 13-14**	**General Target 5:** Enhancing the synergies among the main sectoral policies for the conservation of biodiversity. Establishing incentives

CBD biodiversity strategy Aichi targets for 2020	EU Biodiversity Targets for 2020	National Biodiversity Strategy Targets for 2020
Target 8: By 2020, pollution, including that from excess nutrients, will have been brought to levels that are not detrimental to ecosystem function and biodiversity.	There is no relevant provision in the European Strategy. However, there is extensive European legislation on pollution control (including provisions on nitrates, pesticides, air pollution, chemical industries, etc.)	**General Target 5:** Enhancing the synergies among the main sectoral policies for the conservation of biodiversity. Establishing incentives

CBD biodiversity strategy Aichi targets for 2020	EU Biodiversity Targets for 2020	National Biodiversity Strategy Targets for 2020
Target 9: By 2020, invasive alien species and pathways are to have been identified and prioritised, priority species are to have been controlled or eradicated, so that measures are in place to manage pathways to prevent their introduction and establishment.	**TARGET 5:** To control invasive alien species **Action 15:** Strengthen the EU Plant and Animal Health Regimes **Action 16:** Establish a dedicated instrument on Invasive Alien Species	**General Target 8:** Protection of biodiversity from invasive alien species

CBD biodiversity strategy Aichi targets for 2020	EU Biodiversity Targets for 2020	National Biodiversity Strategy Targets for 2020
Target 10: By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification, are to have been minimised, so as to maintain their integrity and functioning.	There is no relevant provision in the European Strategy. However, EU's commitment to responding to climate change will contribute.	**General Target 5:** Enhancing the synergies among the main sectoral policies for the conservation of biodiversity. Establishing incentives Targets 2 and 3 indirectly contribute to this goal

CBD biodiversity strategy Aichi targets for 2020	EU Biodiversity Targets for 2020	National Biodiversity Strategy Targets for 2020
Target 11: By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are to have been conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.	**TARGET 1**: To fully implement the Birds and Habitats Directives **Actions 1-4** Targets 3 and 4 indirectly contribute to this goal **TARGET 3:** To increase the contribution of agriculture and forestry to maintaining and enhancing biodiversity **Actions 8-12** **TARGET 4:** To ensure the sustainable use of fisheries resources **Actions 13-14**	**General Target 2:** Conservation of national natural capital and ecosystem restoration **General Target 3:** Organization and operation of a National System of Protected Areas and enhancement of the benefits from their management Target 5 indirectly contribute to this goal

CBD biodiversity strategy Aichi targets for 2020	EU Biodiversity Targets for 2020	National Biodiversity Strategy Targets for 2020
Target 12: By 2020 the extinction of known threatened species will have been prevented and their conservation status, particularly of those most in decline, will have been improved and sustained.	All targets will contribute to this goal	**General Target 1**: Increase knowledge about the assessment of biodiversity status **General Target 2:** Conservation of national natural capital and ecosystem restoration **General Target 3:** Organisation and operation of a National System of Protected Areas and enhancement of the benefits from their management All general targets contribute to the achievement of this goal

CBD biodiversity strategy Aichi targets for 2020	EU Biodiversity Targets for 2020	National Biodiversity Strategy Targets for 2020
Target 13: By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is to have been maintained, and strategies will have been developed and implemented for minimising genetic erosion and safeguarding their genetic diversity.	**TARGET 3:** To increase the contribution of agriculture and forestry to maintaining and enhancing biodiversity **Action 10:** Conserve Europe's agricultural genetic diversity	**General Target 1**: Increase knowledge about the assessment of biodiversity status **General Target 2:** Conservation of national natural capital and ecosystem restoration **General Target 3:** Organisation and operation of a National System of Protected Areas and enhancement of the benefits from their management All general targets contribute to the achievement of this goal

CBD biodiversity strategy Aichi targets for 2020	EU Biodiversity Targets for 2020	National Biodiversity Strategy Targets for 2020
Target 14: By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are to have been restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.	**TARGET 2:** To maintain and enhance ecosystems and their services **Action 6:** Set priorities to restore and promote the use of green infrastructure Targets 1, 3, 4 and 5 indirectly contribute to this goal	**General Target 1**: Increase knowledge about the assessment of biodiversity status **General Target 2:** Conservation of national natural capital and ecosystem restoration **General Target 3:** Organisation and operation of a National System of Protected Areas and enhancement of the benefits from their management **General Target 5:** Enhancing the synergies among the main sectoral policies for the conservation of biodiversity. Establishing incentives **General Target 8:** Protection of biodiversity from invasive alien species

