PART II

Chapter 4

The conservation and sustainable use of the marine and terrestrial environment

This chapter reviews Spain's efforts to significantly strengthen its policy framework for the protection and sustainable use of biodiversity. Following a description of the status, trends and pressures on Spain's biodiversity, this chapter reviews the country's progress in establishing key legislation to promote biodiversity conservation and sustainable use. It also discusses the expansion of Spain's terrestrial and marine protected areas, the management tools in place, as well as the main trends in financing biodiversity. Finally, the chapter examines the integration of biodiversity considerations into other sectors, such as agriculture and tourism.

Assessment and recommendations

Spain is one of the world's 25 biodiversity hotspots and hosts 30% of all endemic European species. However, this rich biodiversity has come under increasing threat: nearly 40% of the species assessed by the European Red List of Species are found in Spain, and 45% of ecosystem services are considered to be degraded or used unsustainably. A key factor underlying these trends has been land conversion due to construction and transport infrastructure. A significant increase in the population in coastal areas between 2000-10 accelerated urbanisation and the development of related infrastructure, and resulted in an annual land take that was significantly higher than in other European countries.

Responding to these pressures, Spain has significantly strengthened its legal framework for the protection and sustainable use of biodiversity. It adopted a comprehensive Law on Natural Heritage and Biodiversity in 2007 that is among the most ambitious in the OECD. A particularly important feature was the establishment of the principle that natural resource management plans should prevail over territorial and urban plans when the two were in conflict. Implementation of the law was supported by the 2011-17 Strategic Plan on Natural Heritage and Biodiversity, which specified more than 250 actions to be taken. A first report evaluating progress in 2011-13 indicated that one-third of the plan's actions had been implemented, though it did not assess what impact this had on biodiversity and ecosystems.

A new Law on the Protection of Marine Environment was adopted in 2010 that put the management of these ecosystems on a stronger footing, in line with the related EU directive. State-of-the-art technical guidelines were developed, and given legal backing, to assess environmental status and address habitat fragmentation from infrastructure projects. In 2013, a Law for the Protection and Sustainable Use of the Coast was enacted. It strengthened measures to protect the coast, and was supported by some restoration projects. It would be important to clearly specify the measures required to prevent further habitat fragmentation and loss of coastal biodiversity. Spain has also been active in supporting international and regional initiatives on both terrestrial and marine biodiversity. It was one of the first recipients of the Natura 2000 awards in 2012 for its efforts in promoting bilateral co-operation on biodiversity with France and Portugal.

In Spain's highly decentralised environmental governance system, most responsibilities for implementing biodiversity policies lie with the Autonomous Communities. The State Commission on Natural Heritage and Biodiversity serves as the main co-ordination mechanism between the national and regional authorities. Important progress has been made, for example, in developing guidelines to monitor and protect threatened species, but more co-ordination is needed to make the framework for the conservation and sustainable use of biodiversity more coherent and efficient. The current arrangements do not make the best use of declining existing resources, and are not sufficiently flexible to access alternative sources of funding, including from the private sector. There continues to be a gap between the national authorities, focus on transposing

EU directives, the broader policy picture, and the implementation focus on the Autonomous Communities around staffing and financing issues. Dialogue and co-operation between the national and regional levels should focus more on key, common challenges and best practices, and on benchmarking regional performance.

The Natural Heritage and Biodiversity National Council, established as a result of the 2007 law, has enabled greater involvement by civil society in the development and implementation of biodiversity policy. Successes have included the contribution of NGOs to the designation of Natura 2000 sites and development of sustainable fisheries practices. Spain has also been a pioneer in fostering international scientific collaboration on biodiversity. The Spanish Business and Biodiversity Initiative, launched in 2013, is an example of an innovative partnership with the business sector. Nevertheless, opportunities exist to draw more on the expertise and networks of civil society organisations in developing, and particularly, implementing biodiversity policy.

The establishment of the Natural Heritage and Biodiversity Inventory (NHBSI), and the supporting Nature Data Bank in 2011 were among the key biodiversity achievements in the last 10 years: they aim to address one of the major challenges of the past, namely dispersed, inconsistent and incomplete data on biodiversity resources across the autonomous regions. The annual "Environmental Profile of Spain" provides a comprehensive overview of main trends and a core set of biodiversity-related indicators. However, there are still gaps in issues covered, such as genetic resources, and inconsistencies among the data collected by regions. The development of common methodologies, envisaged in the current revision of the 2007 Law on Natural Heritage and Biodiversity, should facilitate the preparation of a more comprehensive and reliable assessment of Spain's biodiversity.

One university project, Valuation of Natural Assets of Spain (VANE), supported by the Ministry of Agriculture, Food and the Environment, examined the economic benefits of ecosystem services. The first phase of the Spanish national Millennium Ecosystem Assessment provided insights into how changes in ecosystems are affecting human welfare. A second phase, 2013-15, aims to provide a more comprehensive assessment of the economic value of Spain's biodiversity assets and ecosystem services. This analysis should provide a better basis for strengthening the role of economic analysis in setting policy targets, evaluating projects and policies, and more generally making the economic case for biodiversity policies. Recent experience with this type of analysis in Finland, France and the UK has helped to demonstrate that the benefits of expanding Natura 2000 sites far outweigh the costs. In Spain, only the costs have been examined.

Until now, protected areas and activities under the rural development programmes have constituted the main policy instrument for biodiversity protection. The territory under some form of protection increased by 9% between 2000 and 2012, and currently covers 29% of the territory, one of the highest shares among OECD countries. Marine protected areas also significantly expanded and in 2014 cover 8.4% of the territorial waters. As a result, Spain comfortably exceeds the Aichi targets for terrestrial protected areas. It is taking steps that will bring it close to reaching the marine target. However, the country faces several challenges in managing the terrestrial protected areas: the way they are classified and designated varies among the regions, although steps have been recently taken to address this issue; despite efforts to enhance the management of protected areas, about one-third do not have a management plan; and there are difficulties in managing

some national parks wheren they span two or more regions since responsibility for nature protection lies with the regional governments.

Species protection programmes are another instrument for biodiversity protection. There is evidence that these measures are effective: many have resulted in the significant recovery of populations of some endangered species. In 2014, Spain put in place 17 national conservation strategies for "endangered" species, and 166 regional recovery plans for "endangered" and "vulnerable" species. However, further efforts are needed to meet the 2007 biodiversity law target that requires conservation strategies for all "endangered" species which currently number 176.

Biodiversity financing remains heavily reliant on the national budget and EU funds, with more than half of the expenditure provided at the regional level. The reductions in public budgets are clearly impacting the ability of public authorities to maintain existing programmes (natural parks and species protection programmes), their ability to address new and emerging problems (such as habitat fragmentation and marine ecosystems), and to conduct the monitoring and research needed to support policy development and implementation. Part of this could be addressed by more effective use of existing resources, but there is also a need to develop alternative, economic instruments that can provide both incentives for conservation and sustainable use of biodiversity and revenues that can be used for this purpose.

More broadly, greater efforts are needed to move beyond a regulatory approach as well as to mainstream biodiversity in sectoral policies. A notable achievement in this regard has been the rapid expansion of organic agriculture which, by 2011, covered 5% of the total agricultural surface. This is the highest surface of land under organic agricultural production among EU members.[1] A sector plan for biodiversity and nature tourism 2014-20 has been developed. Against this, as in other EU member countries, direct agricultural payments are closely linked with intensive agricultural production, and infrastructure development is a continued threat to biodiversity, particularly in coastal areas. Better information on the economic benefits of biodiversity, as well as new instruments, such as taxes, charges, payments for ecosystem services and biodiversity offsets are needed to more effectively integrate biodiversity into sectoral policies.

Recommendations

- Continue to fill gaps and improve the consistency of information collected by regions with a view to developing a comprehensive and robust assessment of national biodiversity and ecosystems.
- Complete the economic analysis component of the National Ecosystem Assessment; strengthen the role of economic analysis in setting biodiversity policy targets, and in evaluating policies and projects that may affect biodiversity positively or negatively.
- Consider how current institutional arrangements could be reformed so as to make better use of existing resources for terrestrial and marine biodiversity, and facilitate access to alternative sources of finance, including from the private sector; focus dialogue and co-operation between national and regional authorities on common challenges, benchmarking performance and identifying good policy practices; further develop medium- to long-term work programmes to support enhanced co-operation between national and regional authorities.

Recommendations *(cont.)*

- Assess the impact that declining public budgets may have on managing existing and emerging biodiversity challenges; consider and promote alternative sources of financing, including how greater use could be made of economic mechanisms such as payments for ecosystem services and biodiversity offsets.
- Reinforce efforts to reduce pressures on biodiversity from key sectors such as agriculture, transport, construction and tourism, and to promote approaches that create markets for biodiversity-friendly products and services.
- Continue close co-operation with environmental NGOs, business and the academic community in developing and implementing biodiversity-related policies, for example in collecting and disseminating information.

1. Status, trends and pressures in conservation and sustainable use of biodiversity, species and ecosystems

1.1. *Status and trends*

Spain is one of the 25 biodiversity hotspots in the world and is considered one of the most biodiverse countries in the European Union. While the country includes four of the nine European biogeographic regions, Spanish seas, which occupy more than 1 million square kilometres (km^2), belong to 3 of the world's 49 large marine ecosystems. Spain hosts over 8 000 vascular flora species, which constitute 80% of all such species found in Europe, as well as 142 000 fauna species, which represent 50% of all European species. Spain also hosts 120 of 235 EU Habitats of Community Interest, the largest number in the EU. About 30% of all endemic European species are found in Spain, including 25-30% of vascular plants and 64% of its amphibians. Regions with the highest endemic rates are mountainous zones, coastal water regions of the Spanish peninsula and insular areas, especially those of the Canary Islands.

A plethora of data to help assess the status and trends of Spain's biodiversity resources is available from various sources and at various scales, including national, regional and local. Due to Spain's decentralised governance, compiling a harmonised set of baseline data to develop reliable national assessments is a challenge. For some ecosystem and species types such as forests or birds, the challenge is less pronounced; for others such as genetic resources, the knowledge gap is significant, as documented in Spain's latest 2012 Natural Heritage and Biodiversity Report. Over the past decade, important reforms have aimed to develop information systems that can generate and disseminate coherent, co-ordinated and comprehensive biodiversity data. This includes the "institutionalising" of the cataloguing and monitoring of biodiversity data through the Natural Heritage and Biodiversity Spanish Inventory (NHBSI). One of the key biodiversity policy achievements of the past 10 years, the NHBSI addresses the challenge of dispersed, inconsistent and incomplete datasets. Hence, to the extent that these relatively new inventories and data collection efforts will continue, and not be compromised due to lack of funding, the quality of Spain's biodiversity data should be on par with that found in best-practice OECD member countries.

Fauna and flora

Available data from Spain's central national inventories of species suggest that approximately 54% of freshwater species are threatened; this is of particular concern given the high percentage of its endemism in fish fauna (MAGRAMA 2014, 2013a, 2013b and 2012c). The share of threatened terrestrial species is lower, roughly 31% of the total. This includes vertebrates, mammals, birds, amphibians and reptiles. Data on terrestrial invertebrates, as well as on vascular plants, are highly incomplete; consequently, the scale of species under threat is difficult to evaluate (Table 4.1).

Table 4.1. **Threatened terrestrial species of fauna and flora**

Group	Total	Studied %	Threatened
Terrestrial vertebrates	635	100	197 (31%)
Land mammals	107	100	21(20%)
Birds[a]	337	100	99 (25%)
Amphibians	35	100	12 (34%)
Reptiles	87	100	28 (32%)
Freshwater fish	69	100	37 (54%)
Terrestrial invertebrates	57 000	0.5	> 258 (> 0.5%)
Vascular plants[b]	6 500-8 000	7-19	1 192 (15-18%)
Non-vascular plants	> 2 000	0	> 170 (> 9%)
Bryophytes	1 100	0	> 170 (15%)
Fungi and lichens	23 000	0	..
Total terrestrial species	91 000	1.6	..

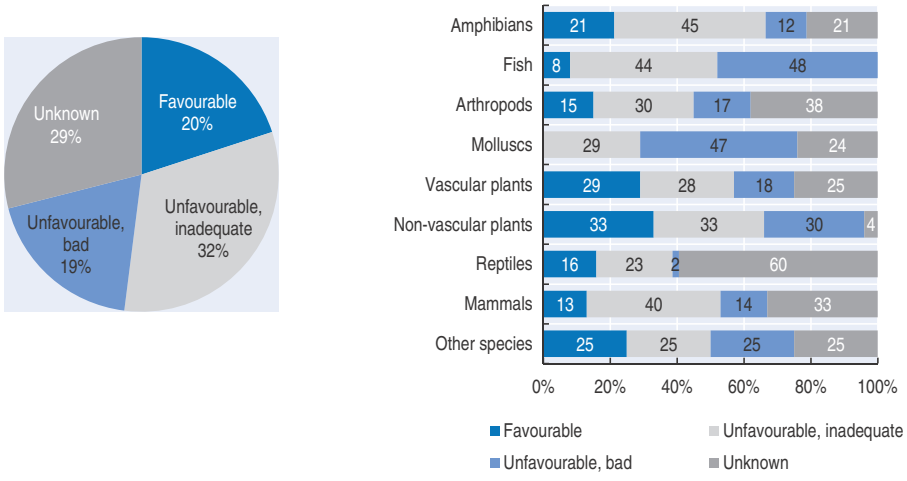
a) Threatened species: breeding species only, the % share is calculated on total species (including non-breeding species).
b) Algae, excluding cyanobacterias and marine species.
Source: MAGRAMA (2013).

Another indicator of wildlife status and trends comes from Spain's periodic reports. They are submitted as part of its obligations to the EU Habitat Directive, which assesses the conservation status of key species. According to Spain's 2007-12 report, out of 681 assessments (corresponding to 430 different taxonomic groups), 20% have "favourable" conservation status, 32% "unfavourable" and 19% "highly unfavourable". However, a large share (nearly 30%) has an "unknown" status (Figure 4.1). Comparing these figures with the previous assessment (2000-06) shows a reassuring trend: the percentage of species assessed with unknown conservation status is declining. Overall, however, the percentage of species with unfavourable conservation status has increased (MAGRAMA, 2014).

In the absence of comprehensive data from national inventories, alternative sources of information provide a reliable proxy indicator for broader ecosystem health. The availability of data on bird species is much more complete and reliable than for terrestrial species, partly due to contributions of nongovernmental organisations (NGOs) such as BirdLife International. Analyses show that bird populations in the forest environments have displayed an upward trend in the last decade, while numbers have declined in agricultural landscapes, urban environments and wetlands (Figure 4.2).

