

# **5**

## **Conservation and sustainable use of biodiversity**

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Greece's forests, mountains, wetlands, marine and coastal zones and agricultural areas are rich in biodiversity and provide a home to numerous species of local and international importance. The national policy framework for biodiversity has been updated in recent years. Still, a notable number of species are in an unfavourable state and biodiversity considerations are not sufficiently integrated into sectoral policies. This chapter reviews pressures influencing the status and trends of biodiversity; the legal, strategic and institutional framework; policy instruments and financing tools established to promote the conservation and sustainable use of biodiversity; and the degree to which biodiversity considerations have been mainstreamed into sectoral policies.

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## 5.1. Introduction

Greece is situated in southeastern Europe at a crossroads between Europe, Asia and Africa. It is one of the most biodiverse countries in Europe due to its high species diversity, extensive coverage of natural areas, lengthy coastline and thousands of islands, which create diverse landscapes with high aesthetic and cultural value. This topographical diversity contributes to the great biological wealth of the country, which is home to abundant flora and fauna, including many endemic plant and animal species, and a wide variety of ecosystems (MoEE, 2016).

Since the last Environmental Performance Review (EPR), Greece has made notable progress in biodiversity conservation and sustainable use. The legal framework was strengthened with laws on biodiversity conservation (2011) and management bodies of protected areas (2018). The National Biodiversity Strategy and related action plan (2014) provide a comprehensive framework with detailed sub-targets to improve knowledge and the status of biodiversity and mainstream it into sectoral policies. In 2017, the Natura 2000 network was expanded in order to address gaps in protected marine habitats and species, especially with regard to marine areas, albeit from a low base. As a result, habitat conservation status has improved in recent years.

However, effective administration and functioning of protected areas is hampered by lack of management plans, which cover a very small share of the network. Additional obstacles are lack of capacity and awareness among authorities and the public.

More thorough integration of biodiversity concerns into spatial planning could be achieved by improving the quality of strategic assessment. Illegal construction, particularly in coastal zones and forest areas, is harmful to biodiversity and ultimately hampers habitat and species protection.

## 5.2. State, pressures and trends

### ***5.2.1. State and trends in biodiversity***

Greece belongs to the Mediterranean zone of the Palaearctic biogeographical region. The territory of Greece occupies around 132 000 km<sup>2</sup>, more than half of which consists of natural and semi-natural areas. Agricultural areas represent 48% of the land area, almost evenly shared between arable land and permanent crops and permanent pasture; forest covers 32% and inland waters, including wetlands, represent 2% of the territory. The remainder is made up of built-up areas and other land (Basic statistics). Box 5.1 describes the main ecosystem types and pressures.

The country has distinct topographical diversity, with 9 800 islands, diverse landscapes and numerous rivers, streams, gorges, valleys and peninsulas. It is primarily mountainous, with two-thirds of land being covered by medium-height mountains. Its extensive coastline totals some 18 400 km and the many islands are located between the Aegean and Ionian seas (MoEE, 2016). Parts of Greece belong to the Mediterranean Basin Hotspot, the world's second largest.

### Box 5.1. Major ecosystem types in Greece and related pressures

#### Forests

Protected forest animals include bear, wolf, jackal, bobcat, chamois, deer, viper and Greek tortoise. Southern and central Greece and Crete, in particular, are home to several key biodiversity areas. A large share of forest and other wooded land is included in the areas of high nature value, which were identified to implement certain measures under the Rural Development Programme (RDP). Coastal forests and forests at low altitudes have experienced degradation due to increased urbanisation and conversion into agricultural land.

#### Mountains

Mountainous ecosystems extend from the Rhodope range to the higher mountains of Crete, and almost all are included in the Natura 2000 network. Mountainous regions host a wealth of species and ecosystems and create conditions for isolation and endemism. Beyond forest edges, the area is covered by shrub and herbaceous vegetation that has been degraded by overgrazing, which has been reported as a serious threat in southern Europe. In recent years, further pressures have come from tourism.

#### Agricultural areas

The high diversity of agricultural ecosystems in Greece includes terraced landscapes (Aegean islands), traditional olive groves (Amfissa, Corfu, Mytilene, etc.), vineyards (Santorini) and pastures. These are home to almost all wild fauna and flora in agricultural ecosystems and as such deserve special protection. A high share of agricultural land (68%) is categorised as high nature value. Pressures on biodiversity come from expansion of intensive farming, abandonment of traditional extensive mountain agriculture and livestock farming, and increased monocultures.

#### Wetlands

Greek wetlands include deltas, marshes, lakes, lagoons, springs, estuaries, rivers and reservoirs. The latest inventory counts 411 wetlands, mostly in the north and the islands. Ten have been designated as wetlands of international importance under the Ramsar Convention. In addition, lagoons are considered priority habitats of European interest. Wetlands have poor conservation status. Pressures arise from human activities, especially drainage and both point source and diffuse pollution.

#### Coastal and marine areas

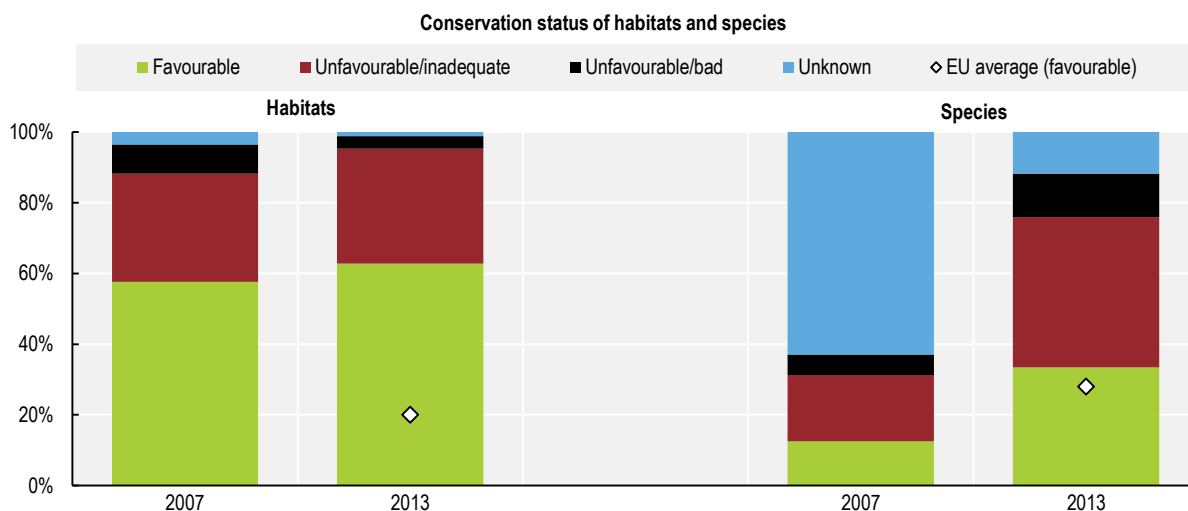
Coastal and marine ecosystems have high biological, aesthetic, cultural and economic value. Over half the coastline runs along the many islands. The main species found in coastal and marine areas are marine macroalgae, coastal land flora, cetaceans, monk seals, sea turtles and several hundred fish species. The main natural pressures arise from extreme climate change, especially sea level rise, changes in storm frequency and intensity, erosion and flooding. Pressures from human activities in coastal ecosystems include tourism, population increase and overexploitation of natural resources.

Source: MoEE (2016).

### Natural habitats

The conservation status of habitats has improved in recent years and is generally positive. The latest report (2013) on habitat conservation status under the Habitats Directive (92/43/EEC) classifies a majority (63%) as favourable, around one-third (33%) as unfavourable/inadequate and a small fraction (3%) as unfavourable/bad. Compared to EU averages, Greece scored significantly more positively on all indicators (Figure 5.1). Unofficial data for the new reporting period does not show important changes from the 2013 assessment.

**Figure 5.1. The conservation status of habitats and species has improved**



Source: EEA (2019), *Habitats of European Interest* (database); Eionet (2019), *Reporting under Article 17 of the Habitats Directive*.

StatLink  <https://doi.org/10.1787/888934155934>

Coastal habitats represent about 16% of habitat types of EU importance (i.e. 14 out of 85 types). Wetlands, river mouths and underwater Posidonia meadows are home to many species, but almost all coastal habitats are in unfavourable condition.

The reasons lie in increasing urbanisation, tourism development and extension of transport networks since the 1990s. The concentration of population and increase in human activities in sensitive areas result in overexploitation of natural resources, along with decision-making failures, including poor implementation and co-ordination among state authorities.

Drainage and conversion of coastal wetlands are mainly driven by expansion of agricultural areas and housing, entailing overpumping and clearing of natural vegetation. These changes have resulted in the loss of important ecosystem services provided by wetlands, such as cleaning of air, water and soil (MoEE, 2016).

### Flora and fauna

With more than half of species (55%) of European interest having unfavourable status (Figure 5.1), more needs to be done to address the root causes. This is particularly pressing given the country's importance to European and Mediterranean flora and fauna, as confirmed by the large number of habitat types and species of European interest.