CBD biodiversity strategy Aichi targets for 2020	EU Biodiversity Targets for 2020	National Biodiversity Strategy Targets for 2020
Target 15: By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks will have been enhanced, through conservation and restoration, including the restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.	**TARGET 1**: To fully implement the Birds and Habitats Directives **TARGET 2:** To maintain and enhance ecosystems and their services Targets 3 and 4 indirectly contribute to this goal **TARGET 3:** To increase the contribution of agriculture and forestry to maintaining and enhancing biodiversity **TARGET 4:** To ensure the sustainable use of fisheries resources	**General Target 2:** Conservation of national natural capital and ecosystem restoration **General Target 3:** Organisation and operation of a National System of Protected Areas and enhancement of the benefits from their management **General Target 5:** Enhancing the synergies among the main sectoral policies for the conservation of biodiversity. Establishing incentives **General Target 7:** Prevention and minimisation of the impacts of climate change on biodiversity

CBD biodiversity strategy Aichi targets for 2020	EU Biodiversity Targets for 2020	National Biodiversity Strategy Targets for 2020
Target 16: By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is to have been in force and operational, consistent with national legislation.	**TARGET 6:** To help avert global biodiversity loss **Action 20:** Regulate access to genetic resources and the fair and equitable sharing of the benefits arising from their use	**General Target 4:** Conservation of the genetic resources of Greece – Facilitating access to genetic resources – Fair and equitable sharing of the benefits arising from their utilisation

CBD biodiversity strategy Aichi targets for 2020	EU Biodiversity Targets for 2020	National Biodiversity Strategy Targets for 2020
Target 17: By 2015 each Party will have developed, adopted as a policy instrument, and commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.	The EU biodiversity strategy *per se* is the realisation of this target	The Greek national biodiversity strategy *per se* is the realisation of this target

CBD biodiversity strategy Aichi targets for 2020	EU Biodiversity Targets for 2020	National Biodiversity Strategy Targets for 2020
Target 18: By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are to have been respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.	There is no relevant provision in the EU strategy. Traditional knowledge is within each Member State's purview	There are no indigenous communities (as defined in the Convention on Biological Diversity) in Greece.

CBD biodiversity strategy Aichi targets for 2020	EU Biodiversity Targets for 2020	National Biodiversity Strategy Targets for 2020
Target 19: By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are to have been improved, widely shared and transferred, and applied.	Cross-cutting issue throughout the EU Strategy	**General Target 1**: Increase knowledge for the assessment of biodiversity status **General Target 12:** Citizen participation in biodiversity conservation Cross-cutting issue throughout the national strategy

CBD biodiversity strategy Aichi targets for 2020	EU Biodiversity Targets for 2020	National Biodiversity Strategy Targets for 2020
Target 20: By 2020, at the latest, the mobilisation of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilisation, should have increased substantially above the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.	**TARGET 6:** To help avert global biodiversity loss **Action 18:** Mobilise additional resources for global biodiversity conservation	**General Target 13:** Appreciation of ecosystem services and promotion of the value of Greek biodiversity



MINISTRY OF ENVIRONMENT ENERGY & CLIMATE CHANGE

PART B

ACTION PLAN FOR BIODIVERSITY



ACTION PLAN
FOR THE IMPLEMENTATION OF THE BIODIVERSITY STRATEGY

Specific Targets	Actions for achieving the specific targets (2014-2018)
General Target 1 **Increasing knowledge about the assessment of biodiversity status**	
1.1 Facilitating access to scientific knowledge (regarding Greek flora and fauna) and filling the gaps in scientific data.	1.1.1 Creation of the biodiversity database of Greece (for flora, fauna, habitat types) and interface with existing or new databases (e.g. forestry maps, cadastre, forest inventory etc). – Creation of the Greek "Biodiversity Portal" according to the standards of other European countries. Mapping the distribution of species and habitats in detailed geographical maps (atlases for flora and fauna) and interfacing with global initiatives for recording biodiversity. 1.1.2 Inventory of biodiversity in Greece – Evaluation of trends and threats (taking into account alien invasive species) – Enhancing and contributing to the organisation and preservation of museum collections of representative samples of all species of Greek flora and fauna in natural history museums and other relevant collections throughout Greece. 1.1.3 Continuous accumulation of knowledge about the components of biodiversity (support for field research on species, habitat types and ecosystems) 1.1.4 Establishment and organisation of monitoring and evaluation of the implementation of the strategy (using monitoring indicators), in collaboration with other relevant Ministries 1.1.5 Completion, continuous updating, upgrading and expansion of the National Database for Hydrological and Meteorological Information and interface with spatial biodiversity databases
1.2 Facilitating access to information on actions for biodiversity conservation and monitoring, as well as implementing the National Strategy.	1.2.1 Establishment and operation of a system for feedback and update of databases and their efficient management 1.2.2 Support for applied research on conservation management of species and habitat types