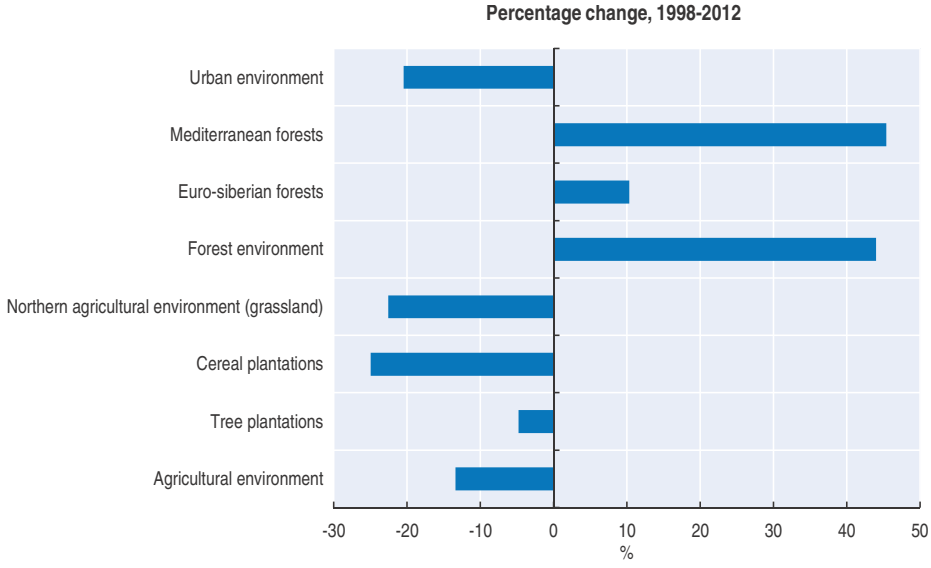
Finally, of the 2 233 species on the European Red List of Species that occur in Spain, more than one-fifth are considered "threatened" and at least 10% are "near threatened" at the European level; one species is "extinct in the wild"; and one species is "already extinct" (Box 4.1).

Figure 4.1. **Conservation status of species of the EU special interest**



Source: Based on national reports on Article 17 of the Habitats Directive (92/43/EEC), 2007-12.

Figure 4.2. **Trends in bird population in various types of habitats**



Source: MAGRAMA (2013), *Environmental profile of Spain 2012.*

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Agricultural and forest biodiversity

Evidence suggests that Spain is losing agricultural genetic diversity preserved over generations at an increasing rate. This is due primarily to homogenisation of agriculture and also rural land abandonment. Furthermore, intensive livestock farming has eroded livestock genetic diversity with over half of native livestock breeds threatened. This implies that current seed and livestock systems are more vulnerable to future climatic changes (EME, 2012; MAGRAMA, 2014).

Box 4.1. **Spain's biodiversity at risk**

Approximately 38% of the species assessed by the European Red List of Species are present in Spain. For some of the taxonomic groups, the percentages of European species that occur in Spain are particularly high, such as dragonflies, saproxylic beetles and butterflies. Species that are considered threatened at the European level and occur in Spain are found mostly in shrublands, rocky areas, wetlands and forests. These ecosystems require particular attention to sustain the habitats of these sensitive species.

Mammals: Spain hosts 48% of all the mammals that occur in Europe. Of these 111 species, 19% are threatened at the European level and at least an additional 11% are considered near threatened. The major threats at the European level that can possibly (or potentially) affect mammals in Spain are invasive and other problematic species, both native and non-native. Mammal populations are also highly threatened mainly by agricultural and forestry effluents and noise pollution. Hunting, trapping, logging and wood harvesting also pose serious threats to mammals in the country.

Reptiles: Spain has 44% of all reptile species in Europe, 24% of which are considered threatened at the European level. Reptiles show the highest percentage of critically endangered species from all groups assessed in the country. Habitat loss, fragmentation and degradation especially due to agricultural intensification and urbanisation are the main threats to this group at the European level. At least 18% of reptile species in Spain may be threatened by human persecution and control, especially snakes and vipers.

Amphibians: They represent 35% of all amphibians occurring in Europe. This group shows richness of high endemic species in the Iberian Peninsula, which also has one of the greatest concentrations of threatened species of amphibians. All told, 17% of amphibian species that occur in Spain are threatened at the European level and more than a quarter of the species are near threatened. The main threat to this group is the loss and degradation of suitable breeding habitat due to agricultural activities through excessive water withdrawal and water pollution by agrochemicals.

Freshwater fishes: They are one of the most threatened groups at the European level, and Spain hosts the largest number of threatened species; 37% of species occurring in Spain are threatened at the European level. Up to 80% of freshwater fish are endemic in the European region. Although areas with the highest richness in species clearly coincide with the lower parts of large rivers flowing to the Black and Caspian Sea, some of the highest concentrations of threatened freshwater fish species are found in Spain. The most important threat to this group is the abstraction of water from underground or from the streams and rivers themselves.

Butterflies: Spain hosts 54% of all butterfly species in Europe and 5% of them are considered threatened at the European level. The mountainous areas of Spain have a rich variety of butterfly species, as well as a high number of endemic species. The conservation status of butterflies in Spain based on the European Red List data is relatively good since approximately 86% of the species are classified as least concern. However, butterflies have very specific food and habitat requirements at different stages of their life cycle. Therefore, they are sensitive to changes in their environment, especially to habitat management such as overgrazing, undergrazing or changes in forestry practices.

Dragonflies: Spain has 58% of all dragonfly species in Europe, and hosts the highest number of dragonflies in Europe after France and Italy. In Spain, 8% of species are considered threatened at the European level. A large concentration of threatened species is found in the Iberian Peninsula, especially in the Mediterranean region. This group is adversely affected by desiccation caused by dry weather, fires and increased water extraction for irrigation and human consumption. River species are also affected by ecosystem modifications such as the construction of dams and reservoirs and water quality deterioration.

Box 4.1. **Spain's biodiversity at risk** *(cont.)*

Freshwater molluscs: 35% of freshwater molluscs that occur in Spain are threatened at the European level. One of the species within this group, which was endemic to Spain, has already gone extinct: *Islamia ateni*. Water abstraction is the main threat to this group, especially in the Iberian Peninsula where the springs are being converted to off-take water and vegetation for habitat is being removed to improve the "cleanliness" of the off-take area. Declining water quality in freshwater rivers and lakes caused by agricultural activities is also a major threat at the European level.

Vascular plants: At the European level, priority crop wild relatives, aquatic plants and all species included in the annexes of the Habitats Directive, Bern Convention and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) have been assessed. A total of 839 species are found in Spain, which represent 46% of the total species assessed in Europe. Spain is also one of the countries with the highest number of single country endemics. Of the 839 vascular plant species assessed in Spain, 26% are considered threatened at the European level. For terrestrial plants, intensified livestock farming, especially intensive grazing activities, have the worst impacts. For aquatic species, direct habitat loss caused by draining for development, agriculture and pasture is the main threat.

Source: IUCN (2013), *Spain's biodiversity at risk: A call for action.*

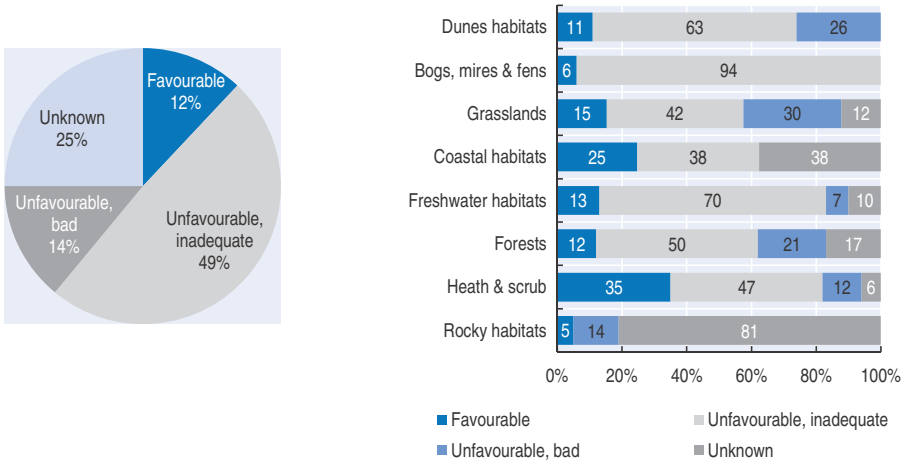
Forest genetic diversity clearly appears to be improving. Using the number of tree species per hundred square kilometres as an indicator of species richness, the data show that Spain outperforms most European countries and further hosts a very high degree of endemic tree plants (MAGRAMA, 2014; MAGRAMA, 2013b). Knowledge about forest genetic resources has also been improving, supported by tools such as the National Registry and Catalogue of Raw Materials. Other actions and measures to promote the increase of forest genetic diversity and conservation include the efforts of the National Committee for the Improvement and Conservation of Forest Genetic Resources, which has developed the Spanish Strategy for the Conservation and Sustainable Use of Forest Genetic Resources.

Ecosystems

A systematic assessment for some ecosystem types is still pending completion of the harmonisation process. Spain's Millennium Ecosystem Assessment (MEA), launched in 2009 and conducted under the auspices of the Biodiversity Foundation, aims to improve understanding of relationships between ecosystems and biodiversity, and human well-being. The first phase of the study focused on the biophysical dimension of ecosystems. It assessed 14 types of ecosystems and 22 different ecosystem services over 1960-2010 using state-of-the-art methods from biological and environmental sciences. The study found that 45% of the ecosystem services assessed are being degraded or used unsustainably; regulating services are the most affected (87% of services in a critical or vulnerable state). While some provisioning and cultural services that meet urban demand have improved in the last decades, 67% of services related to the rural population are in critical condition. Taken together, these data suggest that terrestrial areas characterised by mixed agricultural landscapes, as well as urban and peri-urban environments, remain under serious threat. The next phase of the study (2013-15) is focusing on the economic dimension of ecosystem services. Wilson et al., (2014) summarises lessons learned from Spain's experience with national ecosystem assessment, along with that of other countries.

Another indicator of ecosystem health comes from Spain's report for 2007-12 on the Habitat Directive. Around 25% of habitat types have "unknown" conservation status and the assessment of the remaining share is not positive: only 12% of 224 assessments (covering 117 different habitat types) show "favourable" conservation status, while 49% are "unfavourable" and 14% "highly unfavourable". The latest report included for the first time an assessment of marine habitat types to which over 50% was assigned an "unknown" conservation status; this further reinforces the need for improving understanding of Spain's marine environment (Figure 4.3).

Figure 4.3. **Conservation status of habitat types of the EU special interest**



Source: Based on national reports on Article 17 of the Habitats Directive (92/43/EEC), 2007-12.

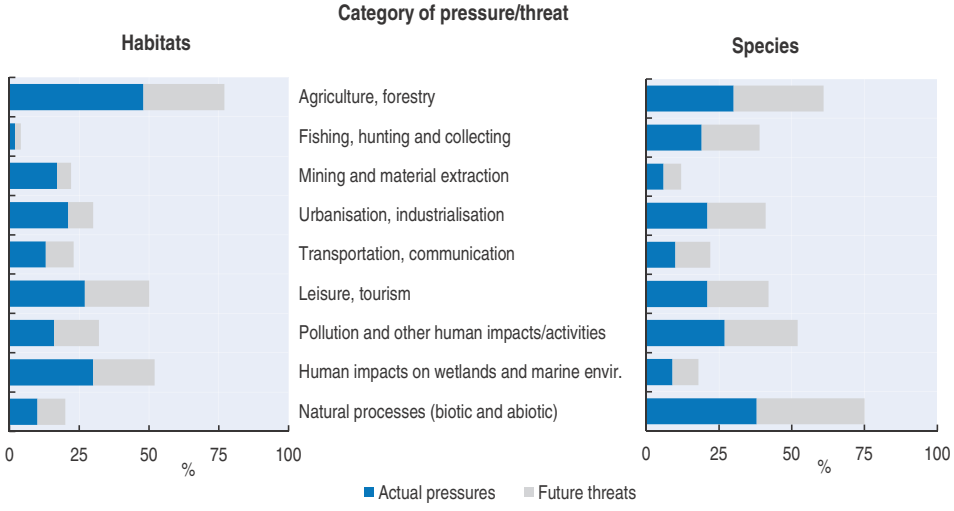
1.2. Key drivers

Spain's biodiversity and ecosystem services face a number of direct and indirect pressures that lead to habitat loss, fragmentation and degradation. The main historical threats include land-use changes, exploitation of natural resources and pollution from productive activities such as agriculture, tourism, manufacturing or mining. These pressures are reinforced by a growing list of external factors, such as invasive alien species and climate change. The indirect drivers of change are mostly related to underlying evolving demographic and socio-economic conditions.

Although not all losses of natural habitat pose a threat to the continued provision of ecosystem services, the degradation of habitats in critical biodiversity areas (ecological and river corridors, wetlands, estuaries and special habitats) is of particular concern. Spain's Millennium Ecosystem Assessment shows increasing direct and indirect pressures on biodiversity for 1960-2010.[2] A slight improvement post-2008 coincides with the implementation and enforcement of environment policies, as well as the downturn of economic activity. The overall long-term trend suggests that threats to biodiversity are considerable.

Land-use change related to agriculture, tourism development and urbanisation remains the most significant internal threat to terrestrial biodiversity (Figure 4.4). The mean annual

Figure 4.4. **Frequency of pressures and threats**



Source: Based on national reports on Article 17 of the Habitats Directive (92/43/EEC), 2007-12.

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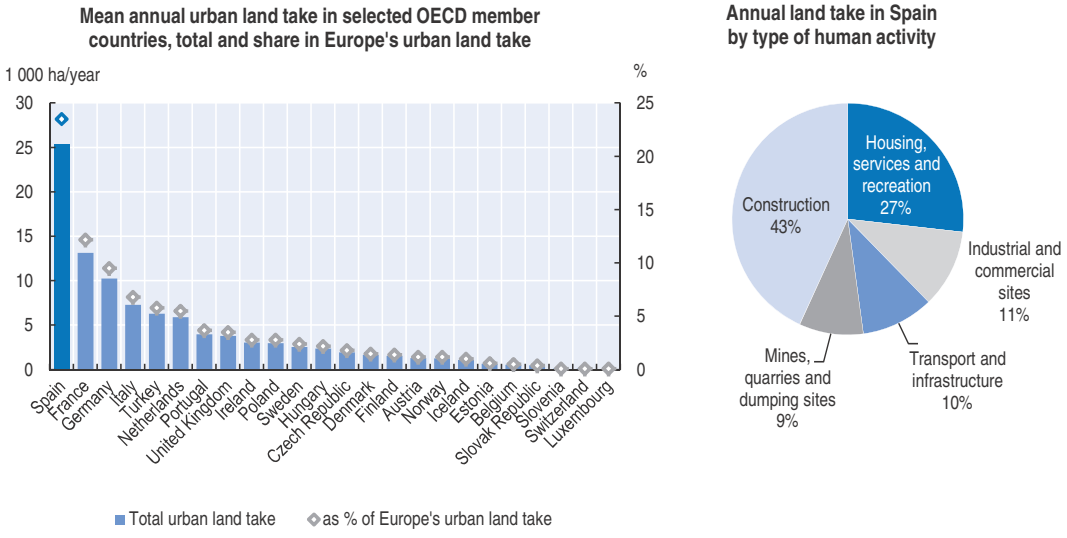
land take as a result of the expansion of residential and construction sites in Spain between 2000-06 was much higher than in other European countries (Figure 4.5) (EEA, 2013). Main causes of land-use change in the last decade include construction, which occurs mostly in coastal areas; and the development of transport infrastructure, which contributes to habitat fragmentation. Between 2006-12, the area occupied by urban surface plots grew by 19%, but in some regions such as Asturias, Murcia, Extremadura and Galicia, conversion to urban lands ranged between 40-75% (MAGRAMA, 2014, 2013b, 2013c).[3] However, only 2% of total land in Spain is covered by artificial surfaces, well below the EU average.