The unfavourable status of species can be attributed to a number of factors. Landscape modification and habitat fragmentation negatively affect all taxonomic groups, including birds, mammals, reptiles, amphibians and invertebrates, especially mobile and migratory species. Many of these species' habitats and ecological corridors occur outside protected areas and thus have less protection. In addition, illegal

hunting and the use of poisonous bait affect mostly species rather than habitats. Finally, animals respond much more quickly than habitats to environmental threats.

There is high endemism in Greece and many endemic species have a limited spread (e.g. a single island). Greek flora includes 5 752 species, 22% of them endemic. Around 23 000 animal species have been recorded in terrestrial ecosystems, 17% of them endemic, while marine environments are home to around 3 500 animal species. Specific efforts should be made to protect endemic species and their habitats.

The 2009 national red list covered 300 threatened plant species and subspecies, 422 vertebrate animals and 591 invertebrates. Some 16% of species are considered endangered. In particular, one-third of freshwater fish and about one-fourth of mammal and amphibian species are threatened. Greece should consider updating the list.

A notable example of endangered species in Greece is *Caretta caretta*, the loggerhead sea turtle, in the Mediterranean. It nests in Kyparissia Bay in the western Peloponnese, an area threatened by unregulated infrastructure development. The European Commission has begun an infringement procedure against Greece for failure to provide adequate protection for the endangered sea turtles.

Birds are less threatened than other taxa and initiatives have been taken to protect selected species, like the Dalmatian pelican (BirdLife International, 2015). Still, common birds in Greece declined by almost 20% over 2007-16, a trend similar to that in the rest of Europe. Trends diverged from European ones for farmland birds (down 2.6%) and forest birds, which are showing a steep (38.15%) decline. Greece should support conservation measures directed to birds in all sensitive areas and continue monitoring the evolution of bird indicators (NCESD, 2018). Collaboration between researchers and policy makers can help develop measures for protection of bird species in areas identified for wind farm development.

### **5.2.2. Pressures on biodiversity**

The main causes of biodiversity loss in Greece are related to natural system modifications, including urbanisation and habitat fragmentation, pollution, invasive alien species, climate change and fires. Key pressures behind these are intensive land use and policies related to agriculture, fisheries, transport and tourism, especially coastal (Section 5.7).

#### *Habitat fragmentation*

Although Greece's artificial land coverage remains below the EU average, over time the country has registered a shift from pastures and agricultural land to urban areas, which has caused loss, degradation and fragmentation of habitats. Greece is one of the least fragmented countries in the European Union (EU). Despite a slowdown between 2012 and 2018, natural areas continue to be transformed into artificial ones by infrastructure and residential development, sometimes carried out without proper planning.

The road network in Greece is extensive, exacerbating landscape fragmentation. Only 24% of the terrestrial surface was found to be more than 1 km from the closest road, far below the European average in 2013 (42%). Moreover, most areas with no roads (44%) cover only up to 1 km<sup>2</sup> (NCESD, 2018).

Road construction harms biodiversity by giving people access to natural areas for poaching and illegal logging, causes soil erosion and indirectly pollutes watercourses, increases the mortality rate of mammals and reptiles, and reduces habitats for protected species.

#### *Climate change*

As in other countries, temperature increases may affect species' ability to survive and reproduce. The Mediterranean basin is one of the regions most vulnerable to climate change, which will affect ecosystems' capacity to provide goods and services. Decreased water availability for drinking and irrigation will contribute to increasing erosion and loss of agricultural potential, and increase the cost of managing such problems (Birdlife International, 2017).

For Greece, the main effects are related to changes in flowering patterns and distribution and the migration and reproduction patterns of various species. In addition, it is estimated that 30% of soil in sensitive climate

zones has been subjected to various stages of desertification, and the percentage is expected to grow (Chapter 4) (MoEE, 2016).

### *Soil, water and air pollution*

Atmospheric pollution is another pressure on biodiversity, causing habitat degradation. Greece has high concentrations of ground level ozone, which, beyond human health, affects vegetation, forests and crops. Key drivers are industrialisation, intensive agriculture, waste disposal, marine accidents and extensive use of non-renewable energy sources (Chapter 1) (MoEE, 2016).

### *Invasive alien species*

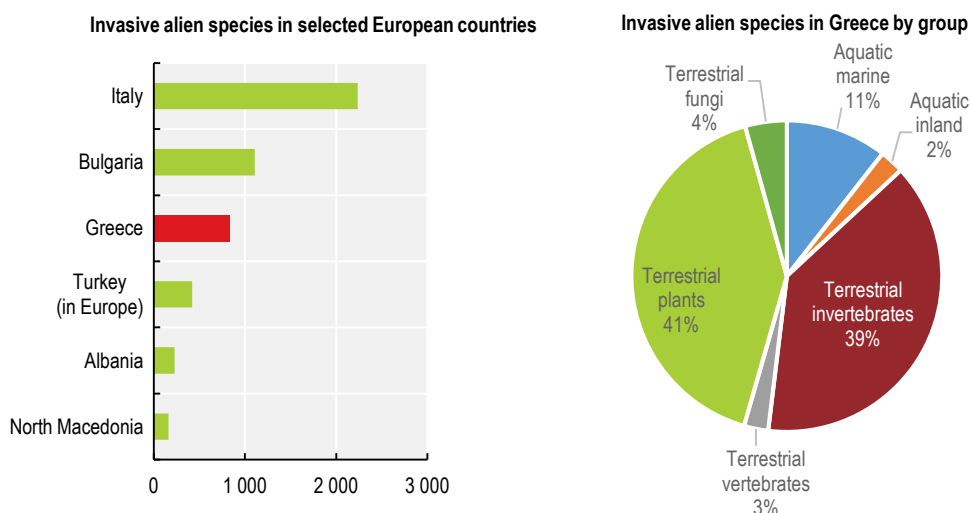
Invasive alien species are those that become established in areas outside their natural range, competing with native species for similar resources and sometimes interbreeding with them. They can also cause significant economic damage. Greece appears to have fewer invasive alien species than some neighbouring countries, though this could indicate data and monitoring gaps (EC, 2019b). Most invasive alien species in Greece are terrestrial plants and invertebrates (Figure 5.2).

Centres and organisations working on invasive alien species in Greece include the Hellenic Centre for Marine Research, which researches marine invasive alien species of flora and fauna, and the Hellenic Network on Aquatic Invasive Species, which contributes to European reporting. As regards terrestrial invasive alien species, the Delivering Alien Invasive Species Inventories for Europe (DAISIE) project helped fill important knowledge gaps, especially concerning flora (MoEE, 2016).

The EU biodiversity strategy requires that by 2020, invasive alien species are identified, priority species controlled or eradicated and pathways managed to prevent new invasive species from disrupting European biodiversity. This is supported by a regulation on invasive alien species (1143/2014). In 2019, the European Commission called on Greece to step up its efforts in implementing the regulation.

The MoEE has plans to improve monitoring of invasive alien species and develop management plans to tackle them. The EU has urged Greece to investigate the apparent lack of data and seek ways of promoting better monitoring. Greece should take effective measures to eradicate invasive species as early as possible, to avoid long-term management costs (EC, 2019b).

**Figure 5.2. Greece reports fewer invasive alien species than some neighbouring countries**



Note: Number of species classified as alien for each country.

Source: DAISIE (2019), *Delivering Alien Invasive Species Inventories for Europe* (database).

StatLink  <https://doi.org/10.1787/888934155953>

## Fires

Fires affect the biodiversity of a region by endangering species, changing drainage basins' hydrological and geomorphological features and increasing soil erosion. In particular, animal species that lack good escape mechanisms are affected beyond recovery, which can result in extinction of local populations. In addition, even temporary loss of forest vegetation can negatively affect fauna (MoEE, 2016).

The area affected by forest fires in the summer of 2018 was smaller than in previous years, accounting for about half the average area affected over 2010-17. Fires in 2018 were nevertheless among the deadliest worldwide in terms of human casualties. In all, 34 fires (above 30 ha) on 12 066 ha were mapped, including 2 331 ha in Natura 2000 sites (San-Miguel-Ayaz et al., 2019). Climate change is expected to exacerbate the occurrence of wildfires.

Natural regeneration is expected in many areas with Mediterranean pine forests. For other areas, Greece has planned restoration measures. For example, a LIFE programme on Mount Parnonas in the Peloponnese, an EU priority habitat in which black pine grows, takes biodiversity concerns into consideration (MoEE, 2016).

### 5.3. Legal and institutional framework

#### 5.3.1. Legal and strategic framework

Greece has a comprehensive legislative framework to support biodiversity, with legislation covering biodiversity, forestry and other areas (Table 5.1). Strong emphasis is put on the establishment and legal protection of protected areas. The most important recent laws are those of 2018 establishing management bodies for protected areas and of 2011 on biodiversity conservation.

