FIFTH NATIONAL REPORT ON THE IMPLEMENTATION OF THE CONVENTION ON BIOLOGICAL DIVERSITY

POLAND

Warsaw, March 2014

LIST OF SELECTED ABBREVIATIONS

Abbreviation	Full name
2007-2013 National Strategy	2007-2013 National Strategy and Action Plan for the Protection and Sustainable Use of Biological Diversity
2014-2020 Programme	2014-2020 National Programme and Action Plan for the Protection and Sustainable Use of Biological Diversity
Birds Directive	Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds
CAFE Directive	Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe
CAP	Common Agricultural Policy
CAWI	Computer Assisted Web Interview
CBD	Convention on Biological Diversity
CFP	Common Fisheries Policy
CIEP	Chief Inspectorate For Environmental Protection
CSO	Central Statistical Office
CSR	Corporate Social Responsibility
DGSF	Directorate General of State Forests
EC	European Commission
EIA	Environmental Impact Assessment
ETC	European Territorial Cooperation
EU	European Union
FBI	Farmland Bird Index
Fifth National Report	Fifth National Report on the Implementation of the Convention on Biological Diversity
FSC	Forest Stewardship Council
GDP	Gross Domestic Product
GIS	Geographic Information System
GDEP	General Directorate for Environmental Protection
Habitats Directive	Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora
ICES	International Council for the Exploration of the Sea
IED	Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions
IHAR	The Plant Breeding and Acclimatization Institute – National Research Institute in Radzikow
IUCN	International Union for Conservation of Nature
LD CSO	Local Database of the Central Statistical Office available on www.stat.gov.pl
LIFE+	LIFE+ Programme
MARD	Ministry of Agriculture and Rural Development
MBP	The Monitoring of Birds of Poland
ME	Ministry of the Environment
MO	Maritime Office

NBP	National Bank of Poland
NFEP&WM	National Fund for Environmental Protection and Water Management
NPAFC	National Programme for Augmentation of Forest Cover
NPMWWT	National Programme for Municipal Waste Water Treatment
NVZ	Nitrate Vulnerable Zones
OM	Office of the Marshal
OPFISH	Operational Programme Sustainable Development of the Fisheries Sector and Coastal Fishing Areas 2007-2013
OPHC	Operational Programme Human Capital
OPI&E	Operational Programme Infrastructure and Environment
PAF	Prioritised Action Framework for Natura 2000
PDRA	Programme for the Development of Rural Areas
PEFC	Programme for the Endorsement of Forest Certification
PFC	Promotional Forest Complex
PR	Public Relations
RBWM	Regional Board of Water Management
RDEP	Regional Directorate for Environmental Protection
RDSF	Regional Directorate of State Forests
ROP	Regional Operational Programme
RWMB	Regional Water Management Boards
SAC	Special Areas of Conservation (of habitats)
SPA	Special Protection Area (of birds)
SEA	Strategic Environmental Impact Assessment
SEMP	State Environmental Monitoring Programme
SESE	Strategy for Energy Security and the Environment 2020
SFNFH	State Forests National Forest Holding
SPA	Special Protection Area
SPA 2020	Strategic adaptation plan for sectors and areas sensitive to climate change up to 2020 with a perspective to 2030
STECF	Scientific, Technical and Economic Committee for Fisheries
VFEP&WM	Voivodship Fund for Environmental Protection and Water Management
VLMWUB	Voivodship Land Melioration and Water Units Board

The Fifth National Report on the Implementation of the Convention on Biological Diversity is a recurring report prepared by Poland as a Party to the Convention on Biological Diversity. In accordance with the guidelines for the preparation of this report – *Guidelines for the Fifth National Report* – developed by the Conference of the Parties to the Convention on Biological Diversity on 29 October 2010, this report:

- is a continuation and contains an update of information included in the *Fourth National Report* (submitted in March 2009); presents trends in biodiversity changes and progress made in the implementation of the Convention and *National Strategy for the Protection and Sustainable Use of Biological Diversity* for 2009-2013;
- contains a succinct overview of the biodiversity status, trends and threats prepared to provide information to decision makers, not an exhaustive assessment of these issues;
- does not duplicate information presented in the previous report, which included a comprehensive description of the flora (along with a description of plant communities, habitats, and the status of particular taxonomic groups), wild animals, crops and livestock, as well as information on measures taken in Poland for the conservation of biological diversity in the years 2006-2008.

The report is based on Article 26 of the Convention on Biological Diversity and decision X/10 of the Conference of the Parties: *National reporting: review of experience and proposals for the fifth national report* (UNEP/CBD/COP/DEC/X/10, 29 October 2010).

The Fifth National Report on the Implementation of the Convention on Biological Diversity **is a recurring report prepared by Poland as a Party to the Convention on Biological Diversity.** This report covers the 2009-2013 period. In accordance with guidelines, it contains information on:

- the current status of and threats to biodiversity, and its impact on the well-being of people (Part 1)
- the implementation of the 2007-2014 National Strategy for the Conservation and Sustainable Use of Biological Diversity, as well as the new 2014-2020 Programme, along with a reference to other sectors of the economy (Part 2)
- progress in the implementation of the 2011-2020 Strategic Plan for Biological Diversity and its objectives (the so called Aichi Targets), adopted by the States Parties to the Convention on Biological Diversity (Part 3).

PART 1

Poland is a country of relatively high biological diversity. It is situated:

- in two biogeographical regions – Alpine and Continental,
- between the sea and the mountains,
- on geologically diversified terrains (old crystalline shields, young fold mountains and post-glacial areas),
- in intermediate climate (marine air of the Atlantic Ocean and continental influences of Eurasia).

All this contributed to the creation of **natural richness** – an important factor that determines the character of our country. Furthermore, as a result of Poland's relatively low industrialization level and the use of extensive agriculture, **many areas, ecosystems and species have been preserved in good condition**. About 23% of the world's population of the white stork (*Ciconia ciconia*), 45% of the EU population of the white-tailed eagle (*Haliaeetus albicilla*), and 90% of the EU population the aquatic warbler (*Acrocephalus paludicola*) nest in Poland. The country can also boast of the world's largest population of free European bison (*Bison bonasus*). A lasting preservation of Poland's impressive natural richness presents a significant challenge. For many years, Poland has been engaged in nature protection efforts, including wildlife and biodiversity conservation measures. **It has many achievements in the field but still faces many challenges.**

The biggest challenge is insufficient linking of biodiversity with the economic growth of the country. Nature protection is seen in Poland chiefly as passive conservation activities and related costs are commonly avoided, particularly during periods of economic crisis. A comprehensive analysis of the significance and value of ecosystem services has not been carried out so far and Polish valuation of national wealth does not take the issue directly into account.

For the purposes of this report, available statistical data on, e.g. the national output of agriculture, forestry, hunting and fishing which is PLN 128.5 billion (USD 43.4 billion), accounting for 4.1% of the production of all sectors were analysed. **An economic valuation of ecosystem services may seem problematic, although their social significance does not raise doubts.** In 2012, employment in these sectors accounted for nearly 17% of the total employment. These data show that almost **one in five employed in Poland derives income**

from activities widely dependent on ecosystem services. The actual share of such individuals is higher since other sectors of the economy, such as tourism, were not taken into account.
Research studies focusing on the economic valuation of natural resources are an important contribution to the discussion on the various methods of their use and the need to protect them. In recent years, Poland has made an attempt at a **valuation of economic benefits from the use of forests**:

- recreation PLN 3.30 billion/year (USD 1.04 billion)
- gathering of mushrooms PLN 0.28 billion/year (USD 0.09 billion)
- gathering of berries PLN 0.06 billion/year (USD 0.02 billion)
- **total value PLN 3.65 billion/year (USD 1.15 billion)**

The value of the Bialowieza Forest – the biggest forest complex on the European Plain (deciduous and mixed forests) with the highest degree of naturalness, where fragments of lowland forest primeval in character, the last ones in Europe, have been preserved – **was estimated at PLN 840 million/year (ca. USD 270 million). The obtained value far exceeds the current annual income from logging (ca. PLN 8 million; USD 2.4 million).**

One of the most important changes in the years 2009-2013 was the development of the European Natura 2000 network (which currently covers about 19.5% of Poland). Biological diversity in Poland is also protected within spatial forms of nature conservation, established at the national level, which cover 32.5% of Poland. Both these systems overlap spatially to a large extent, together covering 40.2% of the country. However, it should be stressed that **the protected areas where the highest priority are environmental objectives (national parks and nature reserves) and those in which a balance between conservation and development objectives is pursued (Natura 2000 sites and landscape parks) take up 25.5% of the area of Poland.** Specialised environmental agencies have been appointed for these sites, which – provided that adequate financial resources are accessible and relevant instruments regulating the conditions for the pursuit of economic activities properly implemented – gives a solid framework to ensure the protection of the most valuable species and habitats in the whole country.

The current range and scope of wildlife monitoring activities in Poland is insufficient to draw reliable conclusions on the state of nature or make an analysis of trends over a longer period of time. In 2006-2008, a monitoring survey of Natura 2000 sites, covering 20 natural habitat types, 16 plant species and 20 species of animals was carried out, and a research conducted in 2009-2011 included 40 types of natural habitats, 44 plant species and 68 species of animals. **The conservation status of a large part of natural habitats and plant and animal species under the Natura 2000 programme in Poland is inadequate.** Heathlands were evaluated as the best preserved, and bogs and dunes are types of natural habitats whose conservation status was assessed as the weakest.

In Poland, bird monitoring is the most extensive. In total, data was obtained for 148 species of nesting birds and 24 species of wintering birds. Fieldwork was conducted in nearly 1/4 of the total country area. Some of the monitoring programmes have been carried with the use of standardised methods since the year 2000, resulting in multiannual measurement series, which have made it possible to identify change trends for 111 species of birds. The most important findings of the monitoring of birds are:

- The abundance index of common forest birds (34 species) indicates an increase in the population size of this group of birds over the last 12 years; the population of an average species in this group in 2012 was approx. 25% higher than in 2000,
- The aggregated abundance index of common farmland birds (FBI 23) indicates a deterioration of in their situation,
- **Wetland birds (31 species) are a group facing the most severe decline,**
- The most endangered among the monitored species in terms of continuously decreasing and extremely low population sizes are the European roller (*Coracias garrulus*) and osprey (*Pandion haliaetus*), while the dunlin (*Calidris alpina*) is on the verge of extinction.
- Population sizes of several species, endangered or extremely rare until recently, are still on the increase, among these is the ferruginous duck (*Aythya nyroca*); some other species whose populations are increasing are: the common crane (*Grus grus*), whooper swan (*Cygnus cygnus*) and black-crowned night heron (*Nycticorax nycticorax*).

The monitoring of threats is one of the elements of the environmental monitoring system. It incorporates both anthropogenic impacts and natural processes affecting the conservation status of species and natural habitats protected within the Natura 2000 network. **Threats arising from natural biotic and abiotic processes and changes in management methods** affect the largest number of types of natural habitats and species. As many as 80% of habitats are modified as a result of natural processes (e.g. plant succession, synanthropisation, eutrophication). In the case of species, even 44% of national populations could become extinct as a result of natural processes. **The second category of threats** that have a negative impact on 70% of habitats and 61% of species **is related to agricultural changes (intensification or setting aside of land) and some aspects of forest management.** Also fishery and hunting management, though on a smaller scale, have an impact on the most valuable species – this has been identified as a threat to 31% of species. Other threats to biodiversity include:

- **unsuitable water management** (an increasing number of activities related to the regulation and development of rivers, barrages and levees, as well as activities related to agricultural drainage systems);
- **fragmentation of habitats and landscape as a result of intense development pressure, the construction of new road networks and a not fully efficient land use planning system**.
- **spreading of alien species;**
- **destruction of habitats and refuges and the killing or destruction of specimens of protected species through various investment projects and plans.**
  The threats are caused, inter alia, by a low efficiency of the environmental impact assessment procedure for plans and projects and an insufficient use of legislation on the prevention and removal of the effects of environmental damage (including impact on protected habitats and species).

PART 2

In 2007-2013, the *National Strategy and Action Plan for the Protection and Sustainable Use of Biological Diversity* was being implemented. Work on an *ex post* evaluation of the implementation status of the National Strategy is currently underway. Due to the lack of measurable indicators of the implementation of the strategy, a qualitative expert analysis was carried out for the purposes of this report, which showed that for more than 50% of the strategy's objectives the direction of their implementation was satisfactory, although there is a need for follow-up action.

One of the most important achievements of the current reporting period is the strengthening of the administrative system, including in Natura 2000 sites, through

a development the General Directorate for Environmental Protection and 16 Regional Directorates for Environmental Protection, the initiation of extensive works on management plans and conservation plans (7 conservation plans for national parks, 199 conservation plans for nature reserves, 15 conservation plans for marine Natura 2000 sites, 447 plans for conservation measures for terrestrial Natura 2000 sites), and developments in organising a system of EIAs for investment projects and SEAs.

Another significant change compared to the previous reporting period was a notable increase in the amount of financial resources allocated to the conservation of biodiversity. In the years 2007-2012, **close to PLN 2.2 billion (ca. USD 0.75 billion)** from national and EU programmes was earmarked for biodiversity projects. The most important group, from both the quantitative and qualitative perspective, consisted of projects for the protection of endangered species and habitats which contributed to the restoration of natural habitats (ecosystems) and refuges for species in protected areas, along with the preservation of endangered species and the genetic diversity of plants, animals and fungi.

More than 460 projects for the active protection of endangered species and habitats received support mainly for: conservation measures, restoration of favorable water conditions, land purchasing, regulation of tourism traffic in areas at risk of excessive anthropogenic pressure and reduction of the emissions of pollutants to water and air in protected areas. **In financial terms, as well as in terms of the magnitude of impact, agro-environmental payments played a dominant role.** The purpose of the agro-environmental programme is to improve the environmental quality of rural areas through: restoring the values or the maintenance of the status of valuable natural habitats used for agricultural purposes, the promotion of a sustainable management system, a proper use of soils and water protection, landscape structure development, the protection of native breeds of farm animals and native crop varieties. Poland is an exceptional example of a Central European country where, thanks to the fragmented agricultural structure, local forms of cultivated plants have been preserved to this day. *Ex situ* and *in situ* protection schemes of genetic resources of crop plants and farm animals are being implemented on a large scale.

Projects such as those involving the **restitution, reintroduction or augmentation of populations of species** illustrate the diversification of activities undertaken in Poland:

- mammals: lynx (*Lynx Lynx*), grey seal (*Halichoerus grypus*), edible dormouse (*Glis glis*), European bison (*Bison bonasus*), speckled ground squirrel (*Spermophilus suslicus*), European ground squirrel (*Spermophilus citellus*),
- birds: western capercaillie (*Tetrao urogallus*), black grouse (*Tetrao tetrix*), peregrine falcon (*Falcoperegrinus*), Eurasian eagle-owl (*Bubo Bubo*), osprey (*Pandion haliaetus*),
- reptiles: European pond turtle (*Emys orbicularis*), smooth snake (*Coronella austriaca*),
- fish: swamp minnow (*Rhynchocypris percnurus*), sturgeon (*Acipenser oxyrinchus*), Atlantic salmon (*Salmo salar*), vimba bream (*Vimba vimba*), brown trout (*Salmo trutta m. trutta*),
- crustaceans: European crayfish (*Astacus astacus*),
- insects: scarce swallowtail (*Iphiclides podalirius*), old world swallowtail (*Papilio machaon*), mountain apollo (*Parnassius apollo*).

Biodiversity conservation issues have also been addressed in strategies and planning documents in other sectors of the economy, as well as through the implementation of instruments such as spatial planning documents, EIAs, or SEAs for plans, policies and strategies. **While the functioning of EIAs and SEAs should be assessed positively (despite some shortcomings resulting from occasional improper recognition of biodiversity issues in these**

documents), the spatial planning system does not fully meet the needs of biodiversity. Although there are legal grounds for the conservation of biodiversity resources within the process of spatial planning, the practical application of such provisions is poor due to a low coverage of the territory of the country with local land use plans and often unsatisfactory quality of the documents, which affects the assessment of the environmental impacts of the plans' implementation. **In 2012, local land use plans covered only 27% of the country** and the annual increase of the area covered by local land use plans in the years 2009-2012 amounted to less than 1% of the country per year.

The implementation of the *2007-2013 National Strategy and Action Plan for the Protection and Sustainable Use of Biological Diversity* should be seen as the initial phase of long-term action that will have to be taken over the next decades, aimed at reducing negative pressures on biodiversity, and as a redefinition of the economic approach to include the valuation and appreciation of the value of biological diversity, and, consequently, to apply appropriate economic methods and tools to preserve its value.

Currently, works on the *2014-2020 Programme and Action Plan for the Protection and Sustainable use of Biological Diversity* (hereinafter referred to as the Programme) are underway. The most important change in the 2014-2020 Programme is giving the issue of ecosystem services the rank of a strategic objective. Both activities related to methods of ecosystem services valuation and those aimed at the implementation of green infrastructure, as an instrument for preserving and strengthening the existing ecosystems and their services will be included in the Programme. An essential innovation consists in attempts at developing output and result indicators. Their absence presents a serious difficulty in assessing the effectiveness of the implementation of the measures and achieving the objectives of the 2007-2013 National Strategy.

Part 3

In Part 3 of the Fifth National Report, an analysis of biodiversity protection activities taken in Poland – in light of the progress in implementing the *Strategic Plan for Biodiversity 2011-2020* and the 20 Aichi Targets – has been carried out. The current (2013) implementation status of the Aichi Targets has been assessed as:

- high for 2 targets (Target 11 and 17)
- medium for 13 targets
- low for 4 targets,
- in the case of 1 target (Target 18), the implementation status has not been specified due to lack of data.

The current rate of progress in the implementation of the targets has also been assessed:

- for 7 targets it has been estimated that they are likely to be achieved by 2020,
- for 11 targets, it has been decided that without an intensification of measures the current progress rate is insufficient to achieve them by 2020,
- in the case of 1 target (Target 2), it has been assessed that currently there is not progress in its implementation,
- in the case of 1 target (Target 18), the rate of implementation has not been specified due to lack of data.

Research indicates relatively low awareness (Target 1) of biodiversity issues. Air pollution (47%), waste (43%), water (39%) and floods (37%), climate change (34%), depletion of natural

resources (21%) were identified as the biggest environmental issues, while only 20% of the respondents mentioned biodiversity loss as a problem. In comparison to research from previous years (2011 and 2012), a significant increase in the awareness of the need for nature protection because of the environment's own value could be noted. **However, the percentage of Poles who know the term *biodiversity* is low – only 30%.** Results of a survey (CAWI) carried out in 2013 among the representatives of nature protection service agencies show that 75% of the respondents regard the **lack of awareness of conservation needs among those who use natural resources (i.e., the lack of awareness of the value of natural resources and their limitedness) as the greatest threat to biodiversity.**

Due to the low awareness, the inclusion of biodiversity protection issues into a wide range of sectoral strategies is only declarative, and the use of instruments such as EIA, SEA or spatial planning requires further improvement. **The incorporation of the value of biodiversity into accounting systems will provide a major challenge for Poland** (Target 2). As seen in the results of a survey conducted among local self-governments (15 marshal offices), only 5 out of 15 surveyed regions reported gaining economic benefits on account of biological diversity.

Data on economic incentives harmful to biological diversity (Target 3) **are incomplete. The majority of institutions do not carry out such analyses.** In a survey (CAWI) conducted in 2013 on a sample of 33 financing institutions which support nature protection efforts, including biological diversity, over 80% stated they had not carried out analyses on the elimination or reforming of subsidies harmful to biological diversity.

It should be noted, however, that Poland has many mechanisms for the exploitation of natural resources within environmentally safe limits (Target 4). These include, among others, fishing quotas, timber harvesting plans, or hunting regulations. **In most sectors, cases of the overexploitation of natural resources have been eliminated.** The number of campaigns and initiatives to promote sustainable patterns of production and consumption, e.g. the use of environmental criteria in public procurement (green procurement), sustainable forestry and increasing forest resources, is rising.

Activities aimed at preventing the loss of natural habitats (Target 5) **are being intensified**. An important achievement was the creation of the Natura 2000 network, where the basic condition for any human activity in the designated areas is minimizing environmental impact. A programme is being implemented to increase the country's forest cover and a reconstruction of tree stands is carried out in order to adapt them to habitat conditions. Countering the fragmentation of habitats and restoring ecological corridors to a passable condition remains a challenge.

Action is taken to protect marine resources (Target 6). Mechanisms, such as limiting the increase of fishing quota, protection periods, restrictions on the use of certain fishing gear or control of by-catches, which form the basis for further activities and improve their effectiveness, have been implemented.

Sustainable resource management (Target 7) includes activities such as: permanently sustainable forest management confirmed by FSC and PEFC certificates: *Forest Stewardship Council* and *Programme for the Endorsement of Forest Certification*; the implementation of agro-environmental packages, in particular: sustainable agriculture and organic farming; extensive aquaculture which retains the natural character of landscape and habitats.

An improvement in the quality of the environment and effective action for the reduction in pollution discharged into water, air and soil, should be noted. **It needs to be determined what pollution levels can be considered harmless for ecosystem and biodiversity functions** (Target 8).

In the period 2009-2013, a regulation of the Polish Minister of the Environment entered into force with a list of **invasive alien species** (16 plant species, 36 animal species), which in the case of release into the natural environment can threaten native species or natural habitats. For all of these species (except fish), a ban on their possession and trading has been issued. A number of scientific publications have been created. The preparation of nationally and regionally coordinated plans of action for the control of the spread of invasive alien species and a risk assessment (Target 9) remains a challenge.

In view of the current climate change (Target 10), an analysis of its impact on biodiversity has been carried out and resulting guidelines for the operation of environmental administration developed. **Among habitats most vulnerable to climate change are all types of peat bogs and watercourses characterised by *Ranunculion fluitantis* vegetation.**

One of Poland's important achievements is the creation of a nature protection system, with an area covering 40,2% of the country (Target 11). However, it should be stressed that **the protected areas where environmental objectives are the highest priority (national parks and nature reserves) and those in which a balance between conservation and development objectives is pursued (Natura 2000 sites and landscape parks) take up 25.5% of the country area. An institutional system has been created for their effective protection.** The monitoring of species and habitats, research studies and active nature protection measures will contribute to preventing the extinction of endangered species (Target12).

Poland can also boast of a high level of crop and livestock genetic diversity conservation (Target 13). Thanks to the fragmentation of agricultural land, local varieties of crops and farm animals have been preserved to modern times. *Ex situ* protection measures have been in place for many years, inter alia conducted by the National Centre for Plant Genetic Resources.

The restoration and **conservation, throughout the entire country, of ecosystems** that provide essential services, including **water ecosystems** (Target 14), **is a big challenge for Poland.** As in the case of activities for strengthening the resilience of ecosystems and their contribution to carbon absorption (Target 15), their proper identification and the determination of priority measures will be of crucial importance.

Action for the implementation of **the Nagoya Protocol on Access to Genetic Resources** (Target 16) and work on the **2014-2020 Programme and Action Plan for the Protection and Sustainable use of Biological Diversity** (Target 17) is in progress.

Comprehensive data on the application of knowledge about biodiversity and traditional practices of its use by local communities are lacking (Target 18). The inclusion of local communities in decision-making is guaranteed through democratic mechanisms and procedures, such as public consultation.

The scope of research on biodiversity (Target 19) is expanded each year and the number of studies is growing, despite the restrictive financial factor, faced not only by natural sciences. The period 2009-2013, however, should be evaluated positively when it comes to the amount of funds spent on biodiversity conservation measures (Target 20). **Due to the availability of EU**

funds, expenditure on nature protection has increased significantly. In the years 2014-2020, a plentiful supply of these resources can also be expected, while providing a similar level of environmental funding after 2020 can pose a challenge.

In conclusion, it should be stressed that successful biodiversity protection still presents a big challenge, especially with regard to the modern approach in which the value of ecosystem services is taken into account in decision making and the issue of biodiversity conservation is included in activities of other economic sectors. It is therefore advisable to focus further on the following problem areas:

- **Scientific research** focused on explaining the mechanisms that link species, habitats and the condition of the environment with their potential to provide ecosystem services;
- **Increasing public awareness** of the significance of biodiversity in economic terms, including its impact on social welfare;
- **The development and implementation of valuation mechanisms for biodiversity resources and ecosystem services** in such a way that they become a permanent element of prosperity assessment and national statistics and serve as considerable premises in current economic decisions, on the level of shaping sector policies, economic decisions made by entrepreneurs, or individual consumption patterns;
- **The propagation of the use of instruments such as spatial planning and the environmental impact assessment system will help to create a synergy effect:** protecting new valuable sites and natural areas while keeping (or restoring) wildlife corridors in a passable condition will help to preserve biological diversity and increase the resilience of ecosystems. Nature protection in closed enclaves and creating corridors in degraded landscape alone will not produce the desired effects, while simultaneous intervention in both areas will increase the durability of the results;
- Bringing up ethical arguments can support a broader inclusion of ecosystem services**.** This refers not only to nature protection as such but above all, to shaping desirable sustainable consumption patterns.

PART ONE

1 UPDATED INFORMATION ON BIODIVERSITY – STATUS, TRENDS, THREATS AND IMPACT ON THE WELL-BEING OF PEOPLE

1.1 IMPORTANCE OF BIOLOGICAL DIVERSITY IN POLAND, ITS IMPACT ON ECOSYSTEM SERVICES AND THEIR SOCIO-ECONOMIC AND CULTURAL SIGNIFICANCE

PERCEPTION OF BIODIVERSITY CONSERVATION AS COMPARED TO OTHER ENVIRONMENTAL ISSUES

Almost every country is largely dependent on ecosystems and the services they provide, such as food, water, disease prevention, climate regulation, aesthetic values and the resulting attractiveness for tourists. In Poland and around the world we have to deal with the ever increasing demand for food, water, timber and energy. Clearly this causes irreversible losses of biodiversity, over-exploitation of certain species and habitats and the destruction of adaptive or regenerative capacities of ecosystems, as well as their fragmentation. Consequently, this generates additional losses (for example, through losses of jobs), or major spending investments (e.g. to ensure access to good quality drinking water or restore natural site features for tourism and leisure). It leaves no doubt that the state of nature has a positive impact on people's well being and socio-economic growth. However, in the common understanding, socio-economic prosperity is not linked with the state of nature and biodiversity.

In the period following the change of Poland's political and economic system in 1989, the country was dominated by two trends: to compensate for economic losses through accelerated economic growth, and an opposite one – to make up for decades of environmental negligence, mainly through efforts to minimise emissions and improve energy and raw material use efficiency. Poland can boast of many achievements in this regard. Pollution of air and water, as well as the energy intensity of some of the sectors of the economy has been significantly reduced. A stable system for funding environmental projects has been created and an environmental impact assessment system, along with a number of other legal and financial solutions to stimulate environmental efforts, have been implemented. Today, no one disputes the fact that it is cheaper to prevent pollution than to invest in removing its effects. This leads to a widespread consensus for action on air and water protection, waste minimisation and energy saving. However, when considering measures for the conservation of biological diversity, for many people this is no longer so obvious. In this context, it is important to emphasize that nature (wildlife) conservation in Poland has a long tradition (primarily with regard to conservatory protection). It is also worth noting that, as a result of low industrialization and extensive agriculture in Poland, many areas, ecosystems and species have been preserved in good condition. There is no doubt that a lasting preservation of Poland's impressive natural wealth poses a significant challenge. However, an effective taking up of this challenge requires further changes in people's attitudes and public awareness of the benefits from biodiversity, including their understanding of how their welfare depends on its conservation. Currently the opinion prevails that biodiversity protection is a luxury for rich countries and that it limits the possibilities of growth at a national, regional and local level.

Nature conservation is seen in Poland chiefly as unproductive and related costs are commonly avoided, particularly during periods of economic crisis. Such an approach does not take into account the long term economic benefits provided by ecosystems, related to both their services and productive functions. Economic and developmental decisions undertaken in isolation from the potential economic interest related to the protection of nature tend to favour activities based on priorities often incompatible with the goal of preserving biodiversity in Polish ecosystems.

OVERVIEW OF ECOSYSTEM SERVICES AND THE POSSIBILITY OF THEIR VALUATION IN POLAND

In Poland, a comprehensive analysis of the occurrence and value of ecosystem services has not been carried out so far. National source data on this issue can be divided into two types: public, aggregated statistical data, which do not include the concept of ecosystem services, and a few scientific studies in which an attempt has been made to estimate the value of some of the services of this type, such as the non-productive values of forests or the value of urban green areas. In assessing the importance of biodiversity ecosystem services – in addition to qualitative analyses – it should be noted that in most cases their mapping and measurement is methodologically complex. Measuring the value of services associated with provisioning functions is relatively the easiest. This is due to the fact that the products obtained are subject to market transactions. The valuation of habitat, regulating, and cultural and tourist services is more complicated.

From a macroeconomic perspective, it is an additional difficulty that the national statistics, including the widely used GDP indicator, do not take into account the state of the environment. What's more, such a model of economic management can lead to false conclusions. The demand for some goods, such as soundproofed windows, water filters etc., can serve as an example. An increase in the sales and production of this type of goods contributes to GDP growth, but the demand is often driven by the deterioration of environmental living conditions. A similar effect applies to fertilisers, plant protection products, the pharmaceutical industry, medical services etc. Demand for these goods or services is often caused by a weakened resistance of ecosystems and the environment, while statistics show it as a positive effect in terms of GDP growth.

As Polish national statistics do not take directly into account the issue of ecosystem services, for the purpose of the present report available data on sectors clearly dependent on ecosystem services, related primarily to food and wood production have been analysed.

When analysing statistics from the years 2009-2012[1] on the global output of agriculture, forestry, hunting, and fishing, in can be concluded, that it constituted a small share of the national output, not exceeding 4.1% of its value (Table 1).

[1] Although the reporting period covers the years 2009-2013, at the time of developing this report, statistical data for 2013 were often not yet available, hence the period of analysis is 2009-2012. The year 2013 was included where possible.

TABLE 1. GLOBAL OUTPUT BY SECTORS AND SECTIONS OF THE ECONOMY

A) BILLION PLN

	2009	(%)	2010	(%)	2011	(%)	2012	(%)
Agriculture, forestry, hunting and fishing, including:	104.05	3.88%	108.44	3.79%	128.53	4.10%	133.41	4.07%
Agricultural crops, farming and animal husbandry, hunting	95.49	3.56%	99.04	3.46%	117.38	3.74%	122.14	3.73%
Forestry and logging	8.11	0.3%	8.89	0.31%	10.77	0.34%	10.72	0.33%
Fisheries	0.45	0.0%	0.52	0.02%	0.38	0.01%	0.55	0.02%
Industry	961.65	35.83%	1,047.14	36.55%	1,198.16	38.20%	1,252.88	38.25%
Other sections of the economy	1,618.27	60.29%	1,709.17	59.66%	1,809.58	57.70%	1,889.34	57.68%
Total	2,683.97	100%	2,864.76	100%	3,136.27	100%	3,275.63	100%

B) BILLION USD (CONVERSION ACCORDING TO THE ANNUAL AVERAGE NBP RATES)

	2009	(%)	2010	(%)	2011	(%)	2012	(%)
Agriculture, forestry, hunting and fishing, including:	33.39	3.88%	35.96	3.79%	43.37	4.10%	40.96	4.07%
Agricultural crops, farming and animal husbandry, hunting	30.64	3.56%	32.84	3.46%	39.61	3.74%	37.50	3.73%
Forestry and logging	2.60	0.3%	2.95	0.31%	3.64	0.34%	3.29	0.33%
Fisheries	0.14	0.0%	0.17	0.02%	0.13	0.01%	0.17	0.017%
Industry	308.60	35.83%	347.23	36.55%	404.32	38.20%	384.67	38.25%
Other sections of the economy	519.31	60.29%	566.76	59.66%	610.64	57.70%	580.08	57.68%
Total	861.30	100%	949.95	100%	1,058.34	100%	1.005.72	100%

Source: based on data from the CSO

An analysis based on comparing employment in sectors dependent on ecosystem services with the total number of employees is another way of assessing their significance (Table 2). In 2012 the employment share in agriculture and hunting was 16.42%, in forestry – 0.34%, and in fisheries – 0.02%. These data show that almost one in five employed in Poland derives income from activities beyond doubt dependent on ecosystem services. The actual share of such individuals is higher since other sectors of the economy, such as a substantial part of the tourism industry, were not taken into account. This points to great social significance of the economy sectors whose dependence on ecosystem services is obvious. In addition, close to 40% of the total population live in villages. There are regions where agriculture is the main branch of economy, affecting the level of development and standards of living.

TABLE 2. EMPLOYMENT IN AGRICULTURE, HUNTING, FORESTRY AND FISHING IN THE YEARS 2009-2012 (IN 1,000 PERSONS).

	2009	(%)	2010	(%)	2011	(%)	2012	(%)
Agriculture, forestry, hunting and fishing, including:	2,124.9	15.42%	2,376.1	16.84%	2,376.7	16.70%	2,378.0	16.78%
Agriculture and hunting	2,071	15.03%	2,326.8	16.49%	2,325.6	16.34%	2,326.2	16.42%
Forestry and logging	49.8	0.36%	46.3	0.33%	47.8	0.34%	48.6	0.34%
Fisheries	4.1	0.03%	3.0	0.02%	3.3	0.02%	3.2	0.02%
Total employment in Poland	13,782.3	100%	14,106.9	100%	14,232.6	100%	14,172.0	100%

Source: based on data from the CSO

A selection of statistics on livestock production (including fish production) and the benefits derived from forests are presented below to illustrate the range of benefits from ecosystem provisioning services (in the broad sense of this concept, which covers also agriculture, including animal husbandry, as a sector based on ecosystem services).

TABLE 3. FISH PRODUCTION AND THE PRODUCTION OF ANIMALS FOR SLAUGHTER IN POLAND IN THE YEARS 2009-2012 (IN 1,000 TONNES)

	2009	(%)	2010	(%)	2011	(%)	2012	(%)
Domestic fish production	262.6	6.8%	213.5	5.2%	224.9	5.4%	228.6	5.5%
Production of animals for slaughter	3,623.0	93.2%	3,909.0	94.8%	3,965.0	94.6%	3956.0	94.5%
Total fish and animals for slaughter production	3,885.6	100%	4,122.5	100%	4,189.9	100%	4,186.7	100%

Source: based on data from the CSO and MARD (2012)

TABLE 4. POLISH MARINE AND FRESHWATER FISHING AND AQUACULTURE IN THE YEARS 2009-2012 (IN 1,000 TONNES)

	2009	2010	2011	2012
Marine fishing, including:	212.1	170.8	179.9	163
in the Baltic Sea	131.4	110.1	110.8	100
deep-sea fishing	80.7	60.7	69.1	63.0
Freshwater fishing and aquaculture	50.5	42.7	45.0	47.4
Total national fishing	262.6	213.5	224.9	210.4

Source: based on MARD (2012)

TABLE 5. HARVESTING OF GAME ANIMALS IN 2009-2012 (IN 1,000 TONNES)

	2009	2010	2011	2012
Wild boars	2.3	3.6	3. 5	3.7
Deer	3.0	3.4	3.8	4.1
Roe deer	1.8	1.9	2.0	2.1
Total	7.1	9.0	9.3	9.9

Source: based on data from the CSO

When compared with the production of meat (livestock), fish production in 2012 constituted 5.5% (in tones) of the total domestic animal production (Table 3). Comparing data on the aquisition of game animals with those related to marine fishing and other forms of livestock production, it is clear that – as in the majority of countries in the world – wild game constitutes an insignificant share (in tonnes) of domestic livestock production (Table 4 and Table 5). When talking about the value of the game animals it should be borne in mind that, from the point of view of ecosystem services, the price of the animals bought cannot be equated with their actual value (Table 6).

TABLE 6. AQUISITION OF GAME ANIMALS IN 2009-2012

A) 1,000 PLN

	2009	2010	2011	2012
Wild boars	6,539.70	16,155.30	19,501.30	17,785.70
Deer	19,212.70	26,017.80	34,370.20	33,345.90
Roe deer	16,867.60	20,959.80	26,290.20	29,297.80
Total	42,620.00	63,132.90	80,161.70	80,429.40

B) 1,000 USD (BASED ON THE ANNUAL AVERAGE EXCHANGE RATES BY THE NBP)

	2009	2010	2011	2012
Wild boars	2,098.61	5,357.06	6,580.72	5,460.76
Deer	6,165.43	8,627.45	11,598.23	10,238.23
Roe deer	5,412.87	6,950.23	8,871.63	8,995.33
Total	13,676.91	20,934.74	27,050.58	24,694.32

Source: based on data from the CSO

Another example of direct benefits from ecosystem services is provided by data on the harvesting of forest fruits and mushrooms in Poland (Table 7). The level of accessible resources is determined by the weather (rainfall, temperature). Data on the value of the harvested mushrooms and forest fruits, in turn, point to a growing market value of these resources (Table 8), but as already stated before, it cannot be identified as their actual value.

TABLE 7. HARVESTING OF FOREST FRUITS AND MUSHROOMS IN THE YEARS 2009-2012 (IN TONNES)

	2009	2010	2011	2012
Forest fruits	12.25	8.38	10.10	16.35
Forest mushrooms	4.18	4.47	4.01	5.94
Total	16.43	12.85	14.11	22.30

Source: based on LD CSO

TABLE 8. HARVESTING OF FOREST FRUITS AND MUSHROOMS IN THE YEARS 2009-2012

A) 1,000 PLN

	2009	2010	2011	2012
Forest fruits	66.07	55.54	56.24	115.61
Forest mushrooms	46.38	55.32	54.26	91.05
Total	112.46	110.86	110.51	206.66

B) 1,000 USD (BASED ON THE ANNUAL AVERAGE EXCHANGE RATES BY THE NBP)

	2009	2010	2011	2012
Forest fruits	21.20	18.42	18.98	35.50
Forest mushrooms	14.88	18.34	18.31	27.96
Total	36.09	36.76	37.29	63.45

Source: based on LD CSO

It is also interesting to assess how important the additional income or non-monetary benefits derived from the harvesting of forest fruits and mushrooms are for households. According to surveys (CAWI)[2] carried out among the Forest Districts, 21% of the respondents regarded the factor as being significant for at least half of the households, and 64% considered it significant, but for a small number of households. In Poland forests take up nearly 30% of the country, of which about 80% are public forests belonging to the State Treasury, where access to the forest and the use of non-wood forest resources (apart from a few exceptions) are free of charge and unlimited.

It is worth noting that in the case of food production, the role of biodiversity and ecosystem services is essential. In Poland, agricultural land constitutes approximately 60% of the country. It includes arable land (about 70% of the total agricultural land), permanent grassland (about 21%), orchards (about 3%) and other types of land (about 6%). Agriculture has a vital influence not only on the socio-economic situation of the inhabitants of rural areas, but also on the state of the environment, as well as the structure of landscape and biological diversity in Poland. Small farms dominate Polish agriculture, and agricultural landscape consists of small fields divided by balks. Numerous woodlots and unregulated watercourses have also been preserved. Agricultural productivity in our country is lower than in highly developed countries as a result of a greater share of extensive farming (especially in southern, central and eastern Poland), largely contingent upon natural ecosystem functions. The presence of environmental islands (roadsides, balks, woodlots) is very important for the richness of bee species, responsible for pollination – an ecosystem service of key importance for food production. Organic farming, a system that refrains from the use of artificial means of crop improvement, is the most dependent on ecosystem services and the quality of the environment. Organic farming in Poland is constantly evolving – over last ten years, the area of organic farms managed in accordance with the requirements of organic farming grew by 12 times to reach 675,000 hectares in 2013 and now accounts for approx. 3.6% of the total area used for agriculture in Poland.