Figure 4.5. **Urban land take in 2000-06**



Note: Annual land take by the expansion of residential and construction sites.
Source: EEA (2013), *Land take Assessment.*

StatLink http://dx.doi.org/10.1787/888933183051

A key underlying indirect cause behind these drivers, which have accumulated for the last 50 years, is the increase in the country's population. Between 2000-10, the population increased by 15.5% with a significant increase along coastal areas (EEA,2013). These changes translated into faster urbanisation and new transport infrastructure, as well as increased waste generation, and pollution of water and air. The financial crisis and the resulting demands for fiscal consolidation translate into a growing new indirect threat to biodiversity conservation. The required budgetary cutbacks across environmental authorities affect monitoring, as well as the ability of national and regional authorities to maintain conservation projects and launch new initiatives. Re-prioritisation of public policy objectives has demoted the importance of biodiversity concerns in favour of other goals, especially concerning employment and health care.

1.3. Projections under a business as usual scenario

Spain has undertaken various long-term ecosystem projection analyses to inform policy making and help set priorities. According to the Spanish National Climate Change Adaptation Plan, species distribution models predict a general and progressive loss in both fauna and flora under a business as usual scenario. In the current climate change context, 51% of vertebrates will need concrete measures for their conservation. According to estimated models, climatic variations may explain up to 30% of the variability in data distribution for amphibians and reptiles, up to 22% for mammals and up to 15% for birds, depending on their thermal physiology. Another study for a group of 96 species of Iberian terrestrial endangered vertebrates has estimated a loss of favourable climate conditions in 13% of the current distribution area. In addition, predictions on the distribution area of 20 species of Iberian trees over the next century under moderately adverse climate change indicate significant reductions. Long-term modelling suggests that, under business as usual scenarios, species diversity and ecosystem resilience will be adversely impacted in the long run. One possible exception is the northern mountainous areas where species richness may improve under plausible climate change scenarios.

2. Policy and institutional framework

2.1. Objectives, goals, targets and key legislation

Policy and legislative framework for terrestrial biodiversity

Since the last review, Spain has made significant advances in developing its legislative framework for nature protection and biodiversity conservation. A number of legal acts were consolidated in 2007 in a new comprehensive Law on Natural Heritage and Biodiversity (42/2007). The law became the basis for managing the conservation, sustainable use, restoration and enhancement of biodiversity and ecosystem services. The law transposed the Habitat Directive (92/43/ECC) and incorporated a number of key biodiversity targets, in some cases with a plan to implement measures more quickly than required by the directive. The law also incorporated Spain's commitments under the UN Convention on Biological Diversity and other international agreements.

In several ways, the biodiversity law is one of the most ambitious among OECD member countries. Its fundamental aims are to integrate biodiversity considerations into other environmental policy areas, and into specific economic or productive sectors. One of the main principles permeating the law is the predominance of environmental protection over territorial and urban planning. The law established that natural resources management plans prevail over territorial and urban planning instruments whenever the two contradict (OSE, 2012). It also introduced novelties such as the new category of marine protected areas,

enhanced the importance of sectoral guidelines, created new institutions to co-ordinate policy implementation between administrative levels and expanded civil society participation. It also made provisions to create information tools for biodiversity management, most notably the inventories and cataloguing activities, as well as indicated the need for management plans on every site in the Natura 2000 Network.

The 2007 law also provided the overarching legislative framework for governing protected areas – the main policy instrument for biodiversity conservation in Spain.[4] Although the law relied on the same categories for classifying protected natural areas as the previous law (4/1989), it harmonised the definition of protected landscapes with that used by the European Landscape Convention. In addition, the law established the Spanish Inventory of Protected Natural Areas and the Natura 2000 Network, and incorporated the protected areas established by international agreements under the same legal framework.

The implementation of the 2007 law was further detailed in the 2011-17 Strategic Plan on Natural Heritage and Biodiversity. The plan contained 281 policy actions and mechanisms, as well as criteria for evaluating progress in their implementation. Sectoral integration of objectives and targets for biodiversity, as well as shared responsibility with the private sector, were two key guiding principles. In a sense, the strategic plan aims to disassociate biodiversity conservation from a strictly public policy matter to one also relevant to the private sector.

The first assessment of the implementation of the strategic plan (2011-13) was submitted as part of Spain's fifth periodic UN Convention on Biological Diversity (CBD) report (MAGRAMA, 2014). The report describes progress in implementation and its contribution to the Aichi targets. The report claims that 33% of the plan's actions have been executed, 45% are ongoing, 14% have not been initiated and 8% remained undetermined (MAGRAMA, 2014), although it did not assess its impact on biodiversity and ecosystems.

Spain has also adopted a range of legal instruments to address other biodiversity-related issues, including eradication of invasive species, combating desertification and soil erosion, and improving links between water and climate management (Box 4.2).

Box 4.2. **Main biodiversity-related legislative and management initiatives**

Regulation for invasive alien species

A series of legal instruments has been introduced in the fields of trade, transport, agriculture and livestock production to address threats from invasive species. Law 42/2007 created the Spanish Catalogue of Invasive Alien Species, which was recently put into place (Royal Decree 630/2013). The inventory will allow for assessing the threat of invasive alien species, as well as for prioritising species that need immediate attention. The MAGRAMA has also set up an official Working Group on Invasive Alien Species to promote co-ordination between administrations and encourage the exchange of information, as well as assessment and diagnostic control strategies for the most problematic species. A warning system is operating under the Committee of Wild Flora and Fauna of the State Commission for Natural Heritage and Biodiversity. A number of management plans for dealing with major invasive alien species have been developed, including the national strategy for controlling the Zebra mussel, the American Mink and invasive plant species in dune ecosystems (e.g. the *Carpobrotus* species), while others are under preparation. Autonomous Communities (e.g. Andalusia and Valencia) have developed complementary management plans and various national parks are putting into place eradication programmes.

Box 4.2. **Main biodiversity-related legislative and management initiatives** *(cont.)*

Combating desertification and soil erosion in Spain

More than two-thirds of Spanish territory is categorised as arid, semi-arid and dry sub-humid. This territory is affected by the impacts of desertification and soil erosion, which result from multiple factors including climate change, urbanisation (mostly coastal) and changes in agriculture and land-use management. To address these challenges, Spain has ratified the United Nations Convention to Combat Desertification (UNCCD). Further, the Forest Law of 10/2006 included specific articles to address desertification, soil erosion and forest hydrological restoration. Also, a National Action Programme was completed in 2008 to combat desertification and soil erosion. Its activities were supplemented by including a new ambitious afforestation programme to plant 45 million trees, which began in 2009. Beyond covering desertification objectives, the initiative also addresses climate change mitigation (an estimated 3.6 million tonnes of CO_2 will be absorbed), as well as rural development (e.g. job creation). Another initiative, approved in 2010, performs emergency restoration of burned hydrological-forest areas; it includes a series of emergency activities to prevent and repair the damage caused by forest fires and other natural disasters such as floods. Since 2010, more than EUR 5 million has been spent on this programme.

Climate change adaptation and biodiversity

In 2006, Spain approved its National Climate Change Adaptation Plan (PNACC). As a main objective, the PNACC sought to integrate climate change adaptation into rural planning instruments and in biodiversity management. Further, the Strategic Plan on Natural Heritage and Biodiversity (RD1274/2011) integrated the aims of the PNACC to achieve synergies between the two plans. A focal area of the First Action Programme of the PNACC is precisely the relationship between climate change adaptation and biodiversity. As a result, Spain launched the project "Assessment of impacts, vulnerability and adaptation of biodiversity to climate change in Spain" (2009-11). The project assessed scenarios over three periods (2020, 2050 and 2080) using data from the National Inventory of Biodiversity and climate change models developed from the Spanish Meteorological Agency. From this analysis, the project published an atlas of climate change impacts on wildlife, as well as an Iberian Spanish atlas that highlighted impacts of, and vulnerability to, climate change on flora and vegetation. In its next phase, the project will identify adaptation measures for the conservation of Spanish biodiversity, and undertake an economic valuation of existing networks of protected areas under alternative future climate scenarios. The Third Action Work Programme of the PNACC (2014-20) will consider assessing the impact of, and potential for, adaptation to climate change in specific sectors, including tourism, agriculture, forests and soils.

Legislative framework for marine biodiversity

While the 42/2007 law provided the legal foundation for all facets of biodiversity policy, the enactment of the Law on the Protection of Marine Environment (41/2010) established a modern and comprehensive framework for the preservation of marine ecosystems in Spain in line with the EU's Marine Strategy Framework Directive (2008/56/CE). The law clarified and classified marine-demarcated areas, the creation of the Spanish Protected Marine Areas Network (including Natura 2000 marine sites) and the establishment of marine reserves for sustainable fishing.

The 2010 law set targets with a 2020 horizon. The first phase (from mid-2012) assessed the status of Spain's marine environment, defining what is considered "Good Environmental Status" (GES). It also established environmental targets, such as including 8% of Spain's marine area under protection status by 2014 and 20% by 2020. Further steps envisaged in the second phase (from 2014 onwards) include i) development of subsequent phases of the marine strategies for the five marine demarcations (North Atlantic, South Atlantic, Canary Islands, East-Balearic Sea and the Gibraltar Strait/Alboran Sea);[5] ii) development and extension of the Spanish Network of Marine Protected Areas; and iii) approval of the Recovery and Conservation Plans for Threatened Marine Species of the National Strategies for the Conservation of Threatened Marine Species (such as sea turtles, the Balearic shearwater, ferruginean limpet, the killer whales of the Gulf of Cádiz and by-catch of vertebrates). The 2010 law also provided for monitoring programmes to measure the progress and effectiveness of these strategies, including assessments every six years; the first one was completed in 2012.

Other legislation affecting biodiversity

Biodiversity considerations have been included in several other laws enacted in the last decade, including coastal management, land-use planning, environmental liability and infrastructure development. Following the recommendation of the 2004 *OECD Environmental Performance Review* for additional policy measures for addressing threats to coastal areas, Spain has introduced various laws and strategies that have, in part, tried to address these concerns. In particular, the Law for the Protection and Sustainable Use of the Coast (2/2013) modified the concept of maritime-terrestrial public domain that was formerly set in the Law of Coasts (22/1988), thereby reinforcing legal safeguards in favour of coastal protection (Box 4.3). The Strategy for Coastal Protection identified coastal areas with a potentially high risk of flooding and erosion caused by climate change. Also, Spain issued a comprehensive manual on the restoration of coastal dunes based on several years of detailed scientific research.

Spain has also incorporated biodiversity considerations into planning legislation. The most important legal development was the 45/2007 Law on Sustainable Development of the Rural Environment and the National Strategic Rural Development Plan. These included components that favourably impact biodiversity both directly (such as requirements for protecting the Natura 2000 network, and specifications and standards for the agricultural, forestry, mining and fishing sectors) and indirectly (such as guidelines for the conservation of water and soil). These requirements are reflected in the rural development programmes of each Autonomous Community.

Spain introduced important developments into property and land law that are associated with land use and planning policy and have impacts on biodiversity. Laws 8/2007 and 2/2008 set out the principles for regulating land use in accordance with public interest and sustainable development. Similarly, Law 10/2006 on Forest Conservation, which modifies Law 43/2003, prohibits land-use change in forest areas for 30 years after a fire.

In addition, Law 26/2007 and Royal Decree 2090/2008 on Environmental Liability enhanced the "polluter pays" principle in dealing with environmental risks, which has ramifications for terrestrial biodiversity and even more so for marine biodiversity. The new liability regime provides improved incentives for the optimal management of environmental risks by the relative industries (e.g. energy, transport and mining). It also strengthens the legal framework for appropriate compensation and restoration in the case

Box 4.3. **Strengthening the protection and sustainable use of coasts**

The Law for the Protection and Sustainable Use of the Coast (2/2013) modified the concept of maritime-terrestrial public domain that was formerly set in Law 22/1988 of the Coast with the aim of reinforcing legal safeguards in favour of coastal protection. The new law harmonised public domain in all of Spain's Autonomous Communities; distinguished between coastal areas that can be subject to sustainable use and other areas that need greater conservation status; and provided guidelines for concessions for the sustainable use of coastal areas. The law also clarified types of construction and building maintenance allowed in coastal areas. In addition, it mandated the development of a strategy to adapt to climate change to enhance resilience in coastal areas. The implementation of the law has been supported by a number of coastal ecosystem restoration projects affecting coastal wetlands and dune ecosystems (MAGRAMA, 2013b).

Conservation NGOs have criticised the law, raising concerns that it legitimised previous transgressions and reduced the size and stringency of the protection easements strip. Yet the law has aimed to retain the same size of coastal protection zone (100 m) for the majority of coastal areas and only allow special provisions for reducing it (to 20 m) in certain cases (areas with an urban character before 1988). Although demand for development in coastal areas could increase due to tourism pressures, the law explicitly prohibits the construction of new buildings in the maritime-terrestrial public domain and includes additional specific measures (such as those provided in Article 119) that aim to avoid urban sprawl in coastal areas.

Currently, 96% of the public maritime-land domain has been demarcated. The process was interrupted due to consultations preceding the enactment of the new Law of the Coast, but the aim remains to reach 100% demarcation of the Spanish coast.

of an environmental hazard. In fact, Spain's environmental liability law are much more stringent and far-reaching than the corresponding EU directive: it includes ecosystems not covered by EU legislation and grants enhanced powers to the public prosecutor to intervene.

Spain has also made significant legislative and institutional advances in addressing habitat fragmentation from infrastructure projects, primarily related to transport and energy. The Commission on Natural Heritage and Biodiversity has produced state-of-the-art technical guidelines to address habitat fragmentation from transportation projects. Electronic journals and workshops disseminate mitigation measures implemented by enterprises and administrations. In addition, the Biodiversity Foundation, together with the Spanish Road Association, has produced maps and other material to enhance awareness of drivers with respect to wildlife protection. Particular danger areas for wildlife have been identified.

International obligations and agreements

Spain has been an active member of international conventions, agreements and organisations related to marine, terrestrial biodiversity and climate change. Spain's Strategic Plan on Natural Heritage and Biodiversity explicitly seeks to promote synergies between key international environmental agreements, most notably between the UN Conventions on Biological Diversity, Combating Desertification and Climate Change. The PNACC is the main vehicle to pursue synergies. With respect to the UN Convention on

Biological Diversity (CBD), Spain played a prominent role in the establishment of the Nagoya Protocol and remains one of the CBD's major donors. Its contribution to the third replenishment of the Global Environment Facility (GEF) amounted to EUR 22 million, with approximately EUR 9 million towards biodiversity. Further, Spain has hosted numerous meetings of the CBD's subsidiary bodies.