**Table 5.1. Main biodiversity-related laws**

Number	Year	Aim
Law 4519	2018	Establishment of management bodies for protected areas
Law 4282	2014	Development of aquaculture
Law 3937	2011	Biodiversity conservation (framework law)
Law 2637	1998	Protection of wildlife sanctuaries
PD 434/30	1995	Conservation and protection of indigenous livestock breeds and habitats or landscapes (decree)
Law 2204	1994	Ratification of Convention on Biological Diversity
LD 996	1971	Protection of national forests, aesthetic forests and conservation of monuments of nature (decree)
Law 1469	1950	Protection of historical sites and places of special beauty

Source: Government of Greece (2019), *Country submission*.

Greece is party to all the main biodiversity-related international conventions, including the Convention on Biological Diversity (CBD), the Convention to Combat Desertification, the Convention on International Trade in Endangered Species (CITES; Box 5.2), the Bern Convention on the Conservation of European Wildlife and Natural Habitats, the Bonn Convention on the Conservation of Migratory Species of Wild Animals, the Ramsar Convention on Wetlands of International Importance and the Framework Convention on Climate Change. It is also party to the Barcelona Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean but has not yet ratified the protocols on Specially Protected Areas and Biological Diversity and on Integrated Coastal Zone Management.

### Box 5.2. Efforts to tackle environmental crime

Various initiatives are in place to address environmental crime, including a risk assessment on illegal trafficking in endangered species. Customs authorities play a key role, as demonstrated by a 2017 joint operation with Spanish authorities, supported by Europol and Eurojust, to prevent illegal export of eels.

As an EU member, Greece is implementing the EU Timber Regulation (995/2010), which aims to reduce illegal logging by ensuring that no illegal timber or derived product can be traded in the EU.

It is also implementing the EU Action Plan for Forest Law Enforcement, Governance and Trade (FLEGT), which requires all timber and timber products imported into the EU from partner countries to be covered by a FLEGT licence stating that the products were legally produced.

Source: Government of Greece (2019).

In line with CBD commitments, in 2014 Greece adopted the National Biodiversity Strategy and Action Plan (NBSAP) for 2014-29 (MoEE, 2014). The 2009 EPR also recommended this. The strategy is based on three pillars: halting biodiversity loss, promoting biodiversity as a national natural capital and intensifying Greece's contribution to prevention of global biodiversity loss. There are 13 main targets, split into non-quantitative sub-targets, with relevant indicators (Table 5.2). The coming development of a new action plan beyond 2019 offers an opportunity to assess achievements and remaining challenges. The new action plan should take into account the key focus areas of the CBD post-2020 global biodiversity framework.

Greece has conducted a voluntary review of implementation of Sustainable Development Goals (SDGs) (Chapter 3). Regarding the SDG 14 commitment on life below water, and in accordance with the EU Marine Strategy Framework Directive, in 2018 Greece endorsed a framework of measures covering all aspects of marine pollution and degradation. It also plans to elaborate a National Maritime Spatial Planning Strategy in 2020. To achieve SDG 15 on life on land, Greece highlights its efforts to complete forest mapping and finalise the national cadastre (Government of Greece, 2018).

**Table 5.2. Greece's National Biodiversity Strategy targets (2014)**

Target	Sub-target
1. Increased knowledge about biodiversity status assessment	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 implementation of the strategy.
2. Conservation of national natural capital and ecosystem restoration	2.1 Conserve species and habitat types in Greek terrestrial and marine ecosystems to promote the goal of sustainability. 2.2 Restore important species and habitat types.
3. Organisation and operation of a National System of Protected Areas and enhancement of the benefits of their management	3.1 Effectively organise the administration and management of protected areas and implement preventive measures in protected areas. 3.2 Apply exemplary and innovative practices in productive sectors and tourism based on the area management plans for biodiversity conservation and management. 3.3 Design, and possibly integrate, ecological corridors and their effective management.
4. Conservation of genetic resources: facilitating access to genetic resources and fairly and equitably sharing the benefits arising from their use	4.1 Ensure access to scientific records of genetic resources and fill gaps in scientific data. 4.2 In situ and/or ex situ, conserve Greek genetic resources. 4.3 Facilitate access to genetic resources and ensure fair and equitable sharing of the benefits arising from their use. 4.4 Study, prevent and reduce the impact of genetically modified organisms on biodiversity.



5. Enhancement of synergies among the main sectoral policies for biodiversity conservation and setting of incentives	<p>5.1 Effectively integrate biodiversity conservation at all levels of spatial planning.</p> <p>5.2 Minimise the impact of large infrastructure projects.</p> <p>5.3 Ensure compatibility of residential and industrial development activities (including conventional energy production) with biodiversity conservation.</p> <p>5.4 Ensure the compatibility of tourist activities with biodiversity conservation.</p> <p>5.5 Ensure the compatibility of agricultural, fishery and forestry activities with biodiversity conservation.</p> <p>5.6 Ensure the compatibility of energy production and infrastructure (including renewables) with biodiversity conservation.</p> <p>5.7 Ensure the compatibility of mining activities with biodiversity conservation.</p> <p>5.8 Ensure the compatibility of other activities (e.g. hunting, collection of plants or animals) with biodiversity conservation.</p>
6. Conservation of landscape diversity	<p>6.1 Completely integrate conservation landscape diversity policy into all sectoral policies.</p> <p>6.2 Maintain landscape diversity both inside and outside of protected areas.</p> <p>6.3 Conserve unique landscapes.</p>
7. Prevention and minimisation of the impact of climate change on biodiversity	<p>7.1 Study the effects of climate change on biodiversity and ecosystem functions.</p> <p>7.2 Act to enable the components of biodiversity to adapt to climate change.</p> <p>7.3 Reduce the biodiversity impact of actions to address climate change.</p> <p>7.4 Enhance the role of forests in mitigating the effects of climate change.</p>
8. Protection of biodiversity from invasive alien species	<p>8.1 Prevent, detect early and control the introduction and spread of invasive species.</p> <p>8.2 Act to reverse the impact of invasive alien species on biodiversity.</p>
9. Enhancing international co-operation for biodiversity conservation	<p>9.1 Substantially enhance the effectiveness of international, regional and transnational co-operation for conservation of biodiversity and ecosystem services.</p> <p>9.2 Enhance transboundary co-operation for biodiversity conservation.</p>
10. Upgrading the quality and efficiency of public administration on biodiversity conservation	<p>10.1 Improve public administration in organisational issues, scientific issues and decision making for effective implementation of policies, measures and legislation on biodiversity.</p> <p>10.2 Ensure adequate funding for biodiversity conservation.</p>
11. Integration of biodiversity conservation into the value system of society	<p>11.1 Integrate biodiversity issues into formal and informal education and promote the value of biodiversity.</p> <p>11.2 Promote environmental awareness in biodiversity conservation.</p>
12. Inspiring citizen participation in biodiversity conservation	<p>12.1 Establish co-operation among citizens, scientists and public administrations in decision making and monitor its implementation.</p> <p>12.2 Promote the accountability of companies in the context of biodiversity conservation.</p>
13. Gaining appreciation of ecosystem services and promoting the value of Greek biodiversity	<p>13.1 Carry out valuation of ecosystem functions and services in social and economic terms.</p> <p>13.2 Promote the value of biodiversity and the services provided by biodiversity and ecosystems.</p> <p>13.3 Promote, establish and maintain natural green infrastructure.</p>

Source: MoEE (2014), *National Biodiversity Strategy & Action Plan*.

### 5.3.2. Institutional framework

#### *National level*

The MoEE is responsible for environment and biodiversity at the national level through the General Secretariat for Natural Environment and Water. The ministry's role and organisation were restructured with a 2017 presidential decree and after the July 2019 elections. Its responsibilities are extensive and adequate staffing appears to be an issue. Within the secretariat are directorates responsible for natural environment and biodiversity and forest policy. The MoEE also supervises institutions with biodiversity-related responsibilities, such as the National Centre for Environment and Sustainable Development, responsible for the State of the Environment report; the Green Fund; and management bodies of protected areas.

Other ministries with responsibility related to biodiversity policy include the Ministry of Rural Development and Food (agriculture and fisheries) and the Ministry of Tourism. The Coast Guard, under the Ministry of

Maritime Affairs and Insular Policy, also assists the MoEE with activities related to biological diversity conservation. The Ministry of Foreign Affairs is responsible for implementation of international agreements, while the Ministry of Education and Religious Affairs is responsible for environmental education, including biodiversity issues.

### *Subnational levels*

Each of the 13 regions has a directorate of environment and spatial planning responsible for ensuring compliance of certain projects with environmental requirements, including environmental impact assessment (EIA).

In 2018, Greece promulgated a law establishing management bodies for all protected areas, supervised by the national Natura 2000 committee, which is the central scientific advisory body on co-ordination, supervision and assessment of protected areas. Local Forest Services are responsible for forest protection and management, among other things.

### *Civil society*

Civil society engagement in biodiversity matters has grown over the years. In 2018, the law establishing management bodies of protected areas included for the first time provisions for stakeholder consultation on management plans, under relevant management bodies. The 2014 NBSAP also went through public consultations. Synergies between the government and academia could be strengthened.