[2]The survey was carried out in 2013 on a sample of 85% of the Forest Districts in Poland (there are 430 Districts which together cover the entire area of the country).

The amount of payments made under the EU Agro-Environmental Programme (as part of the 2007-2013 Rural Development Programme) can be considered as a kind of measure of the economic and social value of ecosystem services. It is a financial instrument that allows for carrying out environmental projects on agricultural land, in particular for the protection of biological diversity, including protection of ecosystems that provide basic services – mainly habitat and provisioning, but also regulatory, as well as cultural and tourist. In 2007-2013, packages under which agro-environmental payments were granted included: sustainable agriculture, organic farming, extensive permanent grasslands; the protection of endangered bird species and natural habitats on Natura 2000 sites; the protection of endangered species of birds and natural habitats outside Natura 2000 sites; the preservation of endangered plant genetic resources in agriculture; the preservation of endangered animal genetic resources in agriculture; the protection of soils and waters, and buffer zones. In 2007-2013, PLN 7.3 billion (nearly USD 2.5 billion)[3] was spent as agro-environmental payments within the aforementioned packages.

Analysing the value of ecosystem services in Poland, it is useful to refer to scientific research studies. Some of them are presented below as case studies 1 to 4. Case Study 1 is an attempt at evaluating the possible non-productive functions of the forest. It is also good to remember that, in addition to the recreational and economic significance of forests, they can be valued as valuable nature areas. Case Study 2, concerning the Bialowieza Forest, illustrates the value of such areas.

CASE STUDY 1. EVALUATION OF NON-PRODUCTIVE FOREST FUNCTIONS

In the traditional model of forestry, the economic function of forests is dominant, whereas the protective and social functions are secondary. Results of economic research suggest, however, that such a model is not socially optimal. Finding a method of using the forest that maximizes social welfare requires the valuation of non-productive forest functions.

The research included:
I – a study of revealed preference: an estimate of the sum of recreational benefits that forests offer for the Polish society and the benefits from the collection of mushrooms and berries;
II – a study of declared preference: determining what features of the forest have an impact on the recreational value of forests and to what extent.

The following results indicating non-productive economic benefits from the forest were obtained:

- recreation: PLN 3.3 billion/year (USD 1.04 billion/year),
- forest mushrooms: PLN 0.28 billion/year (USD 0.09 billion/year),
- berries: PLN 0.06 billion /year (USD 0.02 billion/year),
- total value: PLN 3.65 billion/year (USD 1.15 billion/year) – PLN 401/ha/year (USD 127/ha/year).

These figures show that, on a national scale, recreational benefits alone – which are only part of the full benefit from the non-productive functions – are of similar magnitude to the production benefits.

The research also found that features such as: higher age of the oldest trees, age diversity, irregular arrangement of trees, the presence of dead wood (medium degree), all contribute to improving the recreational attractiveness of an area.

The research confirmed that the productive and social functions of the forest remain in mutual conflict. Methods of timber harvesting, such as clear cutting, directly imply less recreational appeal, whereas forests with a high degree of protective functions are seen as recreationally attractive. Therefore, a multifunctional forestry model, understood as the development of all forest functions at the same place and time – proves to be inefficient.

In the opinion of the authors of the study, multi-functionality should be implemented at the level of forest management on a national scale. Benefits from the productive function should be maximised there where benefits from social and protective functions are less than average. Conversely, where benefits from the social and protective functions are above average, the productive function should be limited to the necessary minimum.

Source: Żylicz and Giergiczny (2013)

[3] This value includes also the financial commitments arising from the 2004-2006 period.

CASE STUDY 2. HOW MUCH IS THE BIALOWIEZA FOREST WORTH?

The **Bialowieza Forest** is the biggest forest complex on the European plain (deciduous and mixed forests) with the highest degree of naturalness. The Bialowieza Forest is the only European forest where fragments primeval in character have been preserved. It is home to the world's largest population of free European bisons (*Bison bonasus*). It is characterized by very high biological diversity. The Bialowieza Forest has about 12,000 species of animals, more than 1,000 species of plants, and 20 forest complexes. The old, primeval tree stands in the Bialowieza National Park are marked with an abundance of dead wood in different stages of decomposition and the presence of species typical for natural forests. The Forest is listed as a UNESCO World Heritage site. BirdLife International has also identified it as an Important Bird Area.

How much is the Bialowieza Forest worth?

The special value of the Bialowieza Forest stems from the natural ecological processes, that take place in it without human intervention and an abundance of species and ecosystem components. Currently, about 15% of the Forest's area has the status of a national park, despite more than 20 years of efforts of environmental organisations to extend the park to cover the entire Bialowieza Forest. The issue of expanding the National Park raises controversy due to a divergence of interests between the timber industry, the local population and the environmental objectives to increase biodiversity and the recreational use of the Forest. A debate on the most effective way to use the Forest has raged for many years. Therefore, various attempts at assessing its value have been made. The annual revenue from 110-150 thousands m^3 of wood from logging in the Bialowieza Forest reaches PLN 3.5-5 million (USD 1.1-1.6 million). However, this is only one of the possible sources of prosperity that the Bialowieza Forest can provide.

Another such source is recreation, whose value has been estimated – using the travel cost method – at not less than PLN 11 million (USD 3.53 million) a year (the study assumed that 110,000 people visit the Forest annually). Economists can assess non-productive values – those that consumers can use or draw satisfaction from even if they don't use them in a direct way. For example, people can be satisfied and thus benefit from the fact of the protection of a forest, even if they never plan to visit it. In practice, this means that they may be willing to pay for the protection of strict nature reserves they will never be allowed to enter.

To estimate both the productive and non-productive values of the protection of the Bialowieza Forest, a study was carried out in 2009 with the use of methods based on declared preferences, whose goal was to assess the value of a biodiversity rise resulting from an increase in the degree of the Forest's protection. Based on a survey, it was possible to determine how much an average citizen of Poland is ready to pay for an increased protection of the Bialowieza Forest. The study examined the value of tax increase to be paid by all Poles for 10 years. Based on the obtained results, it was possible to estimate the equivalent monetary value of an increased protection of the Bialowieza Forest.

This way, an assessment was made of how much money a more extensive protection of the Forest is worth. The sum stood at PLN 70 (USD 22.5) a year per household. For about 12 million households in Poland, this means the total of PLN 840 million (USD 270 million) per year. The obtained sum far exceeds the current income from logging (PLN 3.5-5 million; USD 1.1-1.6 million). Such studies are an important contribution to the debate on changing the current use of the Bialowieza Forest – from a combination of protection and economic use to an increased protection and preservation of this last natural forest in Europe through restraining from further degradation.

Source: Giergiczny (2009), Kalinka (2003), Czajkowski et al. (2009)

To complement the above case study, it should be stated that the number of visitors to national parks proves the importance of tourist and cultural ecosystem services. It is estimated (according to data from 2013) at about 11 million people per year, which accounts for nearly 30% of the Polish population. As with the monetary valuation of protected areas, it is possible to valuate individual species and the benefits from their protection. An example is the Case Study 3 on the white stork.

CASE STUDY 3. ASSESSMENT OF THE RECREATIONAL VALUE OF THE WHITE STORK IN *STORK VILLAGES*

A huge part of the world's population of the white stork (*Ciconia ciconia*) nest in Poland. In our country this species has an exceptional cultural significance and is treated almost as national treasure. Stork populations are also among the most studied and the longest monitored with the use of standard quantitative methods. Long-term trends indicate a moderate decline in the white stork population in Poland (SEMP data from 2001-2012).

Storks nest in the vicinity of human settlements and attract people's attention. A small part of the eastern population of storks forms nesting colonies – *stork villages*. In Poland there are about 10 such colonies, the most famous of which is Zywkowo in the Masurian Lake District, where 20-40 stork nests are resettled each year. It is visited by 2000-5000 tourists each year.

Using this fact, the authors of the study made an attempt at assessing the value of storks as a tourist attraction with the use of the travel cost method. The results of a survey carried out in 2011 in Zywkowo showed that the average consumer surplus, and thus the benefit for visitors from visiting the *stork village*, is almost PLN 200 (USD 63). If – in addition to the average consumer surplus – the value of the time spent in travel is taken into account, this benefit can be estimated at about PLN 400 (USD 127). Therefore, the total annual benefit – all visitors to Zywkowo, Podlaskie Voivodship (2850 people in 2011) included – amounts to PLN 0.57 million (0.18 million USD) or PLN 1.16 million (USD 0.37 million), including the time value.

Results show the scale of social benefits from the recreational function of *stork villages*. They can also be used to estimate social losses that would occur in case *stork villages* would cease to exist.

Source: Czajkowski et al. (2014)

Another example of the importance of ecosystem services for urban residents is the valuation of public green areas. Cooperation with nature and the use of green infrastructure in urban environment can contribute to the improvement of urban living conditions and alleviate the urban heat island effect. Would urban dwellers be prepared to contribute to an increase in the number of trees in their cities? Case Study 4 shows the results of a study carried out in Lodz.

CASE STUDY 4. VALUATION OF PUBLIC GREENERY ON THE EXAMPLE OF TREE STANDS IN THE CITY OF LODZ

The subject of the study was an economic valuation – an assessment of the residents' willingness to pay for increasing the number of trees in the city centre.

According to the study, the average respondent would be willing to pay each year (in the form of higher tax):

- PLN 1.58 (USD 0.49) per kilometre of street with the number of adjacent trees increased from low to medium through tree planting alongside the road,
- PLN 2.25 (USD 0.69) per kilometre of road with islands of trees created.

The respondents were most willing to pay for increasing the number of trees where few or no trees existed. The obtained values can be seen as an approximation of the social benefits that the inhabitants of Lodz would gain from implementing the programme of increasing the number of trees. For example, the willingness to pay for a programme consisting in increasing the number of trees per 5 km of road from low to medium and creating tree islands along 9 km of street is PLN 28.2/person/year (USD 8.7/person/year) in the form of increased taxes. When multiplied by the number of adult residents of Lodz (627,000 at the end of 2010), this amounts to PLN 17.7 million (USD 5.4 million).

This sum represents the assessed change in social welfare resulting from the implementation of the aforementioned programme, which would cover a section of the central part of the city.

In contrast, only about PLN 2 million (USD 0.6 million) from the 2012 budget for the entire city of Lodz was allocated to address roadside greenery issues, including the maintenance, removal, and planting of trees over the entire city. About PLN 11.5 million (USD 3.5) was foreseen for on-going maintenance of green areas other than roadside green belts (including parks) and related investment expenses. This shows the approximate degree of incompatibility between social needs and the city's activity.

Source: Giergiczny and Kronenberg (2012)

1.2 MAIN SHIFTS IN THE STATE OF BIODIVERSITY AND TRENDS IN ITS CONSERVATION IN POLAND

Poland is a country of relatively high biological diversity. It lies in two biogeographical regions – Continental (more than 90% of the country) and Alpine (the Polish part of the Carpathians). Its location in the heart of Europe, between the sea and the mountains, geological diversification (old crystalline shields, young fold mountains and post-glacial areas), intermediate climate (shaped by the Atlantic Ocean air masses and continental influences of Eurasia), have all

contributed to the creation of great natural richness – an important factor determining the character of the country.[4]

NATURE CONSERVATION SYSTEM IN POLAND

Biological diversity in Poland is protected, among others, within spatial forms of nature conservation (established at the national level), which cover 32.5% of the area of Poland, and as Natura 2000 sites (established at the European level), covering 19.5% of the country (see table 9). Both these systems spatially overlap, hence the protected areas and Natura 2000 sites together cover 40.2% of the country.

TABLE 9. FORMS OF NATURE CONSERVATION IN POLAND, INCLUDING NON-SPATIAL FORMS (2013)

Name of the form of conservation	Number of objects	Surface area [1,000 ha]	% of the country's area[5]
National parks	23	314	1%
Nature reserves	1,481	166	0.5%
Landscape parks	122	2,607	8.3%
Protected landscape areas	385	7,078	22.6%
Natura 2000 sites	145 SPAs and 845 SACs	6,078	19.5%
Sites of ecological interest	7,032	52	0.2%
Documentation sites	161	1	0%
Nature and landscape units	328	96	0.3%
Nature monuments	36,316	-	-

Source: based on data from GDEP and CSO

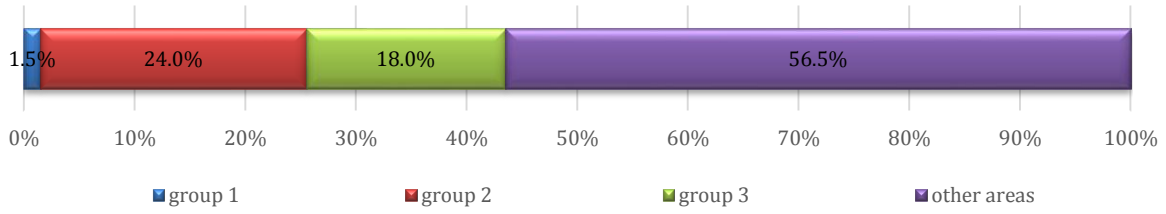
The forms of nature conservation presented in Table 9 vary from the point of view of the level of protection from (1) a total ban on any kind of human intervention and the absolute primacy of protection purposes (strictly protected areas in nature reserves and national parks), (2) through sites where the conservation of important species and habitats is a priority, but where economic activity, such as sustainable use of forest resources, is permitted under certain conditions (landscape parks, Natura 2000 sites), (3) to areas of less strict protection – sites of outstanding landscape quality, with diverse ecosystems or tourist and recreational values or those which perform the function of ecological corridors (protected landscape areas), where limitations on economic activity are negligible. The share of different groups of protected areas in the total area of Poland is shown in Figure 1. The analysis was based on a GIS calculation, in which the fact of the overlapping of individual forms of conservation was taken into account (net surface area was calculated). The following distinction was made:

[4] A comprehensive description of vegetation (along with a description of plant communities, habitats and the state of particular taxonomic groups), wild animals, crop plants and livestock, have been presented in the Fourth National Report (pp. 12-38).
[5] Given that the forms of conservation spatially overlap and have largely different conservation levels, it is not possible to produce a direct sum of their surface areas.

- group 1 - protected areas where conservation objectives are the highest priority: national parks and nature reserves,
- group 2 - protected areas where a balance between conservation and development objectives is pursued: Natura 2000 sites and landscape parks,
- group 3 - protected areas where restrictions on the implementation of development objectives are minimal: protected landscape areas[6]

Another criterion, in addition to the reference to the priority of protection, was the functioning of specialized institutions (including national parks, Natura 2000 sites and landscape parks), responsible for engaging in activities for the protection of the areas.

FIGURE 1. SHARE OF DIFFERENT GROUPS OF PROTECTED AREAS IN THE TOTAL AREA OF POLAND



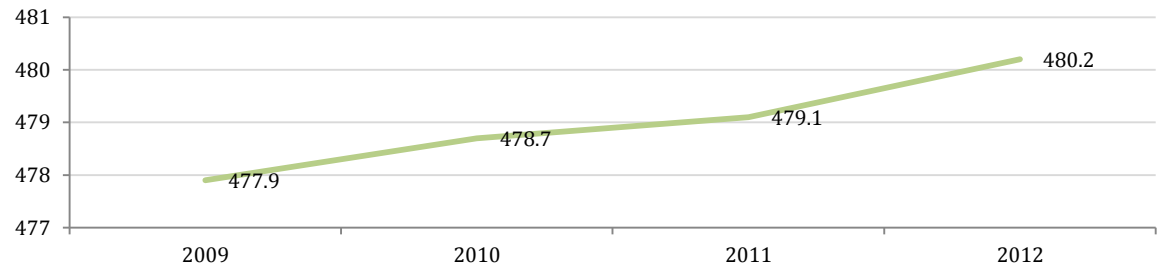
Source: based on a GIS analysis, situation in 2010

The analysis shows that 25.5% of the area of Poland belongs do group 1 and 2. As stated before, specialised environmental agencies have been appointed for these sites, which – provided that adequate financial resources are accessible and relevant instruments regulating the conditions for the pursuit of economic activities properly implemented – gives a solid framework to ensure the protection of the most valuable species and habitats in the whole country. Spatial distribution of the protected areas is illustrated in Map 1.

CHANGES IN THE COVERAGE OF THE PROTECTED AREAS

Most of the naturally valuable areas were placed under different forms of protection in previous years, in a process that had already begun in the 19th century. Over the years 2009-2012, the surface area of sites from group 1 (national parks and nature reserves) slightly increased.

FIGURE 2. AREA OF NATIONAL PARKS AND NATURE RESERVES [1,000 HA]

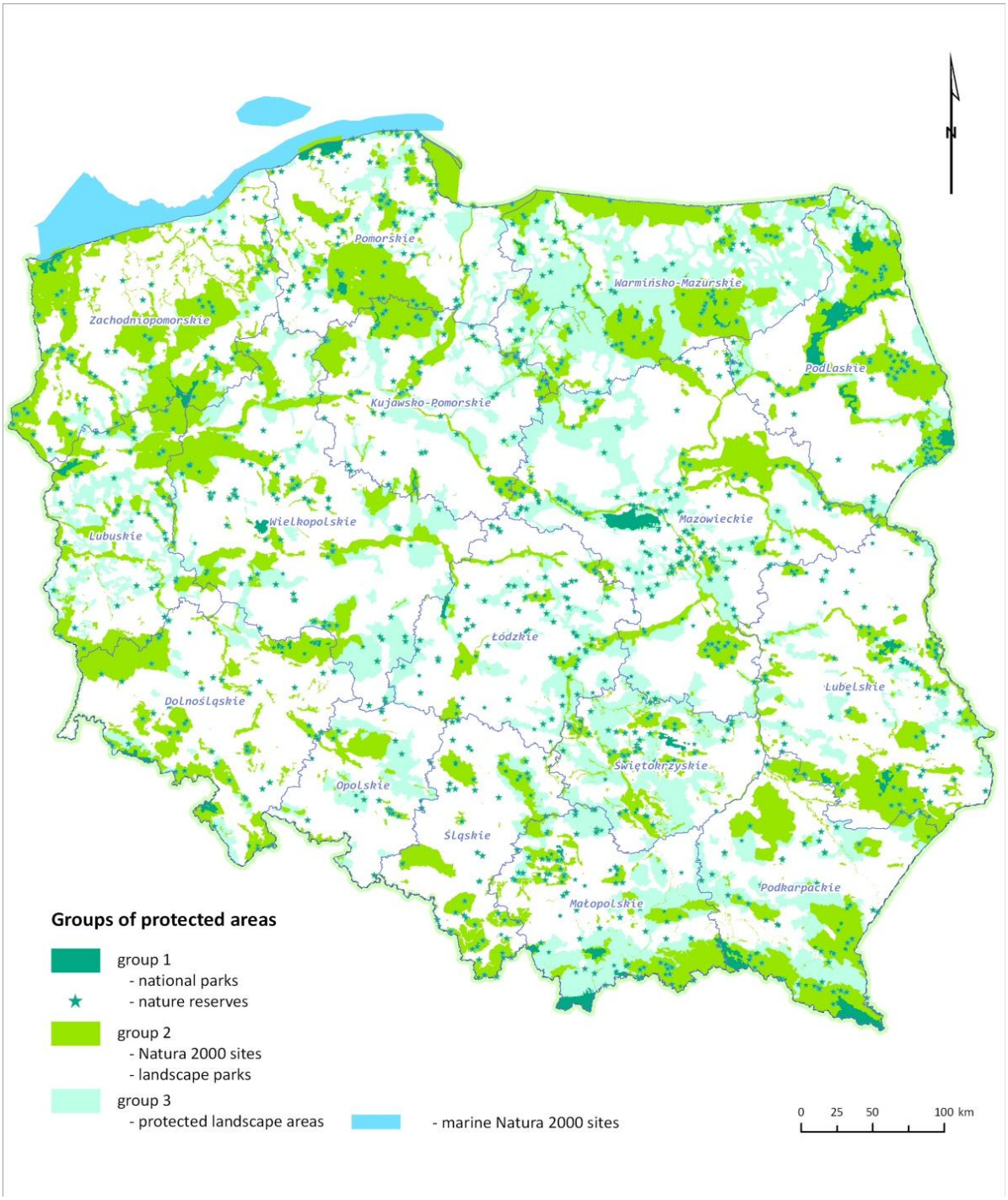


Source: based on LD CSO

In 2009-2012, no new national parks were created and none of the existing ones expanded. There were attempts at enlarging the Bialowieza National Park and the Stolowe Mountains

[6] The analysis excluded sites of ecological interest and nature and landscape units due to their small share in the total area of the country.

National Park, but they failed due to the local governments' refusal to accept changes to the parks' boundaries. There are on-going attempts to enlarge seven more national parks (Karkonosze, Drawa, Pieniny, Magura, Slowinski and Biebrza National Parks). However, it is hard to determine the feasibility of completing the works due to difficulties in reconciling such changes with local municipal authorities, which according to applicable domestic legal provisions, is a precondition for any adjustments of the borders to take place.

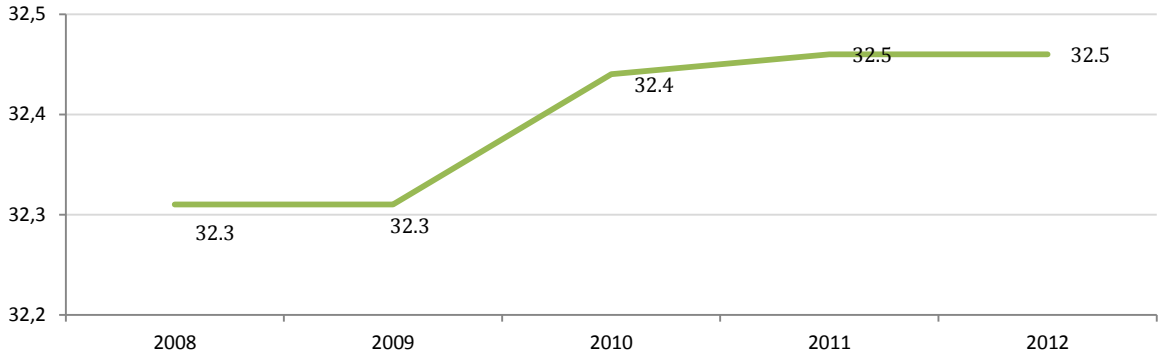


MAP 1. SPATIAL DISTRIBUTION OF DIFFERENT FORMS OF NATURE PROTECTION

Source: own elaboration (situation in 2010)

On the other hand, as emerged from a survey (CAWI) carried out among representatives of local authorities at the regional level (marshal offices), 75% of the respondents reported that the designation of new protected areas, such as nature reserves, landscape parks, and even national parks (Turnicki and Jurajski National Parks), in the total number of more than 170 sites, was planned in their regions. A public discussion on the creation of the Mazurian Lake District National Park has also been going on for years. In 2012, the share of legally protected areas established at the national level reached 32.5%. Compared to 2009, there was an increase of 0.2%. During the period under consideration, as in the case of the group with the strictest protection, these changes were negligible on a national scale (Figure 3, Table 10).

FIGURE 3. SHARES OF LEGALLY PROTECTED AREAS (% OF THE TOTAL AREA)



Source: based on LD CSO

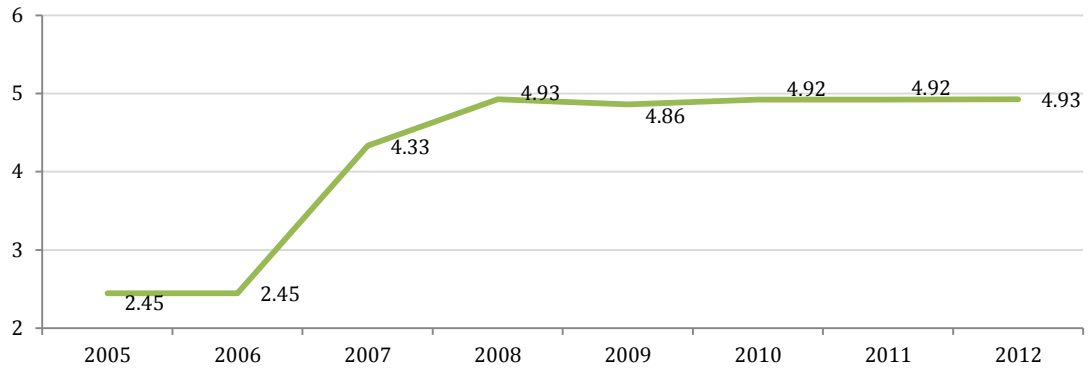
TABLE 10. CHANGES IN THE COVERAGE OF PROTECTED AREAS IN THE YEARS 2008-2012

Types of protected areas	Coverage of the protected areas [1,000 ha]		Change in the coverage [1,000 ha]
Research period	**2009**	**2012**	**2009-2012**
Total	10,103.7	10,149.5	45.8
National parks	314	314	0.0
Nature reserves	163.4	165.5	2.1
Landscape parks	2,607	2,607	0.0
Protected landscape areas	7,059	7,078	19
Sites of ecological interest	47.3	52.2	4.9
Documentation sites	0.8	0.9	0.1
Nature and landscape units	86.4	95.5	9.1

Source: based on LD CSO

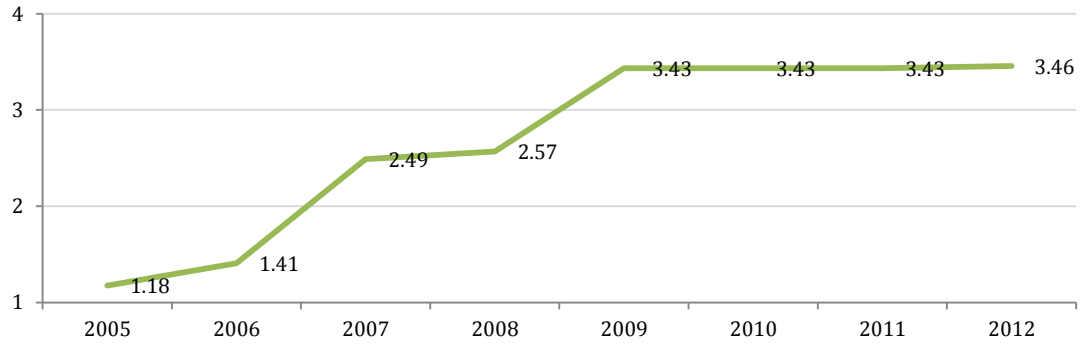
A major innovation in the Polish system of nature conservation was the creation of the Natura 2000 network, which in 2012 covered more than 6 million hectares of land – about 19.5% of the country's total area (the figures refer to bird and habitat areas and take into account their mutual overlapping). In the case of special protection areas for birds, the total area of Natura 2000 sites was determined in 2008 at the level of about 4.9 million hectares (15.7% of the country's total area, Figure 4), and in the case of habitat areas, in the year 2009, at around 3.4 million hectares (close to 11% of the total area of the country, Figure 5).

FIGURE 4. NATURA 2000 – SPECIAL PROTECTION AREAS FOR BIRDS (SURFACE AREA IN MILLION HA)



Source: based on LD CSO (2013)

FIGURE 5. NATURA 2000 – SPECIAL AREAS OF HABITAT CONSERVATION (SURFACE AREA IN MILLION HA)



Source: based on LD CSO (2013)

CHARACTERISTICS OF THE NATURA 2000 NETWORK

The Natura 2000 network protects natural habitats and rare or endangered species of animals and plants. The protection of habitats has a positive impact on the conservation of related organisms (mainly plants, animals and fungi), also those not included in the Habitats Directive. Any human activity in these areas must follow the principle of avoiding significant negative impact on the features under protection. The network overlaps with national forms of protection, including some of the reserves, all of the national parks, and about half of the landscape parks. The Natura 2000 sites designated in Poland cover:

- 81 natural habitats, including 18 EU priority habitats,
- 40 plant species, including 10 EU priority plant species,
- 90 animal species, including 1215 EU priority animal species,
- 74 bird species nesting in Poland, from Annex I of the Birds Directive, and 83 species of migratory birds.

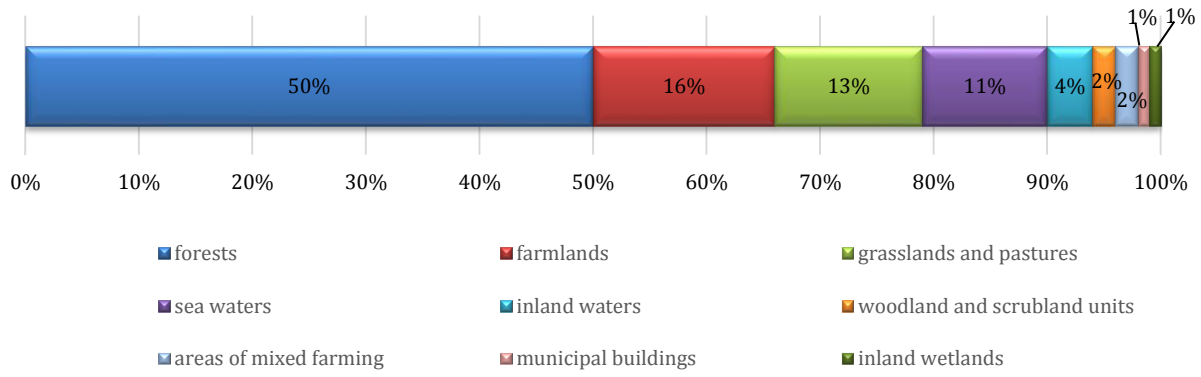
Special attention should be given to these habitats and species that are unique in Europe and in the case of which more than half of their area is located within the borders of Poland. They are presented in Table 11. Figure 6 shows the structure of land use on sites covered by the Polish Natura 2000 network.

TABLE 11. HABITATS OR SPECIES OF KEY IMPORTANCE FOR EUROPE

12 natural habitat types with more than 50% of their total areas in the EU located within the Polish borders:	
1.	91P0 * Holy Cross fir forest (*Abietetum polonicom)*
2.	91T0 * Central European lichen Scots pine forests
3.	91I0 * Euro-Siberian steppic woods with *Quercus spp*.
4.	91D0 Bog woodland
5.	91E0* Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)*
6.	9190 Old acidophilous oak woods with *Quercus robur* on sandy plains
7.	9170 *Galio-Carpinetum* oak-hornbeam forests
8.	6120* Xeric sand calcareous grasslands
9.	6510 Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*)
10.	6520 Mountain hay meadows (*Polygono-trisetion*)
11.	3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition – type vegetation
12.	2180 Wooded dunes of the Atlantic, Continental and Boreal region
5 plant species with more than 50% of their EU populations found in Poland:	
1.	2249 *Carlina onopordifolia*,
2.	1939 *Agrimonia pilosa*,
3.	2189 *Galium cracoviense*,
4.	2216 *Linaria loeselii*,
5.	4069* *Campanula Bohemia*
8 animal species with more than 50% of their identified EU populations found in Poland:	
1.	4021* *Phryganophilus ruficollis*
2.	2608* speckled ground squirrel *Spermophilus suslicus*
3.	4009* swamp minnow *Phoxinus percnurus*
4.	1920 *Boros schneideri*
5.	1923 *Mesosa mops*
6.	1924 *Mannerheima Oxyporus mannerheimii*
7.	1925 *Pytho kolwensi*
8.	4042 *Polyommatus eroides*
Bird species with a significant part of their EU populations nesting in Poland:	
1.	aquatic warbler *Acrocephalus paludicola* (about 90% of the EU population in Poland)
2.	white-tailed eagle *Haliaeetus albicilla* (about 45% of the EU population in Poland)
3.	greater spotted eagle *Aquila clanga* (about 20% of the EU population in Poland)
4.	eurasian bittern *Botaurus stellaris* (over 40% of the EU population in Poland)
5.	white stork *Ciconia ciconia* (over 20% of the EU population in Poland)
6.	black stork *Ciconia nigra* (over 20% of the EU population in Poland)
7.	black-necked grebe *Podiceps nigricollis* (over 20% of the EU population in Poland)
8.	great snipe *Gallinago media* (over 20% of the EU population in Poland)
9.	black tern *Chlidonias Niger* (over 20% of the EU population in Poland)
10.	common crane *Grus grus* (over 20% of the EU population in Poland)
11.	common pochard *Aythya ferina* (over 20% of the EU population in Poland)
12.	black woodpecker *Dryocopus martius* (over 20% of the EU population in Poland)
13.	western marsh-harrier *Circus aeruginosus* (over 20% of the EU population in Poland)

Source: PAF (2013)

FIGURE 6. COVERAGE WITH THE MAIN FORMS OF LAND USE IN THE NATURA 2000 NETWORK IN POLAND



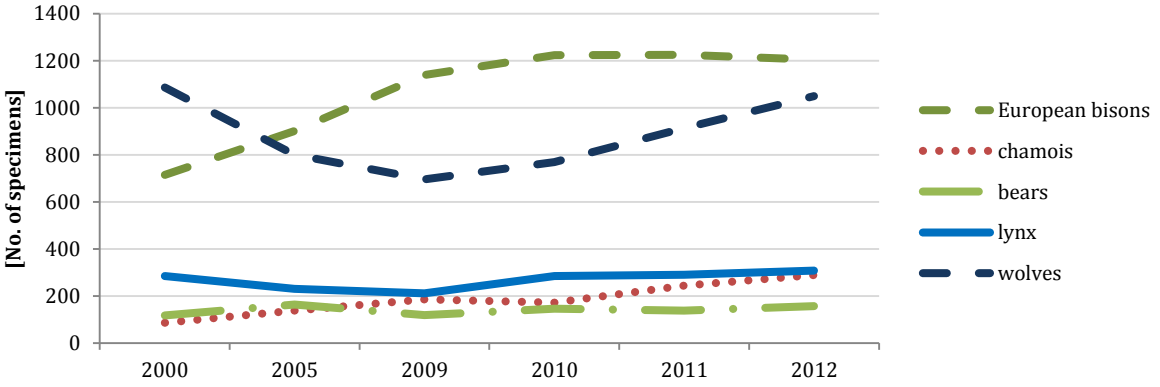
Source: based on PAF (2013)

In Poland, 17 marine Natura 2000 sites have been established: 8 bird areas, 8 habitat areas and one site – Lawica Slupska – which is both a bird and a habitat area. Protected habitats within the marine Natura 2000 sites include: 1110 sandbanks which are slightly covered by seawater all the time, 1130 estuaries, 1150 coastal lagoons, 1160 large shallow inlets and bays, 1170 reefs. Other habitats, such as cliffs, annual vegetation of drift lines, different types of sand dunes and Atlantic salt meadows, are also protected in the coastal zone. The following marine species are protected: European river lamprey (*Lampetra fluviatilis*), sea lamprey (*Petromyzon marinus*), twait shad (*Alosa fallax*), grey seal (*Halichoerus grypus*), and harbour porpoise (*Phocoena phocoena*). In the areas of bird conservation, ducks (eg. long-tailed duck (*Clangula hyemalis*), velvet scoter (*Melanitta fusca*)), gulls, terns, grebes and loons are under protection.

SPECIES PROTECTION

For many years, the CSO has been collecting quantitative data on the abundance of selected species of protected large mammals, such as European bisons (*Bison bonasus*), chamois (*Rupicapra rupicapra*), brown bears (*Ursus arctos*), lynx (*Lynx lynx*) and wolves (*Canis lupus*). Based on this data, it can be concluded that there has been an increase in the abundance of these species (Figure 7) in the reporting period. However, it should be pointed out that data from the CSO are based on inventories developed with various methods. Therefore, differences in abundance can reflect differences in methodology rather than actual changes. An extension of the permanent range of wolf occurrence is, however, a scientifically confirmed fact. As a result of species conservation measures, wolves have colonized the largest forest areas of western Poland, where they had been absent for several decades. Other endangered species (not presented in Figure 7), whose abundance increased in the reporting period, include the grey seal (*Halichoerus grypus*) and the European ground squirrel (*Spermophilus citellus*). Information on declines in the population of certain birds species are discussed further in the subsection *Bird monitoring*.

FIGURE 7. POPULATION OF SELECTED PROTECTED ANIMALS (SPECIES PROTECTION)



Source: based on LD CSO

Provisions of the Nature Conservation Act oblige authorities and relevant wildlife protection services to conduct an inventory and registry of sites of protected species of plants, fungi and animals. In national parks and landscape parks these tasks should be performed, respectively, by national park services and landscape park services. Regional directors for environmental protection in individual voivodships are also obliged to collect documentation on sites of protected species of plants, animals and fungi, as well as their habitats. In practice, these activities are carried out with varying degrees of intensity, depending on the region, and most are limited to recording sites of species that require the establishment of conservation zones. These measures are significantly complemented under the *Register of protected and endangered fungi* social initiative. The outcome of this register is taken into account in the periodically updated *Atlas of Mushrooms and Fungi of Poland*.

SOURCES OF DATA ON THE STATE OF BIOLOGICAL DIVERSITY IN POLAND

The most comprehensive and regular research on the state of the environment and wildlife is conducted within the National Environmental Monitoring Programme, controlled by the Chief Inspectorate For Environmental Protection. In the context of biodiversity protection, the most significant subsystem, the Monitoring of Nature, includes: bird monitoring and its components, such as the monitoring of Natura 2000 special bird protection areas, within which the population state of selected species is being monitored (population size, range, trends, conservation status)[7]; the monitoring of species and natural habitats in selected Natura 2000 special areas of habiat conservation (evaluating the state of the range, population, structure and function of a natural habitat and assessing the state of its species habitat area and conservation perspectives)[8] and an inspection and assessment of the health status of forests in all ownership

[7] Different groups of birds have been monitored, including species listed in appendices to the *Birds Directive*. The whole country has been monitored, especially the areas designated as Natura 2000 special bird protection areas. Also common farmland species have been monitored; their population sizes comprise the Farmland Bird Index, which was approved in October 2004 by the European Commission as one of the official *structural indicators* of changes in EU member states. The values of this indicator are published annually by individual countries and are made available to the public through the Eurostat database.

[8] The main goal is to obtain information on the conservation status of selected wild species of fauna and flora (excluding birds) and natural habitats in the entire country. In accordance with the *Habitats Directive*, the research and assessment cover: inhabited surface area, the range and specific structure and functions of natural habitats, the range and dynamics of species population and the size of their habitats. Test surfaces have been established throughout Poland, with particular attention to selected Natura 2000 special areas of habitat conservation.

categories. Regarding wild species, research in Natura 2000 sites usually covers selected species of fungi, plants and animals, especially those that are close to extinction, endangered and covered by legal protection under national and international law.

In 2006-2008, a monitoring survey of 20 natural habitat types, 16 plant species and 20 species of animals was conducted, and another research that was carried out in 2009-2011 covered 40 types of natural habitats, 44 plant species (or group of species: cup lichens, *Lycopodiophyta*, *Sphagnopsida*) and 68 species of animals. However, a monitoring of species of fungi has not as yet been carried out.

An additional source of information on biological diversity is the subsystem of Water Quality Monitoring and – within the subsystem – of one of its components, the monitoring of the ecological condition of water resources based on biological elements. The scope, including the structure of the subsystem of Water Quality Monitoring is based on the requirements of the Water Framework Directive. Within the monitoring of the ecological condition of water resources based on biological elements, data on the biocenoses of phytoplankton, phytobenthic diatoms, macroalgae, macrophytes, benthic macroinvertebrates and fish are sourced for the assessment of water quality.