Another notable example of Spain's international co-operation is at the EU level, in particular efforts to establish and strengthen regional networks of cross-border protected areas. Spain has initiated co-operation agreements with Portugal and France to develop and adopt common management objectives and plans for neighbouring Natura 2000 network sites (e.g. joint conservation plans for the Iberian lynx in co-ordination with Portugal and for the Pyrenean brown bear and the Spanish Ibex with France). Another example of co-ordination with Portugal is the declaration of the Parque Internacional Tajo-Tejo in 2013. This declaration aims to help manage and preserve this cross-border territory, which has a high biodiversity value. Similarly, Spain initiated two Transboundary Biosphere Reserves: the Gerès-Xurés between Portugal and Spain and the Intercontinental del Mediterráneo between Morocco and Spain. Furthermore, in the framework of the Bonn Convention, Spain has developed an action plan with Portugal, Morocco and Mauritania to conserve the Mediterranean Monk Seal. In recognition of these achievements, Spain was a recipient of the first Natura 2000 awards offered by the EU in 2012.

Spain has played a prominent role in developing and fostering multilateral agreements and co-operation action plans for marine biodiversity. The Spanish Committee of the International Union for Conservation of Nature (IUCN) has been particularly influential on matters related to marine biodiversity conservation in the Mediterranean and in Latin America. Initiatives include, for example, COMET-LA (Community-Based Management of Environmental Challenges in Latin America for 2012-15). Further, the Technical Office of the IUCN Spanish Committee, created in 2007 under an agreement with the Biodiversity Foundation and the MAGRAMA, helps implement multilateral marine conservation action plans. Spain also supports the IUCN's Centre for Mediterranean Co-operation, with offices in Malaga. In 2006, Spain completed the ratification process for the Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances (OPRC-HNS Protocol); it incorporated new amendments to the emergency protocol incorporated into the Barcelona Convention and into national legislation. As of 2006, Spain had developed and funded the Spanish Marine Rescue Service, and a National Rescue Plan to respond quickly to marine pollution incidents in the Mediterranean and Atlantic. These efforts are co-ordinated with counterparts in France, Portugal and Morocco.

2.2. Institutional roles and arrangements

The Ministry of Agriculture, Food and Environment (MAGRAMA) takes primary responsibility for developing biodiversity policy and the legal framework, and also co-ordinates biodiversity policies within the European Union and at other international fora. The MAGRAMA also ensures timely and comprehensive harmonisation of the biodiversity-related legal framework with that of the EU and ensures Spain's ACs also achieve harmonisation.

As in many other substantive areas, ACs have been given responsibility for implementing biodiversity policies, except for a few spatial planning issues such as national parks, coastal areas, transport infrastructure and water resources that extend

beyond one autonomous region. Local administration and municipalities play an important role in biodiversity conservation through transferring the objectives of biodiversity policy into specific fields of action, as well as in raising awareness. They are supported by the Spanish Federation of Municipalities and Provinces, which recently adopted a strategy for the conservation and sustainable use of biodiversity at the local level.

Although the ministry takes the lead in formulating strategic policy and overarching biodiversity legislation, it consults with regional authorities through specific structures. The main co-ordination between the central administration and regional authorities (at the level of General Directors) is the State Commission on Natural Heritage and Biodiversity and its series of specialised committees and working groups. This Commission was established by the 42/2007 law and acts as a consultative and co-operation body on matters related to nature conservation and biodiversity.[6] Among many other issues, the Commission sets guidelines for monitoring and evaluation of the conservation status of threatened species and species under a special protection regime; these guidelines also established common methodologies. This aims to address a key problem with information on the status of biodiversity: lack of consistency across administrative authorities. The reports and proposals developed under the Commission require formal approval by the Sectoral Conference on the Environment; this is the collegiate, advisory and executive co-ordination body that brings together public representatives from central government (headed by the Minister of Agriculture, Food and Environment) and representatives from the autonomous regions with environmental responsibilities (Chapter 2).

Spain recently established the Inter-ministerial Commission on Marine Strategies (Royal Decree 715/2012) as the main government consultative and co-operation body on matters related to marine biodiversity. The Sectoral Conference and specific committees for each of the five marine districts co-ordinate and co-operate among central and regional administrations on marine biodiversity. In addition, bilateral agreements exist between the MAGRAMA and autonomous regions on the designation and management of coastal Natura 2000 Special Protected Areas (SPAs) and Sites of Community Importance (SCIs).

Many steps have been taken in response to calls from the ACs and other stakeholders to strengthen multilevel co-operation. This is intended to reduce the divergence between central authority target setting and the capacity of regional authorities to implement these targets. For example, some special working groups have been established to address specific drivers affecting biodiversity. One such group, which includes policy representatives from all related levels of administration and scientific experts, has produced detailed and state-of-the-art guidelines on habitat fragmentation and defragmentation initiatives related to transportation infrastructure (MAGRAMA, 2013a). This addresses the need to improve ecosystem connectivity, one of the main concerns in the 2004 *OECD Environmental Performance Review*. Other working groups have been established to co-ordinate habitat and species conservation and strengthen implementation of EU policies. Co-ordination has also been strengthened between various agencies at different levels in times of crisis (such as large wildfires) and among the national parks through the National Parks Autonomous Organisation (Organismo Autónomo Parques Nacionales, OAPN). This includes two new bodies, the Collaboration and Co-ordination Committee, comprising representatives of all national parks and OAPN, and a Steering Committee for each of the national parks located in more than one Autonomous Community. Co-operation has also been strengthened through the National Park Network where OAPN maintains the role of monitoring and assessment of compliance with the Master Plan for National Park Development.

Despite progress, concerns are still expressed concerning co-ordination of policy and regulatory development between the central and regional governments. A case in point has been the expansion of protected areas and the feasibility of reaching nationally established objectives and targets. Regional authorities are challenged to keep up with the pace of expansion and to find the matching funds to implement the various protected area management plans. This disparity is partly because central government sets policy targets based more on political and ecological criteria and less on cost-benefit analysis and the feasibility of providing adequate funding. Structured forms of dialogue and co-operation should be strengthened between the national and regional levels of administration on key challenges and best practices, and on helping to benchmark regional performance. The further development of transparent medium and long-term work programmes could strengthen the capacities and impacts of such co-ordination mechanisms.

2.3. Partnerships with NGOs, business, universities and other stakeholders

The Environment Advisory Council (Chapter 2), and its specialised working groups, remains the main institutional channel for involving the public in the development and monitoring of environmental policy, including NGOs, academia and the private sector.[7] A similar co-ordinating body, exclusively devoted to biodiversity issues, is the Natural Heritage and Biodiversity National Council.[8] The Council, established by the 42/2007 law, provides an effective forum for civil society (predominantly biodiversity NGOs and scientific bodies) to influence the design of environmental policy, as well as to undertake *ex ante* valuations of newly proposed policies and *ex post* assessments of existing policies. It also provides a forum for advice on technical and scientific matters in advance of international meetings on biodiversity. Examples of the successful operation of the Council include the contribution of BirdLife International in the designation of Natura 2000 sites or the collaboration fostered between WWF and the fishing industry to introduce sustainable fishing practices. Still, biodiversity NGOs and private sector representatives have raised concerns the Council's work does not provide adequate opportunity to consider their views. Moreover, the timeframes in which these working groups operate do not allow for a high degree of scrutiny of new regulations.

The Biodiversity Foundation, a non-profit public organisation set up by the Ministry of Environment in 1998, provides important support to the development and evaluation of biodiversity policy. The Foundation is an alternative forum for collaboration of different public and private entities and institutions. It has developed significantly over the last decade, in particular, following the 2006 merger with the National Park Foundation. Its purpose and functions include projects, publications, independent expert advisory services and public awareness-enhancing activities on all facets of biodiversity conservation. It hosts a multidisciplinary team of over 40 biodiversity expert professionals and has been developing over 400 projects per year.

Irrespective of the collaborative work through institutions such as the Biodiversity Foundation, the MAGRAMA also engages in direct collaboration with academic and research institutions to produce biodiversity information such as inventories and GIS datasets, which feed into its biodiversity policy. Some important initiatives that contribute to biodiversity knowledge in Spain take place at the Superior Council for Scientific Research and the Spanish Institute of Oceanography. Spain has also been a pioneer in fostering international scientific collaboration on biodiversity. It was one of the initial signatories of the Intergovernmental Science-Policy Platform on Biodiversity and Services

(IPBES). It has also fostered and hosts international biodiversity research centres, such as the Center for Mediterranean Forest Research (CEMFOR), the Centre for Ecological Research and Forestry Applications (CREAF) and the Biodiversity and Landscape Ecology Lab.

The Spanish Business and Biodiversity Initiative is an example of an innovative specific partnership with the business sector. Launched in 2013 by the MAGRAMA and the Biodiversity Foundation, it encourages economic practices that are compatible with biodiversity conservation. It provides a co-operation framework for large businesses, NGOs, associations and government agencies to join efforts to improving and maintaining Spain's natural capital (Box 4.4). Spain, together with Germany, the Netherlands, Belgium and the Global Nature Fund (GNF), established the European Business and Biodiversity Campaign (EBBC) in 2010 to provide practical advice and guidance on how to reconcile business and biodiversity conservation.[9] The web-based platform Environmental Markets[10] provides information for both the public and private sector on developing alternative sources of financing (primarily market-based instruments).

Box 4.4. **The Spanish Business and Biodiversity Initiative**

The Spanish Business and Biodiversity Initiative, launched in 2013 by the MAGRAMA and the Biodiversity Foundation, included as initial signatories of its "Biodiversity Pacts" 15 Spanish companies of which 7 come from the IBEX35, the benchmark stock market index of the Bolsa de Madrid, Spain's principal stock exchange. Since then, a total of 18 companies have become signatories. The Initiative provides a co-operation framework for large businesses, NGOs, associations and government agencies to improve and maintain Spain's natural capital. It promotes the inclusion of biodiversity conservation and management in the business strategies of different sectors of the Spanish economy, and identification of innovative opportunities and projects as solutions to the current financial crisis. It also aims to mobilise private funds to preserve biodiversity.

By signing a "Biodiversity Pact", companies acknowledge and support the objectives of the Convention on Biological Diversity. Companies accept the responsibility to carry out their economic activity in a manner consistent with the protection and conservation of biodiversity. They pledge to meet the following commitments:

- Evaluate the impact of their business activities on biodiversity and natural capital
- Integrate biodiversity protection into their management policies and manuals
- Set realistic and measurable goals for biodiversity conservation that will be reviewed, at least, every three years
- Publish activities and achievements attained in the sphere of biodiversity conservation in their annual reports
- Inform suppliers of the company's targets in the field of biodiversity conservation and support those that gradually incorporate those objectives in their operations
- Explore the possibilities of co-operating in this field with scientific institutions, nongovernmental organisations or government agencies to deepen the dialogue and establish joint projects and an ongoing climate of improvement of business and environmental management practices
- Designate a person in the company responsible for meeting the objectives of the Pact.

Box 4.4. **The Spanish Business and Biodiversity Initiative** *(cont.)*

By signing the voluntary agreement or "pact", firms benefit from best practice sustainable production and marketing approaches; opening of new market opportunities; better access to financial capital; and improvements in the firm's value (including stock value) from its projection of its biodiversity-friendly practices.

Partners in this initiative include the "Sustainability Excellence Club", a non-profit business association comprising large companies that encourage sustainability from the corporate environment by sharing and disseminating business practices that contribute to excellence and further the progress of society; Forética, a leading Spanish business and professional association of corporate social responsibility practitioners that promote ethical management and social responsibility, endowing organisations with knowledge and useful tools to successfully develop a competitive sustainable business model; "Biodiversity in Good Company", a non-profit business association established in 2008 to make tools available that link the business sector with biodiversity conservation; and "Fundación Global Nature", a foundation created in 1993 that aims to preserve and protect the environment.

Source: www.fundacion-biodiversidad.es/.

3. Information systems

Inventories and data portals

Spain has made considerable progress over the last decade in developing and using information tools, including inventories, portals with biodiversity data and monitoring protocols. The Natural Heritage and Biodiversity Spanish Inventory (NHBSI), called for by Law 42/2007 and made operational in 2011, is the main information knowledge tool for supporting the objectives and targets of Spain's biodiversity policy. It contains three main components: i) biodiversity data with over 30 inventories, catalogues and lists of species; ii) an indicator system to evaluate the state of biodiversity and trends; and iii) an annual report to disseminate this information. Independent professional or scientific organisations may generate additional information for the inventory. All of this information is gathered in the Nature Data Bank. Established by Royal Decree 556/2011, the data bank is an integrated system that harmonises, analyses and disseminates information in the NHBSI. It includes all national-level inventories, as well as extensive spatial and GIS-based data through the Geographic Information System Data Bank of Nature (or GeoPortal) and the Web Map Service facility.

The NHBSI and the Nature Data Bank provide an institutionalised process for harmonising the plethora of diverse and scattered data sets. Priority inventories have been harmonised nationally, to some degree, which includes changes to the component lists carried out with the State Commission of Natural Heritage and Biodiversity. This "institutionalising" of the cataloguing and monitoring of biodiversity data is one of the key biodiversity policy achievements in the last 10 years. It addresses one of the significant policy challenges of the past, namely dispersed, inconsistent and incomplete datasets over biodiversity resources across the autonomous regions. Once completed, these inventories and indices will help assess the status, past and future trends of biodiversity resources and, hence, will constitute the cornerstone of policy making and target setting.

Royal Decree 556/2011 also established the Spanish Biodiversity Monitoring System, which strives to obtain a complete annual account of biodiversity trends in Spain. To date, monitoring systems have been put in place for birds (1998), continental fishes (2008) and amphibians and reptiles (2009), while ones for mammals, vascular plants and invertebrates are still under development. The Observatory of Protected Areas (EUROPARC-Spain) is one of the main tools to facilitate the exchange and dissemination of information on the planning and management of protected areas. The Observatory maintains a geoportal that incorporates the protected area databases back to 1994.

Lastly, the NHBSI's Interactive Platform-Biodiversia was created under Laws 27/2006 and 42/2007 to foster civic participation in gathering and disseminating knowledge about species biodiversity. It aims to promote environmental education and awareness, as well as access to information about environmental protection.

Marine biodiversity policy information tools

Information systems on marine biodiversity remain more dispersed, and are significantly less complete compared to terrestrial resources. Significant recent initiatives include the Spanish Inventory of Marine Habitats and Species (to be completed in 2015). It feeds into the Marine Strategy Information System currently under development, which is expected to provide analogous information to the Nature Data Bank, including web-based mapping tools. Monitoring programmes under the Marine Strategy Framework Directive, as well as for the Marine Natura 2000 Network, will feed these information systems, and increase knowledge of marine biodiversity. Steps have also been taken to improve governance among different administrations, especially among central and regional (coastal) bodies. This will improve synergies, avoid duplication of data collection, storing activities and monitoring, and ensure comparability of the information gathered.

Other geographical data and metadata information resources relevant for marine biodiversity policy are the portal by the Spanish Institute of Oceanography (on research in marine science) and the portal under the Centre for Studies and Experimentation of Public Works (CEDEX) that demarcates marine ecosystems.