Non-government organisations (NGOs) in Greece include branches of international organisations and local and national organisations, such as the Hellenic Ornithological Society, which plays a key role in bird protection. NGOs have been quite active, issuing joint memos to the MoEE to improve the status of protected areas, as well as through legislative proposals. They regularly bring issues to court. A recent example is a complaint that new tourism zoning regulations breach the Habitats Directive and the Directive on Strategic Environmental Assessment.

NGOs work with private companies to ensure habitat and species protection through management and restoration, which also benefit from EU funding. Examples are the restoration of black pine forests after fires in the Peloponnese, conservation of coastal dunes and brown bear, and establishment of a network of plant micro-reserves. NGOs also undertake information dissemination and awareness-raising campaigns.

Private funding is limited to the contribution of large businesses and foundations, including financial institutions. A good example is the involvement of Piraeus Bank in management of the Stymfalia Lake Natura 2000 site.

## **5.4. Biodiversity monitoring and information**

Greece has not yet established a national comprehensive monitoring system for biodiversity. The NBSAP includes targets for monitoring and evaluating its implementation, which should facilitate access to scientific knowledge regarding Greek flora and fauna and fill data gaps. A progress report on meeting targets is expected after the end of the action plan (MoEE, 2016). The LIFE-IP4 Natura project, which started in 2018 (Section 5.6), will also contribute to mapping and assessment of habitats and species in Natura 2000 sites.

The EU 2020 Biodiversity Strategy calls for mapping and assessment of the state of ecosystems and their services (MAES). While ecosystem services are discussed in the NBSAP as part of Greece's obligations under the CBD, this has not translated into cross-sectoral regulatory and institutional frameworks to date. A working group, the Hellenic Ecosystem Service Partnership (HESP), has been established to promote the ecosystem service approach in Greece. Its primary objective is to complete biophysical assessments and produce outcomes by 2020 to support decision making (Dimopoulos et al., 2017).

HESP has effectively co-operated with the MoEE on MAES, providing an encouraging example of collaboration between the academic sector and policy makers in advancing the biodiversity agenda. Important work has been conducted on assessing the cultural value of ecosystem services, a novel research area in Greece and abroad (Box 5.3).

### Box 5.3. The cultural value of ecosystem services

Cultural landscapes are considered an interface between nature and culture, tangible and intangible heritage, cultural and biological diversity. In Greece, they account for some 67% of the Natura 2000 network. Efforts to study them have only recently been promoted in Greece and elsewhere in the Mediterranean; they are still poorly inventoried and evaluated. A 2017 study attempted a novel procedure to assess cultural landscape features and their cultural values in the major protected areas of Greece.

Researchers used spatial distribution land cover and EU/national designated habitat type to create a relational database that was linked to Natura 2000 sites' spatial data. To accomplish this, a classification of cultural vs natural landscape features was developed, following human-modified vegetation structure identified in published inventories. Twelve attributes involving cultural heritage values, traditional land uses and aesthetic quality indicators were scored to assess these "cultural values" at each site. These analyses help define the level of "culturalness" of each site and identify the protected areas that may require special attention.

Some examples are salines and related landscapes that were highlighted as highly important for the Greek and Mediterranean people. There have also been studies on the cultural significance of traditional agricultural landscapes in the Aegean islands, using cultivated terraces as case studies. Recent publications on contemporary sacred sites and trees in Epirus have focused on the awareness of younger generations.

Source: Vlami et al. (2017); Dimopoulos et al. (2017).

## 5.5. Policy instruments for biodiversity conservation and sustainable use

As in many OECD countries, regulatory (command and control) instruments are the preferred choice for biodiversity conservation, while voluntary and economic instruments remain marginally used. Expanding the latter (e.g. taxes, charges and fees, offsets, payments for ecosystem services) could help balance trade-offs between biodiversity objectives and economic activities, especially in sectors such as tourism and agriculture, which significantly affect biodiversity (Table 5.3).

**Table 5.3. As in many OECD countries, regulatory instruments are predominant**

Regulatory instruments	Economic instruments
Protected areas and species	Charges and fees (e.g. for natural resource use, access to national parks, hunting and fishing licences)
Restrictions or prohibitions on use (e.g. hunting and fishing restrictions, trade in endangered species)	Charges and fees (e.g. for natural resource use, access to national parks, hunting and fishing licences)
Permits and quotas (e.g. on logging, fishing and hunting)	Non-compliance administrative fines for operators
Environmental impact assessment and strategic environmental assessment	
Land-use planning	

Source: adapted from OECD (2013), *Scaling-up Finance Mechanisms for Biodiversity*.

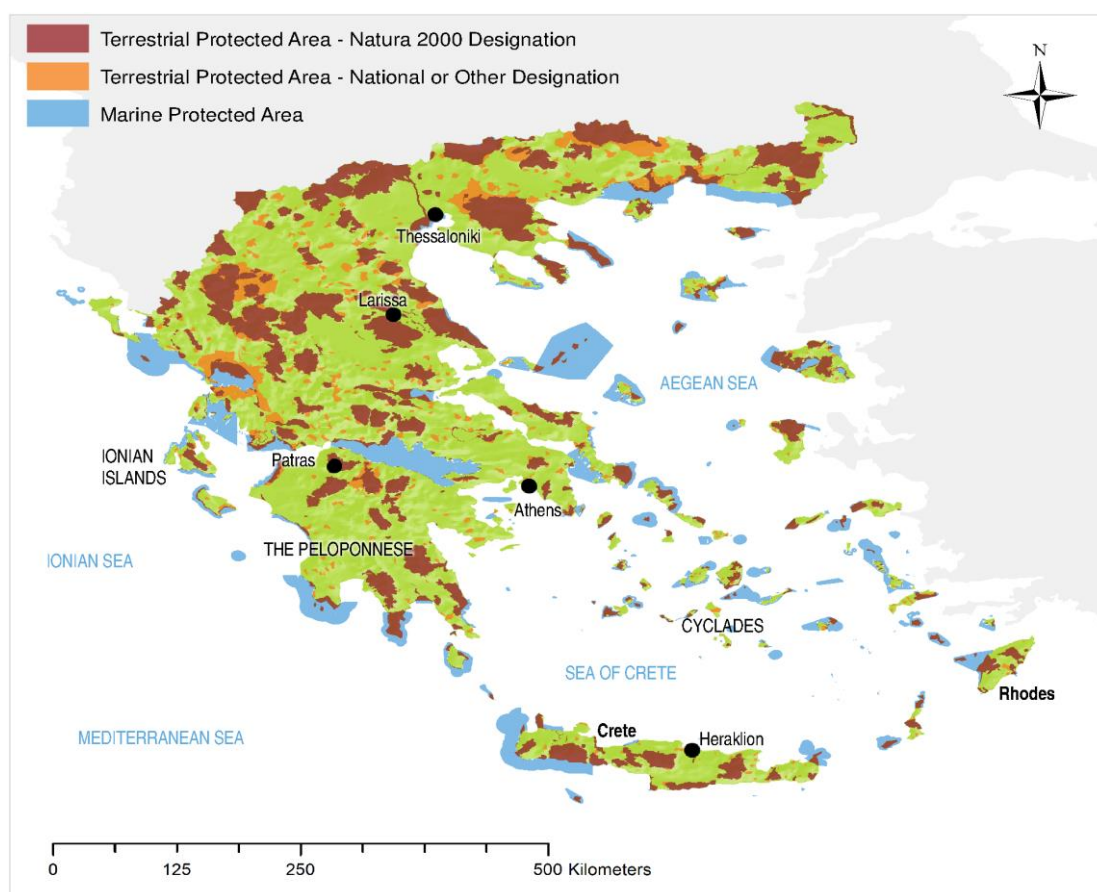
### 5.5.1. Regulatory instruments

#### *Protected areas and species*

According to national data, protected areas cover an extensive share (32%) of terrestrial areas, while marine protected areas account for 20% of the territorial sea (Figure 5.3). Greece thus achieved 2020 Aichi target 11 on terrestrial areas, which calls for reaching at least 17% of terrestrial and inland waters, especially areas of particular importance for biodiversity and ecosystem services, conserved through effective and equitable measures. The performance against Aichi target 11 to protect 10% of marine areas is less clear.<sup>1</sup> Most protected areas belong to the Natura 2000 network and a very small percentage is only nationally designated.

As the 2009 EPR recommended, in 2017 Greece expanded the Natura 2000 network, with a focus on marine areas. It has added 32 areas and extended the boundaries of 63 existing ones. There are 446 Natura 2000 sites.

**Figure 5.3. There is an extended network of protected areas**



Source: UNEP-WCMC and IUCN (2019), *The World Database on Protected Areas*.