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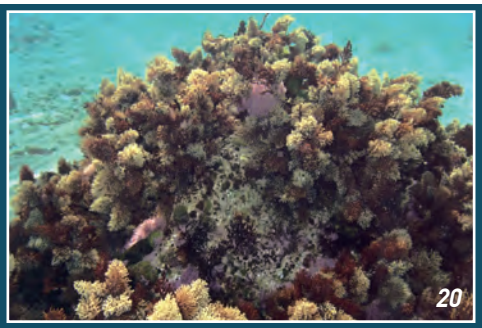

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Specific Targets	Specific Targets
General Target 2 Conservation of national natural capital and ecosystem restoration	
2.1 Ensuring the conservation of species and habitat types in Greek terrestrial and marine ecosystems, to promote the goal of sustainability.	2.1.1 Identification and institutional designation of important species and habitat types (creation of a national list of important flora, fauna species and other groups of organisms, as well as of natural habitat types) 2.1.2 Creation of a national list of endemic species of flora, fauna and other groups of organisms, as well as of natural habitat types 2.1.3 Preparation of a guide for the recognition of the most important endemic species of flora, fauna and other groups of organisms for each conservation risk category 2.1.4 Coding of forest law 2.1.5 Updating the Red Lists for flora, fauna and creation of a Red List for fungi 2.1.6 Preparation of action plans for the important species and habitat types with priority to species with unfavourable conservation status 2.1.7 Mapping of the ranges of species and habitat types with priority to the species of Community interest 2.1.8 Achieving continued support for the implementation of programmes for monitoring the quality and quantity of surface and ground water 2.1.9 Conducting a review of the status of marine waters, definition of good environmental status, establishment of environmental targets and relevant indicators, establishment and implementation of a monitoring programme 2.1.10 Monitoring and keeping under surveillance the conservation status of species and habitat types of Community and National interest 2.1.11 Defining the conservation objectives for habitat types and species, according to the provisions of Directive 92/43/EOK and Law 3937/2011
2.2 Ensuring the restoration of important species and habitat types.	2.2.1 Implementing action plans for important species and habitat types in the country-selection and utilisation of existing action plans (e.g. results of Life projects) 2.2.2 Applying horizontal management and recovery actions for species and habitat types in Greece, taking into consideration the adaptation to climate change (enhancing services and improving infrastructure and mechanisms for prevention and management of risks, such as wildfires, floods etc., horizontal protection measures for the avifauna etc., creation of infrastructure inside protected areas for the protection of seagrass beds, preparation of guides for the creation of artificial wetlands so as to account for the needs of biodiversity conservation, habitat protection measures against erosion, alkalisation, salinisation and desertification etc.)

Specific Targets	Actions for achieving the specific targets (2014-2018)
General Target 3 Organisation and operation of a National System of Protected Areas and enhancement of the benefits from their management	
3.1 Effectively organising the administration and management of protected areas and implementation of preventive measures in protected areas.	3.1.1 Designation as protected of the areas that fulfill the necessary criteria, after consultation with the relevant Ministries 3.1.2 Mapping and assessment of the status of ecosystems and the services they provide 3.1.3 Creation of a database with all available information about the boundaries of protected areas, the delineation of zones established in them, the conservation terms, the ecological and conservation management status of all protected areas 3.1.4 Delineation of important or endangered wetlands, with emphasis on terrestrial wetlands of medium and small size 3.1.5 Specification, development and implementation of management plans, accompanied by action plans, after consultation with the relevant Ministries 3.1.6 Establishment and operation of a system of monitoring based on indicators, focusing on maintaining the favourable status of the conservation objects 3.1.7 Protection measures and actions for the recovery and restoration of wetlands with priority on Wetlands of International Importance (Ramsar) and especially those directly threatened with irreversible loss of biodiversity 3.1.8 Development and implementation of a system for guarding these areas 3.1.9 Management of maritime traffic and fisheries, according to the findings of the assessment of the maritime traffic and fisheries effects on protected areas 3.1.10 Establishment, enhancement and operational support for management schemes of protected areas 3.1.11 Development of a system for remote sensing monitoring of terrestrial protected areas of the 'Natura 2000' network
3.2 Achieving the application of exemplary and innovative practices in the productive sectors and tourism based on the areas management plans for biodiversity conservation and management.	3.2.1 Documenting the identification of other areas (terrestrial and marine) that meet the criteria for inclusion in the 'Natura 2000' network – Achieving the completion of the national list of SCIs with integration of new marine areas into the 'Natura 2000' network 3.2.2 Setting objectives, measures and conservation priorities for each Special Area of Conservation (SAC) and Special Protection Area (SPA) 3.2.3 Implementing conservation measures and management plans for each Special Area of Conservation (SAC) and Special Protection Area (SPA) 3.2.4 Applying horizontal conservation management measures for each habitat type and species listed in the relevant European Directives 3.2.5 Developing a framework for the implementation of compensatory measures, as provided for in Article 6 (4) of Directive 92/43/EEC (setting standards, criteria, conditions and competent service for implementation of compensatory measures) 3.2.6 Ensuring the development and implementation of a priority actions framework for funding the areas of the 'Natura 2000' network