Indicators and reports

In response to Act 27/2006, which called for enhanced access rights to information, public involvement and access to justice on environmental matters, the MAGRAMA produces monthly and annual reports on the state of the environment and issues a complete report every four years. Together with these status reports, the ministry publishes "Environment in Spain" annually, which offers an overall assessment of the state of the Spanish environment, including biodiversity. In addition, the Spanish government has established the Environmental Indicators Public Bank that provides a list of 68 general environment indicators selected to accord with the European Environment Information and Observation Network (Eionet). Another environmental information instrument, published annually (since 2004), is "Environmental Profile of Spain", which seeks to provide a benchmark assessment of intertemporal trends (using EEA indicators) with respect to environmental resources (including biodiversity). In response to Act 42/2007, the MAGRAMA also produces an annual report on the status and trends of biodiversity in Spain, as well as actions implemented for its conservation.[11]

Other notable third-party, independent repositories of biodiversity information developed in the last decade include the Global Biodiversity Facility (GBIF) of Spain

(*www.gbif.es/index_in.php*), ANTHOS, or Spanish Plant Information System, (*www.anthos.es/*) and the InvasIBER website about the introduction of alien species in Spain (*http://invasiber.org/*), as well as an information system on Iberian and Macaronesian vegetation (Sistema de Información de la Vegetación Ibérica y Macaronésica, *www.sivim.info/*) and wild fauna (*www.fauna-iberica.mncn.csic.es/*).

Data gaps and harmonisation needs

Despite important progress, some inventories under the NHBSI still need to be completed and require greater harmonisation across regions. This makes a complete national assessment of the state of Spain's biodiversity particularly cumbersome. The most comprehensive data relate to woodland cover and forest extension, and forest fires. This is consistent with the longer history of institutionalised forest policy and forest monitoring activities. Efforts to generate reliable, comprehensive and coherent baseline data on marine species and marine ecosystems are lagging further behind those related to terrestrial biodiversity.

The latest report assessing Spain's Natural Heritage and Biodiversity Inventory contains the first assessment of the state of these inventories. In 2012, nearly all of the inventories called for by the 42/2007 law were established and implementation guidelines were developed. Yet the MAGRAMA concedes that when considering actual evaluation and monitoring, degree of coverage and quality of data collected (in particular, completeness and accuracy), as well as accessibility of information, the inventories have only generated half of the intended body of knowledge (MAGRAMA, 2013c). There is thus considerable work needed to make these inventories more effective.

There is also room for harmonising monitoring and reporting protocols for biodiversity resources across regions. The Nature Data Bank aims to include various scientific inventories, but they still have not been fully integrated and regional datasets have not been incorporated. A useful template could be the national forest inventories that have a longer history of co-ordinated and homogeneous data collection. Given the governance structure in Spain, a bottom-up approach is being used to harmonise data collection, monitoring and evaluation protocols. Co-ordinating institutions should enhance the voice of regional authorities to enable biodiversity target setting and monitoring protocols that adequately reflect capabilities. Greater collaboration among the Autonomous Communities could stimulate exchange of good practice and capacity building. The challenge in completing and updating existing inventories, catalogues, datasets and web-based databanks becomes particularly grave given increasing budgetary cutbacks.

Role of economic analysis

Spain has advanced its analysis of the economic benefits from ecosystem services. The Valuation of Natural Assets of Spain (VANE), a project by the University of Alcalá in 2004-08 with support from the Ministry of Agriculture, Food and the Environment, was the first attempt to identify the value of goods and services from natural resources throughout the Spanish territory. The project aimed to identify natural services and create physical models of value assignment. The second objective was the development of a Land Information System of natural capital to obtain value maps for each of the considered ecosystem services. Preliminary results showed that while water provision brings the highest annual benefit, recreational services bring the highest values per hectare

(Table 4.2).[12] More recently, Spain has completed the first phase of its Millennium Ecosystem Assessment (*www.ecomilenio.es/*), which was sponsored by the Biodiversity Foundation. This project generated additional information on changes in the ecosystems that directly affect human welfare. However, it provided little assessment of the economic and social costs of the loss of biodiversity and associated ecosystem services. The second phase of the assessment is developing these economic and social dimensions.

Table 4.2. **Preliminary values of Spanish ecosystem services from the VANE project**

Ecosystem services	Valuation method	Value (EUR/year in 2005 prices)	Average value (EUR/ha year)
Food and raw materials production	Market prices; land prices; real options method	5 553 129 950	444
Water provision	Residual value method; consumer surplus; avoided cost method	17 392 648 905	361
Recreational services	Travel cost method; willingness to pay measures	2 738 165 280	1 699
Sport hunting and fishing	Work at prices	106 652 386	30
Erosion control	Avoided costs method	443 022 879	11
Waste treatment	Avoided costs method	241 517 788	8
Carbon capture	Avoided costs method	7 021 831 219	193
Biological diversity conservation	Conservation costs	731 819 052	15

Source: MARM (2010). *Valoración de los Activos Naturales de España,* [Valuation of Spain's Natural Assets], Ministry of Environment, Rural and Marine Environment.

The VANE project has been a promising tool. It helped develop methods for determining the economic value of ecosystems goods and services, provided references for the appraisal of alternative uses of natural resources and made available information about the benefits that environmental services provide to society. It has been used in the context of the environmental liability regime to identify the values of damaged ecosystem services. However, it has played a less prominent role in establishing objectives of the main laws regulating biodiversity (mainly 42/2007 and 41/2010 on terrestrial and marine biodiversity respectively), as well as targets in the Natural Heritage and Biodiversity Strategic Plan; no alternative tools were developed. The planning and approval process for large investment projects considers economic impacts on biodiversity to some extent since they are included in environmental impact assessments. Yet biodiversity policy target setting has not been subjected to rigorous cost-benefit analysis. The strategic plan calls for the inclusion of biodiversity economic values in target setting, but this objective needs further development.

If economic input is used in decision making, it concerns the cost of target setting and managing conservation policies with little regard to benefits generated from biodiversity conservation. For example, the MAGRAMA focuses on the cost of expanding the Natura 2000 network and less on the benefits that can be generated from its expansion. MAGRAMA analysis showed that EUR 1 billion is required to ensure proper management of the Natura 2000 areas, or approximately EUR 80 per ha (Moreno, 2013), but the formal analysis of the benefits of the Natura 2000 sites in Spain has just started. Studies of the Natura 2000 network in the UK and France estimated benefits of around EUR 150/ha, exceeding costs seven-fold; in Finland, a similar study found that benefits exceed costs 20 times.

A more comprehensive assessment of the economic value of the country's biodiversity assets and ecosystem services is expected with the second phase of Spain's Millennium

Ecosystem Assessment (2013-15). The economic valuation of Spain's biodiversity and ecosystem services should also be an integral part of making the "business case" to integrate biodiversity considerations into all sectors of the economy.

4. Protected areas and wildlife conservation

4.1. Protected areas

Expansion of protected areas

The terrestrial area of Spain under some form of nature protection expanded by 9% between 2000-12 and covers 29% of the country. The current share of the protected land is one of the highest among OECD member countries and by far exceeds the 2020 Aichi biodiversity target of a minimum 10%.

Spain recognises three main categories of protected areas by law: i) Natura 2000 Network; ii) Protected Natural Areas (PNAs); and iii) Internationally Agreed Protected Areas (IAPAs) (Box 4.5 and Table 4.3).[13] In several cases, a specific territory falls under more than one protected area category. The PNAs and Natura 2000 network overlap significantly; this can vary from 100% in Autonomous Communities that assimilated the Natura 2000 network into their PNAs to 10-15% in those that kept the networks distinct (EUROPARC, 2012). Each category includes numerous subcategories with different legal ramifications. Some analysis identified up to 46 different types of protected areas in Spain, which make it difficult to compare areas declared at the regional level (Voth, 2007). To address this challenge, the Natural Heritage and Biodiversity Law (42/2007) requires ACs to link their different types of protected areas to one of the IUCN categories.

There is considerable regional variability with respect to protected areas. The Autonomous Communities with the highest percentages of protected territory are the Canary Islands (77%), La Rioja (51%), Madrid (41%) and Valencia (39%). In terms of actual size, protected areas in Andalusia, Castile and León and Castile-La Mancha account for half of the total (Table 4.3).

Marine protected areas (MPAs) have also considerably expanded. Spain estimates that MPAs covered 8.4% of territorial waters[14] by the end of 2014. An important policy shift brought about by the Law on the Protection of Marine Environment (41/2010) moved MPA expansion from a paradigm of designating fishery reserves (that focus mostly on maintaining the natural repopulation of fish stocks) to one designating marine protected areas (that focus on preserving entire marine ecosystems and fostering ecological corridors). The declaration of MPAs in 2010 and the subsequent development of the Network of Marine Protected Areas of Spain (NMPAs) spurred actions to make the network representative by including areas from all of Spain's marine sub-regions (i.e. East Atlantic, Bay of Biscay and Iberian Coast, the Macaronesian Islands Atlantic and the Mediterranean region). As of July 2014, 39 new marine protected areas classified as "Special Protection Areas for Birds" (SPAs) under the European Birds Directive have been established. In addition, four new areas are proposed as Sites of Community Importance (SCIs) under the European Habitats Directive. The ongoing expansion of the marine protected area network is co-ordinated through the Life+ INDEMARES project.

Key challenges in managing protected areas

The wide typology of protection reflects the decentralised and often ad hoc manner with which protected areas designation has evolved in Spain. For long periods, Spanish

Box 4.5. **Main categories of protected areas recognised by law in Spain**

Protected Natural Areas (PNAs)

The Natural Heritage and Biodiversity Law (42/2007) defines protected natural areas as those "within Spain's national territory, including the inland and marine waters (…) that contain natural elements or systems that are representative, unique, fragile, endangered or of special ecological scientific, scenic, geological or educational interest, and are specifically intended to protect and preserve biological diversity, geodiversity and associated natural and cultural resources".

The PNAs cover 12% of the Spanish territory and include 1 553 areas designated under 46 different protection categories. There are 15 national parks, 162 natural parks, 277 natural reserves, 319 natural monuments, 56 protected landscapes and more than 800 sites with different protection categories that add up to 6.2 million ha. The PNAs in Andalusia account for 25% of the total and those in Catalonia for another 15% (Table 4.3). Marine protected areas (MPAs) are a relatively new category. Nearly half of the area designated as MPAs belong to the El Cachucho, Spain's first maritime protected area under the OSPAR Convention. It is located in the waters of the Exclusive Economic Zone of the Cantabrian Sea.

The Natura 2000 Network

The Natura 2000 Network, an ecological network of protected areas in the territory of the European Union, aims to assure the long-term survival of Europe's most endangered species and habitats. It consists of Sites of Community Importance (SCI) declared under the Habitats Directive (92/43/CEE), and Special Protected Areas for Birds (SPA), designated under the Birds Directive (79/409/CEE).

About 27% of Spain is covered by the Natura 2000 areas. In 2014, this included 1 448 SCIs (of which 449 already had a status of Special Areas of Conservation) and 598 SPAs (MAGRAMA, 2014). In total, 23% of the Spanish land territory is protected by SCI status and 19% is under SPA status.* Spain has the highest proportion of Natura 2000 protected areas in Europe, and protects 65% of the 179 existing habitat types included in four Biogeographic Regions of the Habitat Directive.

Internationally Agreed Protected Areas (IAPAs)

The 42/2007 law defined internationally agreed protected areas (IAPAs) as those formally designated in accordance with the provisions of international conventions and agreements to which Spain is a party. This includes the Convention on Wetlands of International Importance (Ramsar); the World Heritage List of the Convention on the Protection of the World Cultural and Natural Heritage, the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR), the Specially Protected Areas of Mediterranean Importance (ZEPIM) and the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean. The IAPAs also include the geoparks and the biosphere reserves declared by UNESCO and the biogenetic reservations designated by the Council of Europe.

The IAPAs cover 10% of Spain's territory. The surface area of biosphere reserves is the largest in Europe (MAGRAMA, 2014, 2013c). The UNESCO's World Heritage Convention recognised four Spanish national parks: Doñana, Garajonay (on the island of La Gomera), Teide (Tenerife) and Monte Perdido (in the Pyrenees). Some of the IAPAs, however, do not have any legal status and their protection is weak. Coverage of national waters by OSPAR MPAs remains at 0.9% in Spain.

* The percentages do not add up due to overlaps.

Table 4.3. **Protected areas by autonomous community and type of protection, 2012 or latest available year**

	Total area	Total terrestrial protected areas	Natural Protected Areas (NPA)[a]			Red Natura 2000			Protected areas under international conventions			
			Terrestrial	Marine	NPA terrestrial	Terrestrial	Marine	RN 2000 terrestrial	MAB	RAMSAR	ZEPIM	Subtotal
	(ha)	(ha)	(ha)	(ha)	% of total area	(ha)	(ha)	% of total area	(ha)	(ha)	(ha)	(ha)
Andalusia	8 760 432	2 815 018	1 626 214	53 282	19	2 587 547	110 066	30	1 524 594	139 116	37 830	1 701 541
Aragón	4 773 063	1 370 251	157 907	-	3	1 354 645	-	28	50 903	16 701	-	67 604
Cantabria	531 367	152 663	152 022	1 055	29	144 773	2 909	27	15 136	4 549	-	19 684
Castile-La Mancha	7 941 031	2 523 421	580 215	-	7	1 838 181	-	23	650 337	10 545	-	660 882
Castile andLeón	9 422 715	2 688 536	717 626	-	8	2 460 878	-	26	488 467	3 042	-	491 509
Catalonia	3 220 195	1 019 682	989 968	79 125	31	979 019	86 054	30	17 207	52 888	10 719	80 815
Ceuta	1 981	630	-	..	-	630	836	32	-	-	-	-
Melilla	1 395	46	-	..	-	46	45	3	-	-	-	-
Madrid	802 558	327 637	110 150	-	14	319 605	-	40	61 992	486	-	62 478
Navarra	1 038 554	273 206	84 942	-	8	265 321	-	26	39 388	316	-	39 704
Valencian Community	2 326 186	914 267	241 647	14 373	10	872 281	64 246	38	-	31 555	17	31 572
Extremadura	4 167 919	1 277 361	314 028	-	8	1 264 075	-	30	116 172	6 990	-	123 162
Galicia	2 967 888	858 993	357 657	40 139	12	352 016	38 158	12	610 900	3 384	-	614 284
Balearic Islands	501 604	176 533	72 810	25 717	15	113 605	108 234	23	69 773	2 188	1 301	73 262
Canary Islands	744 568	572 794	302 254	37 151	41	348 004	12 510	47	450 350	95	-	450 445
La Rioja	504 133	258 254	166 418	-	33	167 558	-	33	119 820	86	-	119 907
Basque Country	722 232	164 793	99 064	3 939	14	145 500	1 455	20	21 775	1 629	-	23 404
Asturias	1 061 094	349 765	232 444	-	22	284 549	19 813	27	243 618	2 171	-	245 788
Murcia	1 131 315	274 348	59 911	114	5	264 779	28 311	23	-	222	-	222
Managed by MAGRAMA		53	-	234 950	-	53	562 410	-	-	-	-	
TOTAL	50 620 665	16 018 253	6 265 278	489 845	12	13 763 065	1 035 048		4 480 383	275 962	49 868	4 806 213

a) Protected areas according to the Natural Heritage and Biodiversity Law 42/2007 of 13 December 2007.