Another important development was the 2018 law on establishing management bodies for all protected areas. It expanded territorial responsibility of the 28 existing bodies and established eight new ones. As a result, every Natura 2000 site has a management body, whose responsibilities and competences are regulated by the 2018 law. Management bodies are led by boards of seven people, appointed through an open call and acting in a voluntary capacity. They can include representatives of the MoEE, local

governments, NGOs, scientific bodies and productive sectors. The scientific community maintains there is insufficient scientific representation, hampering sound management of the areas.

While the 2018 law is a welcome development, Greece should make sure the management bodies are properly co-ordinated and sufficiently funded and staffed to carry out their functions. At the Schinias-Marathon National Park, for example, the management body's territorial responsibilities were expanded as a result of the law, but with no corresponding resource adjustment (Box 5.4). Capacity building and awareness raising are being done through LIFE Integrated Project LIFE-IP 4 NATURA, which should boost overall efforts.

#### Box 5.4. Schinias-Marathon National Park

Schinias-Marathon National Park is one of the most important coastal ecosystems and an area of high ecological value in Attica. It comprises a reconstructed wetland, pine forest, spring, bay, hill and residential and tourist area. It is also home to the Olympic rowing centre, whose construction impact was offset by an overflow basin that significantly improved the biodiversity of the wetland and park.

Since 2018, the management authority of the park has expanded its supervision to southeastern Attica by approximately doubling the areas under its responsibility. Resources, however, have not matched the expansion, which entailed increased risk, especially related to fire management. More financial and administrative resources are needed to properly manage the extended area. The management plan should also be revised to account for the enlargement.

Source: Management Board of Schinias-Marathon National Park (2019).

In terms of site management, the MoEE has allocated EUR 17.5 million to develop special environmental studies and draft presidential decrees and management plans to ensure adequate protection of the Natura 2000 network by 2022. This step is particularly welcome, especially in light of the latest EU Environmental Implementation Review, which said Greece should improve the management of Natura 2000 sites (EC, 2019b). In 2018 the European Commission urged Greece to respect its obligations under the Habitats Directive and establish conservation priorities, objectives and measures for all Natura 2000 sites.

Thus far only six management plans have been adopted, covering 2% of the network's area. While management plans are not mandatory, Greece should work to develop additional ones in identified priority areas, aimed at conserving threatened species. Its current objective is to develop management plans for all protected areas by 2022. This would also help it comply with a 2009 EPR recommendation calling for ensuring that all protected areas were provided with management plans and adequate conservation measures.

NGOs have expressed concerns about licensing of seismic research activities for hydrocarbon exploitation in Natura 2000 areas, Ramsar sites and at least four of the ten national parks (WWF, 2018). Lack of awareness among authorities and the public about Natura 2000 contributes to these concerns. Moreover, lack of incentives and low capacity to promote sustainable land use and mainstream in sectoral policies hamper biodiversity improvement (EC, 2019b).

With regard to protected species, in 2017 Greece issued three ministerial decisions endorsing action plans for protection of endangered species: national plans for the Egyptian vulture and the lesser white-fronted goose and a regional plan for the lesser kestrel in Thessaly. A total of 12 species and habitats action plans are being drafted via the LIFE-IP 4 NATURA project. These action plans are expected to be implemented over 2021-26. A further promising development was a 2018 ministerial decision on adoption of local action plans to tackle illegal use of poisonous bait. The decision is particularly important because it provides a

statutory framework for co-operation among authorities and other stakeholders on tackling this illegal activity more effectively (WWF, 2018).

There is a high number of complaints and infringement cases on degradation of designated sites, poor quality of appropriate assessments under Article 6(3) of the Habitats Directive, lack of strategic assessment and insufficient protection of species and habitats, also as a result of illegal activities (EC, 2019b).

### *Environmental assessment and other instruments*

In accordance with EU requirements, Greece has a special procedure for conducting EIA in Natura 2000 areas, which involves a special ecological assessment. Strategic environmental assessment (SEA) was introduced in 2006. It is conducted for large-scale environment-related plans and programmes, including spatial plans, as well as EU-funded programmes (Chapter 2). SEA includes biodiversity as one of the environmental concerns. SEA is also mandatory for plans and programmes which require an assessment under the Habitats Directive. However, EIA and SEA do not always take sufficient account of potential impact on biodiversity (Box 5.5).

#### **Box 5.5. Wind farm developments do not always take biodiversity into account**

The NBSAP calls for ensuring the compatibility of energy production, including that based on renewables, with biodiversity conservation. However, the regulatory framework for wind farm development is relatively loose: wind farms can be established in Natura 2000 areas, with few exceptions. With wind energy developing fast, it is important to better integrate biodiversity considerations into EIA and SEA to avoid loss of birds and bats, especially in sensitive areas such as mountainous regions, wetlands and migration paths.

A 2017 study analysed the impact of wind farm developments in the eastern Rhodope Mountains, between Greece and Bulgaria, which include ten Greek special protection sites under the Birds Directive (2009/147/EC).

The results showed that if all planned turbines operated at once, predicted cumulative annual collision mortality would account for 50% of the standing population of birds and possibly lead to the extinction of certain species. The report offered science-based options to better integrate biodiversity considerations into SEA and EIA. It suggested running fewer turbines and only in the two outer zones of the area, which it said would allow the national energy production target to be met while minimising bird mortality.

Source: Vasilakis et al. (2017).

Other regulatory instruments include ministerial decisions prohibiting hunting in wildlife refuges, certain forest sites and areas 300 metres from the coastline, and hunting of certain species. However, hunting is not systematically restricted in Natura 2000 sites. There are fishing restrictions and prohibition of harmful techniques. Logging, fishing and hunting are subject to permits and quotas.

Additional regulations control international trade in threatened and endangered species. The General Police Directorate under the Ministry of Interior co-operates with Interpol to tackle crime against wildlife and forests.

### *Spatial planning*

Spatial planning is governed by the 2016 Spatial Planning Law and the national General Framework for Spatial Planning, which provide strategic directions concerning land use and zoning at the national and regional levels. All plans undergo SEA. The abundance of special regimes for spatial planning and the lack



of statutory land-use plans create potential environmental risks. Illegal construction, particularly in coastal and forest areas, remains a major environmental concern (Chapter 2).

In 2018, Greece started updating Regional Spatial Planning Frameworks. The Crete framework, the first to be approved, has been criticised by NGOs as being controversial. Sectoral frameworks for tourism, industry, renewables and aquaculture are in the pipeline for updating and a new Special Spatial Planning Framework for mining is under preparation (WWF, 2018). Local spatial plans, revised every five years, take into account environmental protection rules for sensitive areas, biodiversity considerations and sector-specific restrictions such as limits on proximity to residential areas (Chapter 2).

The NBSAP, which includes integration of biodiversity considerations into spatial planning as a national target, finds the strategic directions of the national spatial planning law and framework insufficient to prevent local pressures within protected areas. Therefore, it is necessary to improve land-use plans at the local level.

Greece lacks an overarching framework for green infrastructure, which is a sub-target of the NBSAP and a target of the EU 2020 Biodiversity Strategy. Green infrastructure is a strategically planned network of natural and semi-natural areas whose purpose can include water purification, air quality, recreation and the like, aimed at improving environmental conditions and people's quality of life. To maximise its benefits, green infrastructure should be an essential component of spatial planning (EEA, 2019).

Greece currently lacks a legally binding national maritime spatial plan (there are plans to develop a National Maritime Spatial Strategy in 2020). Maritime planning issues are addressed in the national Spatial Planning Framework. Sectoral plans for aquaculture (Section 5.7) and tourism (under modification) include spatial planning guidelines for coastal and marine segments of each sector. Additionally, the renewables framework sets strategic guidelines for offshore wind parks.

### **5.5.2. Economic instruments**

Greece applies few economic instruments for the conservation and sustainable use of biodiversity, which is a recommendation of the OECD environment acquis.<sup>2</sup> The 2009 EPR also recommended expanding the use of such instruments. Many countries apply various types of positive incentives to promote biodiversity conservation and its sustainable use, as called for in Aichi Target 3 under the CBD (OECD, 2018a). Economic instruments (e.g. taxes, fees and charges, tradable permits, payments for ecosystem service programmes and environmentally motivated subsidies), by applying the polluter-pays approach, help reflect costs of environmental impacts in decision making and provide signals to producers and consumers to behave in more environment-friendly ways. These instruments also help mobilise finance and generate revenue.

Greece has charges for groundwater extraction (charges and fees for natural resource use), limited fees for access to national parks, and hunting and fishing licence fees. There are no taxes on fertiliser and pesticide use, despite their success in some other OECD countries in addressing diffuse pollution from agriculture (Chapter 3). Nor are there biodiversity offsets, with the notable exception of Schinias-Marathon National Park (Box 5.4).