Specific Targets	Actions for achieving the specific targets (2014-2018)
General Target 3 **Organisation and operation of a National System of Protected Areas and enhancement of the benefits from their management**	
3.3 Designing and possibly integrating ecological corridors, of special designation status and their effective management.	3.3.1 Identifying the species whose conservation requires the definition and delineation of ecological corridors and protected areas – Securing the establishment of the ecological corridors as a tool that enhances the coherence of the National System of Protected Areas 3.3.2 Achieving the determination and implementation of conservation management measures within the ecological corridors


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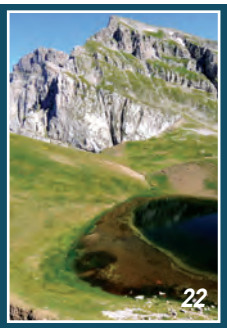

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Specific Targets	Actions for achieving the specific targets (2014-2018)
General Target 4 Conservation of the genetic resources of Greece – Facilitating access to genetic resources – Fair and equitable sharing of the benefits arising from their utilisation	
4.1 Ensuring access to scientific records of genetic resources and filling gaps in scientific data.	4.1.1 Ensuring continuous recording, evaluation and characterisation of genetic resources (plant, animal, forestry, fishing, etc.) with direct or long-term economic interest – Completion of the National List of cultivars and breeds 4.1.2 Ensuring the maintainance and enhancement of the operation of seed and germplasm banks 4.1.3 Making an inventory of private and public scientific or non-scientific collections (of gene material, seeds, and gamete material, of plants, animals and other groups of organisms), as well as botanical, zoological gardens, nurseries, etc. – Developing a national database for the storage of characteristic species and specific genome sequences, which will be available for comparison with other species outside Greece, while it could be used as a measure of genetic uniqueness and diversity of species
4.2 Ensuring the in-situ and/or ex-situ conservation of the Greek genetic resources.	4.2.1 Preparation and implementation of a National plan for the conservation of genetic resources 4.2.2. Ensuring the in-situ conservation of genetic resources on farms 4.2.3 Ensuring the ex-situ conservation of genetic resources of plants and animals 4.2.4 Establishing a National Gene Bank, which will incorporate the specific categories, in order to develop a system of unified management of genetic material
4.3 Facilitating access to genetic resources and the fair and equitable sharing of the benefits arising from the utilisation of genetic resources.	4.3.1 Legal patenting of genetic resources of Greece and products derived from them as national capital – Developing national regulatory licensing framework for access to genetic resources and fair and equitable sharing of the benefits arising from their use
4.4 Studying, preventing and reducing the impact of Genetically Modified Organisms on biodiversity.	4.4.1 Developing and implementing an action plan for biosafety issues (e.g. preventing, assessing and reducing the environmental impacts of genetically modified organisms) in accordance with the Cartagena Protocol