Source: Ministerio de Agricultura, Alimentación y Medio Ambiente (2012), *Informe 2012 sobre el estado del Patrimonio Natural y de la Biodiversidad en España.*

legislation left much room for interpretation to the Autonomous Communities and favoured a heterogeneous evolution of protected areas. Many ACs established their own protected area categories based on their own legal framework. This unco-ordinated procedure has led to a great diversity in denomination of protected areas, as well as planning and management instruments. The 42/2007 law and corresponding strategic plan aimed to clarify this perplexing situation and provide guidelines to harmonise protected area classification and designation. Harmonisation with the IUCN criteria for protected areas is one of Spain's most important objectives, but this has only been accomplished for 30% of its protected areas.

Around one-third of Spanish protected territory areas do not have a management plan. Forty-two percent of national parks have Natural Resources Plans (NRPs), which serve as long-term strategic documents, and 68% have Use and Management Plans (UMPs) to govern day-to-day operations. Of the 15 national parks, 4 do not have management plans, although draft versions are nearly complete for 2 of them and the required public consultations are about to start. Also, IAPAs, which are protected by international agreements, do not have separate management plans as this is not required (EUROPARC-Spain, 2012). Yet IAPAs often overlap with other protected area categories and thus benefit from their management plans such as those for Natura 2000 sites. Delays in development and approval of management plans (which are not compulsory in the Habitat Directive, but are compulsory under the Act 42/2007) also extend to the Natura 2000 sites. Most sites are preparing management plans, around one-quarter have approved plans and only a small portion have no management tools in place (MAGRAMA, 2014). When available, management plans have proven instrumental in the development and sustainable utilisation of protected areas (Box 4.6).

Management plans have been produced at a considerably faster pace over the last few years. For example, the number of NRPs in protected parks doubled in 2010-11 compared to the previous year. In 2014, Spain was awarded the Networking and Cross-Border Co-operation Award for its technical co-operation network, which develops quality standards for management and a reference website on the state of the Natura 2000 Network in Spain. Rebollar de Navalpotro in Guadalajara is one area where these actions have been successfully applied, showing how Natura 2000 is both a network of species and habitats and a network of people. This partly reflects the increased availability of baseline ecological data that is needed to develop such plans, but is also likely an attempt to enhance the efficient management of resources in the face of constrained finances. The Priority Action Framework for the Natura 2000 Network in Spain (2014-20), the overarching strategic tool, aims to have management plans in all Natura 2000 Network sites by 2015. However, given previous experience and limited finances, such a target does not seem realistic.

Spain's third challenge has been governance of its 15 national parks, which cover around 382 000 ha, or 0.78% of its territory. Initially, the parks were conceived as elements of cohesion in the fragmented national network of protected areas. In the late 1990s, a legal framework established shared management of national parks by the national and regional administrations on the basis of a Master Plan. However, some Autonomous Communities continued to consider national parks legislation as un-constitutional and called for an absolute decentralisation of the management of protected areas. In 2004, the Constitutional Court declared that Autonomous Communities have responsibility for management and financing of national parks, but recognised the co-ordination role of the

Box 4.6. **The Albufera Natural Park**

The Albufera Natural Park in the Gulf of Valencia hosts the Albufera freshwater lagoon and estuary. The park, which occupies a surface area of 21 120 ha, is home to a significant variety of fauna and flora.

Once a saltwater lagoon, Albufera was converted into freshwater by the 17th century. The lake itself occupies around 3 000 ha with the remaining 18 000 ha occupied by land (mostly for rice cultivation). Sand dunes separate the lagoon from the Mediterranean Sea, while three gated canals regulate the flow of sea water both into the lake and into the rice fields. This type of paddy landscape surrounding the lake offers a unique ecosystem that serves as an important breeding and migratory route for many bird species, as well as habitat for other flora, fauna, reptile, fish, snail, molluscs and crustacean species. The lagoon represents perhaps the best example (in terms of rare and rich species) of a freshwater coastal lagoon in the Mediterranean. Beyond its national and international ecological significance, it has evolved into a productive landscape and serves as an exemplary case of how protected areas can both conserve the natural environment and generate growth and employment. The reserve hosts various sustainable agricultural activities (such as farming of traditional rice varieties), traditional fishing (which remains the main economic engine) and nature-based recreation (such as bird watching and sailing). Its proximity to the city of Valencia (about 11 km) facilitates the further development of recreation in the region, offering higher value nature-based tourism, agro-tourism and culinary tourism.

Unsurprisingly, the reserve was under constant threat of becoming a victim of its own success from the pressures of intensive agriculture, overfishing, urbanisation, illegal hunting and tourism. The reserve was granted Natural Park status in 1986, has been a Ramsar Site since 1990 and has been a Special Protected Area for Birds (SPA) since 1991 within the Natura 2000 Network. The neighbouring Autonomous Communities have passed several regulations to address specific management and enforcement issues. These regulations, together with the Management Plan (approved in 1990) and the Master Plan for the Use and Management of the Albufera Natural Park (approved in 2004), have been instrumental in balancing the need for both growth and conservation objectives. Despite ongoing pressures, Albufera Natural Park is an instrumental example for the need to develop management plans in all protected areas in Spain.

Source: www.albufera.com/parque/, Ghai et al. (2012).

state. The 2007 law confirmed this principle, but entrusted the Ministry of Agriculture, Food and the Environment with the monitoring and assessment of compliance with the objectives of the Master Plan through the National Parks Autonomous Organisation (OAPN). In 2014, the government adopted a bill on national parks that strengthens the role of the national administration and incorporates co-ordination between the state and ACs to ensure proper conservation of protected areas. It also puts forward an agenda for improvement compatible with green growth, emphasising job creation and sustainable development.

4.2. *Wildlife conservation*

Law 42/2007 and Royal Decree 139/2011 created the List of Wildlife Species of Special Protection Regime, which includes species and taxa that require particular attention owing to their scientific, ecological and cultural value, as well as to the uniqueness, rarity and

degree of threat, as specified by EU directives and international conventions ratified by Spain. This list encompasses the Spanish Catalogue of Endangered Species (also established by the 42/2007 law and 139/2011 decree), which includes species for which scientific information is available so as to formally classify them as technically "endangered" and/or "vulnerable". The 42/2007 law establishes the requirement for development of conservation strategies to be approved by the central government and recovery and conservation plans to be approved by the Autonomous Communities for species considered "endangered" and "vulnerable". Such conservation strategies are to be introduced for threatened species present in more than one AC.

In 2012, there were 904 species in the List of Wildlife Species of Special Protection Regime, 608 species of special protection and 296 species integrated into the Spanish Catalogue of Endangered Species, of which 120 are classified as "vulnerable" and 176 as "endangered".[15] As of 2014, Spain had adopted 17 national conservation strategies for "endangered" species. Such strategies were prepared under the Committee of Wild Flora and Fauna, which co-ordinates actions between different administrations. Also in 2014, the Spanish Strategy of Plant Conservation was developed to co-ordinate policies and actions related to plants with Global Strategy for Plant Conservation (GSPC) commitments. Further, Autonomous Communities are developing 166 regional recovery plans for "endangered" and "vulnerable" species and 44 plans for species under special protection regimes. Lastly, there are notable breeding and reintroduction programmes at national or regional levels for 40 species in the Spanish Catalogue of Endangered Species.

Evidence suggests these conservation strategies, recovery and reintroduction programmes are effective. The cases of the imperial eagle (*Aquila adalberti*), the brown bear (*Ursus arcto*), the Iberian lynx (*Lynx pardinus*) and the bearded vulture (*Gypaetus barbatus*) are exemplary conservation and reintroduction plans. Other high-profile species conservation programmes concern marine wildlife, including turtles and sharks (MAGRAMA, 2014). However, further efforts are needed to develop conservation strategies for all "endangered" species, which currently number 176, in compliance with Law 42/2007.

5. Financing biodiversity

5.1. *Key trends in financing biodiversity*

Although the identification of expenditure related to biodiversity provides only a partial picture, the available data show that biodiversity financing remains heavily reliant on the national budget and EU funds. Between 2000-09, overall expenditure increased from around EUR 870 million to EUR 2.3 billion, but rapidly decreased following the economic crises to EUR 1.5 million in 2011. More than half of expenditures were provided at the regional level. The private sector's contribution has increased since 2006, but only accounts for about 15% of the total (Table 4.4).

In 2011, approximately EUR 86 million was invested in direct management of protected areas, with EUR 248 per ha invested in national parks and EUR 26 per ha in natural parks. Direct investment decreased by nearly 50% between 2005-11. The downward trend was also linked with decreasing visitation as a result of the economic downturn, with 9.5 million recorded visitors in 2010 compared to 10.8 million in 2005. This decrease has escalated since 2007, with some exceptions in high profile parks (MAGRAMA, 2011).

Generally, the steady decline in labour and investment in the last decade has led to more parks with an annual budget of less than EUR 0.5 million; this is now close to 63%

Table 4.4. **Expenditure on biodiversity conservation in Spain in 2006-10**

EUR million, 2005 prices

	2006	2007	2008	2009	2010	2011
Central government	251	478	432	662	441	323
State government	1 054	933	931	949	811	747
Local government	187	247	248	401	221	181
Business sector	156	262	351	307	243	237
Total	1 649	1 920	1 962	2 319	1 716	1 488

Source: EUROSTAT (2014), "Environmental Accounts", *Environment and Energy Statistics* (database); OECD (2014), "General Government Accounts: Government expenditure by function", *OECD National Accounts Statistics* (database).

compared to 42% in 2005 (EUROPARC-Spain, 2012). Although the national parks provide detailed management information, only 30% provide budgetary information and considerably fewer report on key monitoring and evaluation variables. This could reflect budget cutbacks that do not allow for the production of such reports.

Following provisions of the 42/2007 law, a new financing instrument, the Fund for Natural Heritage and Biodiversity, was established. It aims to channel funds to the Autonomous Communities for implementation of the biodiversity law through a wide range of projects and activities. This includes projects on the sustainable use of forests and fire prevention, as well as the protection of Natura 2000 sites and biosphere reserves (including the promotion of sustainable agriculture, forestry and tourism). To date, the central government provides the bulk of financing. However, core government financing of the fund has been decreasing in recent years due to the economic situation.

The European Union also remains a potentially important source of funding for management of Natura 2000 sites. The Priority Action Framework for Financing Natura 2000 sites provides a tool for integrating financing of the network into appropriate EU financial instruments. One of the most important sources of EU funding is the European Regional Development Fund (ERDF). Other sources of EU funding for Natura 2000 sites are the European Agricultural Fund for Rural Development (EAFRD), the European Fisheries Fund (EFF), the European Social Fund, the European structural funds, EU Research Framework Programmes and LIFE+. However, the EU and state funds are not of sufficient magnitude to address Spain's biodiversity conservation needs or commitments. For example, LIFE+, which finances important conservation and recovery projects of Species of Community Interest and projects on the eradication of invasive species, provides funds for less than 10% of requirements. The revised Priority Action Framework for Financing Natura 2000 (2014-20) emphasises alternative sources of financing, with market solutions such as payment for ecosystem services (PES) at the forefront of attention. Such aspirations resurface in revised policy documents, but actual uptake remains limited.

There is no corresponding priority action plan for financing of marine Natura 2000 sites. The Strategic Plan of the Spanish Marine Protected Area Network (RAMPE) is expected to address these concerns, although it will be completed only in 2015. As in the case of the terrestrial Natura 2000 sites, most monitoring, evaluation and conservation activities are expected to be financed by increasingly reduced state and EU funds.

5.2. Reform of fiscal instruments for biodiversity conservation

A number of financial incentives have supported biodiversity objectives in Spain. These include tax credits to landowners who transfer a property right (usufruct) to non-profit entities that then conserves the land; property tax exemptions for purchase of land intended for conservation; a 25% tax deduction on individual income tax or 35% on corporate income tax for grants to organisations engaged in conservation; and other tax exemptions for donating land to conservation organisations. Various co-operation tax incentives have also been awarded to enterprises engaged in biodiversity activities, which increased their allowable deductible expenses. Also, some regions have established tax incentives for biodiversity-friendly investments. Castile and León, for example, provides income tax deductions to landowners within Natura 2000 sites for specific types of activities (authorised and audited by the local regional authorities) (MAGRAMA, 2014). During 2007-13, the European Fisheries Fund provided incentives to modernise the fishing fleet with more sustainable, biodiversity-friendly technology. In the agricultural sector, most notable reforms with respect to financial incentives concern the "greening" of subsidy payments provided under the Common Agricultural Policy (CAP) (Section 6).

The Strategic Plan on Natural Heritage and Biodiversity also called for analysis of the possible adverse impact of certain financial support mechanisms, such as subsidies and tax incentives, on biodiversity and the exploration of avenues for their adjustment. However, this work has advanced slowly and a comprehensive national evaluation of fiscal instruments for biodiversity conservation is under development as part of the general tax reform programme (Chapter 2).

5.3. Alternative sources of financing

Alternative financial instruments have been considered in Spain's Strategic Plan on Natural Heritage and Biodiversity, but their potential has not yet been realised. In some industries, such as agriculture and tourism, sustainable/biodiversity-friendly practices do contribute towards biodiversity preservation. Given the increasing paucity of traditional sources of funding (national and EU), there is an urgent need to develop alternative sources of financing biodiversity conservation and sustainable use that are likely to play a prominent role in the future.

Corporate social responsibility and biodiversity conservation

The National Business and Biodiversity Initiative (Box 4.4) and other business information-exchange initiatives, such as the Spanish Environmental Markets Platform, actively promote activities that link biodiversity conservation with firms' corporate social responsibility (CSR) objectives. A recent report by the Sustainability Excellence Club presents 40 case studies where Spanish businesses and private enterprises have voluntarily promoted biodiversity conservation through a variety of activities, all of which aim at attaining CSR benefits (SEC, 2014). These activities mostly include voluntary private financing of direct conservation activities such as reforestation programmes; ecological restoration initiatives; species and wildlife habitat recovery programmes; sponsoring of research projects for enhancing understanding of biodiversity; and private sponsorship of public awareness events that promote biodiversity conservation. These are typical voluntary environmental initiatives or agreements that yield benefits to firms from displaying such social responsibility.

For example, the food companies Frusansa Andalusian Nuts and Alcampo have financed the reforestation of forest lands with native tree species. The Esteve pharmaceutical company undertook conservation in corridor areas between protected areas, while Cemex and Holcim – both construction and mining companies – completed ecological restoration activities that went well beyond those required by their licensing agreements. Similarly, the Calvo Group fishing fleet initiated an independent audit and monitoring of its fishing practices to ensure sustainable fishing of tuna. The energy company Iberdrola supported and sponsored a major research project by the Spanish Ornithology Society/BirdLife to study the migratory movements of birds that will form the basis for an atlas of bird migration in Spain.