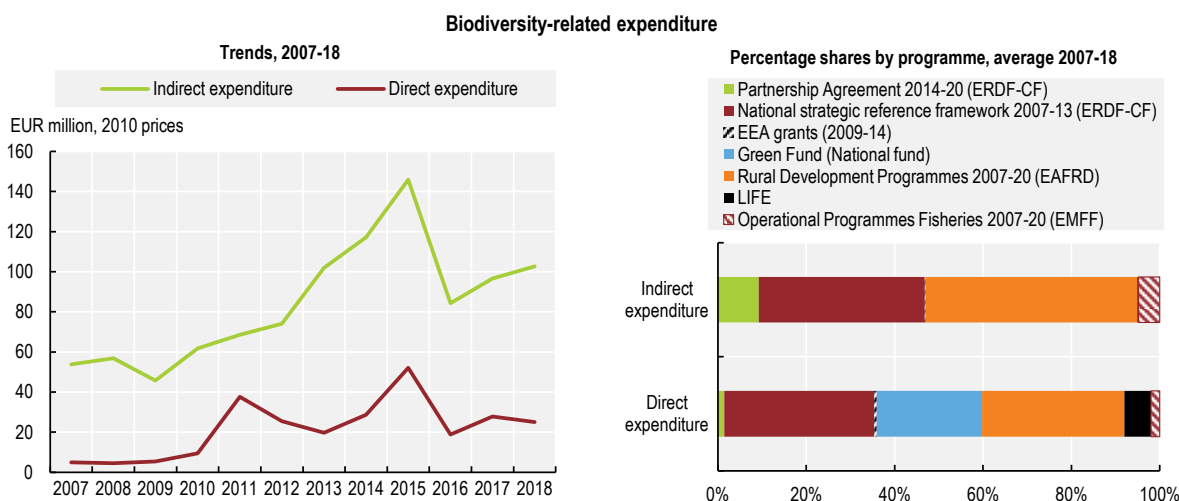
Environmentally favourable subsidies are provided in Greece for landscape and nature conservation and organic farming. Private owners are compensated for income loss in forest areas of Natura 2000 sites, a measure funded through the RDP. In general, subsidies can be favourable or harmful to biodiversity. The former include measures that decouple support payments from non-commodity criteria and impose environmental requirements (Section 5.7.2).

Forms of support considered potentially the most harmful for biodiversity include payments based on commodity output and payments based on variable input use, without imposing environmental constraints (OECD, 2018b). One of the CBD's Aichi targets encourages countries to eliminate, phase out or reform harmful subsidies to minimise or avoid negative impacts. Greece subsidises farmers through an electricity tax exemption. Tax reductions and refunds on diesel used in agriculture have been phased out, but diesel used for domestic shipping, including fishing and tourist boats, is untaxed, as provided by the Energy Taxation Directive (Chapter 3).

## 5.6. Financing biodiversity management

Biodiversity expenditure (direct and indirect) has more than doubled over the last ten years. However, direct expenditure (i.e. when biodiversity conservation and sustainable use is the main objective of the project) accounts for around one-quarter of indirect expenditure (Figure 5.4). Funding for biodiversity relies mostly on EU funds. On the basis of partnership agreements, members draw up operational programmes in which they set out how they intend to invest EU funds. In the current programming period, 2014-20, biodiversity objectives are included in the sectoral programme on environment as well as in the 13 regional programmes. Territorial co-operation programmes (mainly Interreg V) also provide funds to certain biodiversity projects. For this financing period, EUR 128 million in EU funds and national contribution was allocated for biodiversity.

**Figure 5.4. Indirect expenditure is much higher than direct expenditure**



*Note:* Expenditure reported according to the Convention on Biological Diversity requirement, targeting biodiversity conservation and sustainable use either directly (main project objective) or indirectly (20% or 40% of coverage of the objective). The projects concerned fall into the following categories: financing of protected area management bodies; protection and upgrading of forests; conservation of endangered indigenous farm animal breeds and of genetic resources in livestock. Financing comes from national and EU structural and investment funds, including the European Regional Development Fund (ERDF), the Cohesion Fund (CF), the Agricultural Fund for Rural Development (EAFRD) and the European Maritime and Fisheries Fund (EMFF).  
*Source:* Country submission.

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The Prioritised Action Framework (PAF) for Natura 2000 is a policy planning tool for funding the areas of the network by setting priorities at the national and regional levels. Greece's PAF for the current period amounts to almost EUR 700 million. All management bodies for Natura 2000 sites are funded by the environmental sector programme and, to a lesser extent, by regional operational programmes. Greece should take the opportunity of the upcoming programming period to streamline and improve management of EU funds. To this end, it should assess its biodiversity priorities and direct funds where they are most needed.

Greece participates in the LIFE programme, which over 2009-18 co-financed 35 projects, with an EU investment of EUR 43 million. The most recent project is LIFE-IP4 Natura (total budget EUR 17 million, of which EUR 10.2 million is EU funding), which runs 2018-25. Among other outputs, it aims at mapping and assessing ecosystems and their services at the national level. It also monitors implementation of the prioritised action framework for Natura 2000. The projects also aim at mobilising funds from various sources for specific conservation actions.

At the national level, the Green Fund, fed mostly by fines for environmental offences, funds environmental projects, including in forests and marine and protected areas. Over 2012-17, its expenditure for biodiversity-related projects reached about EUR 45 million.



There is little information on private-sector financing for biodiversity. The MoEE has reported that private funds amount to around EUR 0.5 million per year for Natura 2000 sites. For more effective financing of biodiversity management, Greece would need to augment public financing with private-sector finance.

## 5.7. Mainstreaming biodiversity into economic sectors

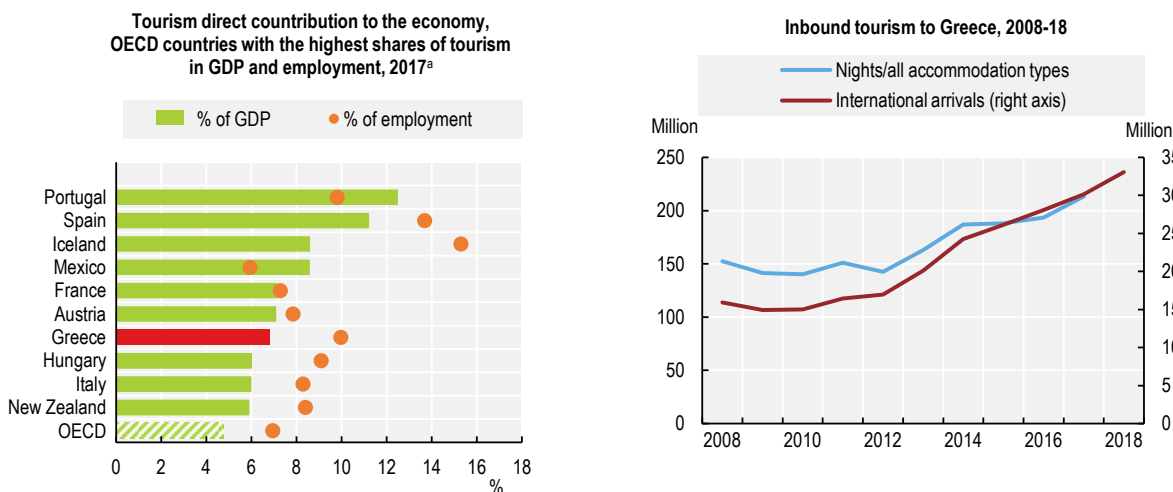
Greece needs to better mainstream biodiversity into other economic sectors by making explicit links between ecosystem services, biodiversity conservation and sustainable use of resources in key policy areas. Target 5 of the NBSAP indicates the need to enhance synergies among the main sectoral policies concerning biodiversity conservation. The eight sub-targets focus on integration of biodiversity considerations into key sectors such as energy, tourism, agriculture, forestry and fisheries.

Natural resources are the basis of important sectors such as agriculture, fisheries and aquaculture, and tourism. Forests, wetlands and coasts are fundamental in providing ecosystem services, such as clean air, water, soil and fish stocks, and this is recognised by the public and by policy makers (MoEE, 2016). Many pressures on biodiversity stem from policies outside the purview of the MoEE, such as fisheries, agriculture and tourism. Therefore, it is important to harness synergies among policy areas and minimise potential trade-offs.

### 5.7.1. Tourism

As tourism expands in Greece, it will be increasingly important to create links between the sector and national biodiversity priorities. Tourism significantly contributes to the Greek economy in terms of direct GDP and employment, with shares that are among the largest in the OECD. The number of tourist arrivals has been steadily growing, even during the economic crisis (Figure 5.5).

**Figure 5.5. Tourism accounts for a large share of the Greek economy and has been growing**



a) 2017 or latest year available. Data for Greece refer to tourism gross value added of industries 55-56 of NACE Rev. 2 only. According to the Greek Tourism Confederation (SETTE), the total direct GDP contribution of the tourism industry was 11.7% in 2018. Data for France refer to international tourism consumption. Data for Spain include indirect effects.

Source: OECD (2019), *OECD Tourism Statistics* (database); National Bank of Greece (2019), *Travel Services* (database).