Specific Targets	Actions for achieving the specific targets (2014-2018)
General Target 5 **Enhancing the synergies among the main sectoral policies for the conservation of biodiversity – Establishing incentives**	
5.1 Effectively integrating biodiversity conservation at all levels of spatial planning.	5.1.1 The relevant data for assessing the conservation status of biodiversity is a key parameter in the planned evaluation and review of the statutory Frameworks (General, Special and Regional) 5.1.2 The relevant data for assessing the conservation status of biodiversity is a key parameter to integrated Spatial Planning at all levels (e.g. Urban Master Plan) 5.1.3 Review for ensuring the conservation of biodiversity and appropriate adjustment of standards drafting Environmental Impact Assessments and the Strategic Environmental Impact Assessments with the selection of appropriate measurable indicators 5.1.4 Taking integrated actions to upgrade the urban natural environment, combined with the creation / maintenance of biodiversity islands within the urban fabric
5.2 Minimising the impacts of large infrastructure projects.	5.2.1 Developing a framework for the implementation of compensatory measures to mitigate the negative environmental impacts of infrastructure projects 5.2.2 Promoting and evaluating green infrastructures and avoiding habitat fragmentation 5.2.3 Setting priorities within a strategic framework for ecosystem restoration by using green infrastructure – Completing the construction of specific infrastructure (e.g. green bridges)
5.3 Ensuring the compatibility of residential and industrial development activities (including conventional energy production) with biodiversity conservation.	5.3.1 Ensuring the compatibility of biodiversity conservation with urban expansion in the framework of the coherent and non-polluting city 5.3.2 Implementing measures to prevent and combat industrial pollution (installation and operation of clean technology and environmental restoration) 5.3.3 Achieving completion of management plans for environmental risks and hazards in the marine environment
5.4 Ensuring the compatibility of tourist activities with biodiversity conservation.	5.4.1 Ensuring the conservation of biodiversity in the development of ecotourism and agrotourism 5.4.2 Promoting specialised actions for supporting green infrastructure and tourism services 5.4.3 Establishing a framework, as a priority in protected areas, for infrastructure development, tourism actions and activities, in compliance with the conservation of biodiversity and in collaboration with the Ministry of Culture in the case of shared responsibilities 5.4.4 Defining indicators for monitoring the impact of tourism on natural resources and infrastructure (water, effluent, waste, land, parking areas, etc.)

Specific Targets	Actions for achieving the specific targets (2014-2018)
General Target 5 Enhancing the synergies among the main sectoral policies for the conservation of biodiversity – Establishing incentives	
5.5 Ensuring the compatibility of agricultural, fisheries and forestry activities with biodiversity conservation.	5.5.1 Promoting production methods that contribute to maintaining the biodiversity of natural ecosystems and rural landscapes 5.5.2 Reforming existing standards for forest management plans in order to meet the needs of biodiversity conservation in modern socio-economic conditions and the need to adapt to climate change with proper management practices 5.5.3 Updating the regulations of forest harvesting operations – Developing and implementing a modern system of forest exploitation in the context of multi-functional management 5.5.4 Preparing for the Forest Registry 5.5.5 Preparing for and implementing sustainable management of forest and agricultural ecosystems 5.5.6 Preparing forestry regulations, based on the conservation needs of species and habitat types 5.5.7 Ensuring the completion of the national Cadastre and preparation, correction and finalisation of forest maps 5.5.8 Creating fisheries protected areas or implementing the provisions of the Fisheries Regulations 5.5.9 Recording and assessing the state of fish species stocks 5.5.10 Recording seagrass beds and coral formations in Greek marine environments, in order to protect them from fishing 5.5.11 Codifying and updating of legislation regulating fishing activities 5.5.12 Revising the regulatory framework concerning fishing and fisheries based on the conservation needs of species and habitat types 5.5.13 Promoting certified systems of sustainable natural resource management 5.5.14 Taking into account the data from the assessment of the conservation status of biodiversity when implementing the regulations for aquaculture and the relevant licensing procedures 5.5.15 Establishing rules regarding methods, tools and practices of primary production, in order to reduce the impact on endangered species 5.5.16 Establishing a monitoring system using biodiversity indicators per activity sector 5.5.17 Achieving the development of a National plan for prevention and risk management of pathogens for forest ecosystems 5.5.18 Preparing forest fire prevention plans at the level of Forest Directorate and spatial responsibility of the Forest Service

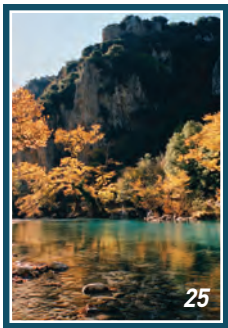
Specific Targets	Actions for achieving the specific targets (2014-2018)
General Target 5 **Enhancing the synergies among the main sectoral policies for the conservation of biodiversity – Establishing incentives**	
5.6 Ensuring the compatibility of energy production activities and infrastructure (including renewable energy) with biodiversity conservation.	5.6.1 Taking into account the data from the assessment of the conservation status of biodiversity in licensing of and spatial planning for small hydroelectrical projects 5.6.2 Taking into account the data from the assessment of the conservation status of biodiversity in licensing of and spatial planning for wind power turbines 5.6.3 Ensuring the development of a strategic programme for the assessment of cumulative impacts and establishment of indicators for monitoring the operation of renewable-energy plans impacts on vulnerable species and habitat types 5.6.4 Providing specification of the guidelines for installation of RES taking into account biodiversity conservation 5.6.5 Mapping Vulnerable Areas in SPAs for the installation of RES
5.7 Ensuring the compatibility of mining activities with biodiversity conservation.	5.7.1. Establishing incentives for the application of best mining practices to conserve biodiversity 5.7.2 Applying appropriate measures for the restoration of the habitats in mines and mining sites, including surface mines (quarries)
5.8 Ensuring the compatibility of other activities (like hunting and the collection of plants or animals) with biodiversity conservation.	5.8.1 Creating the regulatory framework for the collection, control and commerce of species and relevant products, with priority to important species 5.8.2 Hunting regulations – Ensuring the codification and update of the legislation regulating hunting 5.8.3 Achieving development of a National Plan for the management of game species 5.8.4 Providing codification and update legislation for recreational fishing and fishing in mountain waters – Enhancing the port authorities ability to control illegal recreational fisheries 5.8.5 Ensuring sustainable management of soil resources


