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Preface

The Rio Conference and the signature of the Convention on Biological Diversity in 1992, were an opportunity for Belgium, as well as for other signatory countries, to become aware of the essential need to associate classical criteria of development and general welfare to criteria of environmental conservation and of support to a livable society for future generations.

As federal Minister for Scientific Policy, I am in charge of the scientific aspects of the Belgian Federal Policy for a sustainable development, and of the set up of the international agreements signed in Rio.

For this purpose, I have contributed to the creation and the installation of the Federal Council for Sustainable Development and of an Interdepartmental Commission, in charge of making a Federal Plan for Sustainable Development. In June 1996, I proposed the Council of Ministers the adoption of an ambitious long-term Plan for Scientific Support in Decision-Making for the Sustainable Development Policy by the Federal Government.

This Plan for Scientific Support, amounting to 3 billion BEF, finances research activities of which an important part is dedicated to the implementation of the Convention on Biological Diversity, namely through the programs Global Change, North Sea, Telsat and Antarctica.

In addition to a number of research contracts depending on this plan, the Royal Belgian Institute of Natural Sciences and the Royal Museum for Central Africa, two federal scientific institutions, are the bearers of the expertise in taxonomy, systematics, ecology and nature conservancy, needed to reach the aims of the Convention on Biological Diversity, at the Belgian level as well as at the international level.

The Royal Belgian Institute of Natural Sciences, National Focal Point for the follow-up of the Convention on Biological Diversity, plays a pilot role in the set up of the Convention at national level. This Institute becomes therefore a reference for political decisions in conservation and sustainable use of biological diversity. This major role is reinforced by hooting the Management Unit of the Mathematic Models of the North Sea and the Scheldt Estuary, an authoritative department in monitoring and protection of the marine environment. The launching of a National Clearing-House website on the Internet allowed Belgium to become the fifth country in the world to set up that obligation of the Convention.

With the edition of this First National Report to the Convention on Biological Diversity, Belgium again takes an essential step forward in sustainable development. This precious tool, prepared with the support of different decision levels in a dynamic and multidisciplinary approach, is the first step towards a national strategy and action plan for biological diversity.

I wish that such future efforts will be supported and developed, in order to offer to future generations the essential tools for the preservation of diverse and sustainable societies.

Yvan YLIEFF

Federal Minister for Scientific Policy

Preface

I am particularly happy to introduce this First National Report of Belgium. It represents an attempt to convey to our partners (the Parties) an overview of the ways and means chosen by the various parts of my - ecologically and politically diverse- country to meet the challenges of the Convention. As State Secretary of the Federal Government, my responsibilities in the area of nature conservation are limited to the marine areas under federal jurisdiction. It has been a frustrating realization all along that these areas at present remain limited to the territorial sea, i.e. a zone of 12 nautical miles from the shore. Belgium has therefore made it a priority, in the aftermath of the ministerial North Sea Conferences, to extend the jurisdiction of the coastal State to an exclusive economic zone (EEZ) beyond the territorial sea. A bill establishing the Belgian EEZ has recently been approved by the Cabinet, a first step towards a sustainable environmental management in the entire marine area of interest to Belgium.

The second step is of course more complex. Management requires a precise knowledge of what is to be managed, of existing options, of their consequences and side-effects, and of the means required to implement them. The public authorities at all levels need guidance in these matters. They also need powers that only the law can provide. A firm legal reference is therefore a prerequisite of any action of the State in the marine environment. I accordingly instructed my services to lay the bases of a general bill on the protection of the marine environment which would place an emphasis on protected areas and on the conservation of species. In July of last year, I was pleased to table a comprehensive and ambitious text, and to obtain Cabinet approval on what will soon become, after adoption by the Parliament, the *Law on the protection of the marine environment in the marine spaces under Belgium's jurisdiction*.

Land and sea remaining in close ecological relationship all along the Belgian coast, I am fully supportive of the concept of integrated marine and coastal area management. The integration sought in this principle requires that the authorities responsible for marine management on the one hand, and the authorities responsible on land on the other hand, accept some level of control of their activities by one another. Since the beginning of 1997, the services of the Federal Government and the Ministry of the Flemish Community co-operate with non-governmental organisations to create a continuum of nature reservations extending from the polders to the open sea. Under the name 'Integral Coastal Conservation Initiative', this project is partly funded by the European Commission under the LIFE-NATURE programme. It covers four years and runs on a total budget of 100.8 million BEF.

Needless to say, the many international treaties for the protection of the marine environment to which Belgium is a party all play a part in meeting the general goals of the Convention on Biological Diversity. Well-trying mechanisms of co-ordination between the federal Government of Belgium and the Governments of Belgium's three Regions -such as the existing North Sea Technical Commission (MNZ)- should continue to show their usefulness and efficiency in implementing these treaties. Together with the new legislative initiatives I have outlined above they will, I am sure, significantly contribute to the conservation and restoration of the invaluable biological diversity of our marine environment.

Jan PEETERS

Federal State Secretary for Security, Social Integration and Environment

1. Introduction

1.1 Geographical notes

Belgium is situated in the west of Europe, bordered by the North Sea, the Netherlands, Germany, the Grand Duchy of Luxembourg and France, from 51° 30' N to 49° 30' N, and from 2° 33' E to 6° 24' E. Although its surface area of 30,528 km² makes it a small country, its location favoured its past and actual position of economic and urban nerve centre of Europe.

Belgium has a mild temperate wet climate, the south-eastern parts of the country (High Ardennes, Eifel) nevertheless display features of a slightly more continental and tougher climate. Belgium offers a diversity of sites and landscapes due to its very long, eventful geological history, as well as the widely varying - at first glance almost imperceptible - climatic conditions from one region to another.