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The largest impact of tourism is in coastal areas due to infrastructure development, including roads leading to tourist destinations, and overcrowding on beaches. The seasonal nature of tourism in such areas puts pressure on the environment during the peak summer season, including increased water demand during dry periods, especially on islands. Overpumping can cause irreversible salinisation of groundwater aquifers. Tourism also contributes significantly to municipal solid waste volumes, requiring greater effort for local authorities to manage. OECD work on the ocean economy, including coastal and marine tourism,

could help Greece harness the benefits of ocean-based industries as well as protect marine ecosystems (Box 5.6).

### Box 5.6. The ocean economy

The OECD defines the ocean economy as the sum of the economic activities of ocean-based industries and the assets, goods and services provided by marine ecosystems. Much economic activity associated with the ocean depends on marine ecosystems, and at the same time affects them. Tourism is a key sector of the ocean economy.

Various options are available for countries that wish to integrate ocean economic activities and protection of marine ecosystems. These rely on collecting robust data by developing standardised approaches to measuring and valuing ocean industries, and integrating them into national accounting via satellite accounts. In addition, marine ecosystem considerations should be mainstreamed into national development strategies, marine spatial plans and tourism strategies, among others. Effective policies must be put in place to ensure that externalities are addressed and that robust monitoring and evaluation of mainstreaming occur over time.

Source: OECD (2019b).

The NBSAP includes several actions to achieve sub-target 5.4 (Table 5.2) on the compatibility of tourist activities with biodiversity conservation. Key actions include developing ecotourism and agro-tourism, establishing frameworks for infrastructure development, especially in protected areas, and defining monitoring indicators. The Green Tourism Initiative, run by the Ministry of Tourism, aims at improving performance among micro, small and medium-sized tourism enterprises. In particular, through this programme, tourism enterprises are financially supported to improve their resource and energy efficiency and encouraged to promote ecologically wise characteristics of destinations (Government of Greece, 2018). To date, however, it is unclear where Greece stands with respect to this initiative and national targets. The development of the National Maritime Spatial Strategy in 2020, along with the updated Spatial Planning Framework for Tourism, could lead to more effective management of coastal and marine areas.

In July 2019, the minister of tourism presented the new tourism strategy in the parliament. It has five pillars, including one on social and environmental sensitivity. In addition, ad hoc initiatives sponsored by the EU and the European Bank for Reconstruction and Development aim to reduce pressures from tourism, including by diversifying destinations and combatting overtourism (Aristeidou, 2019).

In the 2019 National Strategy for Sustainable and Fair Growth 2030, ecotourism is suggested as a tool for development of the port and shipbuilding sectors, aimed at making Greece a world cruise destination and facilitating mega-yacht chartering (Chapter 3).

For mountain areas, a 2017 law sets specifications for planning, constructing and maintaining trekking routes and hiking trails to promote sustainable tourism practices. There is an electronic registry of trails, and a national certification system of mountain routes is being developed. Such initiatives are supported by the Green Fund.

Environmental projects related to the tourism sector are funded under the 2014-20 Operational Programme Competitiveness, Entrepreneurship and Innovation. Eligible projects include upgrading of buildings to improve their energy performance, energy efficiency measures, water and waste management actions, and environmental awareness initiatives. To date, 102 investment plans for tourist accommodation have been completed, for a total budget of EUR 14.5 million.

### 5.7.2. Agriculture

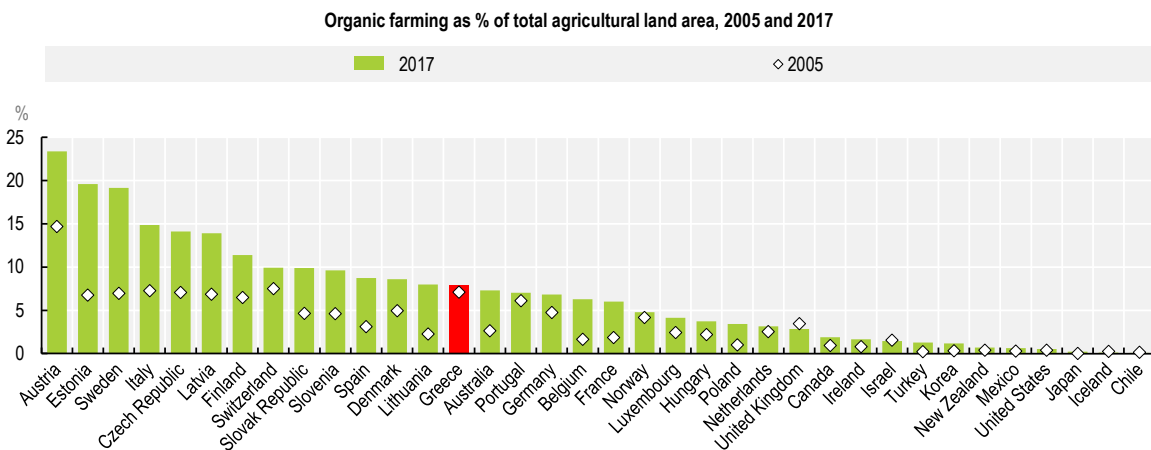
Biodiversity mainstreaming into agriculture is mostly done through the RDP, the second pillar of the Common Agricultural Policy. The RDP focuses on enhancing farm viability and competitiveness, preserving and enhancing ecosystems and promoting local development in rural areas. The NBSAP actions related to mainstreaming biodiversity into agriculture are not very specific: they refer to improving the sustainable management of agricultural ecosystems. The 2009 EPR recommended improving the integration of biodiversity concerns into the agricultural sector.

Agricultural policy is under the purview of the Ministry of Rural Development and Food (MRDF), which co-operates with the MoEE on several environmental issues, including biodiversity. The MRDF has a Directorate for Environment, Spatial Planning and Climate Change.

Over 2014-20, EUR 2.8 billion, almost half the RDP budget, is allocated to restoring, preserving and enhancing ecosystems related to agriculture and forestry. The RDP supports farmers to put 17.4% of farmland under contract to preserve biodiversity (relating to agri-environmental programmes, Natura 2000, afforestation and other biodiversity protection payments), 17.3% to improve water management and 20.6% to improve soil management and prevent soil erosion (EC, 2019a). However, the net effects of agri-environmental measures of the RDP on biodiversity would require a more detailed assessment in order to improve their effectiveness under the next RDP.

Around 20% of Natura 2000 is used for non-intensive agriculture. There are no quantitative national targets on organic farming, which can benefit biodiversity by reducing the use of chemical fertilisers and pesticides and limiting livestock density. Organic farming increased from 7% of agricultural area in 2005 to 9% in 2018, above the 2017 OECD average of 7% (Figure 5.6). Despite significant EU support (EUR 0.8 billion over 2014-20), the share has grown less rapidly than in most countries.

**Figure 5.6. Organic farming has increased less rapidly than in most other OECD countries**



Note: 2017 or latest year available.

Source: OECD (2019), "Environmental performance of agriculture - indicators", *OECD Agriculture Statistics* (database).

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There are ad hoc initiatives that contribute to biodiversity conservation. In 2019, Greece organised a working group to assess available data and information to set up a national soil map. In addition, the Agricultural University of Athens has carried out a study to develop action plans in nitrate-vulnerable zones. The plans are also expected to improve farmers' compliance and strengthen the protection regime of water resources. In the framework of the 2013 National Action Plan for the Sustainable Use of Pesticides, a draft Joint Ministerial Decision is under preparation to improve enforcement of regulations on pesticide use.

### 5.7.3. Fisheries and aquaculture

Despite a significant decrease in the last ten years, Greece has the largest fishing fleet in the EU in terms of number of ships. Mainstreaming of biodiversity into fisheries is mainly done through control of fishing inputs and methods, including restricted areas for fish juveniles, and banning of drift nets and of pelagic trawling, which have a severe impact on protected aquatic fauna (e.g. bycatch of sea mammals and water birds). In addition, fishing is restricted in certain periods (e.g. during spawning season) to conserve habitats and protect endangered aquatic organisms. More stringent restrictions are applied in protected areas and priority habitats, such as the Posidonia meadows, a Natura 2000 site.

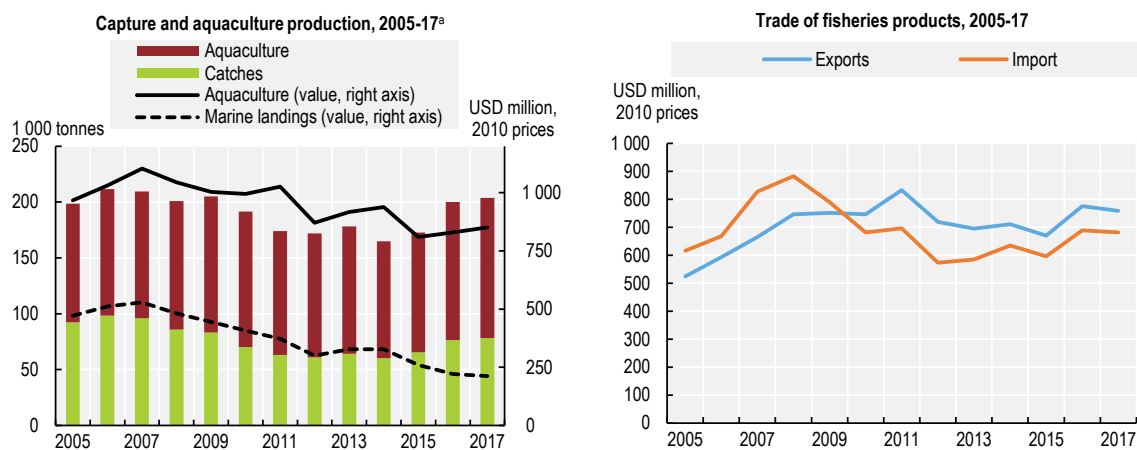
In practice, however, restrictions are not always enforced. Consequently, associated ecosystem services, such as habitat provision and coastal protection, are affected (Tsakalou, 2018).