Various auditing initiatives have also emerged to certify biodiversity-friendly business practices. For example, the Global Nature Foundation has carried out numerous audits, similar to those for EMAS and ISO 14001, on participating companies (such as Cepsa, Ence, Herdade do Freixo do Meio, Cooperativa Agraria de Viver, Iberdrola and Red Eléctrica de España) to explore their biodiversity impacts. The Foundation advises audited companies on how to integrate biodiversity into environmental management plans, as well as how to take actions that directly aim at the sustainable use of resources and protection of nature (SEC, 2014). Audit results are confidential, but the firm's participation in the scheme is made public, which does enhance its corporate social responsibility profile.

Territorial custodianship

Spain also has experience with an alternative policy mechanism known as territorial custodianship schemes. They are akin to land stewardship programmes found in many other OECD member countries. These schemes have a relatively long history in Spain, but were given a more formal legal framework with the 42/2007 law. They have proven highly effective in restoring and conserving natural areas without necessarily requiring public finances. At a national level, the Territory Custody Platform has registered 85 custody entities (67% private and 33% public) in 11 autonomous regions, 80% of which are located in Catalonia and on the Balearic Islands. Through these entities, 706 custody agreements have been signed involving a heterogeneous mix of entities that include public agencies, protected area managers, private businesses and stakeholders, non-profit organisations, foundations, associations and NGOs. The main preservation values identified in these agreements are related to forests (18% of agreements), agricultural lands (14%) or habitat protection (8%). Nevertheless, 37% of projects do not specify their type of preservation benefits. Also, marine territorial custody is under consideration and a suitable legal framework is being prepared. In the meantime, some initiatives have emerged that involve stakeholders from the fishing community and the tourism and recreation sector, as well as consumer and public awareness groups that use beaches and shores.

Habitat banking

The concept of habitat banking first appeared in Spain as a result of the transposition of the EU Environmental Liability Directive. It was included in the Strategic Plan and formally established by the 21/2013 Law on Environmental Assessments. Habitat banks can be used voluntarily to compensate for unavoidable loss of biodiversity in situations regulated by the laws on environmental impact assessment and environmental liability. The general principles for their development have been legally approved and the MAGRAMA is developing detailed technical guidelines that would specify how banking can

ensure "no net loss" and the equivalency of ecosystem services in the "offsetted" site. A small number of consulting firms actively promote the development of habitat banking, carry out cost-benefit analysis of investment in conservation banks, explore alternatives for the purchase of environmental credits and provide training for governments and businesses. However, this sector remains at an embryonic stage.

There are a few cases of voluntarily offset projects by private firms – mostly from the energy and mining sectors (SEC, 2014). For example, the energy company Cepsa has established a new wetland that provides like-for-like ecosystem services (in terms of bird migration routes and other wildlife habitat). The offset wetland is located approximately 1 km from the wetland that was irreversibly transformed by the company in the 1950s. There is considerable scope for further promoting such actions and to expand into other sectors, such as the construction industry (EUROPARC-Spain, 2010).

PES schemes and territorial contracts

Payments for ecosystem services (PES) are payments to farmers or landowners who have agreed to manage their land or watersheds to provide an ecological service. As is the case with other market mechanisms for biodiversity conservation, the use of PES schemes (or beneficiary pays markets) has been prioritised in the 42/2007 law and its strategic plan. While the 42/2007 law provided the legal foundation for PES contracts, the recently established Fund for Natural Heritage and Biodiversity aims to be the vehicle for payments between public "demanders" and private "suppliers" of environmental ecosystem services. Although actual examples of pure PES programmes are practically non-existent, some programmes have affinities to PES schemes. These include agri-environment schemes, mostly funded under CAP and rural development programmes (Section 6) and territorial contracts established by Royal Decree 1336/2011, which serve as a tool for sustainable rural development. These schemes are primarily targeted towards agricultural activities, and under certain conditions compensate farmers for providing biodiversity benefits.

There is also no experience of PES schemes between private entities (e.g. water utility companies and agricultural or forest land users) as observed in other OECD member countries. As PES is an increasingly popular conservation and resource management tool, Spain should explore how PES could help satisfy economic and environmental objectives.

6. Integrating biodiversity into economic sectors

The Spanish 2011 Millennium Ecosystem Assessment showed that management of ecosystems and biodiversity based primarily on the designation of protected areas and species conservation has not been sufficient to stop biodiversity degradation. The need for biodiversity policies that go beyond the realm of protected areas has been accepted in Spain and is now enshrined in all recent key biodiversity legislative documents. This has been most prominent in the 42/2007 Biodiversity Law and the Strategic Plan on Natural Heritage and Biodiversity 2011-17. Ensuring the integrity of ecosystems and productive landscapes, especially those related to agriculture and tourism, and conserving corridor areas between reserves, is imperative for maintaining Spain's biodiversity.

6.1. Integrating biodiversity in agriculture

While agriculture generates more than 2.5% of Spanish GDP and creates jobs for more than 3.5% of the workforce, agricultural landscapes represent around half of the total surface of Spanish territory. Almost 75% of Natura 2000 areas in Spain are used to some

degree for agricultural purposes. The sector exerts significant pressures on biodiversity. Large areas of Spain are at risk of pollution by nitrates, which in turn affect aquatic biodiversity. This is mainly due to chemical fertiliser use for crops and discharges from intensive livestock farming into fresh waters. Nearly 12% of total national surface is classified as Nitrate Vulnerable Zones (NVZ), an area that has increased in recent years. Irrigation accounts for the largest share of water demand (63%), including three-quarters of groundwater used for agriculture. Although agricultural water withdrawals decreased in the last decade, the level of water stress did not, and remains among the highest in the OECD (OECD, 2013). Some regions, such as the Upper Guadiana basin, experienced intensive (and often uncontrolled) groundwater extraction for agriculture, which contributes to the degradation of ecosystems, including important wetlands.

Spain does not have a consolidated nation-wide sectoral plan for integrating biodiversity considerations into agriculture. However, the Strategic Plan on Natural Heritage and Biodiversity set the parameters for its development and included a series of policy measures for integration of biodiversity objectives into the agriculture policy. The main pillars of the integration include subsidy instruments associated with the CAP, rural development programmes and promotion of organic farming.

Despite various initiatives, the overarching trend in the Spanish agricultural sector has been the intensification of agriculture, bigger plots, the prevalence of monocultures, and the erosion and eventual abandonment of traditional agricultural practices. Traditional production landscapes, which included a mosaic of agricultural, forestry and ecosystems, are being gradually replaced by separation of productive areas from protected areas. These are relegated to isolated "islands" of protected areas that are not part of an integral component of broader production landscapes. Yet long-term biodiversity conservation requires the integration of sustainable agriculture and a network of protected areas within broader production landscapes. This is the main challenge in the development and implementation of the impending national sectoral plan for integrating biodiversity into agriculture.

Agri-environment payments

Agri-environment payments under the Common Agriculture Policy have become perhaps the most important policy mechanism for integrating biodiversity into agricultural practices. Spain introduced compulsory environmental conditionality and cross-compliance by Royal Decree 2352/2004. According to the decree, beneficiaries of direct CAP aid, as well as certain rural development subsidies, must comply with environmental requirements. These include appropriate tillage to avoid soil erosion; appropriate management of stubble; investment in and maintenance of terraces; maintenance of ecological features of habitats; contribution towards habitat connectivity; appropriate use of water for irrigation; appropriate storage of livestock manure; and maintenance of permanent pasture. More recently, Royal Decree 486/2009 simplified criteria for cross-compliance with the aim to enhance compliance and facilitate enforcement. Another initiative to establish minimum controls for cross-compliance enforcement has been the development of a National Plan for Cross-compliance Control (implemented annually since 2005). This plan was developed by the Spanish Agrarian Guarantee Fund (FEGA) of the MAGRAMA[16] (the national authority that co-ordinates agri-environment payments) and the Autonomous Communities. More recently, the Royal Decree 202/2012 modified the

provisions of direct payments to agricultural activities and livestock with the inclusion of a compulsory norm on the protection strips along river banks.

Despite such regulations, the actual monitoring and enforcement of cross-compliance remains challenging. There is very little robust evidence on the ecological impact of these payments. Indicative, albeit inconclusive, evidence from declining bird indicators suggests that payments are not delivering intended benefits to ecosystem services; however, compulsory fulfilling of cross-compliance reduces the risk of negative environmental impacts linked to less environmentally respectful agricultural practices.

Spain has further promoted the "greening" of its agricultural policies via the new scheme for "payments for agricultural practices that are beneficial for the climate change and the environment". This mechanism, introduced by CAP reforms and operational from 2015, aims to improve CAP's environmental performance through farming practices that address climate change and environmental objectives. These include requirements to diversify crops and to maintain permanent grassland and ecologically important areas. As such, they emphasise the multifunctional role of farmers as guarantees of environmental protection in rural areas. The new scheme goes beyond cross-compliance, which remains mandatory in 2015-20.

Rural development

The 2007-13 National Strategic Plan for Rural Development (NSPRD) set priorities for national policies and for using and allocating funds from the European Agricultural Fund for Rural Development (EAFRD). Promoting sustainable agricultural activities and projects in Natura 2000 and other areas of high natural value have been granted the highest priority.

The NSPRD provided guidelines to the Autonomous Communities to develop their own rural development programmes (RDP), including measures to promote the integration of environmental and biodiversity conservation activities into rural areas. Approximately 40% of all RDP budgets from EAFRD sources (some EUR 3 billion) have been assigned to such measures; the majority are allocated to agri-environmental measures; afforestation of agricultural land and compensation for loss of profits after adopting biodiversity-friendly agricultural practices or investments; desertification mitigation; and forest fire prevention. In Navarra, for example, farmers in Natura 2000 sites were compensated for loss of profits after adopting biodiversity-friendly practices. Such measures have been complemented under the EAFRD by investments in modern irrigation and soil erosion prevention practices to make the agricultural landscape more biodiversity-friendly.

The surface area covered by agri-environmental measures has been steadily increasing from 2.8 million ha in 2004, to 3.7 million ha in 2006, and 5.17 million ha in 2012. Afforestation programmes on agricultural lands were implemented on 167 273 ha between 2000-04, and increased by another 476 858 ha in 2007-13. The most important of these rural development measures, discussed below, promoted the organic agriculture industry.

Organic farming (agriculture and livestock)

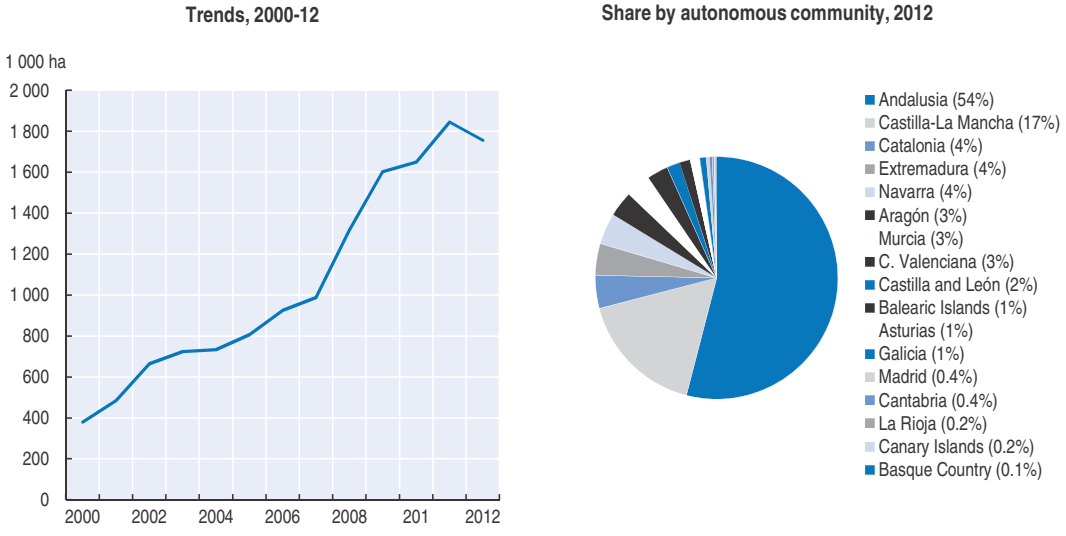
Due to its favourable climate conditions and a larger proportion of agricultural land under extensive production systems compared to other OECD member countries, Spain has considerable potential for developing organic agriculture and livestock. Organic farming has considerable potential for export markets, and could lead to significant employment opportunities and wealth creation for rural communities. At the same time, it helps maintain and improve rural landscapes and conserve biodiversity.

EU Regulations 834/2007 on organic production and labelling of organic products regulate organic farming in Spain. Autonomous Communities designate competent authorities to certify organic agricultural products that may perform the control themselves, confer their competences to a control authority or delegate tasks to private control bodies. Steps have been taken to simplify the labelling process, as well as labelling signals observed by consumers. As a result, certification of organic products is at a much more advanced stage compared to other certified final consumer products, such as from marine or forest resources.

Between 2004-08, the area under organic farming rapidly increased from 733 000 ha to 1.3 million ha, and then to 1.8 million ha in 2011, occupying around 5% of total agricultural surface. Only around 800 000 ha of this area are under agri-environmental payments, which suggests that solely private initiatives are a key driver to this increase (Figure 4.6).

Spain continues to be, for the fourth consecutive year, the EU member with the highest land area under organic agricultural production. In terms of organic crops produced, 25% are cereals, 24% olive trees, 14.3% fallow and green fertiliser, 13.6% nuts and 11% vineyards, while the remaining consists of vegetables, aromatic and medicinal plants, fruit trees (mostly citric) and tubers (MAGRAMA, 2013b, 2012b). The increase in the number of employment opportunities has also been notable. In 2011, there were 32 206 producers and 2 729 processors registered.

Figure 4.6. **Trends in organic farming area**

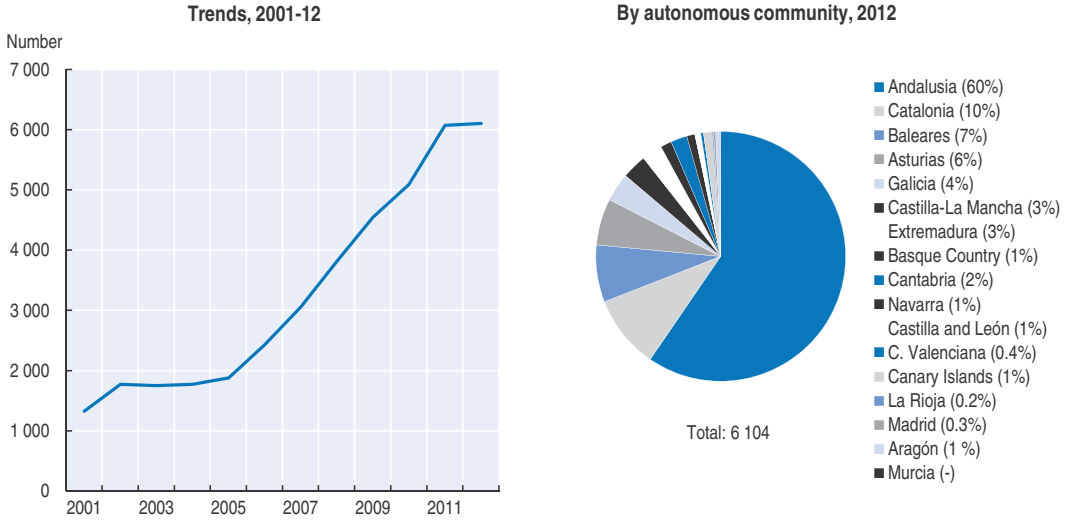


Source: MAGRAMA (2014), *Banco Público de Indicadores Ambientales.*

StatLink http://dx.doi.org/10.1787/888933183062

Spain witnessed the tripling of livestock farms between 2005-12, reaching 6 104 registered ecological livestock producers (Figure 4.7). The highest proportion is in Andalusia (60%), Catalonia (10%), Balearic Islands (7%) and Asturias (6%). There is thus considerable regional disparity in the development of the organic livestock sector. The most popular breeding types are bovine cattle (49%), ovine (28%) and goats (10%) (MAGRAMA, 2013b, 2012b). Although aquaculture accounts for a small share of organic production (0.2%), there are good examples of biodiversity objectives in this type of production (Box 4.7).