A lot of research in the field of biological diversity is being carried out in Poland, but its main focus is on a small number of selected areas (usually privileged in terms of their natural assets) and they often address only selected and narrow aspects of the issue. Work on conservation plans for national parks, Natura 2000 sites (where also management plans are applicable), landscape parks and nature reserves is similar in character. These documents are valuable as they involve the recording of data on particularly valuable areas and research on their most endangered assets. Their weakness, however, lies in their limited spatial range, which makes it difficult to conclude on such things as national change trends, and – in most cases – in a reduction of the scope of interest to animals and plants, excluding research on the mycobiota. Information on natural resources can also be acquired from the more applicable data collected for a variety of planning documents. These include:

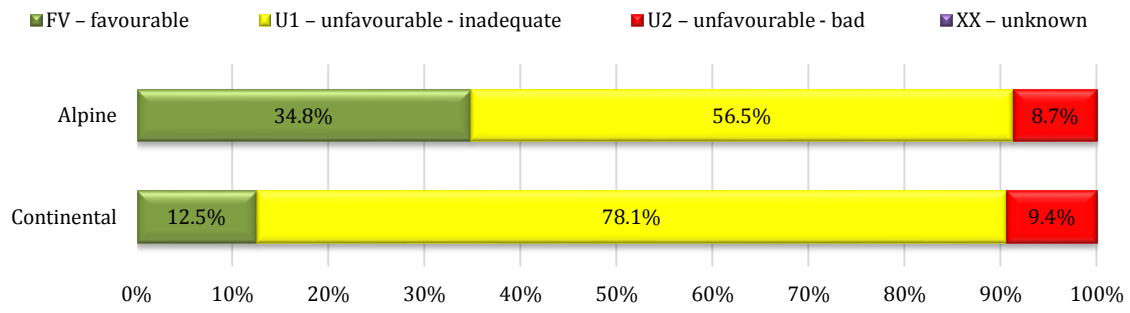
- Inventories made by communes to identify nature conservation and landscape protection needs. Among their advantages is a consideration for anthropogenic conditioning and cultural values. Their drawbacks include the limited spatial extent of this kind of studies, only produced for those communes that managed to secure a source of funding for their research.
- Planning documentation prepared for districts and communes called *environmental protection programmes* have become more common, though non-compulsory in character. They address issues of biodiversity protection within the broad context of environmental protection and aim at formulating concrete action programmes. A weakness of environmental protection programmes lies in their lack of detailed field recognition, because – due to the broad scope of studies – time and financial resources for contractors to conduct their own field research are often insufficient.
- Planning documentation, prepared commonly and obligatorily, also includes studies of the conditioning of and trends in land use management of communes. The quality of planning documents, with reference to biodiversity protection, is varied and often depends on the quality of information sources; similarly to programmes of environment protection, they rarely refer to their own environmental research.
- Two further types of studies are: (1) ecophysiographic studies, whose objective is to provide basic environmental documentation for land use plans, and (2) forecast impact on environment – the effects of planning decisions, inter alia, their impact on biological diversity. In practice, the accuracy of these studies depends on the available materials.

- The State Forests make inventories of protected natural assets and areas and draw up a list of protected species occurring in areas managed by SFNFH, as part of work on forest management plans and nature conservation plans for forest districts.
- For many investment projects, reports on environmental impact are prepared, on which assessments of their impact on the environment, including biodiversity, and thus also environmental permits, are based. For the purposes of these reports, environmental studies with varying degrees of detail are often carried out. Among these studies, the ornithological and chiropterological ones – usually conducted using standard national methodologies – stand out. Given the scope of these studies, their even distribution throughout the country and their qualitative and quantitative comparability, they have the potential to provide valuable data.

CONSERVATION STATUS OF NATURAL HABITATS AND SPECIES IN POLAND (NATURA 2000 SITES)

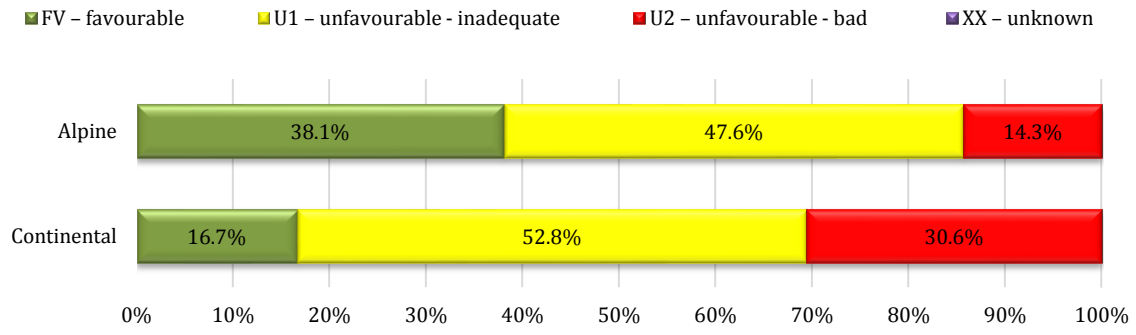
The current range and scope of wildlife monitoring activities in Poland, carried out within the SEMP, is insufficient to draw reliable conclusions on the state of nature or make an analysis of trends over a longer period of time. These are, however, the most complete data regarding their range, scope and methodological consistency. For the purposes of this report, monitoring results from the 2006-2011 period for Natura 2000 sites have been used.

FIGURE 8. **HABITATS:** GENERAL ASSESSMENT OF THE CONSERVATION STATUS OF NATURAL HABITATS IN BIOGEOGRAPHIC REGIONS OF POLAND – MONITORING RESULTS FOR 2009-2011



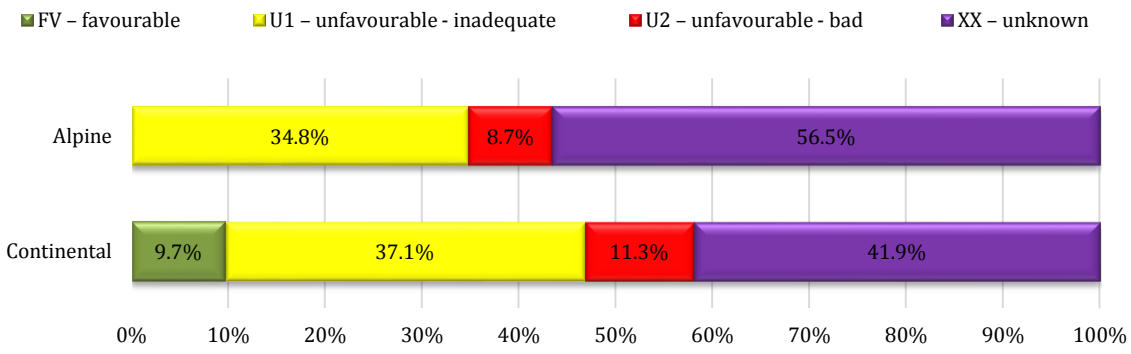
Source: based on SEMP results from 2009-2011

FIGURE 9. **PLANTS:** GENERAL ASSESSMENT OF THE CONSERVATION STATUS OF PLANTS IN BIOGEOGRAPHIC REGIONS OF POLAND – MONITORING RESULTS FOR 2009-2011



Source: based on SEMP results from 2009-2011

FIGURE 10. **ANIMALS:** GENERAL ASSESSMENT OF THE CONSERVATION STATUS OF ANIMALS IN BIOGEOGRAPHIC REGIONS OF POLAND – MONITORING RESULTS FOR 2009-2011.



Source: based on SEMP results from 2009-2011

TABLE 12. GENERAL ASSESSMENT OF THE CONSERVATION STATUS OF NATURAL HABITATS AND SPECIES IN BIOGEOGRAPHIC REGIONS OF POLAND – MONITORING RESULTS FOR 2009-2011.

	FV - Favourable	U1 - Unfavourable – Inadequate	U2 - Unfavourable – Bad	XX - Unknown	Number of habitats or species being monitored*
Habitats					
Continental	**4**	**25**	**3**	**0**	32
Alpine	**8**	**13**	**2**	**0**	23
Plants					
Continental	**6**	**19**	**11**	**0**	36
Alpine	**8**	**10**	**3**	**0**	21
Animals					
Continental	**6**	**23**	**7**	**26**	62
Alpine	**0**	**8**	**2**	**13**	23

* Also under monitoring were 2 types of marine habitats in the area of the Baltic Sea, whose status was assessed as favourable (FV), and 5 species of marine plants and animals, whose status was assessed as unfavourable – bad (U2).

Source: based on data provided by SEMP for 2009-2011.

A favourable conservation status of a natural habitat means that the natural range of the habitat and of the sites within, stay the same or increase, the structure and functions necessary for the long-term maintenance of the habitat exist and are likely to continue to exist, and species typical for this habitat are in a favourable conservation state. If any of these conditions is not met, then the conservation status is defined as unsatisfactory or bad, depending on how serious the deviations from these conditions are.

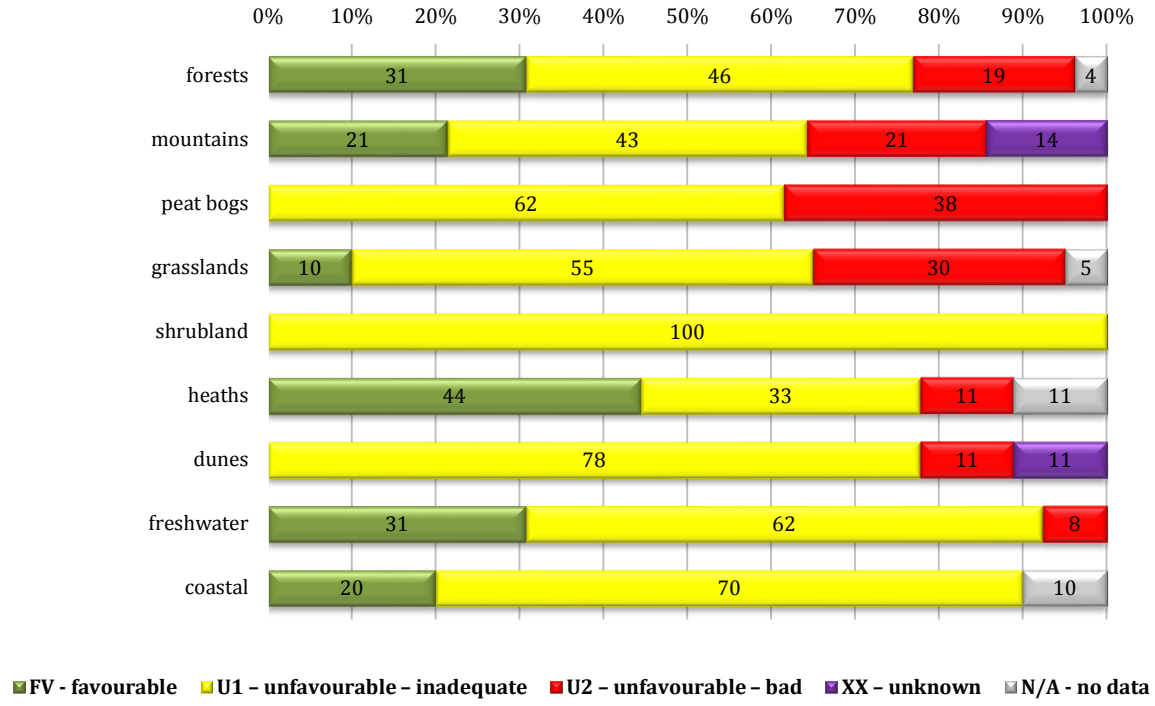
The comparison of the two biogeographic regions in Poland shows that habitats located in the Alpine Region are much better preserved. This region, however, covers a relatively small part of the country (approx. 10%). The conservation status of 8 out of 23 types of the region's habitats – over 1/3 of all habitats – under evaluation was assessed as favourable (FV). Among them are habitats present in protected areas, often alpine and relatively stable, or located in areas where specific substrates and other abiotic conditions are present. On the other hand, the status of only

4 out of 32 types of habitats looked at in the Continental Region was assessed as favourable (FV). The state of the prevailing majority of habitats in both regions – 57% in the Alpine Region and 78% in the Continental Region – was assessed as unfavourable – inadequate (U1), and the conservation status of about 9% of habitats in each of the regions was assessed as bad (U2). In the case of plants, similar assessment results were obtained – plant species in the Alpine Region are much better preserved: the status of 38% of species under research was deemed favourable (FV), while in the Continental Region the conservation status was good in the case of 17% of species. 62% of plant species in the Alpine Region were in an unsatisfactory (U1) or bad condition, and in the Continental Region – covering the major part of the country – 84% of the monitored species were in such condition (U1-53%, U2-31%). The situation is completely different for the assessment of the conservation status of animal species, where the main problem lies in the lack of information: in the Alpine Region the status is unknown for almost 60% of animal species, while in the Continental Region – for over 40%.

Figure 11 and Figure 12 show the assessment of the conservation status according to habitat category and species group, compiled on the basis of data collected within the State Environmental Monitoring Programme in 2009-2011. The conservation status of natural habitats and plant and animal species under the Natura 2000 programme in Poland is mostly unfavourable – inadequate (U1) or unfavourable – bad (U2). In the case of habitats, only the conservation status of heathlands was assessed as favourable (FV) for 50% of the researched sites. Peat bogs and dunes are types of natural habitats whose conservation status was assessed as the poorest, the majority of which was unfavourable – inadequate (U1) or unfavourable – bad (U2). Also in the case of grasslands, the proportion of assessment as unfavourable – inadequate (U1) and unfavourable – bad (U2) is significant.

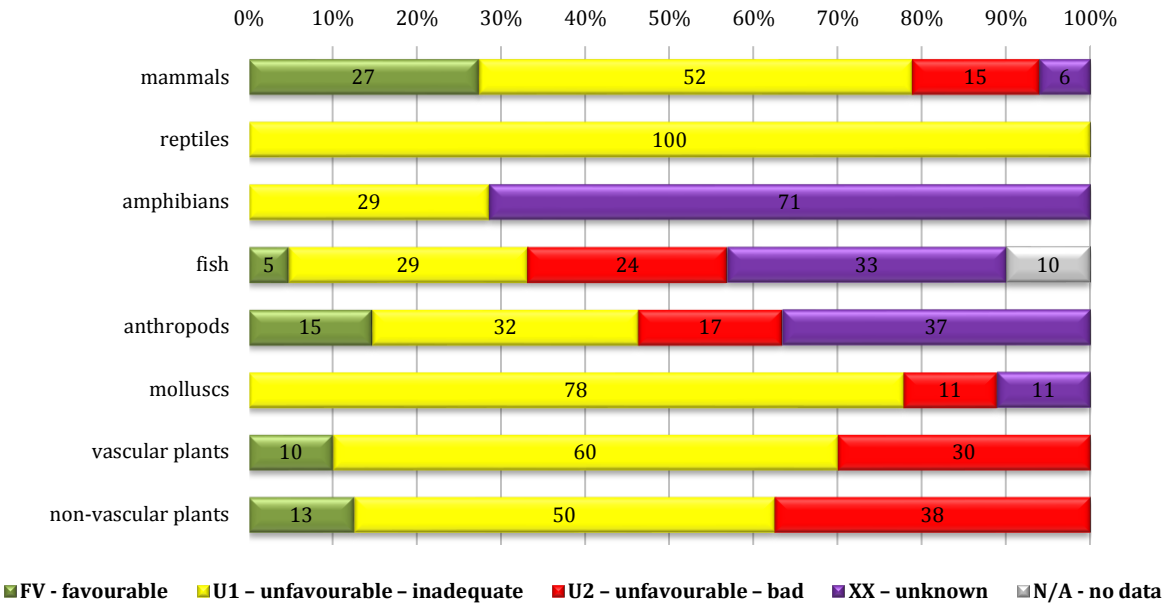
The situation is similar for species whose conservation status has been assessed as favourable (FV) only in the case of 27% of mammals, 15% of arthropods, 13% of non-vascular plants, 10% of vascular plants and 5% of fish. The conservation status of the remaining groups of species has been assessed as unfavourable – inadequate (U1) or unfavourable – bad (U2). In the case of species it has been proved necessary to fill gaps in the knowledge regarding their populations, especially amphibians, whose state is unknown in the case of as many as 71% of the analysed species.

FIGURE 11. GENERAL ASSESSMENT OF THE CONSERVATION STATUS ACCORDING TO NATURAL HABITAT CATEGORIES.



Source: PAF (2013)

FIGURE 12. GENERAL ASSESSMENT OF THE CONSERVATION STATUS ACCORDING TO PLANT AND ANIMAL SPECIES GROUP, EXCLUDING BIRD SPECIES

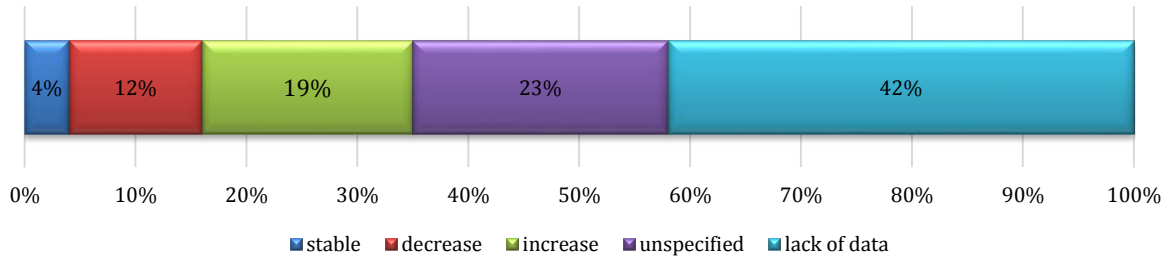


Source: PAF (2013)

The Monitoring of Birds of Poland (MBP) programme – in 2010-2012 consisted of 21 individual subprogrammes dedicated to groups of species or particular species of birds breeding and wintering in the country. It was the most developed subsystem of nature monitoring. In total, data on 148 species of breeding birds (65% of species breeding regularly in Poland) and 24 species of wintering birds have been obtained. Field work was conducted in nearly 1/4 of the total country area. Some monitoring schemes, such as e.g. Common Breeding Bird Monitoring Scheme or Flagship Bird Species Monitoring Scheme, have been conducted according to standardised methods from 2000 or 2001, which made it possible to obtain 11- and 10-year series of measurements, thus allowing to establish population size trends for 111 bird species.
The most important findings of bird monitoring are:

- The abundance index of common forest birds (34 species) indicates an increase in the population size of this group of birds over the course of the last 12 years (see Figure 14); the population of an average species in this group in 2012 was approx. 25% higher than in 2000,
- The aggregated abundance index of common farmland birds (FBI 23) indicates a deterioration in their situation,
- Wetland birds (31 species) are a group facing the most severe decline; the decrease in their population size is especially noticeable in areas outside Natura 2000 special bird protection areas.
- The most endangered among the monitored species in terms of continuously decreasing and extremely low population sizes are the European roller (*Coracias garrulus*) and osprey (*Pandion haliaetus*), while the dunlin (Calidris alpina) is on the verge of extinction. Provisional monitoring results of the great snipe (*Gallinago media*) are also alarming and indicate that the great snipe population is several times smaller than previously believed,
- Population sizes of several species, endangered or extremely rare until recently, are still on the increase. The ferruginous duck (*Aythya nyroca*) is one of them. Some other species whose populations are increasing are: the common crane (*Grus grus*), whooper swan (*Cygnus cygnus*) and black-crowned night heron (*Nycticorax nycticorax*).

FIGURE 13. POPULATION SIZE TRENDS OF BIRD SPECIES UNDER THE SEMP (2012 ASSESSMENT RESULTS)

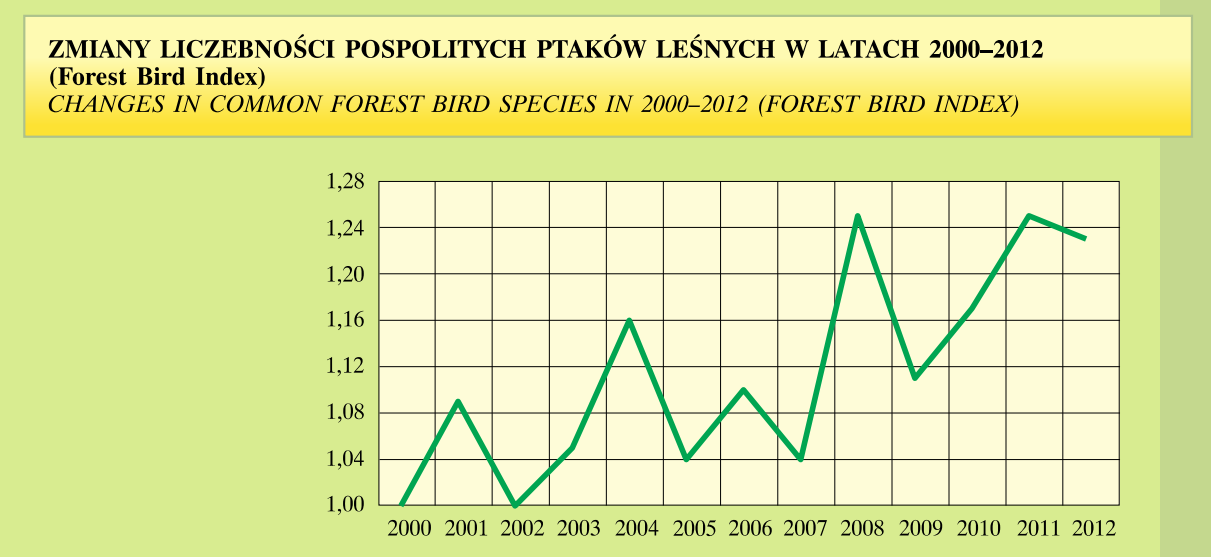


Source: based on PAF (2013)

The monitoring of birds wintering in Poland, both on inland water bodies and on seawaters, indicated 415 and 629 thousand water birds in 2011 and 2012 respectively. Anseriformes (70-80% of identified water birds) and gulls (approx. 15%) were predominant. The most numerous among birds wintering in Poland were: mallard (*Anas platyrhynchus*), tufted duck (*Aythya fuligula*), common goldeneye (*Bucephala clangula*) and common merganser (*Mergus merganser*). Three species of ducks dominated the marine waters: the velvet scoter (*Melanitta Fusca*), long-tailed duck (*Clangula hyemalis*) and common scoter (*Melanitta nigra*). In the case of the first two,

their wintering on the Polish waters is significant on the global scale. It should be noted that bird monitoring does not include research on their habitats.

FIGURE 14. CHANGES IN COMMON FOREST BIRD SPECIES IN 2000-2012



Source: CSO (2013) - reprint

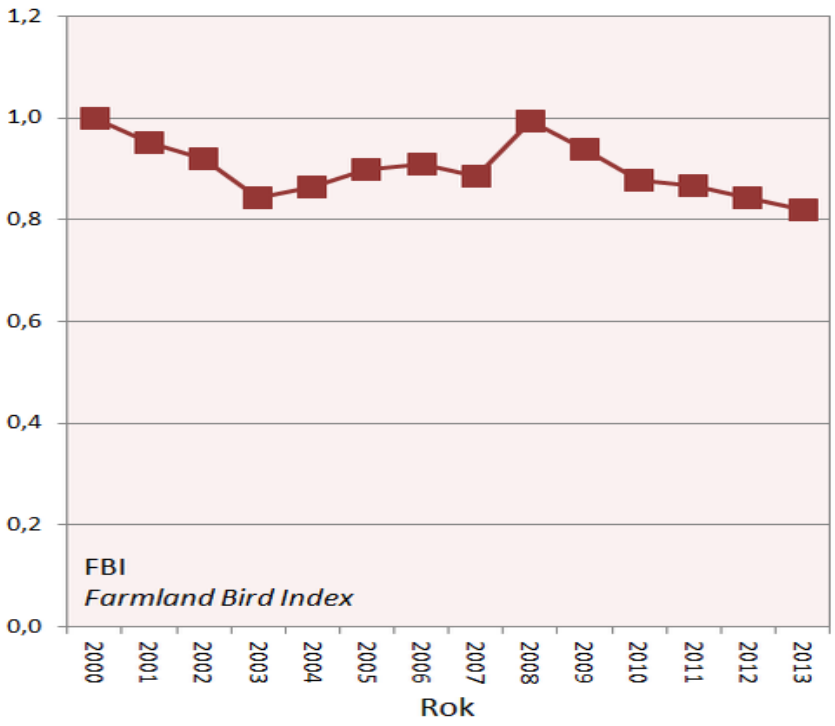
CHANGES IN AGRICULTURAL AREAS

Outside the protection of areas of high natural value, it is necessary to take action for biodiversity conservation in areas of economic, especially agricultural, use. Agricultural areas have a significant effect on biodiversity countrywide because they occupy more than 50% of its territory and offer numerous refuges for endangered species plants, animals and fungi. Around half of the 365 phytocenoses present in Poland (including those protected within the Natura 2000 network) is connected with agricultural areas, 45 types of which are used as grassland and pastures. Many species of birds and other animals, endangered in other European countries but still widespread and with relatively numerous populations, are also linked with the diverse agricultural landscape. It can be expected that, together with a decrease in the size of agricultural land, the range of many plant and animal species will also decrease.

In order to assess the state of agricultural areas, an aggregated index of common farmland bird species population abundance (FBI 23) has been used. Trends of this index are presented in the chart below (Figure 15). They displayed an initial decrease of about 15% in 2000-2003, after which time a slow return to the starting level (in 2000, FBI=1.00) took place in 2008. During the last five years, another decrease in the population of birds in this group has been noted – in 2013 they reached the lowest level on record. The index value reached 0.82, almost 20% less than in the base year. The changes in the FBI index values can be broken down into three components. Firstly, these changes were correlated with the intensity of arable land management, measured in grain crops in the year preceding bird counting. High grain crops correlated negatively with bird population sizes the following spring. Weather conditions during the two winters preceding bird counting were the second factor correlated to the dynamics of the index. Mild winters were related to FBI value increases and harsh winters – with its decreases. The third component was the general long-term decreasing trend of the FBI. The causes of this trend have not yet been found. Factors related to the intensification of agriculture other than those that can be expressed

in crop sizes, such as the accumulated and/or delayed effects of increasing agricultural engineering, are the most likely causes. Their identification requires longer terms of measurements and better data on the intensity of agricultural land use.

FIGURE 15. COMMON FARMLAND BIRD POPULATION ABUNDANCE INDEX (FBI 23)



Source: CIEP (2014)

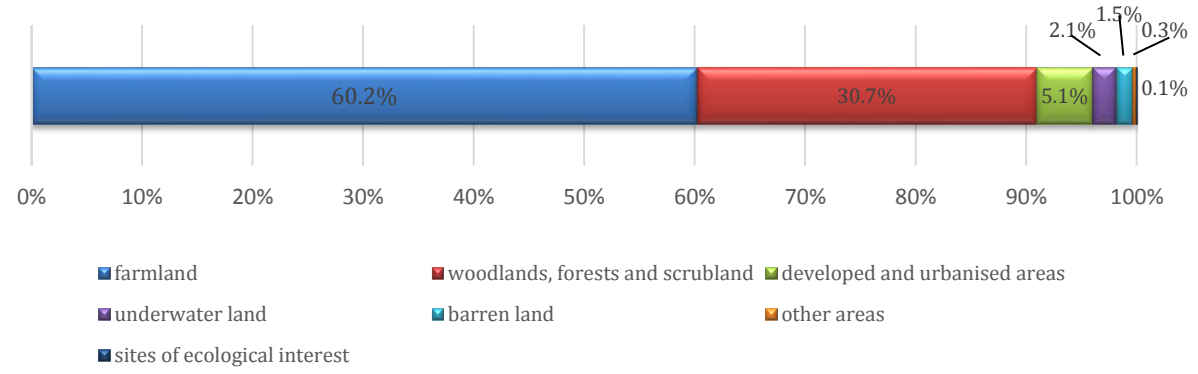
Well preserved biodiversity resources of Polish agricultural areas should be valued because they arise, above all, from the traditional character of Polish agriculture. Despite the changes that have taken place in the recent years, mixed cropping with the use of extensive farming methods is still taking place in a number of areas. This is determined by the character of the natural environment, as well as historical and cultural development. In comparison with the rest of Europe, Polish agriculture is characterised by a notable fragmentation of farms, a large number of workers, the dominance of soil of medium and low agricultural quality, as well as a low utilisation of industrial means of agricultural production. Despite these factors, Poland plays an important role in the world and in Europe as a producer of a range of agricultural, horticultural and animal-origin products. Environmental considerations have also lead to an increasing number of organic farms, discussed in more detail later in this chapter.

The structure of farm sizes is one of the factors influencing the landscape and biological diversity. In 2010, the average area of farms actively engaged in agriculture was 6.8 hectares. Small farms up to 5 hectares dominate in number (they comprise 69% of total farm count); they use nearly 16% of total farmland. Farms over 20 hectares of farmland, including the largest ones, comprise less than 6% of all farms but only 48% of the area is in agricultural use. The share of medium-sized farms (5 to 20 hectares of farmland) is 25% of total farm count. They use 36% of total farmland. Permanent changes arising from land consolidation can also be observed. As a result of concentration, the number of the largest farms (above 20 hectares) is on the increase·

A fragmentation of parcels, which contributes to creating a mosaic structure of natural habitats, plays a positive role in the preservation of numerous species (plants, animals and fungi), especially those not directly related to agrocenoses. These species are likely to survive only in mosaic landscape. Conversely, the fragmentation of farmland is a hindering (and sometimes preventing) factor in economically effective farming. Estimates based on economic criteria of agricultural production indicate that 3 million hectares of farmland should be made subject to consolidation activities. There is a clear discord here between biodiversity needs and those arising from economic calculations. From the point of view of natural resource protection, it would be optimal to maintain the fragmented farm structure with possibly high participation of marginal ecosystems, such as: balks, roadsides, woodlands and shrublands, and wetlands and ponds. However, taking into account economic calculations (which leave out the values of ecosystem services), the land structure is certain to undergo significant changes in the coming years.

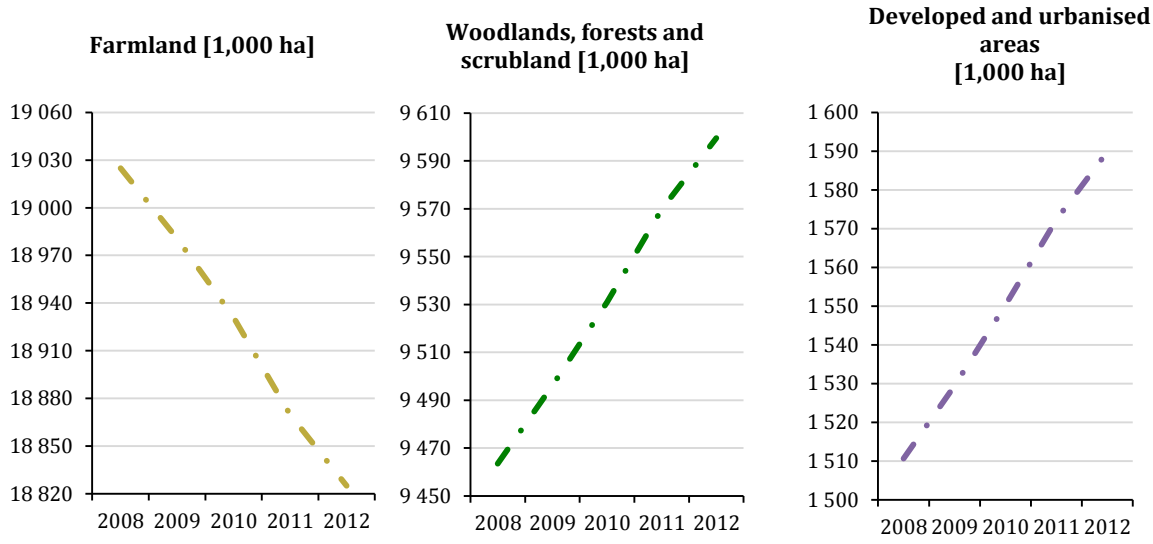
Changing the method of farmland use is another threat to biological diversity. Constant agricultural land use is a condition for the preservation of many species and habitats. However, the amount of arable farmland has been decreasing systematically in Poland. In the period just short of 20 years (1990-2008), farmland decreased by over 2.5 million hectares. In the period under investigation (2009-2012, Figure 17), the total amount of farmland – most importantly, pastures and grasslands – decreased by 160,000 hectares. This decrease was caused by the conversion of farmland to non-agricultural uses and changing its classification. Many farms, especially small ones, abandoned production in the recent years. Moreover, substantial amounts of land with very good and good quality soils, which have been categorised as quality classes 1-3, were converted to non-agricultural use. This decrease was compensated for only partly by an increment in woodland and forested areas (by 114,000 hectares), while the remaining change was due to an increase in developed and urbanised land (by 60,000 hectares).

FIGURE 16. Structure of land use in Poland in 2012



Source: based on data from the CSO

FIGURE 17. CHANGES IN THE SURFACE AREA OF SELECTED TYPES OF LAND IN 2005-2011



Source: based on the CSO

TRADITIONAL BREEDS, VARIETIES AND PRODUCTS

Poland sees a growing interest in high quality production, such as traditional regional products. There is high development potential for these niches – good environmental conditions, agricultural workforce surplus and cultural factors. Rising needs due to high consumer expectations and the need for delivering high, measurable quality standards can be observed.

The high potential of this market in Poland may be illustrated by the fact that over 1,000 products have been included in the List of Traditional Products to date. The list identifies products whose quality or special characteristics and properties result from using traditional production methods – part of the cultural heritage of the region and part of that region's local identity. This attests to a high development potential of this market in Poland. The list also serves indirectly to prepare manufacturers for product registration in the EU Register of Designation of Origin and Protected Geographical Indication, and Traditional Specialities Guaranteed, which is continuously expanded. Moreover, the system of protection and promotion of regional and traditional products is one of the most important factors supporting sustainable development in rural areas. Farmers' participation in the system of protected geographical indications, protected designations of origin, guaranteed traditional specialities and integrated production enables them to improve income, while protecting both natural and cultural resources.

Selected examples below illustrate the relationship between the promotion of traditional products and the protection and sustainable use of rural biological diversity:

- **Milk from Polish red cows** (southern Poland, Malopolskie Voivodship). The output market development for this product can encourage rearing this native breed of cattle, thus having a positive effect on the in-situ preservation of genetic resources. It is also important to encourage pastureland use in regions with difficult environmental conditions (mostly in the southern part of Poland), to which this breed is perfectly adapted. This has an influence on the preservation of the cultural landscape and, in many instances, is a preventing factor to plant succession that leads to an impoverishment of the biodiversity of the mosaic structure of meadows, pastures and other farmland. At the same time, it is an example of measures taken within the Farm Animal Genetic

Resource Conservation Programme (Package 7 of the 2007-2013 Agro-environmental Programme, *Maintenance of genetic resources of endangered animal species in agriculture* – Variant 7.1. Preservation of local cattle breeds).

- **Podhale sheep milk cheese (Bundz/Bunc/Bryndza)** (southern Poland, Malopolskie Voivodship). The output market development for sheep milk products can be an incentive to rear/return to rearing sheep in mountain and foothill areas, where traditional pastures for these animals exist. In many regions, the abandonment of grazing has led to the disappearance of cultural landscape and biodiversity losses, as a result of, inter alia, tree and shrub succession, which led to a decrease in ecotone zone areas between pastures and forest/tree lines.
- **Pulawska pig** (eastern Poland, Lublin Voivodship). Towards the end of 1980s, a stage of intense reduction of this breed started as a result of market preference of carcasses with high meat content. In 1980-1990, organisational measures were undertaken towards genetic resource conservation and the classification of the Pulawska breed as a national maintenance breed. As a result of these measures, the population size has stabilised. The output market development for the pork meat of this breed of pigs is going to have a positive impact on the in-situ preservation of its genetic resources. The Pulawska pig breed is covered by the Farm Animal Genetic Resource Conservation Programme implemented by Package 7 of the Agro-environmental Programme in 2007-2013, *Maintenance of genetic resources of endangered animal species in agriculture* – Variant 7.4. Preservation of local pig breeds.
- **Milicz carp** (southern Poland, Lower Silesian Voivodship). Among the most characteristic features of the natural environment formed as a result of human activities in the Barycz Valley is the presence of numerous large fish ponds under protection as the Milicz Ponds nature reserve and, at the same time, as a Natura 2000 special bird protection area Barycz Valley, as well as a protected site under the Ramsar convention due to its key role for wetland birds. Fishponds in the Barycz Valley are an excellent example of a harmonious co-existence of fishery management and wildlife that has lasted centuries.
- **Old variety of Prince Albrecht of Prussia apple tree** (southern Poland, Opole Voivodship). This is an example of an *in situ* conservation (possible, inter alia, due to opportunities presented by the popularisation of traditional products) of local varieties of crop plants. At the same time, this variety is amongst those preferred in Package 6, *Preservation of endangered genetic plant resources in agriculture*, Variant 6.4. Traditional orchards, as part of the agro-environmental programme for 2007-2013.

The Institute of Plant Breeding and Acclimatization in Radzikow monitor genetic diversity of crops and their accompanying plants. Studies in this area usually focus only on selected regions of Poland. Nonetheless, thanks to yearly collecting expeditions, information on the presence of traditional useful plant varieties, as well as plants that are rare and endangered, is gathered systematically in given regions. An assessment of genetic erosion levels in the country is also carried out. A crop plant genetic resource protection programme, coordinated by the National Centre for Plant Genetic Resources of the Institute of Plant Breeding and Acclimatization, has been carried out since the 1990s by a number of interrelated institutions responsible for individual leading collections of crop plants. These collections make up the Polish Gene Bank, whose task is to collect and evaluate the genotypes of plants threatened by genetic erosion, to keep chosen stored materials alive and make them available to breeders, as well as for scientific purposes, to document the accumulated collections and to disseminate the gathered data.

Farm animal genetic resources are monitored throughout the country by the National Research Institute of Animal Production in Balice, which coordinates programmes for the protection of farm animal genetic resources (the protection of crop plant and livestock genetic resources is described further in Chapter 2.3).

ECOLOGICAL AGRICULTURE

The development of integrated production and organic agriculture also contributes to rural biodiversity conservation. In recent years, a steady increase in the number of issued certificates has been observed. Integrated production is a farming system in which the manufacturer carries out plant production with the use of sustainable technical and biological progress in agriculture, plant protection and fertilisation, paying special attention to environmental protection and human health. Integrated production development is a vital issue in EU countries and steps taken towards encouraging producers to implement this farming method are most recommended. Moreover, integrated production facilitates the sale of high quality certified farm products on the Polish and EU markets.

A systematic increase in the area and number of ecological farms is also worth emphasising (Table 13). Against UE other member states, the significance of organic agriculture is, however, relatively low in Poland, though it has development potential. In the period under investigation (2009-2011), the share of organic farming rose from ca. 1.4% to 3.52%.

TABLE 13. ORGANIC FARMS IN POLAND IN 2005-2012

	2005	2006	2007	2008	2009	2010	2011	2012
Certified farms	1,951	3,504	6,618	8,685	10,153	12,901	15,234	18,187
Certified farmland area (in hectares)	37,492	75,091	137,891	178,732	222,022	308,095	376,036	457,089
Farms in conversion period	5,231	5,683	5,252	6,211	6,938	7,681	8,215	7,757
Farmland area (in hectares) in conversion period	122,218	152,948	149,638	136,116	145,040	210,974	229,484	204,599

Source: based on LD CSO

Despite intensive efforts supported financially by, inter alia, the EU Common Agricultural Policy, the adaptation of Polish farms to European standards of environmental protection and animal hygiene and welfare remains a considerable issue. According to sociological research, poor economic condition of farms and a relatively low level of education and professional training among farmers hinder improvements in these areas. Only 30% of farmers are aware of the potential negative impact of farming on the natural environment[9]. The current level of mineral fertilisation (125.1 kg NPK/ha) and of the use of pesticides in Poland can be assessed as moderate. Generally speaking, it does not have a negative impact on the quality of farmland and products. However, information on the correct fertilisation and chemical plant protection substance application methods needs to be disseminated. New environmental challenges have been formulated in the Code of Good Agricultural Practices, which includes the rules and procedures for environmentally friendly agricultural production.