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Specific Targets	Actions for achieving the specific targets (2014-2018)
General Target 6 Conservation of landscape diversity	
6.1 Achieving the complete integration of conservation landscape diversity policy into all sectoral policies.	6.1.1 Achieving cooperation and synergies with the Landscape Policy under the European Landscape Convention (which views landscape as a natural and cultural good) with the contribution of agencies and institutes concerned with biodiversity, in order to implement a landscape policy at national and regional level
6.2 Maintaining landscape diversity both inside and outside of protected areas.	6.2.1 Taking conservation actions for specific rural/agricultural landscapes and their features – Action plans and measures for conservation and restoration of elements that define the rural landscape (e.g. hedges and terraces) 6.2.2 Maintaining the functions of the landscape regarding biodiversity conservation
6.3 Achieving the conservation of unique landscapes.	6.3.1 Completing the identification and classification of unique landscapes (Geotopes) – Recording the unique landscapes possessing high biodiversity values in areas of palaeontological importance


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Specific Targets	Actions for achieving the specific targets (2014-2018)
General Target 7 Prevention and minimisation of the impacts of climate change on biodiversity	
7.1 Studying the effects of climate change on biodiversity and ecosystem functions.	7.1.1 Carrying out research on the impact of climate change on species, habitats and ecosystem functions (definition of risk zones regarding the intensity of the effects of climate change, assessment of habitat types and species at risk from climate change, and their future range as result of climate change) 7.1.2 Prioritising actions to maintain and help habitat types and species at risk or likely to become at risk by climate change 7.1.3 Updating and implementing the National Action Plan against Desertification 7.1.4 Preparing for a national adaptation plan for management actions regarding habitat types and species of flora and fauna, based on the effects of climate change
7.2 Taking action so that the components of biodiversity will be able to adapt to climate change.	7.2.1 Taking specific actions for species and habitat types assessed (7.1.1.) as sensitive to climate change
7.3 Reducing the biodiversity impacts of actions established to address climate change.	7.3.1 Avoiding, if possible, or reducing the impacts on biodiversity by actions implemented for the adaptation to climate change: in the process of environmental impact assessment of relevant projects, plans and programmes, as well as in the implementation of these projects, plans and programmes
7.4 Enhancing the role of forests in mitigating the effects of climate change	7.4.1 Increasing CO_2 sequestration through sustainable management and restoration of forest ecosystems


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Specific Targets	Actions for achieving the specific targets (2014-2018)
General Target 8 Protection of biodiversity from invasive alien species	
8.1 Ensuring the prevention, early detection and control of the introduction and spread of invasive species.	8.1.1 Establishing an institutional framework for detecting, preventing entry, controlling or eradicating invasive species, for the restoration of systems affected by these and related mechanism for liability – Preparing for a management plan for invasive alien species including provisions for prevention, early detection, monitoring and remediation depending on the risk category 8.1.2 Recording invasive species observed in the country (compiling a list of invasive species and classifying them on the basis of their frequency and spatial distribution, the degree of risk to biodiversity, economy and health) – Exploring their mechanisms of entry and monitoring their spread and impacts – Recording potentially invasive species and exploring possible ways of preventing their entry into Greece (controls at plant nurseries and importers for possible points of introduction) 8.1.3 Implementing national programmes for information/public awareness and training the staff of relevant agencies (per region and municipality, customs officials, etc.) on alien and invasive species
8.2 Taking action to restore the impacts of invasive alien species on biodiversity.	8.2.1 Monitoring and securing the long-term containment of the spread of invasive species (establishing a system for detection, early warning and monitoring of invasive species, with control mechanisms at the points of entry into Greece) 8.2.2 Achieving the restoration of native biodiversity affected by invasive species – Designing and implementing pilot actions to control populations of invasive alien species and habitat restoration 8.2.3 Ensuring the restoration of disturbed forest environments with native species