Fisheries are under the purview of the MRDF. Like other sectors, fisheries and aquaculture are governed by EU policy, namely the Common Fisheries Policy. Targets of the NBSAP include revising the regulatory framework for fisheries, based on conservation needs of species and habitat types, and enhancing the capability of port authorities to control illegal recreational fishing.

Fish stock data for 2015-16 indicate hake (*Merluccius merluccius*) in the Aegean Sea is subject to overfishing, while other species, including mullet, pink shrimp, anchovy and sardine, remained either stable compared to the previous monitoring period or increased (OECD, 2017). Greek fishery production, including aquaculture, increased only slightly over 2005-17, with aquaculture accounting for the largest growth. Values have fluctuated with prices over the last decade (Figure 5.7).

Aquaculture production grew steadily over 2005-09 and is now recovering after the slowdown caused by the economic crisis. The average annual growth rate of 7.8% in real value since 2015 has been aided by a general trend in higher prices for products and increased export demand. In 2017, aquaculture accounted for 62% of total fishery volume (Figure 5.7). Compared with organic farming, organic aquaculture is in its infancy, with only a few farms certified.

Figure 5.7. Aquaculture accounts for a large share of total fisheries



a) Production of fish, crustaceans, molluscs and other aquatic animals in marine areas and inland waters (in 2017, inland waters contributed to about 1% and 2% of total capture and aquaculture production respectively). Aquaculture and inland fisheries volumes are expressed on a live weight basis, marine landings on a landed weight basis.

Source: FAO (2019), *FishStat* (database); OECD (2019), *OECD Fisheries and Aquaculture Statistics* (database).

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The Greek Operational Programme for 2014-20 under the European Maritime and Fisheries Fund (EMFF) has two main priorities: sustainable fisheries and sustainable aquaculture. The overall budget allocation amounts to EUR 523 million, of which EUR 135 million comes from the national budget. The axis on sustainable fisheries envisages investment in modernisation of fishing shelters and landing sites, increased

partnership between fishers and scientists, the creation and monitoring of artificial reefs, and protection and restoration of marine biodiversity.

The aquaculture axis aims at fostering environmentally sustainable, resource-efficient and knowledge-based aquaculture. The EMFF supports actions to improve innovation in the sector, such as developing technical, scientific or organisational knowledge and new aquaculture species, products and processes. Additional objectives include reducing water and chemical use and increasing energy efficiency (OECD, 2017).

To simplify complex administrative procedures and codify existing national and EU legislation, a law for the development of aquaculture was approved in 2014. It established the National Aquaculture Development Programme, with objectives for the sector; the National Council for Aquaculture to implement the programme; and simplified (one-stop shop) licensing procedures (OECD, 2017).

Special management plans are in place for certain species, such as tuna, swordfish and albacore. Fishing these species is permitted only by vessels that obtain special permits and are equipped with specific equipment.

Greece is in the process of establishing a marine strategy, in line with the requirements of the EU Marine Strategy Framework Directive, which requires the development of country strategies in order to achieve good environmental status in all European seas by 2020 (MoEE, 2016).

#### **5.7.4. Forestry**

Integration of biodiversity goals in forestry policy has a relatively long tradition. Since 1920, Greece has applied sustainable management practices for logging and grazing and has adopted strong legal protection for forests and woodlands. Some 40% of forested and wooded area is protected under Natura 2000, but there is a lack of biodiversity-related measures outside protected areas. In particular, it is important to conserve old-growth stands, which are vital habitats for forest birds. The MoEE has signed an agreement with the Institute of Mediterranean and Forest Ecosystems for implementation of a programme concerning the development of a Greek national system for the certification of sustainable management of forests and wood products.

The National Forest Strategy, adopted for 2018-38, represents a big step towards implementing sustainable forest management. It endorses the “Mediterranean forestry model”, which aims at strengthening the multifunctional role of forest ecosystems. The strategy identifies specific objectives as well as the necessary resources and means of implementation. It promotes land-use and land-use change policies to preserve ecosystem services (microclimate, water regulation, soil protection); maintenance of forest land coverage and connectivity to preserve habitats and biodiversity; afforestation and restoration of degraded forests; assessment and management of Greek forest genetic diversity; and use of climate-resilient genetic material.

The MoEE General Directorate of Forests and Forest Environment is responsible for forest policy. Forest Services are local public authorities responsible for the protection and management of public forests and forested areas and for supervision of private owners. Forest Services issue hunting permits and are responsible for controlling illegal logging and preventing fires (Section 5.2.2).

Management plans are prepared by the owner (public official or private consultant) and examined, certified and approved by the local Forest Service. Plans aim at assessing the situation and indicate management tools and protection measures, which cover sustainable management. Plans are carried out for ten years.

Additional tools include the EU Action Plan on Forests, which supports sustainable management of forests and their multifunctional role. One of its objectives is to “maintain and appropriately enhance biodiversity, carbon sequestration, integrity, health and resilience of forest ecosystems at multiple geographical scales”. Moreover, Greece implements the EU Action Plan for Forest Law Enforcement, Governance and Trade, addressing illegal logging and associated trade (MoEE, 2016). Greece participates in the Ministerial Conference on the Protection of Forests in Europe, a high-level political initiative for forest protection and sustainable management.

Data gaps on forestry make it difficult to determine forest cover and intensity of use. As of 2019, forest maps had been drafted for 97% (but ratified for slightly more than half) of the territory and the objective is to complete the mapping by the end of 2020.

Funding is provided by the EU, including the RDP for Natura 2000 forest sites. As in other EU countries, at least 30% of RDP funding must be dedicated to measures relevant to the environment and climate change. In the MoEE, the budget for the sector covers forest protection, sustainable management, afforestation of rural areas and other non-forested land, and prevention measures for biodiversity and climate change issues.

## Recommendations on biodiversity conservation and sustainable use

### Improving biodiversity data and information

- Continue to improve knowledge of the extent and value of ecosystem services, habitats and species within and outside protected areas. Complete the mapping and assessment of ecosystem services, in co-operation with all relevant stakeholders and in line with commitments under the Convention on Biological Diversity and the EU 2020 Biodiversity Strategy. Update the red list of threatened species.

### Implementing effective policy instruments

- Complete management plans for all protected areas, with legal force and sufficient resources for implementation. Ensure consistent and effective implementation of existing plans. Create ecological corridors to reduce fragmentation.
- Support municipalities in effectively implementing local spatial plans that integrate biodiversity considerations. Develop a strategic policy framework for green infrastructure.
- Identify the priority research and data gaps that need to be filled to better prevent and manage the spread of invasive alien species.

### Mainstreaming biodiversity in tourism, agriculture, fisheries, forestry

- Promote the use of relevant indicators and frameworks for infrastructure development to reduce or mitigate the impact of tourism and related infrastructure on biodiversity. Monitor progress towards the relevant NBSAP actions. Support sustainable tourism initiatives and promote thematic forms of tourism in line with protection and conservation of resources. Consider expanding financing sources, including visitor fees to protected areas and fees for tourism operators.
- Provide training and technical assistance to farmers to better implement agri-environmental measures under the RDP so as to reduce pressures on biodiversity. Increase the share of organic farming.
- Introduce additional measures to improve the sustainability of fisheries, including expanding management plans for overexploited species and special habitats. Revise the regulatory framework for fisheries, in accordance with the NBSAP.
- Upgrade the national forestry accounts. Explore opportunities to increase the use of economic instruments for forest conservation, such as payments for ecosystem services, while introducing sustainable management certifications for forestry and derived products.

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## Notes

<sup>1</sup> Using harmonised international data for the denominator, the percentage of marine protected areas in Greece is less than 5% (OECD, 2019a).

<sup>2</sup> OECD Council Recommendation C(2004)81 – Recommendation of the Council on the Use of Economic Instruments in Promoting the Conservation and Sustainable Use of Biodiversity.





**From:**  
**OECD Environmental Performance Reviews:  
Greece 2020**

**Access the complete publication at:**

<https://doi.org/10.1787/cec20289-en>

**Please cite this chapter as:**

OECD (2020), "Conservation and sustainable use of biodiversity", in *OECD Environmental Performance Reviews: Greece 2020*, OECD Publishing, Paris.

DOI: <https://doi.org/10.1787/373beb63-en>

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