CHANGES IN FORESTRY

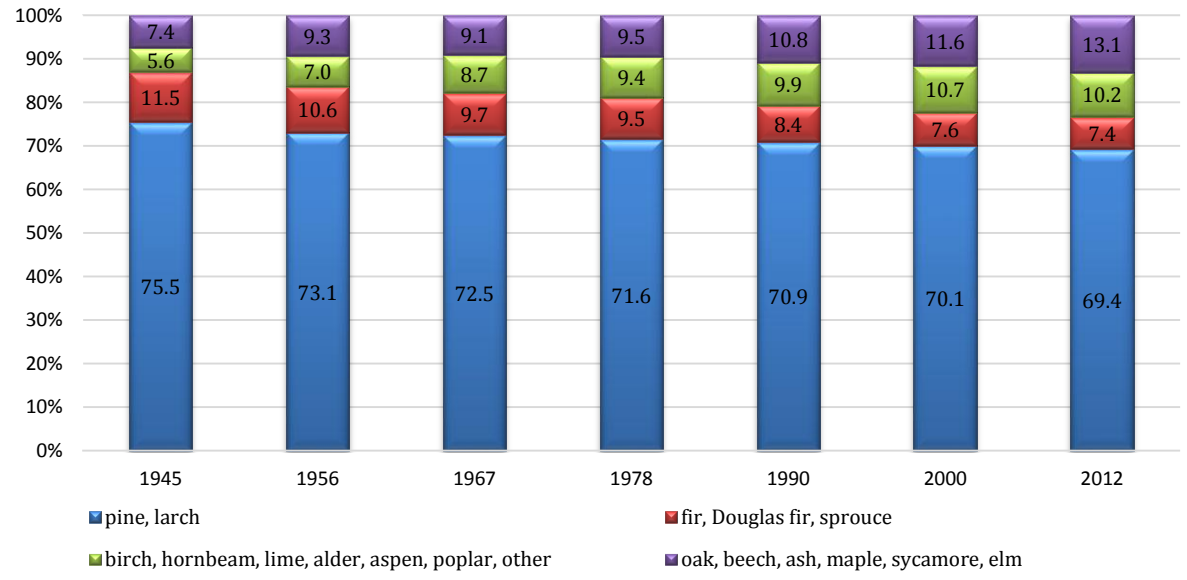
Forests and woodlands are a very important refuge of biological diversity, taking up nearly 30% of total country area. Forested land in Poland totals 9.2 million hectares, corresponding to a forest cover of 29.3%. Public forests, including forests owned by the Treasury and managed by

[9] MARD (2011a)

State Forests National Forest Holding, dominate in the ownership structure – 82% and 78% respectively. Forest ecosystems are the most valuable and most widely represented component of all forms of nature conservation in Poland. Forests take up almost half (43.5%) of the total area under protection. 50% of Poland's sites designated as the European Natura 2000 network are forested. In forests managed by the SFNFH, SPAs of birds constitute 32% of State Forests, while SACs of habitats – 23.5%. Monitoring results of the state of forest habitats, conducted in selected areas by the CIEP, indicate unsatisfactory or bad (U1/U2) status of most forest habitats. Such low ratings were significantly influenced by the negative evaluation of the *structure and function* parameter, and within this parameter – of dead wood resources. From the point of view of biodiversity, this indicator is of crucial importance in forests, as the presence of large-sized dead wood, standing and lying, conditions the occurrence of the most endangered xylobiontic organisms, in particular fungi and invertebrates.

At the same time, the use of wood resources in Poland in recent years has been below production capabilities as defined in accordance with the principle of forest sustainability and increasing wood resources. The country's forestry resources have been increasing successively. The species composition of Polish forests has seen positive changes; the share of pine monocultures is decreasing, while the share of forest stands dominated with deciduous species is increasing (Figure 18). However, despite these changes, the share of deciduous tree stands is much lower than implicated by the habitat structure.

FIGURE 18. VARIATIONS IN SPECIES COMPOSITION OF STATE FORESTS IN 1945-2012



Source: Report on the state of forests in Poland (2012)

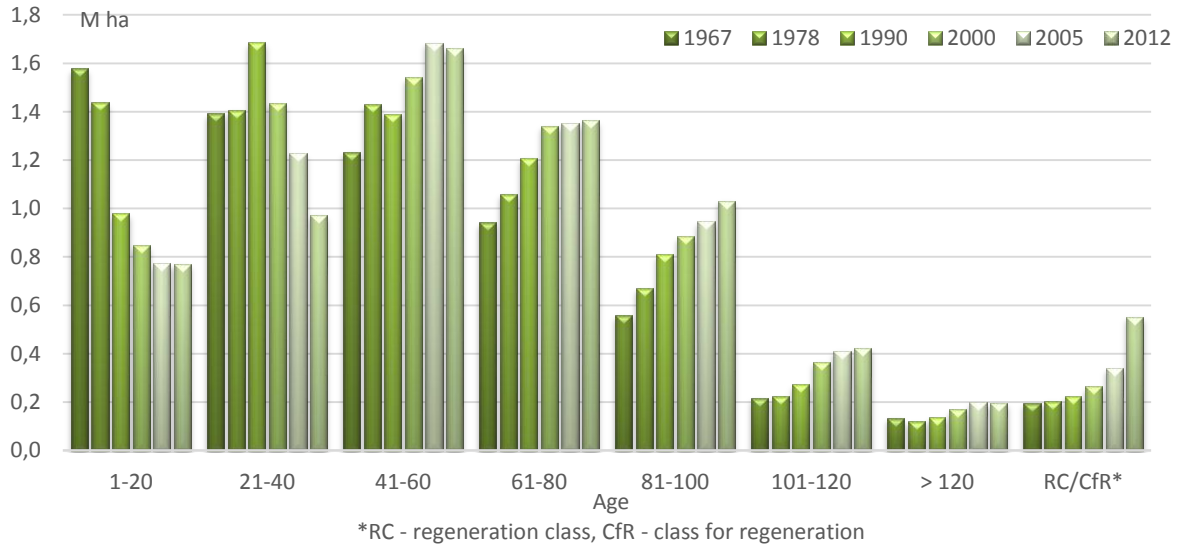
As a result of distortions to the species composition of Polish forests through past forestry management (19th and 20th century) which preferred quickly growing coniferous tree species, they have been dominating large areas of the country (71%), while pine, spruce and fir stands account only for slightly more than half (52%) of all the habitats in the forest habitat structure. A successive reconstruction of forest stands (Table 14), which aims at increasing the share of mainly deciduous species and diversifying the age structure (Figure 19, the area of forests aged 80-120 years is increasing) is the effect of sustainable management currently pursued in the Polish forests.

TABLE 14. RECONSTRUCTION OF FOREST STANDS IN 2009-2012.

	2009	2010	2011	2012	Total 2009-2012
Area of reconstruction of forest stands (1,000 ha)	10.8	10.6	9.8	9.7	40.9

Source: data provided by the DGSF

FIGURE 19.VARIATIONS IN FOREST STAND AGE STRUCTURE IN STATE FORESTS IN 1967-2012



Source: report on the state of forests in Poland (2012)

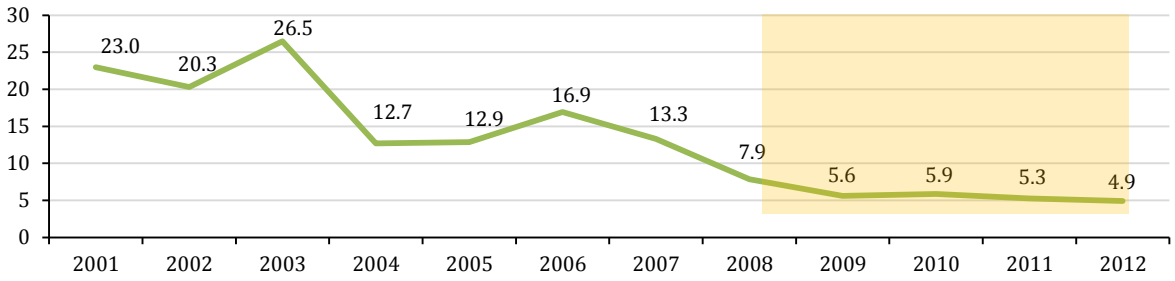
Poland is currently implementing the *National Programme for Augmentation of Forest Cover*. Its objective is to increase the country's forest cover to reach approx. 33% by 2050. This means that the average annual surface area of afforestation (excluding natural succession) in 2011-2020 should be approx. 40,000 hectares. In reality, however, the afforestation rate is lower, because of an insufficient supply of land for afforestation. Despite the aforementioned conditions and assuming that current trends will continue under unchanged legal and economic rules, it can be expected with high probability that the afforestation will increase systematically, albeit slowly, in the entire country. The years 2009-2012 saw an increase in the area of forests and of land covered by afforestation carried out on non-forest land. In comparison to 2005-2008, the afforestation dynamics of non-forest land decreased both on private land and in sites managed by the State Forests (Table 15, Figure 20). By 2012, the forest cover reached 29.3%. Comparing to 2008, this was an increase by 0.3% (Figure 21).

TABLE 15. DYNAMICS OF CHANGES IN KEY FOREST INDICATORS IN 2009-2012

Indicator name	Value in the base year and in the target year [1,000 ha]		Indicator value change (annual average) [1,000 ha]		Change comparison in 2009-12 in relation to 2005-2008
	2008	2012	2005-2008	2009-2012	
Forest land surface area	9,273	9,370	25.4	24.4	↓
Non-forest land afforestation total	7.9	4.9	3.2	1.4	↓
Afforestation of land managed by the State Forests	2.8	0.4	1.0	0.2	↓
Private land	4.9	4.4	2.1	1.1	↓

Source: based on LD CSO

FIGURE 20. NON-FOREST LAND AFFORESTATION (1,000 HA)

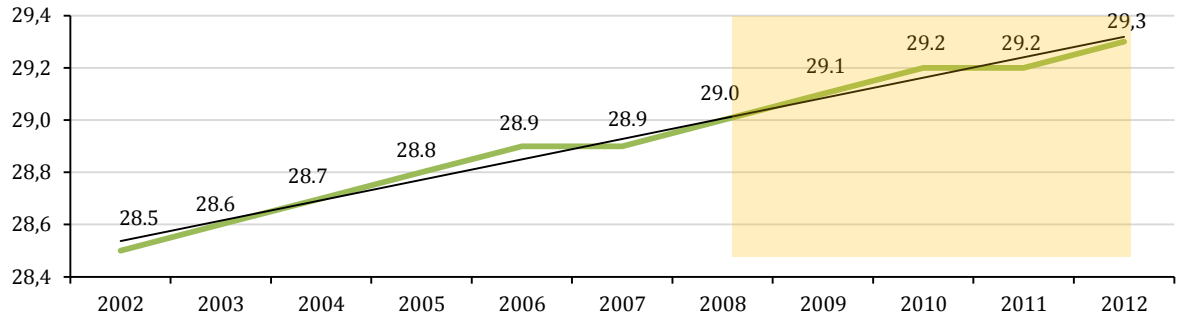


Source: based on LD CSO

Assuming a continuation of the afforestation increase dynamics in 2002-2012, the indicator value will reach approx. 30% in 2020. It should also be noted that activities for the augmentation of the national forest cover are conducted in accordance with the restrictions of the habitat conservation requirements of the Natura 2000 network. For example, in the State Forests afforestation is not carried out on permanent grasslands (meadows and pastures). In accordance with the GDEP recommendation, since 2010, all afforestation planned on Natura 2000 sites is subject to SEA.

Numerous biodiversity conservation projects funded by the EU and from national resources are also implemented on forest lands. Examples include: conservation projects on populations of the European bison (*Bison bonasus*), western capercaillie (*Tetrao urogallus*), black grouse (*Tetrao tetrix*) and lesser spotted eagle (*Aquila pomarina*); small-scale water retention in lowland and mountain forests; the conservation of wetlands; the development of small tourist infrastructure in protected areas, whose imperative objective would be to remove pressure from the most valuable species and habitats present in each given area. These projects are implemented by the SFNFH, national parks, RDEPs, and NGOs alike.

FIGURE 21. CHANGE IN AFFORESTATION (%)



Source: based on LD CSO

Management principles that integrate the objectives of: widespread nature conservation, the intensification of environmental functions of forests, a continuous use of forest resources, the economic stabilisation of forestry and a collectivized management of forests as a public good, are worked on and developed mainly in Promotional Forest Complexes (PFC), created in Poland since 1994. The PFCs are large, dense forest areas included in one or several Forest Districts. Established throughout the entire country, they show the variability of habitat conditions, the heterogeneity of forest species composition and the variety of functions that forests perform. PFCs also promote sustainable forestry and support scientific research and forest education. In the years 2009-2012, the number of PFCs grew from 19 to 25, and two PFCs were enlarged (Table 16).

TABLE 16. CHANGES IN PFC COUNT AND AREA IN 2009-2012

Year	PFC count	PFC area (1,000 ha)	PFC area on SFNFH land (1,000 ha)	% of SFNFH surface area
2008	19	999	979	14
2012	25	1,208	1,180	15.5

Source: State Forests in Figures (2009, 2012)

1.3 PRIMARY THREATS TO BIOLOGICAL DIVERSITY IN POLAND

ENDANGERED SPECIES – GENERAL OVERVIEW

Among species present in Poland, 2,769 animal species (2,174 of which are insect species) have been deemed endangered. The *Polish Red Data Book of Animals*, published in 2001, lists 130 endangered vertebrate species: 32 mammal species, 70 bird species, 4 reptile species, 3 amphibian species, 17 fish species and 4 cyclostomate species.

Three large predators are present in our country: the wolf (*Canis lupus*), lynx (*Lynx lynx*) and brown bear (*Ursus arctos*). All three belong to species protected by the Polish law: bear from 1952, lynx from 1995 and wolf from 1998. Estimates (unproven by research) indicate that in 2012, 158 bears and 309 lynxes lived in the wild and one of the largest European wolf populations totalled 1,050 specimens. Also the largest European bison (*Bison bonasus*) population is found in Poland. In 2012, the European bison population size was 1,204.

Poland can boast its refuges of many rare species of birds of prey and wetland birds. Populations of white stork (*Ciconia ciconia*) or aquatic warbler (*Acrocephalus paludicola*) are among the largest in Europe. The following orders belong to the most endangered: galliformes, accipitriformes, owls and gruiformes, around half the species of which are on the Red List.

Among the most endangered amphibian and reptile species are: the Aesculapian snake (*Zamenis longissimus*), European pond turtle (*Emys orbicularis*), smooth snake (*Coronella austriaca*), northern crested newt (*Triturus cristatus*), agile frog (*Rana dalmatina*) and Carpathian newt (*Lissotriton montandoni*). The population sizes of all amphibians and reptiles show a downward trend, which has been continuing for many years.

In 2009, according to the *Red List of Fish and Lamprey Species*, 37 endangered species of fish and lampreys were present in Poland's fresh waters. Among the extinct or critically endangered species are diadromous species: the Atlantic sturgeon (*Acipenser oxyrinchus*), Atlantic salmon (*Salmo salar*), sea lamprey (*Petromyzon marinus*), twait shad (*Alosa fallax*), allis shad (*Alosa alosa*), vimba bream (*Vimba vimba*), sichel (*Pelecus cultratus*), European river lamprey (*Lampetra fluviatilis*), and huchen (*Hucho hucho*). Merely less than 30% of the native ichthyofauna is in the non-endangered group of species. Also over 30 alien species have a negative impact on the poor condition of the ichthyofauna.

Stenobiont species of low adaptability and with strictly defined requirements are the most endangered by elimination from transforming or transformed environments. A significant part of these species is dependent on dying and endangered ecosystems. In Poland these are species present in different kinds of reservoirs, which require clean water, e.g. the mayfly, odonata, stoneflies, sponges, gastropods and bivalves. In land ecosystems, they are species connected to endangered environments – peat bogs, riparian and alluvial forests, flood meadows, wet pastures and grassland.

The *Polish Plant Red Data Book – Ferns and Flowering Plants*, published in 2001, distinguished 296 endangered plant species, 74 (25%) of which were critically endangered. The *Red List of Plants and Fungi in Poland,* published in 2006, contains 506 vascular plant species and 963 macrofungi species endangered to a lesser or larger degree, extinct or extinct in wild. The number of vascular plants and macrofungi that are becoming extinct – critically endangered – is 144 and 425 respectively.

The monitoring of threats is one of the elements of the environmental monitoring system. It incorporates both anthropogenic impacts and natural processes relevant to good conservation status of species and natural habitats protected within the Natura 2000 network. Threats arising from natural biotic and abiotic processes and changes in agricultural and forestry methods concern the largest number of types of natural habitats and species. As many as 80% of habitats are modified as a result of natural processes (e.g. plant succession, synanthropisation, eutrophication). In the case of species, even 44% of national populations could become extinct as a result of natural processes. The second category of threats, which have a negative impact on as many as 70% of habitats and 61% of species, is related to agricultural changes (intensification or setting aside of land) and some aspects of forest management. Also fisheries and hunting, though on a smaller scale, influence the most valuable species – this has been identified as a threat to 31% of species. In the case of hunting, the biggest problem is the introduction of alien species into the environment [e.g. sika deer (*Cervus nippon*), fallow deer (*Dama dama*), mouflon (*Ovis aries musimon*)] and uncontrolled feeding of wild ungulates, leading to changes in their behaviours and the resulting reduction of natural mortality factors, contributing to the growth of the population of these species and their pressure on the environment. The pressure of fisheries consists mainly in over-fishing of certain species above the limits established at the EU level[10] and uncontrolled by-catches of protected species of fish, marine mammals and birds (a reliable system for monitoring and reporting by-catches is lacking). Fishermen's interest in activities aimed at biodiversity conservation is far from satisfactory, despite the existence of EU programmes and the availability of resources for this type of action. Threats related to the mining and extractive industries were recorded the least frequently (impact on 7% of species) (Table 17).

TABLE 17. IDENTIFIED IMPACT ON AND THREATS TO NATURAL HABITATS AND PLANT AND ANIMAL SPECIES EXCLUDING BIRD SPECIES (%)

Category of impact or threat	HABITATS	SPECIES
Agriculture, forestry	70	61
Fishery, hunting and gathering	18	31
Mining and raw material extraction	25	7
Urbanisation, manufacture and related activities	33	21
Transport and traffic	41	19
Tourism and recreation	54	19
Pollution and other anthropogenic impacts/activities	53	45
Anthropogenic modifications on wetlands and in marine environment	44	36
Natural processes (biotic and abiotic)	80	44

Source: PAF (2013)

[10] According to the EC, in 2012 Poland exceeded the fishing quota for the Atlantic salmon (Salmo salar) in EU waters by 1,776 specimens, and therefore the amount for 2013 has been reduced by 1,776 specimens (http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:320:0020:0021:PL:PDF).

Regarding specific impacts, among the most often mentioned are those related to agriculture (mowing, cutting down), forestry (forestry management in general and the removal of dead or dying trees), tourism (tracks, trails etc.), as well as natural processes taking place in semi-natural habitats that saw a change in or a cessation of their former use. Intensive activities accompany linear projects (disrupting the continuity of ecological corridors, leading to habitat fragmentation) and any activities producing changes in water levels (drainage) and the quality of surface water (eutrophication). The impact of species invasion is also mentioned relatively frequently. It usually refers to the expansion of invasive herbaceous plant species. It has to be emphasised that in the presented data, all effects are listed, regardless of their impact on habitats, so that information on positive impacts of anthropogenic intervention on some natural habitats, e.g. mowing to maintain fresh meadows, is also included. Moreover, during the monitoring work, all human activities were recorded, also those that could (though not necessarily) have a neutral impact on relevant habitats, e.g. angling or tourist trails and tracks (Table 18).

TABLE 18. THE MOST COMMON IMPACTS ON NATURAL HABITATS IN 2009-2011

Impact	Number of sites where the impact was recorded[11]
Mowing / cutting down	590
Biocenotic evolution	492
Footpaths, hiking and cycling trails	389
Forestry – generally	311
Roads, motorways	236
Eutrophication	222
Angling	222
Species invasion	215
Pasturing	204
Drainage	155
Fertilisation (chemical fertilisers)	155
Other natural processes	151
Flooding	148
Removal of dead and dying trees	144

Source: based on SEMP (2012)

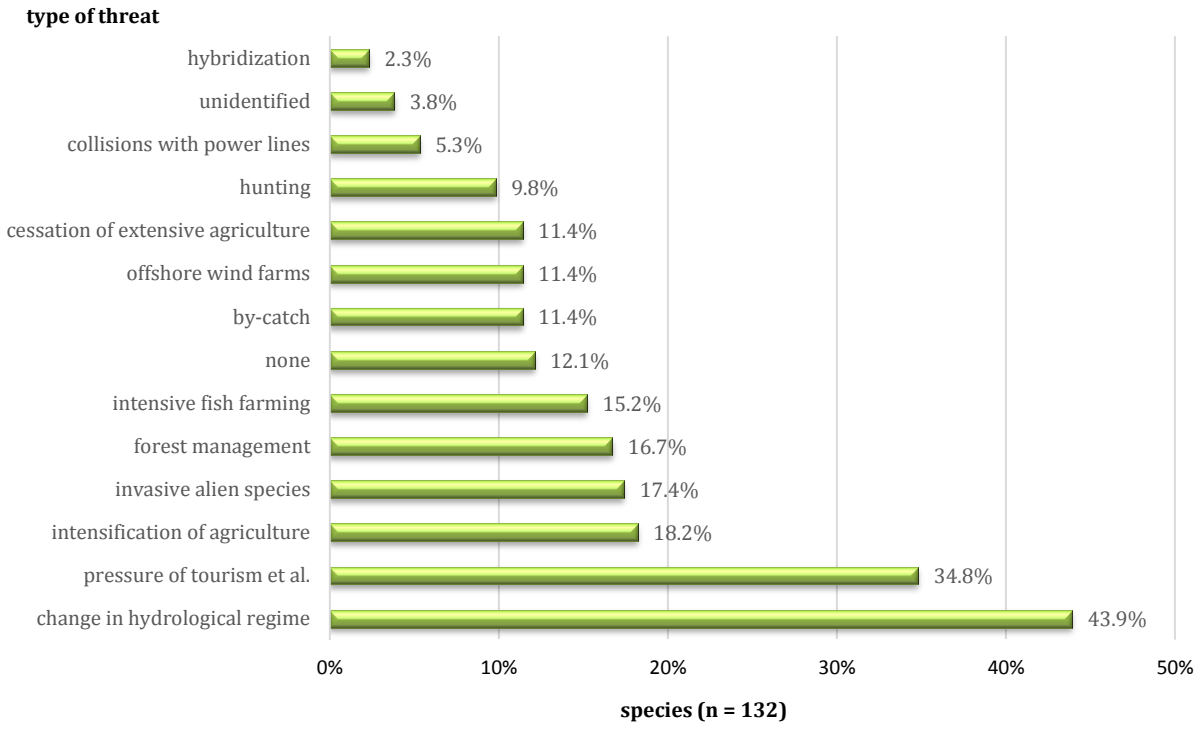
EXISTING AND POTENTIAL THREATS TO BIRD SPECIES

The most common threat that affects 58 bird species (approx. 44% of species of breeding birds protected in Natura 2000 sites) is posed by transformations caused by changes in the hydrological regimes of wetlands (regulation and maintenance of rivers, drainage of wetlands, e.g. aimed at increasing agricultural effectiveness). 46 species (35%) are also endangered by tourist pressure, disturbance by humans, as well as an increase in the area taken up for dispersed development. A slightly smaller group of species is affected by negative impacts arising from agricultural intensification (over 18% of species), predation by alien species (over 17%), forestry activities leading to the felling of old growth forest stands and the removal of dead or dying trees (approx. 17% of species) and the intensification, as well as the discontinuation of fish farming (over 15% of species). By-catches on seawaters, the construction of maritime wind farms and a discontinuation of extensive agriculture leading to the setting

[11] The monitoring included 40 types of natural habitats in 2309 sites

aside of land pose a threat to just over 11% of species. In the case of 21 species (16%), the type of threat was not determined or none was found (Figure 20).

FIGURE 22. EXISTING AND POTENTIAL THREATS TO BIRD SPECIES IN %[12].



Source: PAF (2013)

THREATS TO THE DIVERSITY OF MACROFUNGI

Macrofungi are among the most important components of terrestrial ecosystems. Their mycorrhizal associations with plants and their participation in organic matter decomposition processes are essential for the proper functioning of ecosystems. Therefore, the protection of biodiversity must involve the protection of fungi. Today, the following factors present the greatest threat to fungi:

- the destruction or fragmentation of habitats due to different types of projects (e.g. road and railway construction) without sustainable compensation;
- air, soil and water pollution which affect the health condition of forest stands;
- the conversion of semi-natural plant communities (meadows, pastures, grasslands) due to the cessation of the use of these habitats;
- disappearance – under the influence of various factors – of humid habitats, such as bogs or alluvial forests;
- the destruction of marginal habitats, such as natural ponds;
- excessive collection of fruiting bodies, threatening the destruction of a specimen in a given locality.

In addition, all of the factors that threaten ecosystems may also cause adverse effects on the species diversity of fungi.

[12] Individual values of identified threats do not total 100% because each given type of threat can affect several bird species.

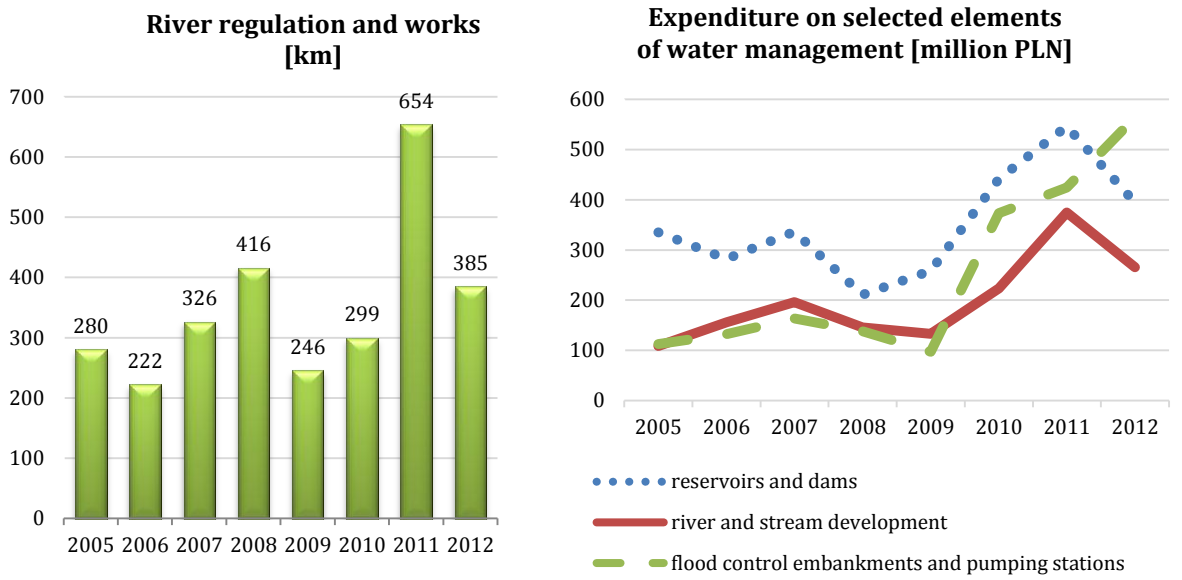
In the last decade, the situation of species, habitats and ecosystems in Poland has not significantly improved, despite measures taken to counter the loss of biodiversity. The benefits of the measures have been neutralised by permanent and developing processes such as: changes in land use methods, excessive exploitation of biological diversity and its elements, the spreading of invasive alien species, environmental pollution and climate change.

Biodiversity losses are also caused by indirect factors, such as population growth, an increase in investment pressure, limited environmental awareness and the fact that the economic value of biological diversity is not recognised in decision making processes.

The most important threats include:

- **unsuitable water management** (an increasing number of activities related to the regulation and development of rivers, dams and levees, as well as activities related to agricultural drainage systems);

FIGURE 23. RIVER REGULATION AND DEVELOPMENT AND EXPENDITURE ON SELECTED WATER MANAGEMENT ELEMENTS IN 2005-2012



Source: based on LD CSO

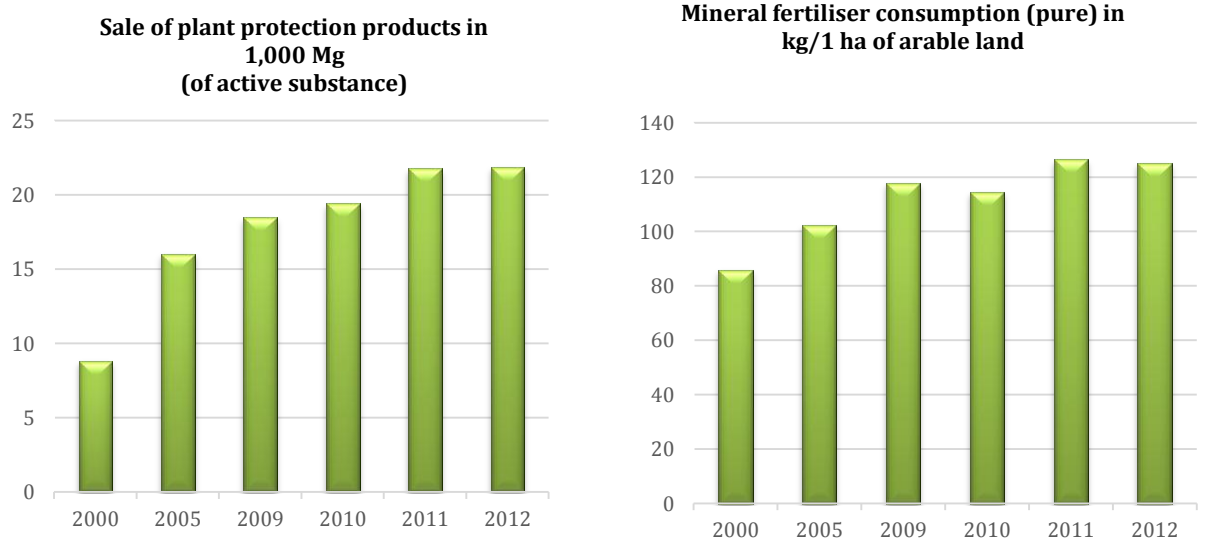
Among the specific factors that have a negative impact on the state of freshwater ecosystems, the following should be mentioned: changes in flow regimes (especially the elimination of springtime high water) caused by hydrotechnical works and changes in catchment area management (an increase in sealed surfaces); excessive water extraction; excessive reduction of water levels in river valleys through drainage systems; disturbances to watercourse continuity by weirs; levees that hinder or disrupt ecosystem connectivity on floodplains with valley ecosystems; river bank modifications – embankments, development and removal of riverside and waterside vegetation; river regulation leading to a standardisation of hydraulic conditions and riverbed morphology; excessive or unsuitable aggregate extraction.

- **fragmentation of habitats and landscapes as a result of intense investment pressure, road network construction and not fully effective system of land use planning.** Disrupting the

continuity of ecological corridors leads to habitat losses and their fragmentation into small isolated areas; it limits or even disrupts ecological connectivity, it hinders species adaptability to climate change which affects their ranges and phenology, which in turn lowers their survival rates along with their capacity to move to new sites. Numerous ecological corridors are present in Poland; the best identified among them are migration routes of large mammals. For these animals, roads with high traffic (more than 10,000 vehicles a day), fences and acoustic screens are barriers impossible to cross. The effects of environmental fragmentation are amplified by the growing pace of urbanization, coupled with excessive architectural freedom and chaotic dispersed development, which disrupts ecological networks, the enclosure of pastures in river valleys and a significant amount of fencing in forests, which is necessary for the protection of tree saplings against gnawing by growing deer populations. River weirs not equipped with normal fish ladders also contribute to environmental fragmentation.

- **regional intensification of agricultural production and resulting increased pollution arising from a growing use of fertilisers and plant protection substances;** noticeable effects include: simplified landscape structure, increasing share of monocultural crops, growing dominance of arable land in farmland structure, and a simplified crop structure dominated by cereals (approx. 80%). The simplification of crop rotation is also detrimental to the environment. Through the elimination of weeds, the intensified use of herbicides decreases population sizes of associated insects and birds. The elimination of pollinating insects, which have an impact not only on biodiversity, but also on agricultural cultivation, is particularly dangerous. Many groups of farmland insects and birds are directly or indirectly dependent on the presence of weeds among crops. Some weed species are required by insects in order to close their life cycles; weed seeds are important to finches, especially in wintertime.

FIGURE 24. SALE OF PLANT PROTECTION PRODUCTS AND USE OF MINERAL FERTILISERS IN 2000-2012



Source: based on LD CSO

- **cessation of farming** (including the setting aside of grassland and the resulting succession), farmland deagriculturalisation towards other farming needs (mainly construction and small to medium economic investments not adapted to rural landscape). The decreasing hay and grazing use of grassland and pastures is especially detrimental to biological diversity. Grazing is particularly important in the active protection of sites threatened by secondary succession and in the conservation of flora and fauna diversity. The progressive specialisation in animal husbandry has been a phenomenon characteristic of recent years, leading to an increasing number of farmers

not keeping animals on their farms. This has a bearing on soil properties in agroecosystems where, as a result of manure deficiency, the humus content decreases, thus lowering the diversity of soil organisms, which are the main factor in metabolism and an indispensable pedogenetic factor.

- **spreading of alien species**
  The share of alien species in Poland's flora is 27%, including invasive or potentially invasive species – 2.5%. The share of invasive and potentially invasive alien species in the country's fauna is 0.2%.
- **marine environment threats**
  Among the most frequently occurring reasons for marine environment changes are: modifications to the shore character due to concrete, stone or other fortifications that are unnatural for a given site, sand and aggregate extraction, seabed destruction through trawling heavy demersal trawls, or treading or leaching of macrophytes, e.g. through ship movements. The exploitation of living and non-living resources beyond their self-renewing capacities is another major threat to the Polish Baltic natural resources. This refers to overfishing of some fish species, excessive exploitation and elimination of macrophytes, excessive extraction of sand and gravel and periodical removal of annual vegetation of driftlines. The elimination of endangered and protected species of fish, mammals and diving birds through by-catching should also be considered as excessive exploitation. The eutrophication and toxic pollution are further threats to biological diversity. Another threat is the uncontrolled development of tourism and increasing pollution of the marine environment with underwater noise. The presence of chemical weapons dumped in the Baltic Sea after World War II is yet another problem.
- **climate change** and **land use changes** arising from adapting to climate changes (a detailed impact analysis of climate changes on individual species and habitats, Natura 2000 sites and a forecast of the impact of expected changes in farming on biological diversity was presented in a study *Evaluation of the impact of climate change on biodiversity and the resulting guidelines for administration for nature conservation by 2030 (available in Polish)*[13].
- **the elimination of valuable components of forest habitats** indispensable for the existence of a variety of species of fungi, animals and plants (e.g. old forest stands, dead wood, standing and lying) or the distortion of the lowest forest strata as a result of mechanical damage to the soil and undergrowth.
- **the destruction of habitats and refuges and the killing or destruction of specimens of protected species through various investment projects and plans.** The threat is caused by a low efficiency of the procedure of environmental impact assessment of plans and projects and an insufficient use of legislation on the prevention and removal of the effects of environmental damage (including protected habitats and species). Despite a gradual improvement in the quality of environmental impact forecasts and reports, the assessment system does not yet provide sufficient protection against projects with significant adverse effects on biological diversity. The most problematic areas are: the identification of natural values and risks, the selection of preventive, mitigation, correction and compensation measures, and their proper implementation. This is due to the lack of a verification system of the competence and reliability of contractors preparing the forecasts and assessments, as well as insufficient support for environmental protection bodies from the part of local and regional authorities.

[13] Fundeko, commissioned by GDEP, Warszawa 2012 (http://www.gdos.gov.pl/files/Materialy-i-publikacje/Raport_bioroznorodnosc.pdf)

PART TWO

2 CURRENT IMPLEMENTATION STATUS OF THE NATIONAL STRATEGY AND ACTION PLAN FOR THE PROTECTION AND SUSTAINABLE USE OF BIOLOGICAL DIVERSITY AND BIODIVERSITY ISSUES IN OTHER SECTORS OF THE ECONOMY

2.1 BIODIVERSITY CONSERVATION OBJECTIVES IN POLAND: GENERAL INFORMATION ON THE 2007-2013 NATIONAL STRATEGY AND THE 2014-2020 PROGRAMME AND ACTION PLAN

Poland's 2007-2013 National Strategy and Action Plan for the Protection and Sustainable Use of Biological Diversity was adopted by the Council of Ministers on 26 October 2007. **The overarching objective of the National Strategy is to preserve the wealth of biodiversity in local, national and global dimensions and to ensure its sustainable development on all levels of its organisation (intra-, inter- and supra-species), taking into account the national needs of socio-economic growth and the need to ensure adequate living conditions and social development of the society.** The overarching objective of the National Strategy is described by eight strategic goals (Table 19) and 77 operational objectives. The operational objectives were developed in the 2007-2013 Action Plan into 134 tasks. The National Strategy and Action Plan was a comprehensive document in which an attempt was made to identify measures necessary to maintain biological diversity in Poland, defined by a variety of aspects. It deals with issues related to the system of protected areas, including the protection of valuable species and habitats, interactions with economic activities undertaken in other sectors – particularly those that are highly dependent on the natural environment, threats to biodiversity, as well as issues related to scientific research, public awareness and participation in efforts to preserve natural heritage.

TABLE 19. STRATEGIC GOALS OF THE 2007-2013 NATIONAL STRATEGY[14]

1	**To identify and monitor** the biodiversity status and the existing and potential threats.
2	To effectively **eliminate or limit the emerging risks** to biological diversity.
3	**To preserve and/or enrich** the existing components of biological diversity and restore the lost ones.
4	**To fully integrate** measures for the conservation of biological diversity with activities of sectors of the economy, public administration and civil society (including NGOs) which have an impact on biodiversity, while maintaining an appropriate proportion between the environmental goals and those of the country's socio-economic growth.
5	**To increase public awareness** and shape social attitudes and behaviours for the sake of the conservation and sustainable use of biological diversity.
6	To improve the mechanisms and instruments for the protection and sustainable use of biological diversity.
7	**To develop international cooperation** on a regional and global scale for the conservation and sustainable use of the resources of biological diversity.
8	**To use biological diversity** in a balanced manner, with fair and equitable sharing of benefits and costs of its conservation, including the costs of discontinuing development activities due to nature protection.

Actors involved in the implementation of the Strategy and the Action Plan were: central and regional authorities, self-governments of voivodships, scientific research units, national and

[14] For broader discussion of National Strategy, see Chapter 2.5

landscape parks, State Forests, regional water management boards. Supervision over the implementation of the National Strategy was entrusted to the Steering Committee appointed by order of the Minister of the Environment. The Steering Committee consisted of representatives of all the stakeholders referred to in the Action Plan as being responsible for the implementation of individual measures, as well as representatives of the funding institutions, research units and NGOs.

An ex-post evaluation of the implementation of the 2007-2013 National Strategy has not yet been completed. Currently, works on the new 2014-2020 Programme and Action Plan for the Protection and Sustainable use of Biological Diversity[15] (hereinafter referred to as the 2014-2020 Programme) are underway. As the works have not yet been completed, the Programme, briefly presented below, should be considered as a draft document and any specific items as proposals for further engagement and consultation.