Figure 4.7. **Number of organic livestock farms**



Source: MAGRAMA (2014), *Banco Público de Indicadores Ambientales.*

StatLink http://dx.doi.org/10.1787/888933183070

The development of the organic agricultural sector has been stimulated by the Spanish Comprehensive Plan of Action to Promote Organic Farming (2007-10), which established priority areas of development that have improved product knowledge, consumption and marketing. The MAGRAMA is making organic certification more reliable by developing the General Registry of Organic Agriculture Producers (REGOE). Numerous professional associations have developed over the last decade promoting organic farming and providing third-party certification.

6.2. Integrating biodiversity into tourism

Key trends

Tourism is one of the mainstays of the Spanish economy and an outstanding driver of social development. It accounts for almost 10% of GDP and 11% of employment. For decades, Spain's tourism destinations grew rapidly based on a model of high volumes, price competition and a standardised holiday experience focusing on "sun, sea and sand" features. The impacts of this growth adversely affected the attractiveness of a number of destinations. In some regions, human pressure increased one hundredfold and led to overloading the capacity of the coastline, degradation of the environment and deterioration of social systems and facilities.

The threat of tourism decline prompted Spanish authorities to look towards a more sustainable approach. The 2007 Tourism Plan "Horizon 2020", a comprehensive strategy to improve the quality of the country's tourism products, called for ensuring that Spain stays competitive in the tourism marketplace by developing business models that are environmentally, socially and culturally sustainable. The plan envisaged mitigating environmental impacts of tourism by extending the tourist season and promoting lesser known areas of the country. To help achieve its goals, the Working Group on Sustainable Tourism was established in 2007 as part of the institutional framework for co-ordination of tourism policies in Spain.[17]

Box 4.7. **Biodiversity-friendly holistic agriculture in the Veta La Palma Estate, Spain**

The Pesquerías Isla Mayor, S.A. (PIMSA) operation is located in the Veta La Palma Estate at Isla Mayor, municipality of Puebla del Rio near Sevilla, Spain. PIMSA is part of Grupo Hisparroz, a leading rice production company. The estate, which stretches across 11 331 ha in the Doñana Natural Park, is faced with increasing agricultural productivity without jeopardising the ecosystem resilience of the surrounding landscape. Veta La Palma illustrates how holistic business practices can lead to productivity gains while taking into account ecosystem services beyond "provisioning", such as enhanced landscape and biodiversity values.

PIMSA established a polyculture fish farming operation in the early 1990s, fully complying with the park's management plan. The firm re-flooded wetlands lost to natural siltation, and used a pump system to engineer drainage to restore the original drainage channels to bring in water from the estuary. The fish farm covers some 3 200 ha and uses extensive and semi-extensive methods to breed a large variety of fish in 45 interconnected ponds of 70 ha each, which are joined to the local river system through a web of irrigation and drainage channels. To maintain high levels of environmental sustainability, the firm keeps fish at a relatively low density and harvests them less frequently compared to intensive aquaculture. The fish feed on microalgae and shrimp that reach the ponds from the estuary through the channel system and hence do not rely on external food sources. The harvest amounts to some 1 360 tonnes of fish per year (2010).

Birds are allowed to feed in the ponds (through nets and other technology), which reduces total production by approximately 20% per year. Before the aquaculture operation was established, only about 50 bird species were recorded in the area. With ecological investment undertaking by the PIMSA, over 250 different bird species (and 600 000 birds) visit or breed on the estates wetlands. Furthermore, the almost 3 200 ha of permanently flooded aquaculture marshland play an important role as a refuge for the natural fish fauna of the Guadalquivir River estuary, including several endangered species. The business provides income to about 100 farm workers from the nearby town of Isla Mayor (5 800 inhabitants) and to surrounding villages.

Apart from aquaculture, Veta La Palma also has an extensive horse and cattle operation for organic beef and grows some dry-farmed crops. About 2 400 ha of the estate produce livestock feed using a rotation system without fertilisers or pesticides; this also benefits steppe birds such as stone curlew (*Burhinus oedicnemus*) or pin-tailed sandgrouse (*Pterocles alchata*). Another 400 ha are used to cultivate rice. The remaining 4 800 ha are set aside as a conservation area. The reclaimed wetland habitat and sustainable production methods on the estate have boosted the area's biodiversity, while generating economic value.

As a result of its pioneering efforts at integrating aquaculture and marsh area restoration, Veta la Palma has been recognised as an exemplary case for sustainable and holistic agricultural development that is biodiversity-friendly.

Source: *www.vetalapalma.es/* and *www.ecoagriculture.org/*.

The creation of the working group expanded existing initiatives that incorporate environmental features in Spain's tourism development, and spurred new ones. These included the "Nature Walks Programme" and "Natural Roads Programme" based on traditional drovers' routes, paths and abandoned railway lines, "Sustainable Diving Strategy in Marine Reserves and Protected Areas", and numerous training courses on sustainable tourism offered to Autonomous Communities. Steps have also been taken to

align recreational hunting practices with the EU Habitats Directive and address the impact of tourism operators on marine mammals (primarily the whale-watching industry).[18] In 2009, the MAGRAMA and the Ministry of Industry, Tourism and Trade developed a joint initiative on the Tourist Product for Spanish Biosphere Reserves Club, promoted by the national tourism agency (Turespaña) and the National Parks Autonomous Organisation (OAPN).

Under the Horizon 2020 Plan, EUR 1.9 billion was made available to the tourism sector under two programmes: "Plan FuturE" and "Plan RenovE". The first, established in 2009 with a budget of EUR 1 billion, was designed to improve the tourist offer with regard to sustainability, accessibility, quality and infrastructure through low-interest loans for small tourism-related businesses with repayment terms of 5-12 years. The Plan RenovE, a partnership between the State Secretary for Tourism and the Official Credit Institute, focused on improvements in energy efficiency and environmental conservation of tourism establishments. In the first two years of operation, EUR 3.6 billion was invested in 3 380 projects, with EUR 1.9 mobilised for every EUR 1 of the budget credit. The plans together created 77 000 jobs. The programmes' success led to an additional EUR 300 million being made available for 2011.

Several other programmes focused on improving coastal tourism. These included the State Secretariat for Tourism's Programme for the Integrated Revalidation of Mature Tourism Destinations in four pilot destinations: the beaches of Palma in the Balearic Islands, the Costa del Sol in Andalusia, San Bartolomé de Tirajana and Puerto de la Cruz in the Canary Islands and the Spanish Tourism Board (CONESTUR) support under the 21st Century Plan for Coastal Tourism. Finally, the Tourism Infrastructures Modernisation Fund (FOMIT), worth EUR 200 million, is available to help municipalities modernise infrastructure and tourism accommodation, particularly in coastal areas.

Horizon 2020 also provided a basis for public-private partnerships. It helped create new tourist products in protected areas through a "Joining Spanish System" programme, which provides assistance to tourist operators and companies to join the European Charter on Sustainable Tourism (EUROPAC-Spain, 2012). Two such initiatives are the Spanish Tourist Quality System (or "Q" system) and the European Charter on Sustainable Tourism (CETS) certification that received considerable uptake from the industry. For example, 28 protected areas were accredited with the Q system (from only 4 in 2005) in 2012 and 36 were certified by the CETS from only 7 in 2005. Further, in 2012, 270 companies were certified under the CETS, while only 95 firms were certified in 2009. Clearly, the trend of additional protected areas and companies being granted such certification is increasing rapidly. These developments suggest that high value, quality sustainable tourism will play an important role in future protected-area management plans. Other notable private sector-led initiatives include the development of Spanish sustainable tourism criteria that meet the requirements of the Global Sustainable Tourism Council (GSTC); the establishment of Ecotourism Club in Spain, which includes 32 protected areas and over 600 private tourist companies; and action plans by the hotel industry to promote corporate social responsibility and green/sustainable tourism.

Currently, the Spanish strategy for tourism is set out in the National and Integral Tourism Plan 2012-15 (Plan Nacional e Integral de Turismo, PNIT). The strategy reinforces efforts to make Spanish tourism destinations more attractive by shifting from standard/basic products in traditional tourism markets to specialised products that address new markets and are tuned to preferences of different consumers. Innovation, technological

change, environmental responsibility and investment in human resources are key axes of the strategy, accompanied by supportive marketing campaigns. One area of growth is adventure tourism based on the country's natural features (Box 4.8).

Box 4.8. **Growth of adventure tourism in Spain**

Adventure tourism is one sector experiencing greater growth in recent years, with approximately 1 300 companies engaged in Spain. This type of tourism attracts over 7 million people annually thanks to a heterogeneous offer that has developed around the great variety of the country's landscape, including mountains, coastal areas, islands, caves and natural parks. Adventure tourism has resisted the economic crisis well, as Spain is able to offer low-cost active holiday opportunities to European markets, which make it a high potential sector of investment.

Land adventure attracts tourists during both summer and winter holidays. For example, the Pyrenean Trail is famous for hiking and includes cross-country routes to France, while Andalusia offers a rich set of natural caves open to the public, as well as the third largest chasm in the world in the Sierra de Tolox in the province of Málaga. Sierra Nevada is one of the most popular winter sports destinations in Europe, equipped with 105 km of runs for all levels. Spain is also one of the most attractive destinations for surfing, windsurfing and kitesurfing, with areas like the Basque Country and the Canary Islands promoted as well-equipped, low-cost destinations.

Adventure tourism was explicitly recognised as a priority area of investment in the Horizon 2020 Plan, as part of a specialisation strategy aimed to de-seasonalise tourism and better tune the sector's offer on different market segments. The current National and Integral Tourism Plan 2012-15 aims to further promote this product in the wider support framework to strengthen destination management, such as support to young and creative tourism entrepreneurs, and to help provide access to financing.

Changes in tourism preferences are generating greater movement away from traditional "sun and beach" destinations towards other locations, especially ones that present environmental values. As a result, Spain's national parks have witnessed an increase in the number of visits during recent years. Therefore, integrating biodiversity concerns into the tourism sector entails both promoting biodiversity-friendly tourism practices in the mainstream tourism sector, and also developing and expanding the nature-based tourism segment of the industry. The PNIT included the development of ecotourism in selected protected areas as a priority area. This approach stimulated the development of the Sectoral Plan for Biodiversity and Nature Tourism 2014-20, which signals the importance of this sector as a vehicle for green growth. The plan, implemented by the Ministry of Industry, Energy and Tourism and the Ministry of Agriculture, Food and Environment, provides a framework for collaboration among all stakeholders (both public and private) to promote nature-based tourism that integrates biodiversity considerations. As its main priority, the plan is to develop ecotourism within the Natura 2000 Network, while ensuring conservation of the sites. A new system for the accreditation of tourism sustainability in the Natura 2000 Network will consolidate and co-ordinate existing structures and mechanisms mentioned above, such as the European Charter on Sustainable Tourism in Protected Areas, the Spanish Biosphere Reserve System and the Ecotourism Club of Spain.

Notes

1. In terms of the total organic area (fully converted and under conversion) of individual EU member states as a share out of the total organic area in EU27, Spain accounted for the highest share as of 2008.
2. The trends of indirect drivers of change based on six indicators are related to demographic, economic and technological dimensions at a national level. The pressure of direct drivers of change based on eight indicators is related to the ecological footprint, emissions of sulphur and carbon dioxide, introduction of invasive alien species, overexploitation of fishery resources and groundwater, and land-use changes associated with urbanisation of the territory.
3. There are important regional variations in these figures with Asturias Murcia, Extremadura and Galicia having converted land to urban lands at a rate ranging between 40-75% (MAGRAMA 2014, 2013a).
4. Other more specialised laws cover specific types of protected areas (e.g. 5/2007 law specifically focuses on national parks, while 41/2010 focuses on marine protected areas).
5. These demarcations correspond to the marine environment over which Spain has sovereignty or jurisdiction.
6. Its exact legal status, its mandates and responsibilities are detailed in Royal Decree 1424/2008.
7. Its status has been upgraded by formally detailing its functions in Act 27/2006. The Council includes working groups on all facets of the environment, including terrestrial, coastal and marine biodiversity.
8. Its composition and function are formally detailed in Royal Decrees 948/2009 and 649/2011.
9. *www.business-biodiversity.eu*.
10. *www.mercadosdemedioambiente.com/plataforma/*.
11. Four of these reports have already been published and are available at: *www.magrama.gob.es/es/biodiversidad/temas/inventarios-nacionales/inventario-espanol-patrimonio-natural-biodiv/informe_anual_IEPNB.aspx*.
12. The values were obtained under the assumption that their future provision is secured indefinitely. Also, non-use values were not considered. As such, these figures can be considered as a minimum lower bound and are likely to be higher when the more comprehensive analysis is completed.
13. The legislative developments since 2004 also brought about Protected Peripheral Areas as an attempt to address habitat fragmentation.
14. In the calculation of territorial waters by the MAGRAMA, the provisions of the exclusive economic zone (EEZ) are applied, according to which the EEZ shall not extend beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured. Protected marine areas include proposed areas for 2014.
15. Of the 176 species, there are 112 flora, 21 birds, 17 invertebrates, 10 fish, 7 reptiles, 7 mammals and 2 amphibians.
16. *www.fega.es/PwfGcp/es/*.
17. Under the Spanish Constitution, the autonomous regions are responsible for the promotion and regulation of tourism within their own territories. However, the national authorities, and in particular the Ministry of Industry, Energy and Tourism, design tourism policy and overall regulation of tourist activity and promote tourism abroad, in addition to their role in national economic planning in which tourism is a key component. The main institutions that bring coherence to the actions of public authorities in tourism matters are: the Inter-Ministry Committee for Tourism (Comisión Interministerial de Turismo), a co-ordination body whose members represent those national ministries that have responsibility for tourism-related matters; the Sectoral Tourism Conference (Conferencia Sectorial de Turismo), a co-ordination body that brings together public representatives from central government and the autonomous regions with tourism responsibilities; and the Spanish Tourism Board (Consejo Español de Turismo – CONESTUR), an advisory body that brings together all the territorial tourism administrations (state, regions and provinces-cities) and the private tourism sector (e.g. chambers of trade, the National Employers' Association [CEOE], professional associations, trade unions and a wide spectrum of tourism professionals).
18. This law provided guidelines for access to sensitive marine areas and for granting of special licences to diving operators, as well as to whale-watching vessels.

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