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Specific Targets	Actions for achieving the specific targets (2014-2018)
General Target 9 Enhancing international cooperation for biodiversity conservation	
9.1 Substantially enhancing the effectiveness of international, regional and transnational cooperation for the conservation of biodiversity and ecosystem services.	9.1.1 Promoting the implementation of relevant international conventions, regulations, and agreements (e.g. Convention on Biological Diversity, Ramsar Convention, Berne, Bonn, Global Action Plan, CITES, FLEGT) – Ensuring Administrative Support for International Activities (including EU activities) 9.1.2 Promoting cooperation and synergies among actions of international conventions related to biodiversity conservation (climate change, desertification, etc.) – Recognition and integration of biodiversity conservation needs in drawing up the national plan for adaptation to climate change 9.1.3 Integrating biodiversity conservation into conventional frameworks that regulate the relations of Greece with other countries 9.1.4 Designing international technology transfer programmes (to and from Greece)
9.2 Enhancing transboundary cooperation for biodiversity conservation.	9.2.1 Creating new partnerships and establishing support for new transboundary parks in cooperation with neighbouring countries (promoting cross-border cooperation in areas of high environmental value) 9.2.2 Formulating cross-border programmes for species conservation


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Specific Targets	Actions for achieving the specific targets (2014-2018)
General Target 10 **Upgrading the quality and efficiency of public administration on biodiversity conservation**	
10.1 Improving public administration in organisational issues, scientific issues and the decision-making process for the effective implementation of policies, measures and legislation on biodiversity.	10.1.1 Restructuring the administration structure with provisions for their support with the necessary infrastructure and manpower at central and regional level (adequate staff and training of personnel) – Improvement of the necessary horizontal inter-administrative cooperation between sectors of environmental policy (biodiversity, forests, waters, coastal areas, rural areas, etc.) 10.1.2 Updating and codifying the legislation related to biodiversity (revision and update of the legal framework for the conservation of biodiversity, environmental law codification) 10.1.3 Enhancing and supporting all environmental control mechanisms at central and regional levels 10.1.4 Initiatives taken by the Ministry of the Environment and Climate Change to coordinate actions with other Ministries for the implementation of the Action Plan for the Biodiversity Strategy 10.1.5 Initiatives taken by the Ministry of the Environment and Climate Change to coordinate actions with other Ministries for the protection, preservation, access, use and fair and equitable sharing of the benefits arising from the utilisation of genetic resources
10.2 Ensuring adequate funding for biodiversity conservation.	10.2.1 Securing national funds for biodiversity conservation through the 'Green Fund' –Supporting the operation of the national 'Natura 2000' committee 10.2.2 Ensuring stable, permanent, and adequate funding for the operation of the Management Bodies for protected areas, and for the Agencies for the conservation of plant genetic material (e.g. Greek Gene Bank) 10.2.3 Utilisation of Community funding opportunities for biodiversity conservation 10.2.4 Securing national funds for the conservation and protection of the genetic resources – Ensuring stable, permanent funding for actions regarding genetic resources conservation and operation of public (National) Gene Banks


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Specific Targets	Actions for achieving the specific targets (2014-2018)
General Target 11 Integration of biodiversity conservation into the value system of society	
11.1 Integrating biodiversity issues into formal and non-formal education and the promotion of the value of biodiversity	11.1.1 Promoting and enhancing teaching biodiversity issues and ecosystem protection at all levels of education – training of teachers at all levels on biodiversity and evolution – Strengthening Environmental Education Centres 11.1.2 Highlighting the value of biodiversity and integrating biodiversity conservation issues into educational curricula and lifelong learning programmes – Making better use of management bodies of protected areas and environmental NGOs in environmental education programmes for biodiversity 11.1.3 Providing education for focus groups of productive sectors (farmers, animal breeders, fishermen, etc.) 11.1.4 Achieving coordination of Ministries dealing with biodiversity issues with the Ministry of Education and Religious Affairs
11.2 Promoting environmental awareness in biodiversity conservation	11.2.1 Preparing for and implementing the Action Plan for Biodiversity Communication Strategy 11.2.2 Ensuring the creation and development of special open access portal (Clearing-House Mechanism) in the Ministry of Environment, Energy and Climate Change, where information on the conservation and management status of Greek biodiversity will be made available (according to the provisions of Law 3937/2011) 11.2.2a This portal will also provide links to all the institutions involved in the protection of biodiversity (e.g. Management Bodies, Universities, Research Institutes, Botanic Gardens, Institutions engaged in environmental education) 11.2.2b Achieving dissemination, through this portal, of scientific information (provided by academic, research institutions, scientific societies, environmental NGOs) accumulated during research and management projects 11.2.3 Providing publication of guides for identification of habitat types and species for the general public (by the Ministry of Environment, Energy and Climate Change), which are made available online 11.2.4 Ensuring adequate staffing and funding of existing information centres, for protected areas, botanical gardens, under the auspices of ministries 11.2.5 Utilising media and information infrastructure for raising public awareness on biodiversity issues 11.2.6 Encouraging citizen participation in actions of biodiversity conservation – Utilising protected areas information centres for public awareness on biodiversity protection –Integration of consultation process with local communities to be promoted by Management agencies and environmental NGOs 11.2.7 Promoting actions by companies for biodiversity conservation (sponsorships, employee volunteer activities, etc.) – Supporting initiatives (from Municipalities, local NGOs but also by individuals) for the conservation of biodiversity through a combination of natural, traditional, archaeological and cultural activities and opportunities