The 2014-2020 Programme is a continuation of the 2007-2013 National Strategy and Action Plan for the Protection and Sustainable Use of Biological Diversity. The **overarching aim of the Programme is to improve the status of biodiversity and develop a more comprehensive correlation of its conservation with the socio-economic growth of the country.** This aim, the strategic goals and objectives (Table 20), as well as tasks set out in the Action Plan (Table 21), are the result of a discussion and consultations with representatives of groups institutionally concerned with the obligations deriving from the Programme.

TABLE 20. PROPOSED STRATEGIC GOALS AND OBJECTIVES OF THE 2014-2020 PROGRAMME

	STRATEGIC OBJECTIVES
A	**To raise public awareness and form social attitudes to support the idea of biological diversity.**
A.I	To develop scientific research aimed at enhancing knowledge on biological diversity.
A.II	To integrate and increase the availability of knowledge on biological diversity.
A.III	To increase public awareness of biological diversity issues and their significance for economic and social development.
B	**To include sectors of the economy in activities for maintaining biological diversity.**
B.I	To protect biological diversity through sustainable management in agriculture.
B.II	To protect biological diversity through sustainable management in forestry.
B.III	To protect biological diversity through sustainable management in fisheries.
C	**To protect and restore populations of endangered species and habitats.**
C.I	To improve the efficiency of planning the management and conservation of biological diversity.
C.II	To protect and restore valuable natural habitats.
C.III	To improve the effectiveness of measures for the protection of species.
C.IV	To perform sustainable harvesting of species from the wild.
D	**To manage natural resources in an effective way.**
D.I	To enforce nature conservation laws.
D.II	To ensure adequate financial resources for the conservation of biological diversity.

[15] In the current 2014-2020 perspective, there has been a change in terminology. The 2007-2013 National Strategy and Action Plan for the Protection and Sustainable Use of Biological Diversity has been replaced with the 2014-2020 Programme and Action Plan for the Protection and Sustainable Use of Biological Diversity.

D.III	To strengthen management system in protected areas.
D.IV	To ensure protection of areas with high natural value.
D.V	To develop a better understanding of the status of and trends in biological diversity for an efficient resource management.
E	**To preserve and restore ecosystems and their services.**
E.I	To attribute socio-economic value to ecosystems.
E.II	To implement green infrastructure as a tool to maintain and strengthen the existing ecosystems and their services.
E.III	To restore degraded ecosystems and their services.
F	**To reduce pressure of invasive and conflicting species.**
F.I	To improve knowledge on invasive and conflicting species in order to prevent their negative impact on biological diversity.
F.II	To reduce pressure from invasive and conflicting species through the implementation of proper legislation and a system of their detection, monitoring and control.
G	**To reduce and mitigate the effects of climate change.**
G.I	To determine the impact of climate change on ecosystems.
G.II	To reduce ecosystems' vulnerability to expected stress factors associated with climate change.
H	**To protect biological diversity through the development of international cooperation.**
H.1	To support biodiversity conservation efforts through increasing Poland's involvement in international activities.

Source: based on the draft 2014-2020 Programme

TABLE 21. STRUCTURE OF THE PROPOSED GOALS, OBJECTIVES AND TASKS OF THE DRAFT 2014-2020 PROGRAMME

Strategic goal	Number of operational objectives	Number of tasks in the 2014-2020 Action Plan
A	3	8
B	3	23
C	4	13
D	5	23
E	3	7
F	2	8
G	2	5
H	1	5
Total	23	92

Source: based on the draft 2014-2020 Programme

The draft 2014-2020 Programme anticipates the defining of output and result indicators. Since work on the Programme is still in progress, result indicators have not yet been defined at this stage. Output indicators have been initially developed for individual measures. Presented below are some examples of output indicators (Table 22).

TABLE 22. EXAMPLES OF TASKS AND ANTICIPATED OUTPUT INDICATORS (2014-2020 PROGRAMME)

	Task	Output indicator
A.I.1	Preparation of a summary of needs and identification of research priorities to supplement knowledge on biodiversity conservation issues at the national level.	A list of priority research topics necessary to complement knowledge on biological diversity at the national level.
B.III.6	Development and implementation of rules for the preparation of environmental impact assessment studies on fisheries and aquaculture.	Revised legislation on environmental impact assessment, containing rules for the preparation of EIA studies on fisheries and aquaculture.
C.II.1	Development and implementation of programmes for the conservation and restoration of degraded habitats, especially wetlands.	A number of programmes developed for the protection and/or conservation of habitats.
D.II.1	Pilot support for biodiversity-friendly business.	Establishment and implementation of a pilot mechanism of financial support for biodiversity-friendly business.
E.I.3	Development of ways to integrate the value of ecosystem services into accounting and reporting systems at a national level.	National rules developed to include the value of ecosystem services into the national accounting and reporting systems, in compliance with EU standards.
F.II.3	Creation of a system of monitoring invasive alien species.	A number of invasive alien species monitored.
H.I.4	Coordination of activities related to the implementation of the Nagoya Protocol.	Establishment of an authority responsible for the implementation of the Nagoya Protocol.

2.2 INCORPORATING THE AICHI BIODIVERSITY TARGETS IN THE 2014-2020 NATIONAL PROGRAMME AND ACTION PLAN AND THEIR INCLUSION TO OTHER SECTORS OF THE ECONOMY

The most important innovation in the draft 2014-2020 Programme is that it gives the issue of ecosystem services the rank of a strategic goal. Activities related to methods of valuating ecosystem services, as well as those for the implementation of green infrastructure as an instrument for preserving and strengthening the existing ecosystems and their services, will be included in the Programme. The goal to reduce pressure from invasive and conflicting species and the one focusing on limiting and mitigating the effects of climate change have been set up in the Programme as new – compared to the previous period – strategic goals. A very important goal of the currently developed strategy is to engage other sectors of the economy in activities contributing to biological diversity. A range of activities to support sustainable management in forests, agriculture and fisheries has also been planned.

The Programme under development is characterized by a different structure of operational objectives – their number has been reduced from 77 to 23 – and tasks, of which the number has been reduced from 134 to 92. An essential element is the development of output and result indicators. Their absence presents a serious difficulty in assessing the effectiveness of the tasks' implementation and the level to which the 2007-2013 National Strategy objectives have been met.

In Table 24, the objectives of the new 2014-2020 Programme are presented in conjunction with the 2020 Aichi Targets in the form of a matrix.

Goals of the 2014-2020 National Strategy and Action Plan for the Protection and Sustainable Use of Biological Diversity	**Aichi Targets**	To address the causes of biodiversity loss by mainstreaming biodiversity across government and society				To reduce direct pressures on biodiversity and promote sustainable use						To improve the status of biodiversity (ecosystems, species and genetic diversity)			To enhance the benefits to all from biodiversity and ecosystem services			To enhance implementation (participatory planning, knowledge management, capacity building)			
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
To raise awareness and form civic attitudes	**A.I**																			+	
	A II																			+	
	A III	+																			
To include sectors of the economy in activities for maintaining biological diversity	**B I**			+		+		+	+					+					+		+
	B II			+		+		+													+
	B III						+	+													
To protect and restore populations of endangered species and habitats	**C I**		+			+												+			
	C II				+	+						+									
	C III					+							+								
	C IV				+			+													
To manage natural resources in an effective way	**D I**	+																			
	D II			+																	+
	D III											+			+	+					
	D IV											+	+			+					
	D V																			+	
To preserve and restore ecosystems and their services	**E I**		+																		
	E II		+																		
	E III															+					
To reduce the pressure of invasive and conflicting species	**F I**									+											
	F II									+											
To reduce and mitigate the effects of climate change	**G I**																			+	
	G II	+	+																		
To initiate international cooperation	**H I**																+				

2.3 ACTIVITIES TAKEN TO IMPLEMENT THE PROVISIONS OF THE CONVENTION AND THEIR EFFECTS IN THE PERIOD FOLLOWING THE SUBMISSION OF THE FOURTH NATIONAL REPORT

This chapter presents selected examples of activities undertaken in Poland over the 2009-2013 period for the implementation of the National Strategy and, consequently, the provisions of the Convention. However, some of the aggregate data are presented for the years 2007-2012, i.e. the period for which data were available during the drafting of this report. Such a time frame results from the fact that in Poland many reports cover periods concurrent with the financial perspectives of the European Union, in this case, the 2007-2013 perspective. And, as previously noted, at the time when the report was being compiled, data on the last year of the perspective were not yet available. The presented projects should not be regarded as an exhaustive review of all undertaken activities. The aim of the Chapter was to show their diversity (where data was sufficient) and the scale of the implemented programmes.

STRENGTHENING OF THE ADMINISTRATION

One of the most important achievements of the current reporting period is the strengthening of the administrative system in Natura 2000 sites, resulting from a development of the General Directorate for Environmental Protection and 16 Regional Directorates for Environmental Protection, the initiation of extensive work on management plans and conservation plans, and developments in organising a system of EIAs for investment projects and SEIAs.

FINANCING NATURE CONSERVATION IN 2007-2012

Another modification with respect to the previous reporting period was a significant increase in the amount of financial resources allocated to biodiversity conservation. Given that most of the funds allocated to nature protection have come from external sources, the financial analysis regarding biodiversity conservation is based on a database of projects carried out in Poland in the period 2007-2012[16]. Biodiversity conservation measures have been financed from the following programmes and funds:

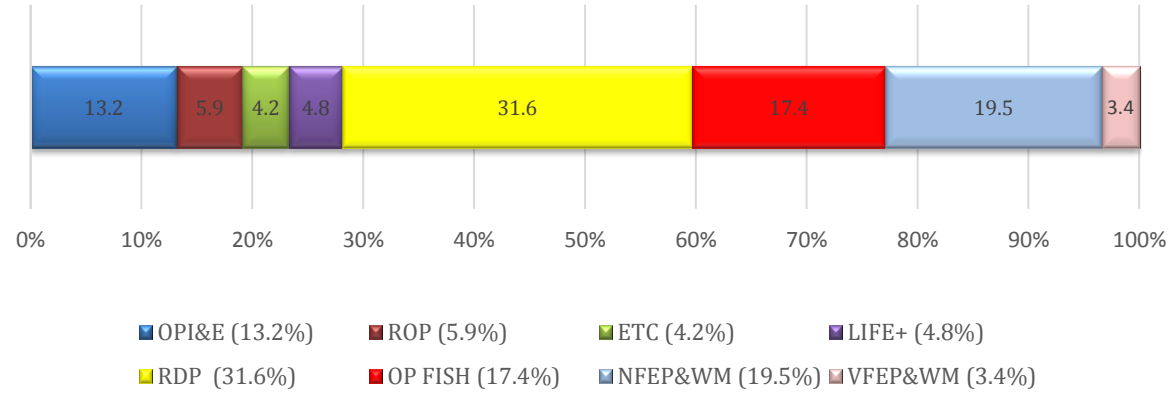
- Rural Development Programme
- Operational Programme Infrastructure and Environment
- Operational Programme Sustainable Development of the Fisheries Sector and Coastal Fishing Areas
- LIFE + Programme,
- European Territorial Cooperation Programme,
- Regional Operational Programmes,
- National Fund for Environmental Protection and Water Management,
- 16 Voivodship Funds for Environmental Protection and Water Management.

In the years 2007-2012, close to PLN 2.2 billion (USD 0.57 billion) from national and EU programmes were earmarked for biodiversity conservation projects. Figure 25 presents the

[16] The analysis was based on a database of co-financing agreements signed within the framework of EU programmes, VFEP&WMs and NFEP&WM over the 2007-2012 period. The presented data on funding resources represent the contracted values. Some of the projects are in the implementation phase and costs may be incurred till 2015. The paid amounts are presented only in the case of the RDP (agri-environment payments). Individual institutions present data in different forms, hence the analysis required the adoption of certain generalizations. The purpose of this analysis was to show general trends and proportions in relation to sources for biodiversity conservation in Poland and types of supported activities.

contribution of individual funds and programmes to nature conservation activities, expressed as a percentage of the total value of signed agreements. As indicated in the chart, the most important have been: Rural Development Programme, Operational Programme Sustainable Development of the Fisheries Sector and Coastal Fishing Areas, National Fund for Environmental Protection and Water Management, and Operational Programme Infrastructure and Environment (Priority Axis 5: Nature conservation and promotion of ecological attitudes).

FIGURE 25. ENGAGEMENT OF THE FINANCIAL RESOURCES OF NFEP&WM, VFEP&WMS AND EU PROGRAMMES (OPI&E, ROP, RDP, OP FISH, ETC, LIFE+) IN NATURE CONSERVATION EFFORTS



Source: based on databases on agreements signed within EU programmes, NFEP&WM and reports on the operations of VFEP&WMs

The most important group, from both the quantitative and qualitative perspective, consists of projects for the protection of endangered species and habitats, which have contributed to the implementation of the National Strategy for the Protection and Sustainable Use of Biological Diversity through the restoration of natural habitats (ecosystems) and refuges for species in protected areas, along with the preservation of endangered species and the genetic diversity of plants, animals and fungi. Details are presented in Figure 26.

More than 460 projects for the protection of endangered species and habitats received support from OPI&E, NFEP&WM and, to a lesser extent, ROP, RDP and LIFE+, mainly for: conservation activities, restoration of favourable water conditions, land purchasing, regulating tourism traffic in areas at risk of excessive anthropogenic pressure and limiting the emissions of pollutants to water and air in protected areas. From the point of view of the effective protection of species and habitats, the most valuable from among the supported projects are those characterized by a comprehensive approach to the species' conservation needs or the problems and risks occurring in the area covered by the project.

CASE STUDY

***Protection of the white stork population in the Natura 2000 site Ostoja Warminska*, LIFE+ Programme, co-financed from NFEP&WM, beneficiary: Regional Directorate of Environmental Protection in Olsztyn and Polish Society for Bird Protection, project value nearly PLN 6.3 million (USD 2.13 million).**

This project for a **comprehensive** protection of the white stork population aims at:

- **reducing mortality:** the project's objective is to minimize birds' mortality resulting from collisions with electricity transmission and distribution lines. Such operations are planned on a large scale and include the adaptation of electricity devices to the needs of birds, in order to prevent their death from electric shock. Securing energy provision devices against collisions will significantly reduce the mortality of birds, mostly the young ones, which will positively affect the status of the population of white storks in the refuge. According to estimates, electricity devices kill several hundred birds yearly.
- **protection of feeding grounds:** the protection of white storks' feeding grounds will consist in preserving biodiversity in agricultural landscape and preventing its unification. In addition, an increase in water retention and a rise in the groundwater level through melt water and rainwater retention is planned. Support for extensive farms, where traditional agriculture and livestock management create a supportive environment for white stork populations, has also been scheduled.
- **Increasing food base:** it is planned to increase food base for white storks by means of protecting the habitats of amphibians and thus increasing the number of sites for the reproduction, transformation and survival of the animals that white storks feed on and which require the existence of a permanent or temporary water reservoir.

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CASE STUDY

***Conservation of natural habitats and species in Natura 2000 sites*, Lublin Voivodship, OPI&E, beneficiary: Regional Directorate of Environmental Protection in Lublin, Poland, project value PLN 2.7 million (USD 0.87 million)**

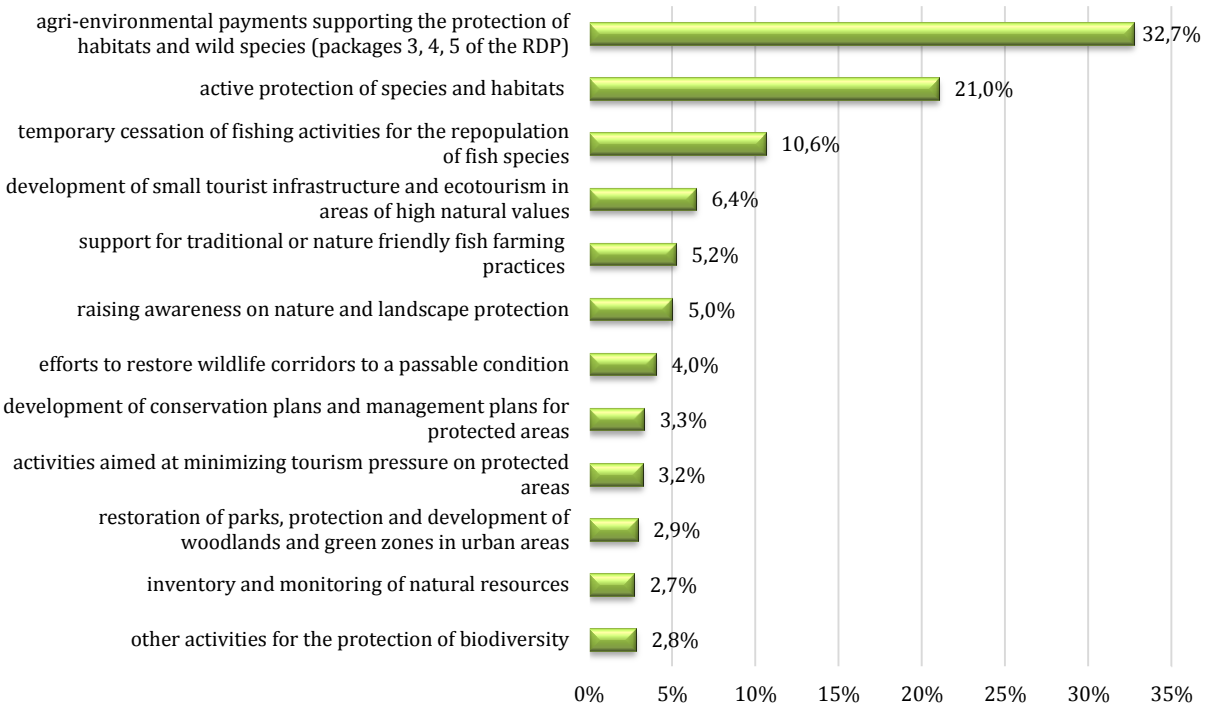
The project's objective was to take comprehensive action to maintain or restore a favourable status of natural habitats and the habitats of species present in the area of Lublin. The project covered measures for the protection of the open landscape of xerothermic grasslands and bogs, the safeguarding of the broods and habitats of the European pond turtle (*Emys orbicularis*) and East Palearctic ground squirrels (*Spermophilus Sciuridae*).

The project was carried out in various parts of the Lublin Voivodship, such as the embankments of the Vistula River, peat bogs of Polesie Wolynskie, and neighbouring areas of Chelm and Zamosc. An important common feature of all the activities is that they were mostly taken within Natura 2000 sites and in areas essential from the point of view of ensuring adequate protection to the most vulnerable species and habitats in the Lublin Voivodship.

In financial terms, as well as in terms of the magnitude of impact, agro-environmental payments[17] allotted under the RDP played a dominant role. In 2007-2012, 56,400 agro-environmental payments under the RDP for a total amount of ca. PLN 682 million (ca. USD 233 million) were made. The purpose of the Agro-Environmental Programme is to improve the environmental quality of rural areas by restoring or maintaining good quality of natural habitats used for agricultural purposes, promoting a sustainable management system, a proper use of soil and water protection, landscape development, and the protection of native species of farm animals and native crop varieties. Farmers who will voluntarily commit themselves to environmentally friendly management to serve the above purpose will receive financial support in the form of agro-environmental payments. The fact of this mechanism's existence should be interpreted as positive, though it will also be important to assess its effectiveness within an ex-post analysis for the RDP.

[17] The analysis covers Packages 3, 4, 5 and 9 of the RDP. Information on Packages 6 and 7 – see subchapter: *Protection of genetic diversity, including agrobiodiversity*

FIGURE 26. TYPES OF SUPPORTED MEASURES AND THE VALUE OF SIGNED AGREEMENTS (% OF THE TOTAL VALUE OF SIGNED AGREEMENTS[18])



Source: based on databases on agreements signed within EU programmes, NFEP&WM and reports on the operations of VFEP&WMs

From the point of view of biodiversity conservation, the most significant were four packages implemented within this programme:

- Package 3: *Extensive permanent grasslands* – the area covered by support following decisions granting agro-environmental payments was more than 270,000 hectares of permanent grasslands by the end of 2012;
- Package 4: *Protection of endangered birds species and natural habitats outside Natura 2000 sites* – the area covered by support was almost 81,000 hectares of permanent grasslands, the largest amount within the package was allocated to the variant: *Protection of bird breeding habitats*;
- Package 5: *Protection of endangered birds species and natural habitats in Natura 2000 sites* – the area covered by support was almost 94,000 hectares of permanent grasslands, the largest amount within the package was also allocated to the variant *Protection of bird breeding habitats*;
- Package 9: *Buffer zones* – the buffer zones were over 489,000 rm long.

An indirect, though considerable impact on the biodiversity of marine ecosystems was caused by payments for the temporary cessation of fishing activities made under OP FISH to more than 2,900 fishing businesses. These activities were originally aimed at the repopulation of species of fish used commercially, but they can, in an indirect way, have a significant effect on other aquatic organisms.

[18] The summary does not include agreements signed under the VFEP&WMs

In line with the Act of 16 April 2004 on nature conservation, a conservation plan, which includes: an assessment of nature resources, a concept of nature protection and elimination or reduction of existing and potential internal and external threats, as well as an indication of appropriate conservation measures, including their character, scope and location – is the basic document for conservation planning in Polish national parks, nature reserves and landscape parks. The plan is written for a 20-year period. For a national park or nature reserve, pending the establishment of conservation plan supervisor shall prepare a draft of conservation measures. For Natura 2000 sites (with the exception of marine areas and areas for which conservation plans have been developed), 10-year management plans are developed and implemented. These documents are less detailed than conservation plans.

As regards national parks, currently only the Bory Tucholskie National Park has a conservation plan. The managementn of the remaining 22 national parks is based on conservation measures established by the Minister of the Environment. For seven parks (Polesie, Wolin, Tatra, Wielkopolska, Drawa, Gorce and Wigry National Parks), conservation plans are under development.

In the 2007-2013 period, 199 conservation plans for nature reserves were produced and another 38 were in preparation (RDEPs: Gorzow 47, Bydgoszcz 39, Kielce 47, another 7 in preparation, Katowice 10, Krakow 2, Lodz 27 by the end of 2013, Olsztyn 5, Opole 5, another 2 in preparation, Rzeszow 2, Warszawa 16, Wroclaw 1 conservation plan, 2 in preparation, Gdansk 25). Conservation measures were established for 28 nature reserves (RDEPs: Bydgoszcz 23, Opole 5). The Regional Directorate of State Forests in Gdansk implemented the *Conservation plans for nature reserves* project, within which plans were developed for 20 nature reserves. Currently, about 30% of the 1,478 nature reserves in Poland have a conservation plan.

Successively conservation plans are created to protect the landscape parks. According to data from the year 2012 about 30% of the parks had existing conservation plans.[19]

The preparation of conservation plans for 15 out of 17 marine Natura 2000 sites is underway. In the years 2008-2013, significant progress was made in the preparation of management plans for Natura 2000 sites. The current status of preparation is shown in Table 24. Management plans for Natura 2000 sites are, in their vast majority, made under the *Development of management plans for Natura 2000 sites in Poland,* a project implemented by the GDEP (in cooperation with RDEPs). 406 management plans are to be developed by the end of 2014. The University of Technology and Life Sciences in Bydgoszcz is implementing a project entitled *Management plans for Natura 2000 sites in the Kuyavian-Pomeranian and Masovian Voivodships*. 40 plans are expected to be developed by 2014. Forest management plans, functioning also as site management plans, are created in Natura 2000 sites managed by the State Forests.

[19] This value is estimated on the basis of the Supreme Chamber of Control (examination covered 73 landscape parks of the 123 existing in Poland).

TABLE 24. STATUS OF WORK ON MANAGEMENT PLANS FOR NATURA 2000 SITES (DATA FROM JULY 2013)

	Percentage of the total number of sites
Sites with developed plans	1%
Sites with plans in preparation	51%
Areas with plans to be prepared in the 2013-2020 period	48%

Source: based on a survey by RDEP and NDEP (2013)

PROGRAMMES FOR THE REINTRODUCTION/RESTITUTION OF SPECIES IMPLEMENTED IN 2009-2013

In the years 2009-2013, numerous activities for the reintroduction or restitution of endangered species, as well as active conservation measures were undertaken. They were carried out by various entities, including non-governmental organizations, scientific research institutions, RDEPs and national parks. In comparison with the previous reporting period, the number and extent of protective measures could grow thanks to an increase of financial support, primarily from the EU.

In 2009-2013, the following endangered species were being reintroduced/restored: *Echium russicum*, *Ligularia sibirica*, *Cochlearia polonica*, *Iris aphylla*, *Caldesia parnasifolia*, *Marsilea*, *Lauronium natans*, *Schoenoplectus mucronatus*, *Gladiolus paluster*. Moreover, active protection measures for the preservation of habitats of halophytic plants, *in situ* and *ex situ* breeding of priority plant species (e.g., *Primula farinosa*, *Adonis vernalis*, *Gladiolus paluster, Ligularia sibirica*) and measures for the conservation of local populations of endemic species were carried out.

As regards the protection of animal species, during the research period, various Polish organisations implemented projects which involved the restitution, reintroduction or boosting of the population of the following species: lynx (*Lynx lynx*), grey seal (*Halichoerus grypus*), edible dormouse (*Glis glis*), European bison (*Bison bonasus*), ground squirrel (*Sciuridae spermophilus*), European ground squirrel (*Spermophilus citellus*), Western Capercaillie (*Tetrao urogallus*), black grouse (*Tetrao tetrix*), peregrine falcon (*Falco peregrines*), Eurasian eagle-owl (*Bubo bubo*), osprey (*Pandion haliaetus*), European pond turtle (*Emys orbicularis*), smooth snake (*Coronella austriaca*), swamp minnow (*Rhynchocypris percnurus*), migratory fish [Atlantic sturgeon (*Acipenser oxyrinchus*), Atlantic salmon (*Salmo salar*), vimba bream (*Vimba vimba*), brown trout (*Salmo trutta m. trutta*)], European crayfish (*Astacus astacus*), Scarce Swallowtail (*Iphiclides podalirius*), old world swallowtail (*Papilio machaon*), mountain Apollo (*Parnassius apollo*).

ACTIVITIES FOR THE ERADICATION OF ALIEN SPECIES IN 2009-2013

In the reporting period 2009-2013, a list of alien species[20], which in the case of release into the environment could threaten native species or natural habitats, was published in Poland. It contains 16 species of plants and 36 species of animals. In relation to all these species, except fish, a ban on possession or trade has come into force. Furthermore, in 2012 a publication, commissioned by GDEP, entitled *Plants of foreign origin in Poland with particular emphasis on invasive species* (B. Tokarska-Guzik, Z. Dajdok, M. Zajac, A. Zajac, A. Urbisz, W. Danielewicz, Cz. Holdynski, Warsaw 2012) was issued, which includes a list of 88 invasive and potentially invasive plant species on a national, regional, or local scale, which should be covered by activities aiming at halting their spread in the natural environment. In an expert study

[20] Regulation of the Minister of the Environment of 9 September 2011on a list of alien plants and animals species

commissioned by the GDEP as a basis for the *Guidelines, which should be addressed when evaluating proposals for the implementation of activities prohibited in relation to alien species that threaten native species or natural habitats*, the following animal invasive alien species were listed as the most threatening: warty comb jelly (*Mnemiopsis leidyi*), Chinese mitten crab (*Eriocheir sinensis*), red swamp crawfish (*Procambarus clarkia*), signal crayfish (*Pacifastacus leniusculus*), Chinese pond mussel (*Sinanodonta woodiana*), Asian clam (*Corbicula fluminalis*), round goby (*Neogobius melanostomus*), Chinese sleeper (*Perccottus glenii*), American bullfrog (*Lithobates catesbeianus*), pond slider (*Trachemys scripta*), Canada goose (*Branta canadensis*), Egyptian goose (*Alopochen aegyptiaca*), ruddy duck (*Oxyura jamaicensis*), American bison (*Bison bison*), North American beaver (*Castor canadensis*), sika deer (*Cervus nippon*), raccoon (*Procyon lotor*), eastern gray squirrel (*Sciurus carolinensis*). Currently, work on action plans for controlling the spread of invasive alien species is underway. A number of scientific publications, guides, best practices, and informative publications on alien species have also been produced. A nationwide educational campaign on the risks posed by the red-eared slider (*Trachemys scripta elegans*), with an inventory of the species' sites, supported by notifications from the public, has been carried out. Appropriate activities are included in plans for conservation measures and conservation plans developed specifically for each of the reserves that need to remove alien or invasive plant species which pose a threat to the reserves' biodiversity resources. Moreover, Poland, along with other EU countries, actively participates in the drafting of the EU Regulation on Invasive Alien Species, designed to establish the rules to prevent, minimize and mitigate the impact of invasive alien species on biodiversity.

WILDLIFE CORRIDORS

In Poland, a number of activities aimed at restoring the connectivity of wildlife corridors are being carried out. The efforts, however, are mostly local. There is a problem of insufficient coordination of action at the national level.

Various analyses have been performed to enhance the connectivity of wildlife corridors, thus enabling the movement of animals and functioning of populations on a national scale. Some of the developed documents are:

- *Protection of wildlife connectivity in Poland*,[21]
- A map of wildlife corridors, as a part of the *Protection of habitats and wildlife corridors of wild fauna along Polish highways* project,
- *Effectiveness of the protection of wildlife corridors. A concept of legislative changes* (2011),[22]
- *Natura 2000 in spatial planning. Role of ecological corridors* (2009)[23].

These are, however, scientific documents that have no legal or planning implications. The *Biodiversity protection through the establishment of a land-based network of wildlife corridors in Poland* project is planned for implementation in the GDEP in the 2014-2016 period. The aim of the project is to evaluate the conservation status and functioning of Poland's seven major wildlife corridors of international importance and a network of national corridors designated as a part of implementation of the European ecological network in Poland. The project will also involve a revision of the corridors' boundaries and the preparation of a basis for a land-based network of wildlife corridors in Poland.

[21] http://www.mir.gov.pl/aktualnosci/fundusze_europejskie_2007_2013/Documents/3_7_ZBS_PAN_Wdrazanie_Koncepcji_Korytarzy_ekologicznych_w_Po2.pdf (in Polish)
[22] http://awsassets.wwfpl.panda.org/downloads/efektwnosc_ochrony_korytarzy_eko.pdf (in Polish)
[23] http://www.gdos.gov.pl/files/Materialy-i-publikacje/Podrecznik_-_planowanie_przestrzenne.pdf (in Polish)

Reduction of nonpoint source pollution, of which the origin is agriculture, is among the measures taken to improve water quality. In 2007-2012, 103,000 m^3 of liquid and solid manure tanks and over 83,000 m^2 of manure pads were built with support granted to farms under the RDP. Also the OP FISH, under which 15 projects received support for the reduction of pollution associated with the fisheries sector, contributed to limiting the outflow of pollutants from rural areas.

In 2008-2011, 19 zones particularly vulnerable to nitrates from agricultural sources, covering the area of 4,623 km^2 – about 1.48% of the country's total area – were designated in Poland. Action programmes were developed for all the Nitrate Vulnerable Zones (NVZs). In 2012, a verification of the NVZs was made, resulting in an increase in 2012 of the zones' total area to 13,935 km^2 (4.46 % of the country's area), which represented a threefold (about 200%) increase compared to the situation in 2008. For all 48 newly designated NVZs, action plans were produced and brought into force through regulations by the directors of the Regional Boards of Water Management in 2012. It should be noted that, although the designation of NVZs and the development of action plans for them is the responsibility of the Regional Boards of Water Management, the implementation of the conservation measures set out in the plans lies with the agricultural sector. As can be seen from the Report on the Implementation of Council Directive 91/676/EEC (Nitrates Directive) in 2008-2012, the most common problems with implementing action plans in NVZs resulted primarily from difficulties that farmers residing within the NVZs had with acquiring financial support and problems with financing the activities that farmers were responsible for – soil tests, nitrogen balances and fertilization plans.

The implementation of The National Programme for Augmentation of Forest Cover, in which it is recommended to treat areas under afforestation as substitutes for those forests in which afforestation possibilities are limited (in rural areas), also brings about a reduction of nonpoint source pollution, wooded areas being natural biogeochemical barriers.

An important demonstration project for a comprehensive reduction of nonpoint source pollution (and its inclusion in river basin management plans), aiming at achieving high water quality required by the Water Framework Directive, was carried out within the LIFE + project described below. Its significance also lies in the fact that the project's concept is based directly on one of the regulating ecosystem services – the neutralization and decomposition of pollution through natural processes**.**

CASE STUDY

***ECOtones for the reduction of NPS pollution,* LIFE+, beneficiary: Regional Water Management Board in Warsaw and European Regional Centre for Ecohydrology, project value – almost PLN 4.5 million (USD 1.5 million).**

The project's goal is to develop a programme of innovative measures for the reduction of nonpoint source pollution in the basin of the Pilica River by means of cost-effective ecohydrological methods with the use of ecosystem biotechnology to enhance the water quality of Zalew Sulejowski. A manual for the formation of ecotone zones, optimal for a more efficient removal of nonpoint source pollution and an improvement of biodiversity, is being written within the project.

Typologically diverse ecotone zones are being constructed, calibrated and optimized with the use of plant communities that occur naturally in the basin of the Pilica River. In the course of creating the ecotone zones, an innovation solution - *denitrification walls* as a barrier against the outflow of nitrates from agricultural catchments, but also in non-channelised areas - are being used. The aim of the project is to optimize the technology for creating ecotone zones through an innovative use of biodegradable geofibres that help plants to adopt and take roots.

INCREASING WATER LEVEL IN FORESTS (SMALL RETENTION)

During the 2007-2015 period, numerous projects for small water retention are being co-financed from EU funds – 26 under the ROP (PLN 122 million; USD 41 million). Two major projects to improve water retention in forests are being conducted in the SFNFH:

- *Improvement of retention opportunities and prevention of floods and drought in forest ecosystems in lowland areas*, carried out between 2007 and 2014 in almost 180 forest districts, covers the renaturalisation of wetlands, restoration of irrigation systems, reconstruction of melioration systems, and construction and reconstruction of water retention facilities (more than 3,300 facilities that together will retain 31 million m^3 of water; 2,500 objects retaining more than 21 million m^3 of water have been completed until 2013). Funding from OPI&E – PLN 136 million (USD 46 million).
- *Countering the effects of rainwater runoff in mountain areas. Increasing retention and keeping streams and related infrastructure in good condition,* implemented in the 2007-2015 period in 55 Forest Districts in southern Poland. It includes the retention and renaturalisation of permanent watercourses and wetlands, limitation and control of surface runoff (surface retention) and the settlement and slowing of flood waters (flood retention). It was planned that 3,500 infrastructure components would be built and ca. 1.3 million m^3 water retained. By the end of 2013, 3,052 objects were constructed and ca. 0.8 million m^3 (62,5%) water retained. Funding from OPI&E amounted to 119 million PLN (ca. USD 40 million).

SELECTED ACTIVITIES IN FORESTRY

Restitution programmes for the European silver fir (*Abies alba*) in the Sudetes Mountains and the protection and restitution of the European yew (*Taxus baccata*) were continued in the 2009-2012 period within measures aimed at increasing the genetic and species diversity of forest biocenoses (Table 25). The programme for silver fir was initiated in 1996 as the species faced extinction – according to an inventory carried out that year, in the Western Sudetes it numbered less than 2000 specimens, none of them in good condition. The programme is being implemented in 15 forest districts in the Sudetes. Throughout the duration of the programme, silver fir was planted in the total area of 2,445 hectares, so that its share in the Sudetes increased to 1.2%. About 25,000 hectares of the forest area of the Mountains constitute ideal habitats for this species.

TABLE 25. REGENERATION OF SILVER FIR UNDER THE 2009-2012 SILVER FIR RESTITUTION PROGRAMME

	2009	2010	2011	2012	Total 2009-2012
Area of silver fir introduction (ha)	253.25	209	222	266	949

Source: data provided by DGSF

European yew is a species under strict protection. Many years of observation have shown that the conservation of its genetic resources, when relying solely on natural processes, is no longer possible, and therefore active protection is necessary. In 2006, the *Programme for the protection and restitution of the European yew in Poland* was developed and approved for implementation in the organisational units of the State Forests. The programme's main objectives, implemented over the 2007-2012 period, were: seed collection, production of planting stock, maintenance breeding in selected areas, young tree stands nursery and active protection of natural sites of the European yew. Over the years 2007-2012, maintenance breeding was planned for an area of 117 hectares, where a total of 407,722 specimens of the European yew were introduced in seven

(out of 17 existing in Poland) Regional Directorates of State Forests. The RDSF in Cracow is running its own project for the protection of the European yew under Axis 5 of OPI&E. In the remaining RDSFs the programme is financed by the Forestry Fund.

Urgent action, similar to that taken for the European yew, is also needed for the endangered species of the wild service tree (*Sorbus torminalis*). A national programme for the protection and restitution of this species has not yet been developed in Poland. However, five RDSFs are taking active conservation and restitution measures and, over the years 2010-2012, the Kostrzyca Forest Gene Bank was running the *Ex-situ gene pool protection of selected sites of the wild service tree Sorbus torminalis L. Crantz* project.

PROTECTION OF GENETIC DIVERSITY, INCLUDING AGRI-BIODIVERSITY

The **Kostrzyca Forest Gene Bank** (FGB), functioning since 1995, is in charge of the conservation of genetic diversity of forest plant communities. More than 243,000 hectares of stands constitute a seed source which makes it possible to propagate the native ecotypes of forest-forming species. The FBG has been consistently implementing the country's strategic programmes as part of its duties. One of them is the *Preservation of forest genetic resources and selective tree breeding in Poland in 2011-2035*, an element of the European Forest Genetic Resources Programme (EUFORGEN). The strategic objective of the Polish Programme is to preserve forest genetic resources – primarily through the improvement of seed sources and selection of forest trees. The maintenance of forest genetic resources has been considered necessary to ensure the continuity of basic ecological processes, sustainable forest management and use of ecological systems, the restitution of forests in degraded or damaged habitats, the conservation of biological and genetic diversity for future generations and increased natural resistance of tree stands. Another objective is to preserve native populations and specimens of deciduous and coniferous trees which originated before 1860, basing on their adaptability (maintenance tree stands and trees), and populations and specimens of admixed tree species and other species of plants liable to withdrawal or extinction in forest ecosystems. The Kostrzyca Forest Gene Bank is carrying out one more project, *Ex-situ conservation of endangered and protected plants, growing wild in the western part of Poland*, the aim of which is to preserve the genetic resources of 58 species of plants – rare and endangered – classified by the International Union for Conservation of Nature (IUCN) as critically endangered (CR), endangered (EN), and vulnerable (VU) species. All plant sites are located in Natura 2000 sites, including 52% in national parks, 24% in landscape parks and 2% in nature reserves.

The Biodiversity Conservation Centre of the Polish Academy of Sciences in the Botanical Garden in Powsin carries out activities for the *ex situ* conservation of endangered and protected plants in eastern Poland. Within the project, seeds of 61 endangered, rare or protected species of vascular plants have been secured in a cryogenic seed bank. In addition, inventories of natural sites of protected plants and substitute sites, in the cases of scurvy-grass (*Cochlearia polonica*) and yellow azalea (*Rhododendron luteum*), have been maintained, and protocols for assessing the viability of seeds, breaking their dormancy and long-term seed storage in liquid nitrogen vapour developed. For educational purposes, brochures and information leaflets have been issued and an exhibition of photographs of plants covered by the project organised.

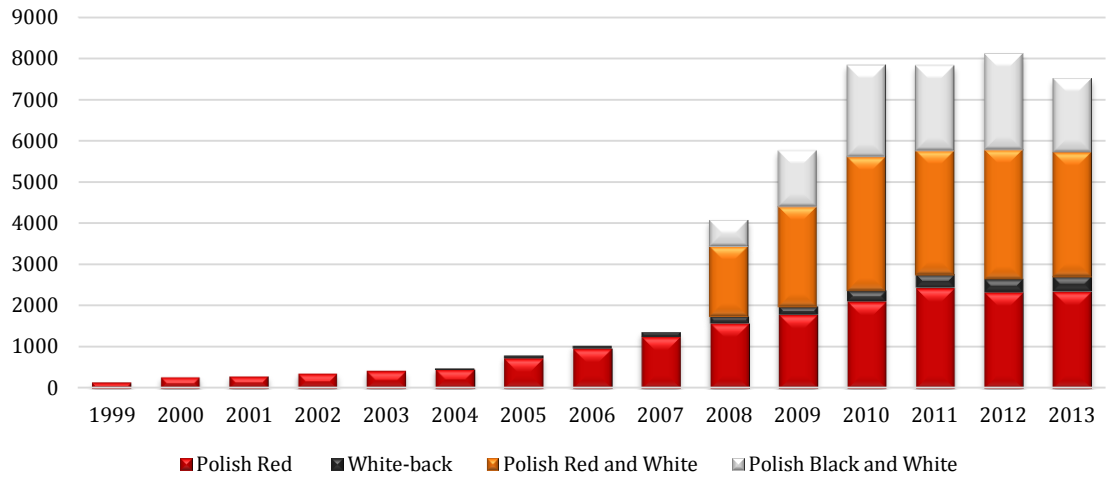
The National Centre for Plant Genetic Resources of the Institute of Plant Breeding and Acclimatization (IHAR) in Radzikow coordinates the Programme for the Protection of Crop Plants Genetic Resources. Within the program an assembly of 18 institutions conducts *ex situ* collections of plants, which include more than 78 000 objects, of which 45% have Polish origin.

The largest part of the collected objects - about 37% - are samples of cereals, about 25% are samples of grass. Other samples are leguminous plants, oilseeds, industrial, vegetables, legumes, medicinal and segetal. A central air-conditioned storage (containing seeds of more than 66 000 objects), and the central information system for plants covered by the protection program of genetic resources of plants, are located in the National Centre for Plant Genetic Resources.

In situ protection of crop plant genetic resources has been included in the Agro-Environmental Programme under the 2007-2013 RDP. Package 6: *Preservation of endangered genetic plant resources in agriculture*, includes 12 varieties of local crops: semi-perennial rye [*Secale cereale var multicaule* (biennial plant)], emmer wheat (*Triticum dicoccum*), einkorn wheat (*Triticum monococcum*), proso millet (*Panicum miliaceum L.*), bristle oat (*Avena strigosa Schreb.*), camelina (*Camelina sativa L.*), greater bird's foot trefoil [*Lotus uliginosus Schkuhr* (perennial plant)], white sweet clover (*Melilotus alba Medik.*), celtuce (*Lactuca sativa L. var. angustana hort. Ex*), grass pea (*Lathyrus sativus L.*), lentil (*Lens culinaris Medik.*), and parsnip [*Pastinacasativa L.* (biennial plant)]. By the end of 2012, agro-environment payments of almost PLN 21 million (USD 7 million) were made under this package. The total area that received support based on decisions to grant environmental payments covered 28,368 hectares for 3,674 farms. The biggest share of financial support went to Variant 6.1: *Local crop varieties commercial production* – about 65% of the total amount of payments made within the package.

The National Research Institute of Animal Production in Balice coordinates programmes for the protection of livestock genetic resources (*in situ*). Farmers who breed animals from protected populations and organizations, which keep records on farm animals of a given species/breed, are usually responsible for their implementation. The programmes include 4 cattle breeds, 3 pig breeds, 7 horse breeds, 13 sheep breeds, poultry (geese – 14 breeds, ducks – 10 breeds, chickens – 19 breeds), fur animals (Popielno white rabbit, white-necked fox, pastel fox, coypus, beige chinchilla, ferret), fish (carp – 6 breeds, rainbow trout), bees (4 lines of the Central European breed), goats (Carpathian goat). In the years 2009-2013, compared to the previous period, the number and size of stocks covered by the conservation programmes increased substantially, as observed in the example of cattle (Figure 27).

FIGURE 27. NUMBER OF ANIMALS IN CATTLE BREEDS COVERED BY PROGRAMMES FOR THE PROTECTION OF GENETIC RESOURCES



Source: National Research Institute of Animal Production (http://bioroznorodnosc.izoo.krakow.pl/)

The Ministry of Agriculture and Rural Development in the Agro-Environmental Programme under the RDP 2007-2013 included the implementation of conservation programmes for farm animal genetic resources. As part of Package 7: *Maintenance of genetic resources of endangered animal species in agriculture*, including cattle, horses, sheep and pigs, agro-environment payments of more than PLN 70 million (close to USD 24 million) were made until the end of 2012. The number of farms that received support based on decisions to grant environmental payments was 2,868. The population sizes of individual species and breeds of farm animals under support within Package 7 were 48,016 stock units on a yearly average. The biggest share of financial support went to Variant 7.3: *Preservation of local sheep breeds* – about 37% of the total amount of payments made within this package.

2.4 Effectiveness of the inclusion of biodiversity issues in strategies, sectoral plans and programmes, as well as cross-sectoral instruments

This chapter shows how biodiversity conservation issues have been included in other sectoral strategies and presents instruments to strengthen biodiversity conservation activities, such as land-use planning and EIAs (including SEIAs).

Analysis of sectoral strategies

20 strategic or land-use planning documents used in Poland on a national scale were researched to assess the extent to which these documents integrated the issue of environmental and biodiversity protection (Table 26), but the implementation status of individual strategies was not analysed. The assessment of the documents' "greenness" was relativistic – the analysed strategies were compared to each other and a score was attributed to each of them in relation to other comparable documents. This does not mean that there exists one objective criterion for assessing the "greenness" of a document. It should also be pointed out that the 2007-2013 National Strategy and Action Plan for the Protection and Sustainable use of Biological Diversity covered a range of cross-sectoral activities. The following scale was used for assessing the "greenness" of each strategy:

Assessment method	Description
Very green	Documents that refer to environmental protection and biodiversity in a comprehensive way, exhibiting high awareness of the issues.
Medium green	Documents that refer to environmental protection and biodiversity to a limited extent, exhibiting moderate awareness of the issues.
Faintly green	Documents that refer to environmental protection and biodiversity in a vague way, exhibiting low awareness of the issues.

Table 26. Analysis of sectoral strategies

Strategy	"Greenness" of strategy
National Development Strategy 2020	Very green
Strategy for Sustainable Rural Development, Agriculture and Fisheries 2012-2020	Very green
National Strategy for Regional Development 2010-2020, Regions, Cities, Rural Areas	Very green
State Forest Policy	Very green

Strategy for Wetland Conservation 2006-2013	Very green
Draft State Water Policy up to 2030 (taking into account stage 2016)	Very green
Strategy for Energy Security and the Environment 2020 (draft)	Very green
National Spatial Development Concept 2030	Very green
Polish Climate Policy – strategies for greenhouse gas emission reductions in Poland until 2020	Medium green
Strategic Plan for the Adaptation of Sectors and Areas Vulnerable to Climate Change by 2020, with a perspective until 2030	Medium green
National Transport Policy 2006-2025	Medium green
Transport Development Strategy up to 2020 (with a vision towards 2030)	Medium green
Strategy of Socio-Economic Development of Eastern Poland up to 2020	Medium green
National Environmental Policy 2009-2012 and its 2016 outlook	Medium green
Directions for Tourism Development until 2015	Medium green
Energy Policy of Poland until 2030	Faintly green
Strategy of Innovation and Economic Efficiency – Dynamic Poland 2020	Faintly green
Strategy for Hard Coal Mining Industry in Poland in 2007-2015	Faintly green
National Strategy for Environmental Education	Faintly green
Master Plan for Railway Transport in Poland till 2030	Faintly green

Source: own elaboration

SPATIAL PLANNING AS AN INSTRUMENT FOR NATURE CONSERVATION

The national land use planning system[24] consists of hierarchically ordered planning studies and accompanying documents of which one of the goals is to include environmental aspects in the planning process. The system covers four basic levels of planning studies:

- national (Concept of National Spatial Planning)
- applying to voivodships (voivodship land use plan, supplemented with a metropolitan land use plan in the case of the country's largest conurbations)
- applying to communes (study of conditions and directions of spatial development)
- local (local land use plan)

The first two levels are strategic land use plans, in which land use policy and not the precise location of different forms of land use is defined. The next two levels of planning, applying to smaller areas (communes or parts of them) and characterised by large scale maps (studies of conditions and directions of spatial development – 1:10,000 -1:25,000, local land use plans – 1:1,000 – 1:5,000), are operational in nature and point to specific locations of various forms of land use, with local land use plans (made, as a rule, for parts of municipalities) being acts of local law of crucial importance. The study of conditions and directions of spatial development made for the whole area of a commune is not a law and can be used as a guide, although local land use

[24] Regulated by the Spatial Planning and Land Development Act of 27 March 2003.

plans should be consistent with the findings of the studies of conditions and directions of spatial development.

For all four levels of planning, there is an obligation to take into account environmental conditions. This requirement should be met through the implementation of two types of documentation:

- ecophysiographic studies that describe individual nature components and their interrelationships, including biological diversity and natural resources, as well as their legal protection. These studies should be developed before preparing a draft planning document to make it possible to include the conditions described in the ecophysiographic study in the document;
- prognosis of the impact on the environment as an element of strategic environmental impact assessment. A prognosis is made for a finished draft planning document, in order to give an evaluation of the project's environmental performance, as well as formulate alternative solutions and measures to mitigate or offset the negative environmental effects and to include its findings in the draft planning document. Decisions about the scope of information required in the prognosis and an assessment of the local spatial plan are made by the Regional Director of Environmental Protection. The opinion of the RDEP must be taken into account prior to the plan's adoption. If the strategic environmental impact assessment implies the plan's significantly negative impact on a Natura 2000 site, it can't be accepted.

In the absence of a local land use plan, arrangements for types of land use and land development conditions are made in the form of a land development conditions decision. In the case of public projects, this decision is made, for areas located within the park's borders and in its buffer zone, following an agreement with the director of the national park and for other areas protected under environmental laws, with the regional director of environmental protection. The legal system thus provides a foundation for the conservation of biodiversity resources by means of spatial planning. Its practical application, however, is insufficient since local land use plans cover only a small fraction of the country and their quality is often unsatisfactory, which influences the evaluation of the environmental impact of their implementation. In 2012, local land use plans covered only 27,2% of the country (Table 27). The growth of area covered by local land use plans over the 2009-2012 period – when strategic environmental impact assessment regulations came into effect – was less than 1% of the country's area a year. The reasons why local land use plans were not adopted by local self-governments were financial considerations and the desire to maintain greater freedom in managing land use. The land development conditions decision, originally intended to be an auxiliary instrument used as an exception in areas where a local plan was lacking, has become the main instrument for land use planning in Poland. Over the 2009-2013 period, more than 150,000 land development conditions decisions and over 20,000 decisions on the location of a public project were issued in Poland per year.

According to a CAWI research, over the 2009-2012 period, land use plans in 36% of communes contained – in terms of project location or building restrictions – environmental constraints resulting mainly from prohibitions in areas included in forms of legal nature protection.

In 2009, the Ministry of the Environment and the General Directorate for Environmental Protection issued the *Natura 2000 in land-use planning – the role of wildlife corridors*[25], a document which provides methodical guidelines on how to include Natura 2000 environmental requirements in spatial planning.

[25] http://www.gdos.gov.pl/files/Materialy-i-publikacje/Podrecznik_-_planowanie_przestrzenne.pdf

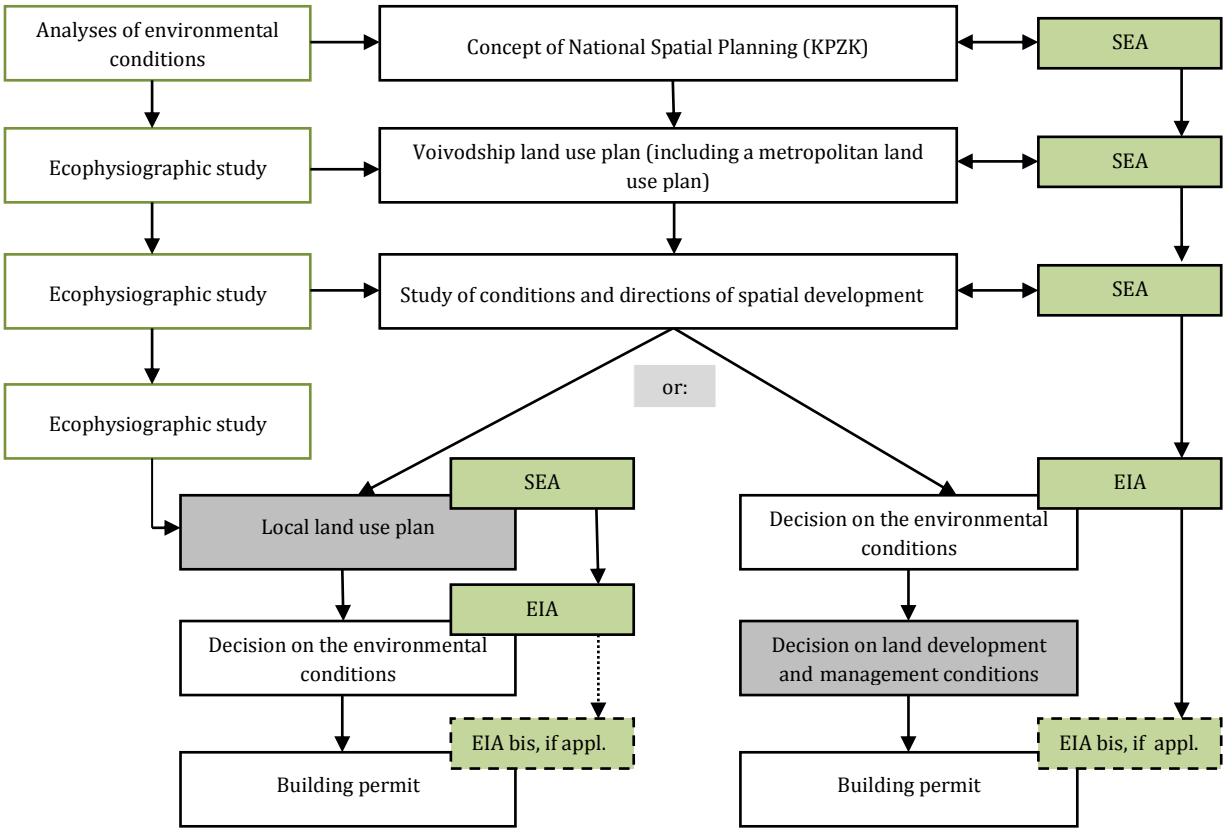
In 2011, Warsaw hosted an international Planning for Biodiversity conference. Listed among the main causes of biodiversity loss were a progressive fragmentation of natural landscapes and an insufficient integration of the objectives of biodiversity and ecosystem conservation with spatial management policies. In this context, it is an urgent need to strengthen the role of spatial planning in environmental protection, which should be based on an ecosystem approach.

TABLE 27. AREA OF THE COUNTRY COVERED BY EXISTING LOCAL LAND USE PLANS

	Area covered by plans	
	[thou. ha]	[%]
2004	5,390.8	17.2
2005	6,167.7	19.7
2006	6,872.4	22.0
2007	7,557.1	24.2
2008	8,007.9	25.6
2009	7,962.4	25.5
2010	8,242.5	26.4
2011	8496.3	27.2

Source: IGiZP PAN (2012)

FIGURE 28. LEVELS OF LAND USE PLANNING AND RELATED ENVIRONMENTAL STUDIES



Source: Kistowski M., Pchałek M. (2009)

The Act of 3 October 2008 on the Provision of Information on the Environment and its Protection, Public Participation in Environmental Protection and Environmental Impact Assessments, imposed the obligation to perform a strategic environmental impact assessment (SEA) for the following:

1. national spatial development concepts, studies of conditions and directions of spatial development, land use plans and strategies on regional development;
2. policies, strategies, plans or programmes in the fields of industry, energy, transport, telecommunications, water management, waste management, forestry, agriculture, fisheries, tourism and land use, developed or adopted by administrative agencies which set the framework for the subsequent implementation of projects likely to have a significant environmental impact;
3. policies, strategies, plans or programmes, other than those referred to in points 1 and 2, the implementation of which may result in a significant impact on a Natura 2000 site, if they are not directly related to the protection of a Natura 2000 site or do not result from such protection.

Authorities competent to review and make arrangements in the SEA procedure are: the general director for environmental protection in the case of documents prepared and amended by the main or central government administration bodies, and the regional director for environmental protection in the case of other documents. In 2009-2012, according to the results of a survey (CAWI), 75% of communes subjected drafts strategy papers to SEAs and incorporated their results in the final versions of the papers. SEAs were lacking in 25% of the communes either because no strategy papers were released in that period or a resignation from SEA had been agreed with RDEP.

2.5 EVALUATION OF THE IMPLEMENTATION OF THE 2007-2013 NATIONAL STRATEGY AND ACTION PLAN IN POLAND

MODE OF ASSESSING THE IMPLEMENTATION STATUS OF THE 2007-2013 NATIONAL STRATEGY

During the period May-October 2013, an evaluation of the implementation status of the objectives set out in the 2007-2013 National Strategy and Action Plan for the Protection and Sustainable Use of Biological Diversity was carried out. The evaluation was based on two independent surveys. The first of them referred to each of the 134 tasks listed in the 2007-2013 Action Plan. Answers were submitted by entities indicated as responsible for or co-operating in the implementation of individual objectives and measures. The second survey focused on the effects and scope of action taken not only by entities specified in the 2007-2013 Action Plan, but by a broadest possible range of stakeholders acting directly and indirectly for the broad field of biodiversity conservation. The evaluation of the status of implementation began with an analysis of the structure of objectives and measures.

TABLE 28. STRUCTURE OF GOALS AND TASKS OF THE NATIONAL STRATEGY

Strategic goal	Number of operational objectives	Number of tasks in the 2007-2013 Action Plan
1	5	10
2	14	21
3	21	55
4	2	2
5	10	13
6	19	25
7	4	5
8	2	3
Total	77	134

Source: own elaboration

For 8 strategic goals, 77 operational objectives were identified, which were then divided into 134 tasks. Tasks were not assigned to five operational objectives. Five operational objectives were repeated in more than one strategic goal (synergy effect). Great variability was observed between the numbers of the operational objectives that the strategic goal had been divided into. An analogous conclusion applies to the number of tasks identified with regard to the implementation of the operational objectives. These disparities were significant. For example, for strategic goal no. 3, 21 operational objectives were established, to which 55 tasks were assigned, and for strategic goal no. 8, 2 operational objectives were established with 3 tasks assigned to them. This situation had an influence on the methodology of evaluating the implementation status of the National Strategy and Action Plan. The evaluation began with assessing the implementation status of tasks defined in the 2007-2013 Action Plan. It was based both on information obtained directly from institutions responsible for the implementation of the measures and on indirect inference, based on surveys and literature. The results of the analysis are presented in the Table 29 below. It should be noted that the evaluation provided in this report is incomplete. The Ministry of Environment is currently[26] conducting a final comprehensive evaluation of the implementation status of the National Strategy based on extensive and detailed reports generated by all stakeholders involved directly or indirectly in the implementation of the tasks.

TABLE 29. IMPLEMENTATION STATUS OF TASKS UNDER THE 2007-2013 ACTION PLAN – QUANTITATIVE APPROACH

Assessment scale	Number of tasks	% of tasks
tasks completed	11	8%
tasks under implementation, well advanced and/or nearing completion	16	12%
tasks in progress, requiring follow-up	51	38%
continuous tasks, requiring follow-up by their nature	31	23%
tasks requiring improvement and follow-up, not completed, or implementation status impossible to assess	25	19%
total	134	100%

Source: own elaboration

[26] Data from March, 2013

The next stage was an assessment of the implementation status of individual operational objectives. Since there are no measurable indicators of the implementation status of individual objectives, the study was prepared by experts and was qualitative in nature. Directions of activities were evaluated by distinguishing two classes: A) The direction of the implementation of the objectives is satisfactory but there is a need for follow-up action (the activities were targeted and well defined and their effectiveness satisfactory, but they need to be continued for a full achievement of the objectives), and: B) An effective meeting of the objectives requires a clarification and intensification of action (measures taken were not effective enough to achieve the objective or imprecisely defined, in some cases, a revision of the objective is needed). The evaluation presented in this report is of a general nature due to incomplete – at this stage – data on the implementation status of individual measures assigned to each of the objectives. The absence of indicators (of both output and result) makes it difficult to conduct an unambiguous evaluation (Table 30, 31).

TABLE 30. IMPLEMENTATION OF THE OPERATIONAL OBJECTIVES OF THE NATIONAL STRATEGY – QUANTITATIVE APPROACH

Evaluation result	Symbol	Number of objectives	% of objectives
The direction of the implementation of the objective is satisfactory but there is a need for follow-up action	**A**	41	53%
An effective meeting of the objectives requires clarification and intensification of action	**B**	36	47%

Source: own elaboration

EVALUATION RESULTS OF THE IMPLEMENTATION STATUS OF THE NATIONAL STRATEGY OPERATIONAL OBJECTIVES

TABLE 31. ASSESSMENT OF THE IMPLEMENTATION STATUS OF INDIVIDUAL OPERATIONAL OBJECTIVES OF THE 2007-2013 NATIONAL STRATEGY

	Operational objectives	Evaluation result
1	To supplement and disseminate knowledge on the distribution and the resources of biodiversity components.	**A**
2	To restore and maintain a network of wildlife corridors (forest, river and other types) to ensure genetic exchange between local populations.	**B**
3	In-situ and ex-situ conservation of endangered, vulnerable and key species of plants, fungi and animals, considering their regional variability.	**A**
4	To rationalise the systems of the economic harvesting of plants, fungi and animals.	**B**
5	To prevent the penetration and spreading of alien species and native species from alien populations, particularly those most threatening to native biodiversity resources.	**B**
6	To improve the systems for dealing with GMOs and controlling their possible impact on the environment and biological diversity.	**B**
7	To improve the systems for dealing with conflicting species and species causing negative public reaction.	**A**
8	To combat international and national trade in endangered species.	**B**
9	To develop and strengthen the national system of protected areas, including the implementation	**A**

	of the European Network Natura 2000.	
10	In-situ conservation of valuable and endangered natural habitats and ecosystems, with special emphasis wetlands, mountains and seas.	**A**
11	To enhance the quality of the most valuable, damaged ecosystems, including river valleys, wetlands and forest areas.	**B**
12	Conservation of green areas, woodlots and shrubland in fields and along roads	**B**
13	In-situ conservation of valuable natural and semi-natural landscapes.	**B**
14	To improve and implement forest cultivation, conservation and planning systems in order to meet the requirements of the conservation and sustainable use of biological diversity, including the objectives and obligations arising from conventions, agreements and other international instruments.	**A**
15	To establish groups of forested areas or stands of similar composition, especially within wildlife corridors and watershed areas.	**A**
16	To extend the scope of degraded land reclamation works through afforestation.	**A**
17	To create conditions for minimizing the effects of mineral exploitation on biological diversity.	**B**
18	To create conditions to minimise pollution of water, air and soil, which impairs biological diversity.	**A**
19	To increase efforts to raise public awareness and knowledge on the conservation and sustainable use of biological diversity.	**A**
20	Wide dissemination of information on the conservation and sustainable use of biological diversity through a variety of media.	**B**
21	To improve public information system on biological diversity.	**B**
22	To strengthen civic engagement in efforts for the conservation and sustainable use of biological diversity.	**A**
23	To provide decision-makers and the public with up-to-date and reliable information on the status, changes and threats to biological diversity.	**A**
24	To strengthen the institutional operating of the environmental protection management system.	**A**
25	To improve the laws concerning the conservation and sustainable use of biological diversity, especially in the context of its conformity with the European law and other acts of international law (conventions and agreements).	**A**
26	To improve the methods of information exchange between administrative bodies, research units and NGOs, as tools to support the management of the conservation and sustainable use of biological diversity.	**A**
27	To develop international cooperation for the conservation and sustainable use of biological diversity, including for the protection and joint management of valuable natural cross-border areas and populations of rare and protected species occurring on both sides of the border, as well as the restoration of a cross-border network of wildlife corridors.	**B**
28	To develop inter-sectoral cooperation for the conservation and sustainable use of the resources of biological diversity.	**B**
29	To ensure an adequate level of funding for activities related to the conservation and sustainable use of biological diversity.	**A**
30	To provide effective mechanisms for a wider access to financial resources earmarked for purposes related to the conservation and sustainable use of biological diversity.	**A**
31	To ensure that a high priority is given to the issues of the conservation and sustainable use of biological diversity in environmental impact assessment procedures.	**A**
32	To harmonise regulations, policies, strategies and sectoral programmes in order to ensure consistent approaches to the conservation and sustainable use of biological diversity.	**B**
33	To monitor the progress of work on the implementation of tasks in the Action Plan.	**A**

34	To determine the directions and methods for the implementation of the National Strategy in the next programming period.	**A**
35	To intensify activities taken by central and local authorities for the conservation and sustainable use of biological diversity.	**A**
36	To strengthen the human, institutional and technical capacity of public administration bodies operating in the field of nature conservation.	**A**
37	To reinforce measures for achieving and maintaining a high environmental quality of waters, as well as aquatic and water-dependent ecosystems, including maintaining – wherever possible – a natural or close to the natural character of rivers and their valleys.	**B**
38	To restore ecological continuity in rivers.	**B**
39	To intensify activities for the implementation of agricultural methods which favour the conservation and sustainable use of biological diversity.	**A**
40	To implement an ecosystem approach in agriculture.	**B**
41	To create conditions conducive to the restoration of wildlife corridors and increasing the surface of woodlands and scrublands in areas used for agriculture.	**B**
42	To intensify efforts towards minimizing pollution, especially where it causes the eutrophication and acidification of terrestrial and aquatic ecosystems.	**B**
43	To create conditions conducive to the transfer of agricultural land for the purposes of nature conservation.	**B**
44	To support activities aimed at the conservation of *ex situ* genetic resources for food production and agriculture.	**A**
45	To intensify efforts for the conservation of in-situ biological diversity in agriculture, especially genetic resources of local crop varieties and native breeds of farm animals.	**A**
46	To ensure the profitability of traditional indigenous varieties of crops and livestock breeds.	**B**
47	To increase efforts towards raising farmers' awareness and knowledge on the conservation and sustainable use of biological diversity.	**A**
48	To implement the principles of conservation and sustainable use of biological diversity in spatial planning procedures.	**B**
49	To ensure that a high priority is placed on issues of biological and landscape diversity in the process of spatial management.	**B**
50	To improve the substantive and technical tools to support the process of spatial planning, in the form of current and comprehensive spatial databases on the biological diversity of individual areas.	**B**
51	To create conditions and promote the development of sustainable tourism as a form of sustainable use of valuable natural areas.	**A**
52	To take into account in the development of education for all stages of the programming principles and curricula issues of conservation and sustainable use of biological diversity, including on skills recognition of 200 species of common animals, plants and fungi in their environment.	**A**
53	To provide relevant vocational training, programmes and teaching aids for teachers to promote the conservation and sustainable use of biological diversity.	**A**
54	To provide tertiary education programmes that will develop highly qualified human resources in the field of environmental protection, in accordance with the demand of the labour market.	**A**
55	To develop and popularize scientific knowledge on the condition of and threats to biological diversity and the effectiveness of different conservation activities.	**A**
56	To support scientific efforts to develop methods to assess the condition of and threats to biological diversity and instruments for its protection.	**B**
57	To create favourable conditions for minimizing the negative impacts of the existing and planned transport networks on the components of biological diversity, including preventing the blockage of wildlife corridors.	**A**

58	To create favourable conditions for the conservation and sustainable use of the sea and the coastal areas.	**B**
59	Implementation of measures for the protection of marine and inland water ecosystems.	**B**
60	To improve and implement inland and marine fisheries management systems, while meeting the needs of the conservation and sustainable use of biological diversity.	**B**
61	To intensify awareness raising activities for fishermen, fish producers and anglers on the conservation and sustainable use of biological diversity.	**B**
62	To implement an ecosystem approach in fisheries and aquaculture.	**B**
63	To prevent the overexploitation of marine species and destruction of habitats to ensure the sustainability of these species.	**B**
64	To intensify efforts for the development and implementation of production technologies conducive to maintaining biological diversity, by minimizing environmental pollution, especially where it causes the eutrophication and acidification of terrestrial and aquatic ecosystems.	**B**
65	To include the business sector in activities for the conservation and sustainable use of biological diversity.	**B**
66	To assess the condition of and threats to biological diversity in military operations areas.	**A**
67	To create good conditions for the conservation and sustainable use of biological diversity in military areas.	**A**
68	To protect nature and cultural landscapes.	**A**
69	To create suitable conditions for the conservation of valuable local and regional cultural phenomena related to the maintenance of traditional forms of farming, which promote the sustainable use of biological diversity, as well as for teaching children and young people about this issues.	**A**
70	To intensify efforts towards maintaining cultural diversity as a means to support the conservation and sustainable use of biological diversity.	**A**
71	To create conditions for the development of "green" jobs in the area of the protection and sustainable use of biological diversity.	**B**
72	To intensify police operations in enforcing laws on the conservation and sustainable use of biological diversity.	**B**
73	To take action to toughen and apply immediate and strict penalties for violations of laws pertaining to the conservation and sustainable use of biodiversity.	**B**
74	To ensure adequate funding of measures to achieve the goals of the protection and sustainable use of biological diversity.	**A**
75	To improve the efficiency of measures taken by the customs authorities to enforce the laws on the conservation and sustainable use of biological diversity.	**A**
76	To promote Poland's biodiversity assets and achievements in the field of the conservation and sustainable use of biodiversity at an international level.	**A**
77	To initiate and actively participate in international activities for the conservation and sustainable use of biological diversity.	**A**

Source: own elaboration

TABLE 32. NATIONAL STRATEGIC GOALS FOR THE 2007-2013 PERIOD – ASSESSMENT OF THE IMPLEMENTATION STATUS

	STRATEGIC OBJECTIVES	
1	To identify and monitor the biodiversity status and the existing and potential threats.	**A**
2	To effectively eliminate or limit the emerging risks to biological diversity.	**B**
3	To preserve and/or enrich the existing components of biological diversity and restore the lost ones.	**A**
4	To fully integrate measures for the conservation of biological diversity with activities of sectors of the economy, public administration and civil society (including NGOs) that have an impact on biodiversity, while maintaining the appropriate proportion between the environmental goals, and those of the socio-economic development of the country.	**B**
5	To increase public awareness and shape social attitudes and behaviours for the sake of the conservation and sustainable use of biological diversity.	**A**
6	To improve the mechanisms and instruments for the protection and sustainable use of biological diversity.	**A**
7	To develop international cooperation on a regional and global scale for the conservation and sustainable use of the resources of biological diversity.	**A**
8	To use biological diversity in a balanced manner, with equal and fair sharing of benefits and costs of its conservation, including the costs of discontinuing development activities in the interest of the protection of natural resources.	**B**

Source: own elaboration

The last stage of evaluating the implementation status of the National Strategy was the evaluation of the implementation status of eight strategic goals, the results of which are presented in Table 32. It should be noted that the weights of individual evaluation indices vary as a result of disparities in the structure of objectives and tasks, for example, for strategic goal no. 3, 21 operational objectives were established, to which 55 tasks were assigned, and for strategic goal no. 8, 2 operational objectives were established with 3 tasks assigned to them. These disparities, as mentioned in Chapter 2.1 of this report, come from the fact that the National Strategy and Action Plan is the first comprehensive document of this kind and it can be defined as cross-sectoral to a certain extent. Its authors made an attempt to define a very wide range of activities necessary to preserve biological diversity, defined broadly and by a variety of aspects, to cover not only the protection of endangered species and habitats, but also a possibly large number of interactions with economic, scientific and social activities, as well as a wide range of institutions involved in its implementation. As a consequence, the implementation of many measures and the achievement of individual objectives has a long-term perspective, and the weight of individual tasks and objectives, as well their effective implementation, is varied.

Successes related to the implementation of the National Strategy include:

- Establishment of central and regional nature conservation authorities, such as the GDEP and 16 RDEPs;
- Significant progress in the designation of the Natura 2000 network, which can be considered as finished in view of the current state of knowledge;
- Initiation of systematic activities for the development of conservation and management plans;
- Strengthening of the environmental impact assessment system;
- A significant increase in the funding for biodiversity protection efforts.

Examples of fields where more action is needed:

- Spatial planning, particularly in the context of the effective protection of wildlife corridors (land-based, river-based and marine) and landscape protection;
- Popularization of the concept of ecosystem services and the implementation of sustainable management methods, particularly in sectors heavily dependent on the environment;
- Improvement of nature conservation management in landscape parks, protected landscape areas and small-scale forms of nature protection under the administration of local authorities; as well as marine sites;
- A greater integration of biodiversity conservation issues with other sectors of the economy;
- A fuller recognition and more comprehensive monitoring of the status of biological diversity, e.g. by implementing a representative system of monitoring species and habitats in the whole country, in particular those species for which it is impossible to perform a reliable assessment of conservation status based only on the monitoring of limited areas;
- Improvement of penal provisions that apply to offences against the environment and their more effective enforcement.

The implementation of the 2007-2013 National Strategy and Action Plan should be evaluated positively as an initial phase of long-term action that will have to be taken over the next decades, aimed at reducing negative pressures on biodiversity, and as a redefinition of the economic approach to include in it the valuation and appreciation of biological diversity, and, consequently, to apply appropriate economic methods and tools to preserve its value. The implementation of the Strategy should also be evaluated as a learning-by-doing process, whereby the extremely complex issue of biodiversity protection is approached, also in terms of new technical tools - practical proposals for the formulation of objectives and measures for the next 2014-2020 perspective. These include proposals such as: limiting the number of objectives, their precise prioritising and the formulation of measurable progress indicators.

PART THREE

3 IMPLEMENTATION PROCESS OF THE AICHI TARGETS AND MILLENNIUM DEVELOPMENT GOALS

3.1 PROGRESS IN THE IMPLEMENTATION OF THE STRATEGIC PLAN FOR BIODIVERSITY 2011-2020 AND THE AICHI TARGETS

The progress analysis of the implementation of 20 Aichi Targets was conducted using qualitative assessment, the results of which are presented in the form of a table. The description of the progress is two-level:

- Descriptive: cells present descriptions of the current level of target implementation: HIGH, MEDIUM, LOW
- **With grade and colour markers** signifying the assessment of the speed of progress in reaching the target by 2020 according to the presented scale.

A	The target has been reached or it is highly likely that it will be reached by 2020, assuming that intense further action will be taken towards its implementation
B	The progress is insufficient to reach the target by 2020 if the current speed of action is continued
C	Lack of progress, indicating the difficulties in achieving the target by 2020
D	No data or data insufficient for assessment

The current (2013) implementation status of the Aichi Targets has been assessed as:

- high for 2 targets (Target 11 and 17)
- medium for 13 targets
- low for 4 targets,
- in the case of 1 target (Target 18), the implementation status has not been specified due to lack of data.

The current rate of progress in the implementation of the targets has also been assessed:

- for 7 targets it has been estimated that they are likely to be achieved by 2020,
- for 11 targets, it has been decided that without an intensification of measures the current progress rate is insufficient to achieve them by 2020,
- in the case of 1 target (Target 2), it has been assessed that currently there is not progress in its implementation,
- in the case of 1 target (Target 18), the rate of implementation has not been specified due to lack of data.

TARGET 1: BY 2020, AT THE LATEST, PEOPLE ARE AWARE OF THE VALUES OF BIODIVERSITY AND THE STEPS THEY CAN TAKE TO CONSERVE AND USE IT SUSTAINABLY

TARGET IMPLEMENTATION STATUS	MEDIUM
ASSESSMENT OF THE RATE OF PROGRESS IN REACHING THIS TARGET	B

In Poland, a number of activities have been undertaken towards increasing ecological awareness and changes that have taken place within the last 25 years are vast. Despite general awareness of the essence of environmental issues, their place in the hierarchy, in comparison to other areas of life, is low[27]. When asked to indicate areas in which our country had the most issues/challenges to face, only 11% of Poles indicated nature conservation, whereas with regard to issues such as work, social policy, healthcare or economic progress, their answers came to 51%, 50% and 27% respectively. Unfortunately, research also showed a lack of awareness of biological diversity issues. Air pollution (47%), waste (43%), water (39%) and floods (37%), climate change (34%) and depletion of natural resources (21%) were indicated as the biggest environmental problems, while only 20% respondents mentioned the loss of biological diversity. The opinion, shared by 75% of the respondents, that environmental protection can have a positive impact on economic growth is very important here (this regards all environmental issues, not just biological diversity). Among reasons for which the environment is worth protecting, answers included caring for human health (62%), caring for future generations (58%) and nature's inherent value (47%), while economy or economic factors were mentioned by 29% of the respondents. In comparison to research from previous years (2011 and 2012), a significant increase in awareness of the need for looking after the environment based on nature's inherent value was not recorded. However, the percentage of Poles who know the term *biodiversity* is low – only 30%.

The results of a survey (CAWI) conducted among environmental conservation institutions (sample size n=118, survey conducted in 2013) indicated the following as the biggest threats to biodiversity conservation:

- lack of awareness of conservation needs among users of natural resources (lack of awareness of the value of natural resources and their limitedness) – 75%;
- excessive economic pressure (development, fishing etc.) – 69%;
- low priority of issues of nature and landscape conservation among decision makers and in management – 67%.

In 2009-2013, numerous campaigns aimed at raising the awareness of biological diversity were conducted in Poland. They included extensive nationwide events, e.g. the Ministry of the Environment's *Biodiversity* campaign or GDEP campaigns: *Natura 2000 network – a path to development*, *Nature and Economy – Basis for Dialogue*, *Get Your Balance – Discover Nature*. Non-governmental organisations were also very active in this area. The scope of undertaken action is reflected in the fact that from 2007 onwards, the total funding from public resources (national and EU) for projects aimed at raising social awareness of biodiversity has exceeded PLN 100 million (over USD 32 million). The scope and variety of measures taken to raise awareness of the value of biodiversity and methods of its protection was significantly higher in 2009-2013 than in the preceding five year period.

When assessing the probability of reaching Target 1 by 2020, it has to be stated that this would require intense and well coordinated action, as biodiversity conservation is not a priority issue either on the social or the political and decision making level. Due to a high supply of EU funds in Poland for 2014-2020, intense media and educational campaigns are planned, aiming to raise awareness of the value of natural resources and their impact on social welfare. The draft 2014-2020 Programme includes this kind of action, as well as other measures, such as: increasing the participation of local communities in activities leading to the protection of natural heritage, the integration of tourist activities aimed at nature protection with shaping new tourist attitudes, and training public administration officials engaged in decision making on biodiversity conservation issues.