Specific Targets	Actions for achieving the specific targets (2014-2018)
General Target 12 Citizen participation in biodiversity conservation	
12.1 Establishing cooperation among citizens, scientists and public administration in the decision making process and monitoring of its implementation.	12.1.1 Enhancing the implementation of the provisions of the International Convention of Aarhus 12.1.2 Defining the role of educational and research institutes, of scientific organisations and of environmental NGOs as stakeholders
12.2 Promoting the accountability of companies in the context of biodiversity conservation.	12.2.1 Enhancing business activity to develop products and services designed to conserve natural resources, to recycle materials and reduce emissions of hazardous and non- hazardous substances into the environment throughout the products lifetime (eco-design) – Ensuring development and diffusion of environmental sustainability policies and sustainability in business – Promoting actions, practices and procedures for maintaining and enhancing biodiversity within business activities 12.2.2 Encouraging low environmental disturbance activities with significant beneficial effects on biodiversity and discouraging activities with negative impacts when planning and funding of investment projects by companies – Mapping the direct and indirect impact of the activities of any business on biodiversity, applying as best practice the «Life Cycle» approach including the record of the relative footprint of the supply chain of any company, wherever possible


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Specific Targets	Actions for achieving the specific targets (2014-2018)
General Target 13 Appreciation of ecosystem services and the promotion of the value of Greek biodiversity	
13.1 Obtaining Valuation of ecosystem functions and services in social and economic terms.	13.1.1 Obtaining commission and performing research for the valuation of ecosystem services from a social and economic perspective (utilising the results of the TEEB) (Resource Mobilisation) 13.1.2 Social and economic benefits of protected areas, starting from protected areas with management body 13.1.3 Evaluating the social and economic benefits of genetic resources and of National Gene Bank
13.2 Promoting the value of biodiversity and the services provided by biodiversity and ecosystems.	13.2.1 Promoting the value of biodiversity and of the socio-economic benefits of conservation 13.2.2 Creating and promoting incentives for the conservation of biodiversity and ecosystem services 13.2.3 Promoting the value of agricultural biodiversity and the socio-economic benefits of its conservation
13.3 Ensuring the promotion, establishment and maintenance of natural green infrastructure.	13.3.1 Creating a national system of incentives for the creation and maintenance of "natural green infrastructure" 13.3.2 Ensuring the conservation of natural floodplains 13.3.3 Achieving the completion of registration, designation and institutional establishment of biodiversity management islets (parks, streams, hills, lakes, rivers, wetlands, coasts) within the urban fabric



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Panayotis Dimopoulos	12	2	Black-winged stilt (*Himantopus himantopus*) in the river Kalamas wetlands
Panayotis Dimopoulos	14	3	Mediterranean salt marshes and riparian tamarisk stands
Panayotis Dimopoulos	19	4	Hygrophilous forest with *Quercus robur* subsp. *pedunculiflora* at Doirani lake
Stamatis Zogaris	24	5	*Nerium oleander* stands on mount Ochi (Evvoia)
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Charitakis Papaioannou	120	28	Lake in the springs of the river Louros
Charitakis Papaioannou	120	29	Alpine triton (*Icthyosaura alpestris)*

Photographer	Page	Photo Number	Photo Caption
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Charitakis Papaioannou	121	31	Sacred grove in Konitsa
Gregoris Iatrou	121	32	*Globularia stygia*: endemic plant species of Peloponnios
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Charitakis Papaioannou	125	42	Bridge at the oak forests of Zagori
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