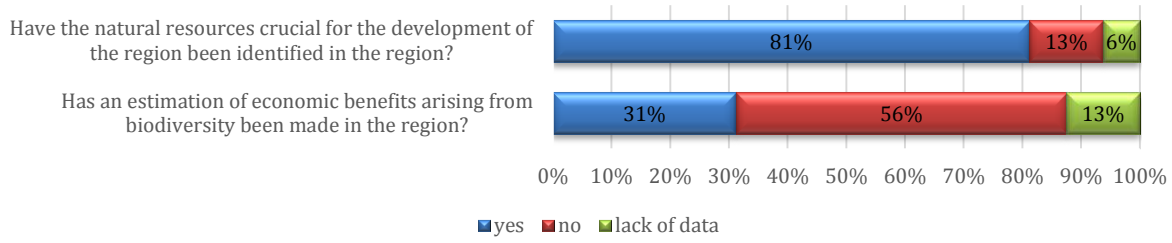
TARGET 2: BY 2020, AT THE LATEST, BIODIVERSITY VALUES HAVE BEEN INTEGRATED INTO NATIONAL AND LOCAL DEVELOPMENT AND POVERTY REDUCTION STRATEGIES AND PLANNING PROCESSES AND ARE BEING INCORPORATED INTO NATIONAL ACCOUNTING, AS APPROPRIATE, AND REPORTING SYSTEMS

TARGET IMPLEMENTATION STATUS	LOW
ASSESSMENT OF THE RATE OF PROGRESS IN REACHING THIS TARGET	C

Environmental monitoring (State Environmental Monitoring Programme), including nature monitoring, works

[27] http://www.mos.gov.pl/g2/big/2013_12/ee41d9c93bc700729faf03103120a38c.pdf (in Polish)

smoothly in Poland. It is regularly revised, improved and extended. Over the years, the quantity and quality of data collected by the CSO on biodiversity conservation has been growing. On a declarative level, biological diversity has been included in numerous sectoral strategies (discussed in more detail in Chapter 2.4) and, on a basic legal level, in instruments such as the EIA, SEIA and spatial planning, though the effectiveness of applying these mechanisms requires further improvement. A lack of information and documents (inventories) describing natural resources of individual voivodships – especially of communes at a local level – which could be used in practice for planning purposes, poses a substantial problem. Including the value of biological diversity in accounting systems is going to present an even greater challenge. As seen in the results of the survey conducted among local authorities (15 marshal offices), only 5 out of 15 regions stated that they had made an assessment of economic benefits from biological diversity.



It has to be emphasised that no specific methodologies were used for assessing the economic benefits; it involved merely qualitative assessment. Among the 5 regions, which had conducted this assessment, 4 concluded that they derived moderate benefits from natural resources and 1 assessed the benefits to be high.

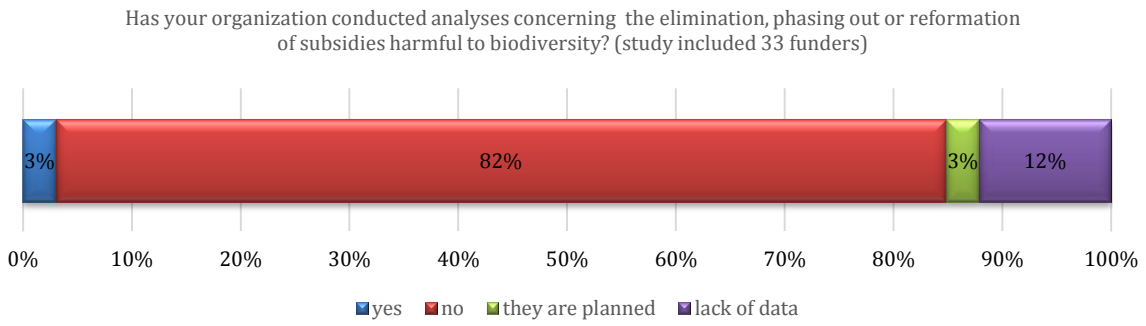
The biggest challenge is calculating the economic value of ecosystem services and including them into national accounting and statistical systems. At the current rate, reaching the target fully by 2020 in this respect does not seem plausible.

Among its objectives, the draft 2014-2020 National Programme includes: improving the effectiveness of management planning and biodiversity conservation, assigning socio-economic value to ecosystems, and creating green infrastructure as a tool that helps to maintain and strengthen the existing ecosystems and their services. These sub-objectives are to be implemented through measures such as: the development of a method for calculating the value of ecosystem functions, the development of a method for including the economic value of ecosystem functions into accounting and reporting systems at a national level, the development of national guidelines that would allow for giving green infrastructure the status of a standard element in spatial planning and land development, and the inclusion of the green infrastructure in planning processes at a local level.

TARGET 3: BY 2020, AT THE LATEST, INCENTIVES, INCLUDING SUBSIDIES, HARMFUL TO BIODIVERSITY ARE ELIMINATED, PHASED OUT OR REFORMED IN ORDER TO MINIMISE OR AVOID NEGATIVE IMPACTS, AND POSITIVE INCENTIVES FOR THE CONSERVATION AND SUSTAINABLE USE OF BIODIVERSITY ARE DEVELOPED AND APPLIED, CONSISTENT AND IN HARMONY WITH THE CONVENTION AND OTHER RELEVANT INTERNATIONAL OBLIGATIONS, TAKING INTO ACCOUNT NATIONAL SOCIO-ECONOMIC CONDITIONS

TARGET IMPLEMENTATION STATUS	**LOW**
ASSESSMENT OF THE RATE OF PROGRESS IN REACHING THIS TARGET	**B**

Data on economic incentives harmful to biodiversity are incomplete. The majority of institutions do not carry out such analyses. In a survey (CAWI) conducted in 2013 on a sample of 33 financing institutions, which support environmental protection in various aspects, including biological diversity, over 80% stated they had not carried out analyses on the elimination or reform of subsidies harmful to biological diversity.



An example of negative subsidies is subsidising farmland drainage, which is in conflict with the national environmental and water policy and which neutralises other positive steps towards aims such as small-scale water retention. From the point of view of biodiversity conservation objectives, water management on farmland should include mainly the irrigation functions of melioration systems and measures that enhance water retention. In 2010, among 6,421,000 hectares of meliorated land in Poland only 414,000 (6.4%) had water retention equipment and irrigation was conducted only on 105,000 hectares. In 2011, the situation was no different. Numerous melioration works were financed under the RDP, the majority of which, however, served water drainage rather than retention.

On the other hand, significant financial incentives that have a positive impact on the sustainable use of biodiversity have also been employed in Poland, e.g. direct payments for farmers in the framework of the agro-environment scheme of the RDP (description of packages in Chapter 2.3). The impact of the RDP agro-environmental scheme on the agricultural sector should be regarded as significant. One example of this impact is the doubling of organic farmland surface area in the last five years: from approx. 315,000 hectares in 2008 to approx. 661,000 hectares in 2012.

Financial incentives conducive to biodiversity conservation in agriculture will also be provided under the 2014-2020 agro-environmental and climatic programme of the RDP. Moreover, the draft programme includes: pilot support for biodiversity-friendly enterprises, the development and implementation of programmes for job creation in services for the conservation and sustainable use of biological diversity, and the implementation of instruments that support traditional practices of sustainable use of biodiversity resources by local communities.

TARGET 4: BY 2020, AT THE LATEST, GOVERNMENTS, BUSINESS AND STAKEHOLDERS AT ALL LEVELS HAVE TAKEN STEPS TO ACHIEVE OR HAVE IMPLEMENTED PLANS FOR SUSTAINABLE PRODUCTION AND CONSUMPTION AND HAVE KEPT THE IMPACTS OF USE OF NATURAL RESOURCES WELL WITHIN SAFE ECOLOGICAL LIMITS

TARGET IMPLEMENTATION STATUS	**LOW**
ASSESSMENT OF THE RATE OF PROGRESS IN REACHING THIS TARGET	**B**

In the case of enterprises, sustainability, including sustainable production and consumption, is equated with Corporate Social Responsibility (CSR). Above all, it requires enterprises to assess their own activities in a broad and long-term perspective. In Poland, producing sustainability reports is a relatively new practice. According to a survey conducted in 2008 among 212 enterprises commissioned by of Harvard Business Review Poland and CSR Consulting, it is in the domain of large enterprises, 32% of which declared having CSR action plans in place. 7.6% of respondents stated that their social responsibility strategy was holistic and comprehensive and took into account all business aspects (including nature conservation). According to a study conducted in 2006 by the Responsible Business Forum and Polish Public Relation Association, CSR activities in Poland were usually initiated by public relations (PR) departments. Although the Polish market has seen some changes since then, these competences are still usually in the PR departments, despite more and more common recruitment of CSR specialists or managers. This situation hinders a strategic approach to this subject and a full implementation of comprehensive systems of sustainability management.

Simultaneously, numerous initiatives promoting sustainable consumption models, such as the use of environmental criteria in public procurement (green public procurement), have been taken at a governmental level. The results of studies conducted by the Public Procurement Office show that the share of green public procurement increased from 4% in 2006 to 12% in 2012. In the *Strategy of Innovation and Economic Efficiency*, *Dynamic Poland 2020*, using green public procurement on a larger scale is mentioned among the preventive tools that help limit energy and material intensity of the economy. The value of public procurement in Poland (PLN 144.1 billion, or approx. USD 48,6 billion in 2011) is proof of the large potential of this area and points towards public administration, which could and should play an important role in initiating and consolidating environmentally friendly attitudes, thus enabling the development of products and services to high environmental standards. Green public procurement has also been indicated in the draft *Strategy for Energy Security and the Environment 2020* (SESE) as one of the most successful instruments that help to shape production and

consumption models. The Strategy envisages the stimulation of growth of green procurement so that by 2020, half of the public contracts commissioned will be environmentally friendly. SESE also points out the need to promote the use of environmental criteria in the private sector (green shopping).

In 2009-2013, substantial intensification of informational and promotional action on sustainable consumption patterns took place. The Ministry of the Environment played a remarkable role by carrying out numerous nationwide campaigns: *European Mobility Week*, *Don't litter your conscience*, *Change your habits for good – change the climate for better*, *Eco-basket, Effective use of resources*, *Turn off power – turn on savings*. Activities promoting sustainable consumption models were also carried out by NGOs and public institutions (e.g. institutes, local governments, higher education institutions). The total funding for projects of this kind from public funds (national and EU) in 2007-2012 amounted to approx. PLN 30 million (ca. USD 10,1 million). The scope and range (also in the media) of action undertaken in this area were significantly higher than before 2009.

As for other activities taken towards safe ecological limits and their assessment with regard to sustainable production and consumption, it has to be stated that many mechanisms of this type are already used in Poland, e.g., fishing quota, timber harvesting plans or the use of hunting species. However, they need to be constantly analysed, improved and adjusted to the latest state of knowledge. A variety of sustainable economy mechanisms have been implemented and cases of natural resource overexploitation eliminated in Poland, though a full implementation of Target 4 is a challenge. It has to be expected that, in terms of keeping the level of natural resource use within safe ecological limits, EU and national regulations of habitat and species protection are going to play a vital role.

According to the draft 2014-2020 Programme, activities towards sustainable exploitation of wild species are going to help to implement Aichi Target 4.

TARGET 5: BY 2020, THE RATE OF LOSS OF ALL NATURAL HABITATS, INCLUDING FORESTS, IS AT LEAST HALVED AND WHERE FEASIBLE BROUGHT CLOSE TO ZERO, AND DEGRADATION AND FRAGMENTATION IS SIGNIFICANTLY REDUCED

TARGET IMPLEMENTATION STATUS	**MEDIUM**
ASSESSMENT OF THE RATE OF PROGRESS IN REACHING THIS TARGET	**B**

The development of the Natura 2000 network in Poland, which has been taking place since 2004, has led to establishing special areas of conservation of habitats, encompassing approximately 11% of the country, and special bird protection areas, covering nearly 15% of the country (due to overlapping, together these areas cover 19.5% of the country). Any human activity in these areas must follow the principle of avoiding any significant negative impact on the features under protection. The network overlaps with national forms of protection, including some nature reserves, all national parks and about half of all landscape parks. The state of habitats is discussed in more detail in Chapter 1.2.

The Polish National Programme for Augmentation of Forest Cover (NPAFC) has been underway since 1995. Its goal is to increase the forest cover to 30% by 2020 and to 33% by 2050. In 2009-2012, the rate of forest cover growth was similar as in the preceding four years (2004-2008) and came to 0.075% per year. If this rate is maintained until 2020, the cover will reach 29.9%. It should be noted that land in Natura 2000 sites is excluded from afforestation until management plans for these sites are developed.

As a result of distortions to the species composition of Polish forests due to former forestry management, which favoured quickly growing coniferous tree species, these species have dominated large areas of the country (70.8%), while, in the forest habitat structure, pine, spruce and fir forest stands merely account for slightly more than half of the habitats (52.1%). In accordance with the State Forest Policy (1997), Polish forests have seen a restoration of forest stands aimed at increasing the share of deciduous species and diversifying the age of forest stands and the species structure. In 2009-2012, the area of forest stands that had been restored totalled 40,900 hectares.

In recent years, the use of Polish forestry resources has been below the level of natural capabilities determined according to the Forest Principles and the principle of increasing forestry resources. Since 2009, State Forests (approx. 78% of all forests) are subject to certification under the PEFC system (aside from the previously used FSC system). In comparison to other EU countries, Poland has the largest share of certified forests in the total forest area.

Despite numerous measures taken against the fragmentation of natural habitats and towards the restoration of the continuity of wildlife corridors, land ownership structure in Poland (high fragmentation), imperfections in the spatial planning system, and transportation and urban development, may pose a significant barrier in reaching this target by 2020.

According to the draft 2014-2020 Programme, the implementation of this Aichi Target will be aided by sustainable farming in agriculture (inter alia, targeted expenditure of the agro-environment-climatic schemes), sustainable forest management and activities for the protection and restoration of valuable natural habitats and species, including the development and implementation of conservation programmes.

TARGET 6: BY 2020, ALL FISH AND INVERTEBRATE STOCKS AND AQUATIC PLANTS ARE MANAGED AND HARVESTED SUSTAINABLY, LEGALLY AND APPLYING ECOSYSTEM BASED APPROACHES, SO THAT OVERFISHING IS AVOIDED, RECOVERY PLANS AND MEASURES ARE IN PLACE FOR ALL DEPLETED SPECIES, FISHERIES HAVE NO SIGNIFICANT ADVERSE IMPACTS ON THREATENED SPECIES AND VULNERABLE ECOSYSTEMS AND THE IMPACTS OF FISHERIES ON STOCKS, SPECIES AND ECOSYSTEMS ARE WITHIN SAFE ECOLOGICAL LIMITS

TARGET IMPLEMENTATION STATUS	MEDIUM
ASSESSMENT OF THE RATE OF PROGRESS IN REACHING THIS TARGET	B

Cod catches – for cod being particularly important for Polish fishermen among the basic Baltic species – are subject to limits arising from, inter alia, fish stock recovery plans (restricting the raising of catch quota, introducing recovery periods and restricting the use of certain fishing gear).

The state of fish stocks exploited commercially in the Baltic Sea is assessed annually by the International Council for the Exploration of the Sea (ICES) and the Scientific, Technical and Economic Committee for Fisheries (STECF). Taking into account their assessment of Baltic fish schools, it has to be stated that currently the stocks of the main fish species caught by Polish fishermen, the eastern Baltic cod and the central Baltic herring, are in good condition and they are exploited in accordance with maximum sustainable yields, while sprat stocks are at a level which makes it possible to reach this state by 2015.

Since 2006, the National Marine Fisheries Research Institute has been implementing the Incidental Catches of Cetaceans Monitoring Programme, based on obligations arising from Regulation (EC) 812/2004. Since 2011, the programme has also included incidental catches of seabirds and endangered fish species, such as the twaite shad (*Alosa fallax*), or fish originating from reintroduction programmes, such as the Atlantic sturgeon (*Acipenser oxyrhynchus*). From the beginning of the programme's existence, no incidental catch of cetaceans or other marine mammals has been recorded and protected fish species were not found in the monitored catches either. At the same time (2006-2011), however, there were 2 cases of voluntary reports of catches of the harbour porpoise (*Phocoena phocoena*) and of 19 dead bodies of animals found thrown onto the shore. These results may indicate that the applied monitoring methodology is inefficient. Neither does the system of catch reporting make it possible to control catches of protected species.

In 2008-2011, with the NFEP&WM's support, a project involving active protection of harbour porpoises (*Phocoena phocoena*) against catching was implemented. It consisted in installing a line barrier of acoustic deterrents in the mouth of the Bay of Puck (*Zatoka Pucka*) in order to prevent porpoises from swimming into the fishing grounds of high net density.

As a member of the EU, Poland is obliged to obey the regulations of the Common Fisheries Policy, whose main objective is to reach a sustainable exploitation level in fisheries. In 2009-2013, the EU was working on a reform of the Common Fisheries Policy, which is to come into effect in 2015. It introduces the ecosystem approach – fishing quota based strictly on scientific advice, the requirement of reaching MSY (*maximum sustainable yield* – such annual yield that does not cause the population size to decline below the level of biological safety), the application of prudential rules where information is lacking, and a ban on discards – into long-term management.

One of the objectives of the draft 2014-2020 Programme is to support biological diversity through sustainable fishery management. This objective is to be implemented through, inter alia: the development of long-term management plans which take into account the environmental impact of fish harvesting and restocking for all commercially exploited stocks, the introduction of regulations aimed at restricting discards, and the development and implementation of EIA rules for fisheries and aquaculture.

TARGET 7: BY 2020, AREAS UNDER AGRICULTURE, AQUACULTURE AND FORESTRY ARE MANAGED SUSTAINABLY, ENSURING CONSERVATION OF BIODIVERSITY

TARGET IMPLEMENTATION STATUS	MEDIUM
ASSESSMENT OF THE RATE OF PROGRESS IN REACHING THIS TARGET	A

Forests cover nearly 30% of Poland, with 78% owned by the State Treasury and managed by the SFNFH. It can be presumed, therefore, that they are managed in a sustainable way. In accordance with the Forest Act in force, the main task of the State Forests is to engage in long-term sustainable forestry management practices, implemented with forest management plans, with special attention to the following objectives: preservation of forests and maintaining their positive impact on the climate, air, water, soil, living conditions, human health, and natural balance; conservation of forests, especially those forest ecosystems which constitute natural elements of the native environment or which are particularly valuable from the perspective of environmental diversity, forest genetic resources, landscape features and scientific needs; protection of soils and land particularly vulnerable to destruction or damage and of special social significance; conservation of surface water and groundwater and water

retention in catchment areas; production of timber, raw materials and minor forest products based on rational forest management. Certification in the FSC system applies to all Regional Directorates of State Forests (RDSF) in Poland except for Krosno, while certification in the PEFC system is applicable to all RDSFs.

The RDP agro-environment scheme, and especially its packages, sustainable agriculture and organic agriculture, plays an important role in the promotion of sustainable agricultural management. As one of its key elements, the reform of the EU Common Agricultural Policy (CAP), passed in December 2013, introduced the so-called "greening" – making the direct payments from pillar 1 conditional on farmers' respecting certain obligatory agricultural practices, such as: crop diversification, retaining areas under permanent grassland, retaining ecological focus areas on farmland, or other equivalent measures. The new regulation will come into force in 2015. Also 30% of funds from the Rural Development Programme (CAP pillar 2) are to be directed towards environmental, organic and climate aims. Poland already allocates nearly 30% of those funds to such initiatives.

Poland has introduced the Code of Good Agricultural Practices; the share of organic farms is growing continuously (though their % share is still low, at 3.5% of total farmland in Poland). Although the fragmented farming structure supports biodiversity conservation, changes and trends, the growing use of fertilisers and the intensification of agricultural production need to be constantly monitored.

Aquaculture in Poland is based mainly on freshwater fish farming or breeding, mainly of the carp (around 400 farms) and trout (around 200 farms). Currently, nearly 70% of freshwater fish production in Poland is associated with aquaculture carried out in fishponds, tanks and other facilities. It is an extensive system, which has generated half-natural lands, capes of high aesthetic quality and habitats of high significance for biodiversity conservation. For this reason, some Polish ponds have been included in the Natura 2000 network. Water-related and environmental measures implemented under the 2007-2013 OP FISH serve to promote sustainable aquaculture management; their objective is to compensate producers for the use of traditional production methods that support the protection and improvement of the state of the environment and biodiversity, as well as to promote organic production in the Polish aquaculture sector. The amount of payments made under such water-related and environmental activities from the beginning of the programme reached over PLN 276 million (over USD 93 million). The draft Operational Programme *Fisheries and the Sea 2014-2020* includes the *Aquaculture providing environmental services* action, with support for: aquaculture methods that comply with special environmental needs and are subject to special management requirements as set by Natura 2000 sites; protection and breeding of water animals within programmes of environmental protection and restoration of biological diversity; forms of extensive aquaculture, including the conservation and enhancement of the environment, biological diversity, as well as landscape management and traditional features of aquaculture sites.

One of the strategic objectives of the draft 2014-2020 Programme is to include economy sectors in biodiversity activities. The implementation of this objective is to focus on three main sectors: agriculture, forestry and fishery; it is going to involve both financial support under the RDP agro-environment-climatic schemes, water-related and environmental operations of the OP FISH, as well as educational, regulatory and planning measures.

TARGET 8: BY 2020, POLLUTION, INCLUDING FROM EXCESS NUTRIENTS, HAS BEEN BROUGHT TO LEVELS THAT ARE NOT DETRIMENTAL TO ECOSYSTEM FUNCTION AND BIODIVERSITY

TARGET IMPLEMENTATION STATUS	**MEDIUM**
ASSESSMENT OF THE RATE OF PROGRESS IN REACHING THIS TARGET	**A**

Poland has been making diverse efforts to limit environmental pollution (mainly of air and water) with potentially negative impacts on ecosystems and biological diversity. Deciding on a level harmless to ecosystem and biodiversity functions is another question in hand.

Water
From the point of view of environmental effect, the most significant measures in this area have been taken under the National Programme for Municipal Waste Water Treatment (NPMWWT), which has been implemented since 2003. According to data from 2011, the total biodegradable contamination load coming from urban agglomerations in 2011 was reduced by 76% (compared to approx. 70% reduction in 2008), while the biogenic contamination load in municipal waste waters was reduced by 61.1% for total nitrogen and 61.8% for total phosphorus. The share of municipal and industrial wastewater discharged after treatment was 92.9% in 2008 and 93.5% in 2012. Moreover, in 2008-2012, 19 zones in Poland were declared as particularly vulnerable to nitrates from agricultural sources (Nitrate Vulnerable Zones – NVZ); their surface area totalled approx. 1.48% of the country. Action programmes were implemented in these zones in order to limit the nitrogen runoff from agricultural sources. In 2012, the surface area of NVZs increased to 4.46% of the country. Despite efforts, national nitrogen balance increased slightly compared to the situation before 2009. In comparison to the period before 2009, for common locations of surface water: 14.3% were stable, a significant increase in nitrogen concentration was noted in 35.7% of the locations and a significant decrease – in 5.3% of the locations. For common locations of groundwater, 47% were stable, 6.5% noted a significant increase in nitrogen concentration and 8.9% a significant decrease.

Air

The process of fuel combustion in the power industry and transport is the main source of air pollution in Poland. A decrease in SO_2, NO_x and dust emissions from energy generation has been observed over the course of many years. The reduction of emissions in 2011, in comparison to 2002, was: for SO_2 – approx. 45%, for NO_x – approx. 6% and for PM10 dust – approx. 35%. The quality of air in Poland, though improving, still requires intense action in order to provide safe levels for human health and ecosystems. Similarly to the preceding years, in 2009-2011, most Polish zones recorded exceeded criterion values for dust (PM10, PM2.5) and benzo(a)pyrene. The main reasons for exceeding these values were emissions related to heating (the domestic sector) or from fuel combustion in individual and local sources of heat of low efficiency, heated mainly with low quality solid fuels. In these zones, recovery programmes are implemented in order to eliminate such sources.

Soils

The chemical composition of Polish soils has been monitored since 1995. The results of this monitoring indicate that in the case of the majority of parameters describing the quality of soils, no significant changes occurred over the course of 15 years in comparison to the initial state. Observed changes of some parameters did not significantly decrease the soil's capacity to perform its functions. Operations aiming to counteract the degradation of arable soils (inter alia, by dissemination of good practices in agriculture and organic agriculture) were implemented under the RDP agro-environmental scheme in 2007-2013, especially within Package 2: *Organic farming* (by the end of 2012, 693,000 hectares – over 23 thousand farms received support) and Package 8: *Water and soil protection* (by the end of 2012, 625,000 hectares of land – almost 53 thousand farms – received support; measures related to the introduction of stubble catch crops were prevalent).

In 2009-2013, significant changes in waste management (a reform of the system of collection and recovery of communal waste in municipalities), of high significance to the conservation of soil ecosystems and a potential positive impact on the state of soils in the coming years, took place in Poland. During that period, landfill sites were adjusted to EU standards and those, which did not meet them, were closed down. The reclamation of closed landfill sites is underway, though progressing slowly; for example, in 2010, 84 out of approx. 380 hectares of closed municipal landfill sites were reclaimed, while in 2011 – only 6.2 out of 190 hectares (CSO data).

The scope of degraded land reclamation conducted in 2009-2012 was small in relation to the needs. According to CSO data, the area of degraded and devastated land was over 60,000 hectares, while annual reclamation covered 1,200-1,800 hectares in 2009-2011 and 2,700 hectares in 2012.

The draft 2014-2020 Programme refers to the issue of reducing pollution only indirectly within activities towards sustainable agriculture. However, binding EU regulations (i.e., the Water Framework Directive, the Nitrates Directive, the Urban Waste Water Directive, the Industrial Emissions Directive, the CAFE directive) guarantee that Poland will take serious action towards reducing pollutant emissions.

TARGET 9: BY 2020, INVASIVE ALIEN SPECIES AND PATHWAYS ARE IDENTIFIED AND PRIORITISED, PRIORITY SPECIES ARE CONTROLLED OR ERADICATED, AND MEASURES ARE IN PLACE TO MANAGE PATHWAYS TO PREVENT THEIR INTRODUCTION AND ESTABLISHMENT

TARGET IMPLEMENTATION STATUS	**LOW**
ASSESSMENT OF THE RATE OF PROGRESS IN REACHING THIS TARGET	**B**

In 2009-2013, scientific studies on invasive alien species with the creation of a central database of these species, as well as numerous projects for limiting their impact and for their removal from nature reserves and national parks were conducted in Poland. A number of publications on invasive alien species have been published in Poland; there is an awareness of the issue and a number of activities have been taken but they are dispersed and there is no coordinated plan at a national or regional level with precisely defined priorities and control mechanisms.

In accordance with the Act on Nature Conservation of 16 April 2004, the introduction into the natural environment or transport in such environment of plants, animals or fungi of non-native species is prohibited. Keeping, farming, breeding, offering for sale and selling alien species which, if released into the natural environment, could endanger native species or natural habitats (of invasive alien species) is possible only on prior permission from the appropriate regional director for environmental protection. Importing invasive alien species from abroad, as well as their keeping, farming, breeding, offering for sale and selling requires permission from the General Director for Environmental Protection. The above regulations do not apply to fish species, the introduction of which requires permission from the minister in charge of agriculture.

On 5 April 2012, an order of the Minister of the Environment, dated 9 September 2011, came into force with regard to a list of alien plant and animal species which, if released into the natural environment, could threaten native species or natural habitats. The list contains 16 plant species and 36 animal species.

In September 2013, the European Commission presented a draft regulation on invasive alien species. It was created with a view to a future list of invasive alien species, which present serious problems for the EU. This list will be developed together with other Member States, based on risk assessments and scientific evidence. Species present on this list will be prohibited from import into the EU, as well as purchase, use, introduction into the environment

and sale within the EU. Once in force, the regulation will need to be effectively and universally implemented in Poland.

One of the strategic goals of the draft 2014-2020 Programme is to limit the pressure of invasive and conflicting species, and operations planned to help reach this objective involve raising awareness, developing and implementing an action plan and creating an invasive alien species monitoring system.

TARGET 10: BY 2015, THE MULTIPLE ANTHROPOGENIC PRESSURES ON CORAL REEFS AND OTHER VULNERABLE ECOSYSTEMS IMPACTED BY CLIMATE CHANGE OR OCEAN ACIDIFICATION ARE MINIMISED, SO AS TO MAINTAIN THEIR INTEGRITY AND FUNCTIONING

TARGET IMPLEMENTATION STATUS	MEDIUM
ASSESSMENT OF THE RATE OF PROGRESS IN REACHING THIS TARGET	A

In 2012 commissioned, by the General Directorate for Environmental Protection, a report entitled: *Assessment of the impact of climate change on biological diversity and resulting guidelines for environmental protection administrative activities by 2030* was produced. Besides indicating the species and habitats most susceptible to changes in climate conditions, it also analysed the possible pressure on biodiversity resulting from changes in economic practices due to their adaptation to such climate changes. The report also included guidelines for environmental protection services.

Ecosystems particularly vulnerable to climate changes in Poland, similar in this respect to coral reefs, requiring special protection under this target include:

- peat bogs of every kind (very sensitive to water balance, including the quantity, as well as distribution, of rainfall),
- watercourses characterised by Ranunculion fluitantis (complex dependencies resulting in very high sensitivity to climate changes).

In October 2013, the Council of Ministers passed the *Strategic Adaptation Plan for Sectors and Areas Sensitive to Climate Change up to 2020 with a Perspective to 2030* (SAP 2020). The main objective of the SAP 2020 is to ensure the sustainability and effective functioning of the economy and society under changing climate conditions. The Plan points to the priority objectives of adaptation measures that should be taken by 2020 in areas most sensitive to climate change, such as: water management, agriculture, forestry, biological diversity, healthcare, power and construction industries, spatial planning, urban areas, transport, mountain areas and coastal areas. These actions, taken by both public and private entities, are to be implemented through policies, infrastructure investments and technological development. From the point of view of habitat protection, among the most important measures indicated were: wetland restoration (wherever possible), support for sustainable forestry in changing climate conditions, and preparing forest ecosystems for increased pressure from extreme weather events, such as periods of drought, heat waves, violent rainfalls and gusty winds.

TARGET 11: BY 2020, AT LEAST 17 PER CENT OF TERRESTRIAL AND INLAND WATER, AND 10 PER CENT OF COASTAL AND MARINE AREAS, ESPECIALLY AREAS OF PARTICULAR IMPORTANCE FOR BIODIVERSITY AND ECOSYSTEM SERVICES, ARE CONSERVED THROUGH EFFECTIVELY AND EQUITABLY MANAGED, ECOLOGICALLY REPRESENTATIVE AND WELL CONNECTED SYSTEMS OF PROTECTED AREAS AND OTHER EFFECTIVE AREA-BASED CONSERVATION MEASURES, AND INTEGRATED INTO THE WIDER LANDSCAPES AND SEASCAPES

TARGET IMPLEMENTATION STATUS	HIGH
ASSESSMENT OF THE RATE OF PROGRESS IN REACHING THIS TARGET	A

Biological diversity in Poland is preserved within area-based forms of environmental protection (established at the national level), which cover 32.5% of the area of Poland, and as Natura 2000 sites (established at the European level), covering 19.5% of the country: 145 special bird protection areas and 845 special areas of conservation of habitatss. A detailed description of area-based forms of environmental protection and their surface areas is presented in Chapter 1.2 (see Table 9). Both these systems overlap spatially to a large extent, covering a total of 40.2% of the country. It is important at this point to take into account the actual protection levels – i.e. the effectiveness of the undertaken protective measure. According to the analysis presented in section 1.2 of this report, areas, where biodiversity conservation is a priority, cover 25.5% of country and appropriate institutions to ensure its protection are established. Due to organisational weakness (lack of human resources or appropriate funds), it is not possible to meet the current protection needs in the areas of less effective protection level.

The Natura 2000 network includes 17 marine areas: 8 bird areas, 8 habitat areas and one area – Lawica Slupska – which is both a bird and a habitat area. In 2009, according to CSO data, there were 34 water nature reserves in Poland with the total area of 4,162 hectares, while in 2011, there were 44 water nature reserves with the total area of 4,652 hectares.

The Wetland Conservation Strategy with the 2006-2013 Action Plan (in accordance with the recommendations of the Ramsar Convention on Wetlands) was developed and was implemented in Poland. The superior objective of this strategy was a broad conservation of the hitherto preserved wetland areas in the country by: ensuring their sustained existence, natural character and ecological functions, halting the process of their degradation and disappearance, as well as enabling the natural restitution of degraded areas. The Ramsar Convention on Wetlands lists 13 Polish wetland areas with the total area of 145,075 hectares: national parks (Biebrza, Wigry, Polesie, Slowinski and Narew), nature reserves (Luknajno Lake, Swidwie Lake, Karas Lake, Seven Island Lake, Druzno Lake, Milicz Ponds, Slonsk – in the Warta River Mouth National Park), and subalpine peat bogs in the Karkonosze National Park. Almost all wetland areas of national and international importance have been included in the Natura 2000 network, thus creating a good basis for the future planning and implementation of protection measures, as well as the restoration and renaturation of these areas.

Poland has 11 biosphere reserves registered on the UNESCO list: the Bialowieza Forest, Babia Gora Massif, Luknajno Lake, Slowinski, East Carpathian (the first trilateral biosphere reserve in the world – Poland, Ukraine, Slovakia), Karkonosze (Poland and the Czech Republic), Tatra (Poland and Slovakia), Kampinos Forest, West Polesie (since 2012, joined with the Belarussian and Ukrainian parts; together they create a three-national trans-border reserve) and Tuchola Forest (entered on the UNESCO list in 2010).

The sub-objectives included in the draft 2014-2020 Programme, which fit into the Aichi Target 11, involve the conservation and restoration of valuable natural habitats, strengthening the management system of protected areas and the protection of areas of high natural value. Some of the measures particularly important in view of these objectives are: the implementation of conservation plans or management plans to provide a consistent Natura 2000 site management system, the creation of new and expansion of the existing national parks, the completion of the nature reserve network and the establishment of a system of wildlife corridors with an operational and management scheme. A significant increase in the number and size of areas of strict protection (category 1 in the IUCN) should also be considered an important goal.

TARGET 12: BY 2020, THE EXTINCTION OF KNOWN THREATENED SPECIES HAS BEEN PREVENTED AND THEIR CONSERVATION STATUS, PARTICULARLY OF THOSE MOST IN DECLINE, HAS BEEN IMPROVED AND SUSTAINED

TARGET IMPLEMENTATION STATUS	**MEDIUM**
ASSESSMENT OF THE RATE OF PROGRESS IN REACHING THIS TARGET	**B**

The monitoring of a certain number of species, including some endangered species, is being conducted and a variety of protective measures have been undertaken in Poland. There are positive examples of restoring some populations, while others, despite protective measures, are still endangered. It is difficult to state with confidence that the situation of all endangered species has improved, due to insufficient information and difficulties in isolating the real reasons for the loss of individual taxa or their populations.

Among all species present in Poland, 1,159 animal species, including 1080 species of invertebrates (of which 784 are insects) and 79 species of vertebrates (13 – mammals, 34 – birds, 3 – reptiles, 29 – fish), 328 species of vascular plants, 62 moss species, 545 lichen species, 637 species of macromycetes and 232 species of algae have been listed as endangered [critically endangered (CR), endangered (EN) or vulnerable (VU)].

Among Polish birds, the highest relative risk affects the order of galliformes, which includes 7 species, 5 of which are on the list of endangered species. Three orders, the Accipitriformes, the owls and the Gruiformes, are equally endangered, and with nearly half of their species included on the Red List. The conservation status of these species has been improving, however, since the introduction of protection areas around their nests and other refuges.

The population sizes of most amphibians and reptiles show a downward trend, which has been continuing for many years. 4 amphibian species and 4 reptile species are on the Red List of endangered species. Among the most endangered in Poland are: European green lizard (*Lacerta viridis*), the Aesculapian snake (*Zamenis longissimus*), European pond turtle (*Emys orbicularis*), smooth snake (*Coronella austriaca*), northern crested newt (*Triturus cristatus*), agile frog (*Rana dalmatina*) and Carpathian newt (*Lissotriton montandoni*).

In Polish fresh waters, 37 taxa of lamprey and fish are currently the most endangered. The highest categories (EXP, EW, CR) include anadromic (diadromous) species: the Atlantic sturgeon (*Acipenser oxyrinchus*), Atlantic salmon (*Salmo salar*), sea lamprey (*Petromyzon marinus*), twait shad (*Alosa fallax*), allis shad (*Alosa alosa*), vimba bream (*Vimba vimba*), sichel (*Pelecus cultratus*), European river lamprey (*Lampetra fluviatilis*), and huchen (*Hucho hucho*). 12 species with specific environmental needs are included in categories EN and VU. 19 species, accounting for 29.7% of the native ichthyofauna, are in the group of species of least concern (LC).

Compared to other EU countries, the share of total endangered mammals, birds, fish and vascular plants among all species identified in Poland is relatively low.

In accordance with the draft 2014-2020 Programme, in order to preserve species present in the protected areas, it will be necessary to promptly implement measures included in the guidelines for conservation plans. For these measures to be effective, lists of habitats, endangered species and their conservation needs will have to be updated.

TARGET 13: BY 2020, THE GENETIC DIVERSITY OF CULTIVATED PLANTS AND FARMED AND DOMESTICATED ANIMALS AND OF WILD RELATIVES, INCLUDING OTHER SOCIO-ECONOMICALLY AS WELL AS CULTURALLY VALUABLE SPECIES, IS MAINTAINED, AND STRATEGIES HAVE BEEN DEVELOPED AND IMPLEMENTED FOR MINIMISING GENETIC EROSION AND SAFEGUARDING THEIR GENETIC DIVERSITY

TARGET IMPLEMENTATION STATUS	MEDIUM
ASSESSMENT OF THE RATE OF PROGRESS IN REACHING THIS TARGET	A

Poland is an exceptional example of a Central European country where, thanks to the fragmented agricultural structure, local forms of crop plants have been preserved to this day. Local crop plant materials are found mainly in the southern regions of the country, such as the mountainous region of the Beskid and Tatra Mountains, and Pogorze. Smaller refuges have been found in eastern and south-eastern parts of Poland, in Podlasie and the Sandomierz Basin. Geographic, environmental and sociological factors favour local cultivars in these regions. On the other hand, it has to be emphasised that local varieties successfully compete against new varieties in these regions. Also some relict varieties, such as the false flax (*Camelina*), oilseed radish (*Raphanus sativus* L. var. *oleiformis* Pers) or proso millet (*Panicum miliaceum)*, are characteristic for these regions. Documented examples of active farming practices, such as the cultivation of populations of vetches (*Vicia*) selected from weed populations of this species for fodder purposes, have been gathered.

Ex situ protection of national genetic resources of cultivated plants has been carried out through harvesting and preserving still existing local varieties of crops and related species in the Gene Bank at the Plant Breeding and Acclimatisation Institute (IHAR) in Radzikow. Programmes for *in situ* protection of genetic resources of crop plants and farm animals are being implemented on a large scale. The issue of the protection of genetic diversity have been discussed in more detail in Chapter 2.3.

The draft 2014-2020 Programme anticipates further support for biodiversity conservation on farmland through targeted expenditure of the agro-environment-climatic scheme resources.

TARGET 14: BY 2020, ECOSYSTEMS THAT PROVIDE ESSENTIAL SERVICES, INCLUDING SERVICES RELATED TO WATER, AND CONTRIBUTE TO HEALTH, LIVELIHOODS AND WELL-BEING, ARE RESTORED AND SAFEGUARDED, TAKING INTO ACCOUNT THE NEEDS OF WOMEN, INDIGENOUS AND LOCAL COMMUNITIES, AND THE POOR AND VULNERABLE

TARGET IMPLEMENTATION STATUS	MEDIUM
ASSESSMENT OF THE RATE OF PROGRESS IN REACHING THIS TARGET	B

The issue of preserving and restoring ecosystem functions is a priority of the EU Biodiversity Strategy to 2020, intended to encompass the whole country. It is planned to be based on: an assessment of the state of ecosystem services (benefits arising from ecosystem functions), the development of a valuation system of ecosystem services and inclusion of their values in the development strategy, a planning system and national systems of accounting and reporting. Thanks to these activities, biodiversity will acquire the status of a driver of growth in national development programmes and it will be more readily recognised by politicians. The planning and implementation of green infrastructure designed to restore the functions of 15% of the degraded ecosystems is also planned.

The idea of green infrastructure, closely related to the concept of wildlife corridors, planned to form a basis for the infrastructure, is not new in Poland. A project of wildlife corridors connecting protected areas into a spatially coherent system – despite the lack of applicable legislation – has already been developed and is being taken into account in the Concept of National Spatial Planning, planning studies, and EIA procedures. Experience gained in this field will significantly facilitate the implementation of this undertaking. Systemic solutions being the most beneficial, the green infrastructure should be maximally integrated with the existing environmental conservation system, especially with landscape protection areas, which by default perform spatial connectivity functions. Such a proposal entails a rationalisation of the nature protection system in our country.

The draft 2014-2020 Programme includes activities such as the demarcation of a system of wildlife corridors with its operational and management system and an amendment of the Nature Conservation Act to take into account the management principles of wildlife corridors.

As described in more detail in Chapter 1.1, comprehensive analyses of ecosystem services and their valuation have not yet been conducted in Poland. However, measures to preserve and restore the most valuable ecosystems and their functions have been carried out. In the case of forest ecosystems these have been: granting 38.7% of forests in all ownership structures the status of protection forests, in which – depending on their dominating functions – a modified approach, involving putting limits on clear cutting, raising the minimum cutting age and adjusting the composition of species to their functions, have been used; the restoration of forest stands in order to increase the share of deciduous species and to diversify the ages of forest stands and species structure (in 2009-2012, forest

stand restoration completed on 40.900 hectares of land), the European silver fir restitution programme in the Sudety Mountains (in 2009-2012, the area where silver fir was introduced reached nearly 950 hectares) and the European yew conservation and restitution programme (in 2007-2012, there were 116 hectares of maintenance breeding areas, where over 400 thousand European yews were introduced).

Numerous research projects and restitution programmes or ecosystem renaturation schemes have been conducted in Poland, particularly for wetlands (mainly peat bogs, but also rivers and springs). Activities of this kind are conducted both by governmental and non-governmental organisations, as well as scientific centres. With regard to the conservation of water ecosystem functions, a reduction of released pollutants has had the greatest impact on their condition, as described in more detail in the section on Aichi Target 8. Measures for the renaturisation of riverbeds have been carried out on a relatively small scale in Poland, usually as initiatives of NGOs, and involved: connecting a single old riverbed to a regulated riverbed, old water treatment (old riverbeds, ponds, small reservoirs), and the restoration of wet biotopes in forests. The largest-scale activities of this kind have been carried out since 2011 in the Biebrza National Park under the LIFE+ project entitled *The restoration of the hydrological system in the Middle Basin of the Biebrza Valley*. *Phase I.*

TARGET 15: BY 2020, ECOSYSTEM RESILIENCE AND THE CONTRIBUTION OF BIODIVERSITY TO CARBON STOCKS HAS BEEN ENHANCED, THROUGH CONSERVATION AND RESTORATION, INCLUDING RESTORATION OF AT LEAST 15 PER CENT OF DEGRADED ECOSYSTEMS, THEREBY CONTRIBUTING TO CLIMATE CHANGE MITIGATION AND ADAPTATION AND TO COMBATING DESERTIFICATION

TARGET IMPLEMENTATION STATUS	**MEDIUM**
ASSESSMENT OF THE RATE OF PROGRESS IN REACHING THIS TARGET	**B**

Based on available data on wood resources, the carbon content of tree biomass in Polish forests has been estimated at 1,099 million tonnes, including 26 million in dead wood (State of Europe's Forests 2011). Moreover, the quantity of CO_2 sequestrated by forests (along with soils and taking into account the use of forests) has been estimated at 51.9 million tonnes, which corresponds to approx. 14.2 million tonnes of carbon.

In Poland, the input of ecosystems into carbon storage requires fundamental changes in agricultural farming on peat soils. This refers mainly to extensive fens. Currently, an "optimisation" of water levels in the peat soils for agricultural needs is assumed in this kind of farming, which usually results in the decomposition of the peat surface. As a result, Poland is the 10th largest emitter of CO_2 from degrading and decomposing peat bogs in the world. A rather fundamental change would be required here – peat bog conservation on a national scale through the restoration and maintenance of optimal irrigation levels and a resulting adjustment of agricultural technologies to the existing water conditions, rather than the other way round.

In October 2013, the Council of Ministers passed the *Strategic Adaptation Plan for Sectors and Areas Sensitive to Climate Change up to 2020, with a Perspective to 2030*. The main objective of the SAP 2020 is to ensure the sustainability and effective functioning of the economy and society under changing climate conditions. This document suggests priority adaptation measures to be undertaken by 2020. From the point of view of habitat protection, among the most important measures are those pertaining to wetland areas and their restoration wherever possible and those supporting sustainable forestry under changing climate conditions, as well as preparing forest ecosystems for increased pressure from escalating extreme weather events, such as periods of drought, heat waves, violent rainfalls and gusty winds.

Different activities pertaining to sustainable forest management and the augmentation of forest cover are described in more detail in Chapter 1.2. Measures to restore natural ecosystem functions responsible for water management regulation were included in two major projects for the improvement of water retention, implemented in 2007-2014 in the State Forests: *Improvement of retention opportunities and prevention of floods and drought in forest ecosystems in lowland areas*, covering the renaturation of wetlands, and *Countering the effects of rainwater runoff in mountain areas – Increasing retention and keeping streams and related infrastructure in good condition*, covering the retention and renaturasation of permanent watercourses and wetlands.

The restoration of degraded ecosystems and their services is one of the objectives of the draft 2014-2020 Programme. This objective is to be implemented through the identification of priorities for the restoration of degraded ecosystems and the development and implementation of programmes for the restoration of degraded ecosystems and their services.

TARGET 16: BY 2015, THE NAGOYA PROTOCOL ON ACCESS TO GENETIC RESOURCES AND THE FAIR AND EQUITABLE SHARING OF BENEFITS ARISING FROM THEIR UTILIZATION IS IN FORCE AND OPERATIONAL, CONSISTENT WITH NATIONAL LEGISLATION

TARGET IMPLEMENTATION STATUS	**MEDIUM**
ASSESSMENT OF THE RATE OF PROGRESS IN REACHING THIS TARGET	**B**

As one of its measures, the EU Biodiversity Strategy 2011-2020 includes the implementation of the Nagoya Protocol throughout the EU by 2015. In 2012, a proposal for a Regulation of the EU Parliament and of the Council on access to genetic resources and the fair and equitable sharing of benefits arising from their utilization in the Union (COM 2012/576/FINAL) has been developed by the European Commission. Then it was subject of the work of the European Parliament and of the Council of the EU. Once in force, this regulation will be a legal act applicable directly in Poland (the same as in any other EU Member State), governing obligations of users of genetic resources and traditional knowledge associated with these resources. In 2013, the Ministry of the Environment has published the contents of the Nagoya Protocol in Polish, conducted a wide consultation with stakeholders, and organised a conference on the implementation of the Protocol and proposed regulations.

TARGET 17: BY 2015, EACH PARTY HAS DEVELOPED, ADOPTED AS A POLICY INSTRUMENT, AND HAS COMMENCED IMPLEMENTING AN EFFECTIVE, PARTICIPATORY AND UPDATED NATIONAL BIODIVERSITY STRATEGY AND ACTION PLAN

TARGET IMPLEMENTATION STATUS	**HIGH**
ASSESSMENT OF THE RATE OF PROGRESS IN REACHING THIS TARGET	**A**

Currently work on the 2014-2020 Programme and Action Plan for the Protection and Sustainable Use of Biological Diversity is underway; this is a continuation of the 2007-2013 National Strategy and Action Plan for the Protection and Sustainable Use of Biological Diversity; adapted to the purpose of the Strategic Plan for Biodiversity and Aichi Targets 2020. The document will be submitted for approval to the Council of Ministers in 2014.

TARGET 18: BY 2020, THE TRADITIONAL KNOWLEDGE, INNOVATIONS AND PRACTICES OF INDIGENOUS AND LOCAL COMMUNITIES RELEVANT FOR THE CONSERVATION AND SUSTAINABLE USE OF BIODIVERSITY, AND THEIR CUSTOMARY USE OF BIOLOGICAL RESOURCES, ARE RESPECTED, SUBJECT TO NATIONAL LEGISLATION AND RELEVANT INTERNATIONAL OBLIGATIONS, AND FULLY INTEGRATED AND REFLECTED IN THE IMPLEMENTATION OF THE CONVENTION WITH THE FULL AND EFFECTIVE PARTICIPATION OF INDIGENOUS AND LOCAL COMMUNITIES, AT ALL RELEVANT LEVELS

TARGET IMPLEMENTATION STATUS	**Data insufficient for assessment**
ASSESSMENT OF THE RATE OF PROGRESS IN REACHING THIS TARGET	**D**

In Poland, a framework for public participation in decision making process is in place thanks to nation-wide democratic mechanisms, and public participation procedures of the SEIA. However, there is no data on actual possibilities and on the use of these mechanisms by local communities. There is no doubt that the growth of popularity of local goods/products/brands and the sense of identity with "little homelands", including their natural values, are positive trends.

Aichi Target 18 can be implemented in Poland through: maintaining the rights of local communities to a sustainable use of selected forest resources (not restricting these rights beyond real needs arising from the necessity of species and habitat protection); an authorisation for traditional sustainable pasture in a scale adjusted to habitat capacities, especially in mountainous areas, including its use for the protection of some anthropogenic habitats; the use of traditional methods for controlling damage caused by large predators (especially a promotion of the use of sheepdogs of traditional breeds).

TARGET 19: BY 2020, KNOWLEDGE, THE SCIENCE BASE AND TECHNOLOGIES RELATING TO BIODIVERSITY, ITS VALUES, FUNCTIONING, STATUS AND TRENDS, AND THE CONSEQUENCES OF ITS LOSS, ARE IMPROVED, WIDELY SHARED AND TRANSFERRED, AND APPLIED

TARGET IMPLEMENTATION STATUS	MEDIUM
ASSESSMENT OF THE RATE OF PROGRESS IN REACHING THIS TARGET	B

A number of environmental research studies, databases and important monitoring studies have been developed and carried out in Poland. Several dozens of scientific research units operate in the country, conducting research on broadly defined biological diversity. Some of them are: the Institute of Nature Conservation of the Polish Academy of Sciences (PAS) in Krakow, the Institute of Environmental Protection in Warsaw, the Institute of Botany of the Polish Academy of Sciences in Krakow, the Forest Research Institute, the Marine Station of the University of Gdansk Institute of Oceanography, the Mammal Research Institute of the Polish Academy of Sciences in Bialowieza, the Ornithological Station of the Institute of Zoology (PAS) in Gdansk, the Centre for Ecological Research (PAS) in Dziekanow, the Maritime Institute in Gdansk, the Inland Fisheries Institute in Olsztyn, the Plant Protection Institute, the Pathogen Gene Bank, the Plant Breeding and Acclimatization Institute (IHAR) in Radzikow, the Institute of Ichthyobiology and Aquaculture (PAS) in Golysz, the Institute of Dendrology (PAS), the Institute of Soil Science and Plant Cultivation in Pulawy, the Institute of Technology and Life Sciences in Falenty, the Kostrzyca Forest Gene Bank and the Research Institute of Horticulture.

The scientific research studies, research and development activities, grants, and long-term programmes and projects all pertain to broadly understood biodiversity conservation in Poland, the threats it faces and conservation issues, including conflicts between the environmental needs and those of the socio-economic growth of the country. They include *in situ*/*ex situ* activities and biodiversity issues on the level of genes and species, as well as habitat diversity issues, including agro-biodiversity. Undertakings of the Institute of Nature Conservation of the Polish Academy of Sciences in Krakow are a good illustration of the various activities carried out: *Social attitudes of people working in nature protection with regard to alien species management in Poland* (2009-2011), *Current population sizes of endangered vascular plant species – basis for a new edition of the Polish Plant Red Data Book* (2010-2012), *The impact of climate parameters, habitats and anthropopressure on the plant and bird distribution in Lesser Poland* (2009-2013), *The book of invasive alien species in Poland's fauna* (2011-2012), *Fragmentation or invasion – what poses a higher risk to biodiversity?* (2011-2013), *Phytosociological database in the assessment of the diversification, transformation and state of conservation of meadow vegetation in Polish Carpathians* (2009-2012), *An atlas of Polish amphibians and reptiles – a new, revised edition* (2011-2014), *The protection of mountainous plant populations through bank genes, cultivation and introduction to natural locations* (2010-2013), *Restoration of wildlife corridor connectivity in the Biala Tarnowska River valley* (2010-2014), *Models of bear habitat quality in Bieszczady Mountains and in the Polish Carpathians – consequences for the protection of the species, forest management and spatial planning* (2007-2010), *Genetic bases for wing dysfunction of the Mountain Apollo – mechanisms and consequences for environmental protection* (2007-2010), *Active protection of the Aesculapian Snake in Western Bieszczady Mountains* (2011-2014).

It should be emphasised that the above-mentioned projects constitute only a narrow section of the activities of one of many research institutes that operate in Poland. It also has to be stated that, generally speaking, knowledge on biodiversity is constantly improving, though it is still inadequate in relation to the needs. Similarly, despite increasing expenditure on scientific research [e.g. in the Institute of Nature Conservation (PAS) the value of funds increased from PLN 6.3 million (USD 2.02 million) in 2009 to PLN 11 million (USD 3.48 million) in 2013], financial limitations are a serious concern. Moreover, the implementation of conclusions and guidelines based on the collected knowledge, especially in other sectors of the economy, is problematic. This follows from relatively low awareness of the importance and value of biological diversity.

The entry into force of the Act of 3 October 2008 on the provision of information on the environment and its protection, public participation in environmental protection and environmental impact assessments and the Act of 4 March 2010 on spatial information infrastructure (transposing the 2007/2/EC – INSPIRE Directive) led in 2009-2013 to significant improvements in methods of sharing information on the environment and its protection by public institutions, mainly through creating publicly accessible databases (also spatial ones) in electronic form, available on line.

The draft 2014-2020 Programme covers the development of scientific research with a view to improving knowledge on biological diversity and the integration of and increased access to information on biological diversity.

In 2014, the National Centre for Research and Development is planning to start implementing the strategic programme, *Natural environment, agriculture and forestry* – BIOSTRATEG. The programme covers five strategic problem areas: food security and safety; rational management of natural resources with particular focus on water management; the prevention of and adaptation to climate change with particular focus on agriculture; conservation of biodiversity and sustainability of agricultural production; forestry and wood industry. The total planned budget of the Programme, covering projects for scientific research, development works and preparing for implementation, is approx. PLN 500 million (over USD 160 million).

TARGET 20: BY 2020, AT THE LATEST, THE MOBILIZATION OF FINANCIAL RESOURCES FOR EFFECTIVELY IMPLEMENTING THE STRATEGIC PLAN FOR BIODIVERSITY 2011-2020 FROM ALL SOURCES, AND IN ACCORDANCE WITH THE CONSOLIDATED AND AGREED PROCESS IN THE STRATEGY FOR RESOURCE MOBILIZATION, SHOULD INCREASE SUBSTANTIALLY FROM THE CURRENT LEVELS. THIS TARGET WILL BE SUBJECT TO CHANGES CONTINGENT TO RESOURCE NEEDS ASSESSMENTS TO BE DEVELOPED AND REPORTED BY PARTIES

TARGET IMPLEMENTATION STATUS	**MEDIUM**
ASSESSMENT OF THE RATE OF PROGRESS IN REACHING THIS TARGET	**A**

In 2013, draft methodology for gathering and converting data on financial resources for broadly defined biodiversity protection activities was developed within efforts to implement the Strategy for Resource Mobilization in support of the achievement of the objectives of the Convention on Biological Diversity. In 2006-2010, these resources were estimated in order to establish the initial level to which needs and expenses could be compared in future years. The estimation covered both expenditure on supporting biodiversity in developing countries (approx. USD 1.5 million) and national expenditure from, i.a., the budget, EU funds and environmental protection and water management funds, on activities pertaining directly and indirectly to biodiversity in various industry sectors (approx. USD 560 million per year).

According to current estimates, in 2014-2020, an outlay of approx. USD 96 million is required only for liabilities of Natura 2000 sites. The implementation of active habitat and species protection will require a further USD 1.3 billion.

In 2014-2020, Poland will have access to financial resources for biodiversity conservation from EU funds, where the most significant financial contribution is anticipated under the agro-environment-climatic scheme of the RDP. As a reform (greening) of the Common Agricultural Policy is being implemented, direct payments from pillar 1 envelope to farmers, dependent (in 30%) on their respecting certain obligatory agricultural practices (crop diversification, retaining areas under permanent grassland, retaining ecological focus areas on farmland or other equivalent measures), will serve as a financial instrument to promote biodiversity conservation.

Also the NFEP&WM has planned priority programmes for biodiversity conservation –approx. PLN 150 million (about USD 48 million) for 2014-2015. The operational programme *Protection of biodiversity and ecosystems* of the European Economic Area Financial Mechanism 2009-2014 envisages approximately EUR 20 million (approx. USD 27.5 million) for 2013-2016 for activities towards: an increase in the effectiveness of Natura 2000 site management and monitoring, an increase in the resistance of native ecosystems to the pressure of invasive alien species, raised public awareness of biological diversity, better education in this area linked with the issues of climate change and the economic value of ecosystems, and an increased potential of NGOs to promote biological diversity.

As an innovative financing instrument, an objective of the draft 2014-2020 National Programme is to initiate a pilot financial support mechanism for biodiversity-friendly enterprises.

The period after 2020, when similar-scale EU funding will not be available, may witness problems with financing biodiversity conservation.

TABLE 33. SYNERGY EFFECTS FOLLOWING THE IMPLEMENTATION OF OTHER INTERNATIONAL ENVIRONMENTAL PROTECTION CONVENTIONS IN POLAND

Convention	Measures undertaken (selection)	Aichi Target	Impact mechanism	Scale of impact
United Nations Framework Convention on Climate Change (**UNFCCC**)	In 1988-2011, greenhouse gas emissions in Poland were reduced by 28.7% net to CO_2 equivalent; in terms of CO_2 itself – by 29.3% (excluding LULUCF)[28].	**10.** Minimisation of anthropogenic pressures on vulnerable ecosystems impacted by climate change or ocean acidification	**Indirect**	**Global**
United Nations Convention to Combat Desertification (**UNCCD**)	According to the UNCCD, Poland is not a country threatened by desertification and the country's involvement in providing official developmental help to countries threatened by this phenomenon is insignificant. During Polish presidency of the EU Council in 2011, Poland was very active in the development of COP10 UNCCD, particularly in the coordination of the EU position. In its actions, Poland aimed at: raising the efficiency of Convention institutions and mechanisms; directing the Convention towards taking action rather than creating institutions; increasing the significance of the Convention on the international forum; an appropriate use of the Convention's resources in order to guarantee its effectiveness and efficiency.	**15.** Ecosystem resilience and contribution to carbon stocks	**Indirect**	**Global**
Convention on Wetlands (**Ramsar Convention**)	Poland has developed and has been implementing the *Strategy and Action Plan for Wetland Conservation in Poland for the years 2006-2013*. The list of the Ramsar Convention on Wetlands includes 13 Polish wetlands with the total area of 145,075 hectares. Almost all wetlands, important both domestically and internationally, have been included in the Natura 2000 network. In 2009-2013, the National Secretariat of the Ramsar Convention was created and the preparation of management plans for Natura 2000 sites, including for the majority of Ramsar sites and other nationally important wetlands, was started. A national programme for the protection of alkaline peatland has also been developed. Several projects for the restoration and renaturation of wetland areas have been implemented. There has also been significant progress in marsh inventories and funds have been secured for marsh conservation and renaturation projects with input from EU funds.	**11.** A system of protected areas	**Direct**	**Local**

[28] Poland is under obligation to reduce greenhouse gas emissions by 6% and has accepted 1988 as the base year for obligations arising from the UNFCCC Convention and the Kyoto Protocol

Convention	Measures undertaken (selection)	Aichi Target	Impact mechanism	Scale of impact
Convention on International Trade in Endangered Species of Wild Fauna and Flora (**the Washington Convention – CITES**)	The EU, being one of the most important commercial outlets of wild animals, plants, their parts and products originating from them, has implemented the CITES Convention through regulations applicable directly in the Member States, including Poland: Council Regulation (EC) No 338/97 on the protection of species of wild fauna and flora by regulating trade therein; with a list of species under trade regulation and a number of other implementing regulations of the EU. The above regulations lay down stricter criteria of importing and conducting commercial activities with species than defined by the CITES. In 2009-2012 Polish customs services seized 739 encompassing a total of 56,358 specimens of CITES species.	**12.** Prevention of the extinction of threatened species	**Indirect**	**Global**
Convention on the Conservation of European Wildlife and Natural Habitats (**the Berne Convention**)	As a member of the EU, Poland pursues the Convention's objectives mainly through implementing the EU Habitat and Bird Directives. In 2004-2013, the Natura 2000 network was created and placed under protection – 145 special bird protection areas and 845 special areas of conservation of habitats, which together cover 19.5 % of the country area. In 2009-2013, scientific studies on invasive alien species were conducted in Poland, including the creation of a central database of these species, as well as numerous projects limiting the impact and removal of invasive alien species from nature reserves and national parks. Also draft protection plans for large predators – wolf, lynx and brown bear – were developed and international cooperation on the management of trans-border populations of large predators was held. In 2009-2013, numerous activities aimed at raising public awareness of species and landscape protection needs were also conducted (conferences, publication of information and promotion materials, research publications, guidelines).	**5.** Halting the loss of natural habitats **9.** Prevention of invasive alien species **12.** Prevention of the extinction of threatened species and **1**, **2**, **6** and **11**.	**Direct**	**Local**
Convention on the Conservation of Migratory Species of Wild Animals (**the Bonn Convention**)	Measures taken by Poland involved mainly the monitoring of migratory bird species (in 2010 its scope was significantly expanded), bat species and small cetacean species, as well as placing them under species protection and protecting their habitats (mainly under the Natura 2000 network) on Poland's territory.	**12.** Prevention of the extinction of threatened species **6.** Sustainable collection of (marine) water organisms	**Direct**	**Global**
The Framework Convention on the protection and sustainable development of the **Carpathians**	The objective of this convention is to pursue a comprehensive policy and cooperate for the protection and sustainable development of the Carpathians with a view to improving the quality of life, strengthening local economies and communities, and preserving natural values and cultural heritage. Poland is actively engaged in all measures undertaken under the Convention, including in the working group on the protection and sustainable use of biological and landscape diversity and the working group on sustainable forestry and agriculture.	**5.** Halting the loss of natural habitats **7.** Sustainable agriculture, aquaculture and forestry oraz **1,9,11,12,14**	**Indirect**	**Local**

Convention	Measures undertaken (selection)	Aichi Target	Impact mechanism	Scale of impact
Convention Concerning the Protection of the World Cultural and Natural Heritage (**the Paris Convention**)	The following natural sites in Poland are on the UNESCO world heritage list: (1) the Bialowieza Forest (a natural, primeval forest) – a Polish-Belarusian trans-border site; (2) the Muskauer Park (a landscape park) – a Polish-German trans-border site.	**5.** Halting the loss of natural habitats	**Indirect**	**Local**
European Landscape Convention	In the framework of the National Landscape Convention Secretariat, founded in 2010, numerous tasks have been completed, e.g.: the development of landscape conservation reports, the organisation of a conference with representatives of landscape management institutions and research institutions, the preparation of promotional and educational materials and, in 2012, the announcement of the first edition of the Polish Landscape Award, won by the Lower Silesia Complex of Landscape Parks. Since 2012, the Secretariat has been involved in work on the presidential draft legal act on amending certain acts towards a strengthening of landscape conservation instruments. The draft act was presented to the Polish Sejm (the lower house of the Parliament) for discussion in July 2013.	**1.** Raise ecological awareness **14**. Restoration and safeguarding of ecosystems providing essential services	**Indirect**	**Local**

3.2 CONTRIBUTION OF MEASURES UNDERTAKEN FOR THE IMPLEMENTATION OF CONVENTION IN MEETING THE MILLENNIUM DEVELOPMENT GOALS

As described in Part II of this Report, measures taken in Poland and aimed at implementing the objectives of conventions, including those for the implementation of the Aichi Targets, naturally supported efforts towards reaching Target 7: *Ensuring environmental sustainability* of the Millennium Development Goals, particularly in terms of:

- integrating the principles of sustainable development into country policies and programmes (sub-objective 7.A – described in more detail in Chapter 2.4)
- reducing biodiversity loss (sub-objective 7.B), which was to be implemented by 2010 through a significant reduction of the loss rate of, i.a.:
  - ✓ the share of forested land (in 2009-2012, forest cover in Poland increased by 0.3% of the country's total area, as described in more detail in Chapter 1.2);
  - ✓ the share of protected areas (in 2009-2012, protected areas in Poland rose by approx. 0.2% of the country's total area, as described in more detail in Chapter 1.2).

It has to be mentioned that Poland, as a developed country, endorses the Millennium Development Goals mainly through supporting developing countries, including the countries of the Eastern Partnership. Towards this end, in 2009-2013 Poland completed numerous projects of bilateral assistance, such as:

- Armenia: preparation and delivery of a series of training sessions for specialists in the management of chemical substances and environmental protection in Armenia (i.a., improving ecological standards in municipal services, improving the waste management system, the promotion and implementation of good practices in water management, raising public environmental awareness through environmental education, raising the number of pro-environmental and energy saving solutions in the housing and municipal sector and in industry, prevention of environmental degradation and neutralisation of the negative effects of climate change);
- Azerbaijan: an institutional strengthening of the Azerbaijani administration responsible for environmental protection through the promotion of good management in selected fields (the implementation of new mechanisms of local community cooperation for environmental protection, support for social groups active in environmental protection, environmental degradation and climate change prevention, elimination of risks of contamination with toxic substances and hazardous waste, strengthening the efforts of the country and local communities to prepare for coping with natural disasters and reducing the risk of their occurrence);
- Georgia: development of a basis for comprehensive forestry management in the Georgian region of Racha; support for a reform in forestry – forest conservation through enhancing the competences of foresters;
- Tajikistan: raising awareness of environmental protection and sustainable management among local communities of Tajikistan – the world's mainstay of biodiversity;
- Ukraine: the development of basic nutritional biotechnology for juvenile endangered fish for aquacultural needs in Ukraine.

3.3 CONCLUSIONS FROM THE IMPLEMENTATION OF CONVENTION IN POLAND

Environmental protection measures taken in Poland in 2009-2013, the reference years of this report, should be assessed as positive, particularly because of the intensification of active protection measures and the scale of financial support they were given. However, it should be stated that despite increasing environmental awareness of the society, biodiversity efforts made in our country are still far from sufficient. It has to be remembered that a successful conservation of biological diversity still presents a big challenge, especially with regard to the modern approach, in which the value of ecosystem services is taken into account in decision making and the issue of biodiversity conservation is included in activities of other economic sectors. It is desirable to focus further action on the following problem areas:

- Scientific research which explains the mechanisms that link species, habitats and the condition of the environment with their potential to provide ecosystem services;
- Shaping public awareness of the significance of biodiversity in economic terms, including its impact on social welfare;
- The development and implementation of valuation mechanisms for biodiversity resources and ecosystem services in such a way that they become a permanent element of prosperity assessment and national statistics and serve as considerable premises in current economic decisions, on the level of shaping sector policies, economic decisions made by entrepreneurs, or shaping individual consumption patterns;
- Tools such as spatial planning or the EIA system should be improved; this conclusion refers to not only to biodiversity issues but to more broadly understood environmental protection and sustainability;
- Propagation of the use of instruments such as spatial planning and the EIA system will help to create a synergy effect: protecting new valuable sites and natural areas while preserving (or restoring) the connectivity of wildlife corridors will help to preserve biological diversity and increase the resilience ecosystems. Nature protection in closed enclaves and creating corridors in degraded landscape alone will not produce the desired effects, while simultaneous intervention in both areas will increase the durability of the results of the efforts;
- The existence of synergy can also be considered in the context of the added value of the implemented measures. For example, the development and promotion of organic agriculture and issuing quality certificates are measures that not only support the protection of the earth's surface through enhancing the country's food security and the health of its inhabitants, but also to particular economic benefits;
- Bringing up ethical arguments could support a broader inclusion of ecosystem services. This refers not only to nature protection as such but above all, to shaping desirable sustainable consumption patterns.

ANNEX 1. INFORMATION ON THE PREPARATION OF THE REPORT AND LITERATURE

INFORMATION ON THE PREPARATION OF THE REPORT

The report is based on Article 26 of the Convention on Biological Diversity and decision X/10 of the Conference of the Parties ***National reporting: review of experience and proposals for the fifth national report*** (UNEP/CBD/COP/DEC/X/10, 29 October 2010).

Work on the report proceeded in two stages. Stage I involved the preparation of a draft report, while stage II consisted in carrying out detailed, extensive expert consultation and development on the basis of the comments and discussions held, the final version of the report.

In the course of work on the preparation of the Fifth National Report on the Implementation of the Convention on Biological Biodiversity, the following test methods were used:

- Desk research (analysis of literature, strategic and planning documents, legal issues),
- Statistical data analysis (including the analysis of data from the Central Statistical Office and the results of the State Environmental Monitoring Programme),
- Matrix analysis (an assessment of the implementation status of strategy objectives and action plans),
- Expert analysis (qualitative assessment on the basis of collected materials/information),
- GIS spatial analysis and case studies,
- Surveys with 615 entities directly and indirectly involved in biodiversity conservation in Poland and 415 communes
- Mechanisms for interinstitutional and interdepartmental cooperation.

The preparation process of the Fifth National Report on the Implementation of the Convention on Biological Biodiversity include the following research methods:

- Analysis of the Guidelines for the Fifth National Report and the Resource manual for the Fifth National Report and the development of the Report's structure (to make it correspond to the research questions arising from the guidelines).
- Acquisition of information from literature and survey results.
- The presentation of assumptions for the process of preparing the Fifth Report at the meeting of the Steering Committee on the implementation of the National Strategy for the Conservation and Sustainable Use of Biological Diversity; working meetings and presentations of current progress in the seat of the ordering party.
- Drafting of the Fifth National Report, based on the following:
  - analysis of the importance of biodiversity in Poland, including ecosystem services (taking into account an analysis of economic scientific research on biodiversity carried out in Poland),
  - analysis of changes in the state and trends in biodiversity conservation (including analyses based on statistical data from the CSO and SEMP),
  - biodiversity threats assessment,
  - assessment of the implementation status of the *2007-2013 National Strategy and Action Plan for the Protection and Sustainable Use of Biological Diversity*,
  - analysis of the draft 2014-2020 Programme,
  - identification and description of measures taken for the implementation of the Convention in Poland in the years 2009-2013,
  - analysis of financial expenditures on biodiversity conservation,
  - analysis of the inclusion of biodiversity issues into other sectoral policies and synergy effects resulting from the implementation of other environmental conventions,

- evaluation of progress in the implementation of the 2020 (Aichi Targets) and 2015 (Millennium Development Goals) objectives.

- Consultation on the report, with the participation of experts from institutions/organizations such as: Ministry of the Environment, Ministry of Agriculture and Rural Development, Ministry of Infrastructure and Development, General Directorate for Environmental Protection, Directorate General of State Forests, National Fund for Environmental Protection and Water Management, Chief Inspectorate of Environmental Protection, Institute of Environmental Protection, Polish Mycological Society. Consultations with the participation of State Council for Nature Conservation were held. The vast majority of comments, observations and suggestions have been taken into account and implemented.

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ANNEX 2. ONLINE SOURCES

WEBSITES OF INSTITUTIONS

General Directorate of Environmental Protection (EN) www.gdos.gov.pl

Chief Inspectorate of Environmental Protection (EN) http://www.gios.gov.pl/?language=2

Central Statistical Office (EN) http://www.stat.gov.pl/gus/index_ENG_HTML.htm

Institute of Environmental Protection - National Research Institute (EN) http://www.ios.edu.pl/eng/welcome.html

National Centre for Plant Genetic Resources (EN) http://www.kcrzg.ihar.edu.pl/home.php

National Water Management (EN) http://www.kzgw.gov.pl/en/

State Forests (EN) http://www.lasy.gov.pl/informacje/publikacje/in-english

Ministry of Agriculture and Rural Development (EN) http://www.minrol.gov.pl/eng/

Ministry of the Environment (EN) http://www.mos.gov.pl/?j=en

Monitoring of Birds of Poland (EN) http://www.monitoringptakow.gios.gov.pl/about-project

State Environmental Monitoring Programme (EN) http://www.gios.gov.pl//zalaczniki/artykuly/pms.pdf

Polish Development Assistance (EN) www.polskapomoc.gov.pl

Programme for the Maintenance of Genetic Resources of Animal Species in Agriculture (PL) www.bioroznorodnosc.izoo.krakow.pl

Framework Water Directive (EN) www.rdw.org.pl

DATABASES:

Database of the Natura 2000 network (PL) natura2000.gdos.gov.pl/strona/rozumiem

Geospatial information about forms of nature protection (PL) geoserwis.gdos.gov.pl/mapy/

Natura 2000 draft management plans: Information and Communication Platform (PL) pzo.gdos.gov.pl/index.php

Central Register of Nature Conservation Forms (PL) crfop.gdos.gov.pl/CRFOP/

Alien Species in Poland (EN) http://www.iop.krakow.pl/ias/en

National Biodiversity Information Network EN) http://www.ksib.pl/?l=en

Natura 2000 Network Viewer (EN) natura2000.eea.europa.eu

National Parks (PL) www.parkinarodowe.edu.pl

Ekoportal (EN) http://www.ekoportal.gov.pl/opencms/opencms/ekoportal/en/index.html

Local Data Bank of the Central Statistical Office (EN) http://www.stat.gov.pl/bdlen/app/strona.html?p_name=indeks

STRATEGIC DOCUMENTS:

National Spatial Development Concept 2030 (EN)
http://www.mir.gov.pl/english/Regional_Development/Spatial_Policy/NSDC_2030/Documents/KPZK_2030_ENG_small.pdf

2007-2013 National Strategy and Action Plan for the Protection and Sustainable use of Biological Diversity (PL)
http://biodiv.mos.gov.pl/biodiv/files/Krajowa_strategia_roznorodnosci_biologicznej.pdf

Our life insurance, our natural capital: an EU biodiversity strategy to 2020 (EN)
http://ec.europa.eu/environment/nature/biodiversity/comm2006/pdf/2020/1_EN_ACT_part1_v7%5B1%5D.pdf

National environmental policy for 2009-2012 and its 2016 outlook (EN)
http://www.mos.gov.pl/g2/big/2009_07/2826c539c3015384e50adac8fe920b0b.pdf

Energy Policy of Poland until 2030 (EN)
http://www.mg.gov.pl/files/upload/8134/Polityka%20energetyczna%20ost_en.pdf

Poland's Climate Policy - strategies for greenhouse gas emission reductions in Poland until 2020 (EN) http://www.mos.gov.pl/g2/big/2009_04/cf234906b019de170218bf79f913990c.pdf

National Forest Policy (PL)
http://www.mos.gov.pl/g2/big/2009_04/34ba398d45e363aed16d2ad3b015136a.pdf

Draft Strategy for Energy Security and the Environment - 2020 perspective (PL)
http://bip.mg.gov.pl/files/upload/19680/2013-11-25_BEi%C5%9A_v.4.1.pdf

Dynamic Poland 2020 – Strategy for Innovation and Economic Efficiency (PL)
http://www.mg.gov.pl/files/upload/17492/Strategia.pdf

2006-2013 Strategy for Wetland Conservation (PL)
http://www.gdos.gov.pl/files/Konwencje/ramsarska/strategia_ochrony_plan_dzialan.pdf

National Development Strategy 2020 (EN)
https://www.mir.gov.pl/english/Regional_Development/Development_Policy/NDS_2020/Documents/NDS%202020.pdf

Transport Development Strategy up to 2020 (with the prospect of 2030) (PL)
http://www.mir.gov.pl/Transport/Zrownowazony_transport/SRT/Documents/Strategia_Rozwoju_Transportu_do_2020_roku.pdf

Sustainable development of rural areas, agriculture and fisheries for 2012-2020 (PL)
https://www.minrol.gov.pl/pol/content/download/39850/221066/file/SZRWRiR%20przyj%C4%99ta%20Uchwa%C5%82%C4%85%20Nr%20163%20RM%20z%20dn%2025%20kwietnia%202012r.pdf

A strategic plan for the adaptation for sectors and areas vulnerable to climate change by 2020, with the prospect of 2030 (PL) http://klimada.mos.gov.pl/wp-content/uploads/2013/10/SPA2020.pdf

Green Infrastructure (GI) — Enhancing Europe's Natural Capital, COM(2013) 249 final
http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2013:0249:FIN:EN:PDF

Prioritised Action Framework (PAF) for Natura 2000 (EN)
http://ec.europa.eu/environment/nature/natura2000/financing/docs/PAF.pdf

SOURCES OF INFORMATION ON THE IMPLEMENTATION OF OTHER CONVENTIONS:

ASCOBANS (EN)

http://www.ascobans.org/pdf/Ch_XXVII_09_CertifiedTrueCopiesAgreement.pdf

EUROBATS (PL) http://www.eurobats.org/official_documents/agreement_text

European Landscape Convention (EN) http://www.coe.int/t/dg4/cultureheritage/heritage/Landscape/Publications/Convention-Txt-Ref_en.pdf

Bern Convention (EN) http://conventions.coe.int/Treaty/en/Treaties/Html/104.htm

Bonn Convention (EN) http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31982D0461&from=EN

Helsinki Convention (PL) www.gios.gov.pl/artykuly/321/Konwencja-Helsinska

Paris Convention (PL) www.unesco.pl/kultura/dziedzictwo-kulturowe/swiatowe-dziedzictwo

Ramsar Convention (EN) http://www.ramsar.org/cda/en/ramsar-documents-texts-convention-on/main/ramsar/1-31-38%5E20671_4000_0__

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The Framework Convention on the Protection and Sustainable Development of the Carpathians (EN) http://www.carpathianconvention.org/tl_files/carpathiancon/Downloads/01%20The%20Convention/1.1.1.1_CarpathianConvention.pdf

United Nations Framework Convention on Climate Change (UNFCCC) (EN) http://unfccc.int/resource/docs/convkp/conveng.pdf

NON-GOVERNMENTAL ORGANISATIONS (SELECTED):

Greenpeace Polska www.greenpeace.org/poland/pl

Klub Przyrodników www.kp.org.pl

Ogólnopolskie Towarzystwo Ochrony Ptaków www.otop.org.pl

Polskie Towarzystwo Ochrony Przyrody SALAMANDRA www.salamandra.org.pl

Polskie Towarzystwo Ochrony Ptaków www.ptop.org.pl

Pracownia na Rzecz Wszystkich Istot www.pracownia.org.pl

Polskie Towarzystwo Przyjaciół Przyrody "pro Natura" www.pronatura.org.pl

Stowarzyszenie dla Natury „Wilk" www.polskiwilk.org.pl

Towarzystwo Przyrodnicze BOCIAN www.bocian.org.pl

Liga Ochrony Przyrody www.lop.org.pl

WWF Polska www.wwf.pl