At the end of 1996 Belgium had a population of 10,170,000 people. Since then the population density has achieved 333 inhabitants per square kilometer which makes Belgium, together with the Netherlands, one of the most densely populated countries in Europe. Evidently, population density is unequally distributed among big cities and country side (81% of Belgians live in cities). Population is furthermore concentrated in Lower and Middle Belgium with a density range of 100 to 333 inhab./km², while in Upper Belgium the density is inferior to 50 inhab./km². Like in most European countries, population growth is very low: the birth rate was estimated at 11.36 per 1,000 inhabitants for a death rate of 10.27. Infant mortality is one of the lowest of Europe with 0.561 per 1,000 inhabitants (data for 1996).

The gross national product (GNP) of Belgium for 1996 amounts to 8,248 billions BEF and the net national income to 6,732.8 billions BEF. The greatest part of the GNP comes from the tertiary sector, employing the largest part of the working population.

1.2. Landscape diversity

Geographically Belgium shows three major areas: Lower Belgium (up to 100 m above sea level), Middle Belgium (between 100 and 200 m above sea level) and Upper Belgium (from 200 to over 500 m above sea level). Lower Belgium starts in the west at the coast, with beaches and dunes which extend in a straight line for 66.5 km; it has been in continuous urbanisation for decades because of popular tourism. The particular geological conditions include highly permeable calcareous dune sand, sometimes loose and mobile, a water layer with very pure and hard water. The physical environment is also characterized by powerful wind and high precipitation and therefore sustains a very original flora. Inland from

the coast lie the 'polders'. These polders are recent, clayey sea deposits which have been laid below the level of the highest tides and only the dune belt, together with dykes, prevent them from being washed over by the sea. This flat and fertile land suffered from flooding by the sea in the past but is now totally dry, thanks to the sluices which protect it from tidal erosion. This plain is sporadically peppered with rather elongated sandy decalcified hillocks which run parallel to former coastlines. Between the western polders, the Leie and the Scheldt, lie the Flemish lowlands, a sandy region with local hills such as the Kemmelberg and the Kluisberg. This region is characterized by surface sand deposits from the Pleistocene. The Kempen are situated in the east of Lower Belgium. The soil in the Kempen is poor and the landscape comprises fir woods, heathlands, ponds and marshes. The soil of the Kempen Plateau consists of gravel and sand deposits washed along by the river Meuse in wide banks during the Quaternary. The Kempen lowlands, which cover the greatest part of this region, have a soil of Quaternary surface sand.

Behind the Flemish lowlands and the Kempen, gradually rising to the Sambre and Meuse valleys, lies Middle Belgium, with its low and very fertile clay plateaus. The soil of this central region consists of Quaternary loess. The heavily urbanized Brabant has its own lush green carpet, the Forest of Soignes, a forest area and a remnant of the earlier Forest of Cologne, which covered a large part of the country in Roman times. Furthermore, Middle Belgium boasts Hainaut in the west and Hesbaye in the east, both fertile areas with large farms and extensive fields and pastures. The soil of the Hainaut is characterized, in the north by deposits of Quaternary eolian sand, in the south by Cretaceous chalk (loam-chalk basin of Mons). To the east, the Sambre Country is characterized by a complex and undulating geological structure. Mining heaps dominate, among Tertiary clay and sand, limestone and carboniferous dolomites, modern alluvial deposits, all covered with discontinuous loam deposits. In the east, the Meuse valley forms the Meuse country, crossing the provinces of Namur and Liège with numerous calcareous rocks.

Upper Belgium, the most sparsely populated and densely wooded part of the country, begins south of the Sambre and the Meuse at the Condroz plateau, a fertile area primarily seen as a tourist attraction considering the valleys of the Meuse and the Ourthe and its numerous historical monuments. Between the Vesder and the Meuse lies the Country of Herve which due to its rich clay soil is suitable for grazing and cattle rearing. To the south of the Meuse, lies the Condroz, with a geological substrate consisting of a series of foldings in the calciferous soil of the Famenne Region; erosion has made depressions in the limestone and carved reliefs in harder rocks. The ground of the Condroz is in general covered with a layer of lime. This geological variety is accompanied by an equally characteristic vegetation. Down south lies the area of Fagnes and Famenne, a poor agricultural region, well-known for its many caves, the most interesting examples being those at Han-sur-Lesse and

Remouchamps. This region has a schist substrate low in lime with thinner occasional layers of loam. The Fagne-Famenne Depression is a clayey depression caused by erosion in the very soft shales of the Famenne and the region around Fagne. In the south the schist region of the Fagne is dominated by limy hillocks from the Devonian of the Calestine strip. Further to the south are the Ardennes, a region alternating between a magnificent, wooded area with natural beech forests and specially grown fir trees, plateaus and deep valleys. The high plateaus of the Ardennes which are formed by hard, tartish rocks and exposed to a harsh, rainy climate feature a particular flora. Its still semi-wild environment makes it an ecotourist attraction because of access to vast protected forest areas. The southernmost part of the country, the Belgian Lorraine, has a milder climate than the rest of the country.

1.3. Biological diversity

The diversity of the physical environment has resulted in an equally great biological diversity. Botanists, for example, have identified no less than eight phytogeographic districts, a very high number, indeed, for such a small country.

The vast majority of components of the actual fauna and flora, roughly estimated at more than 40,000 species, colonised Belgium after the last glaciation, some 12,000 years ago. Some glacial relict components of biological diversity did remain in the Upper Ardennes; most however have disappeared in very recent times or are highly threatened today. The first Neolithic farmers settled in the very fertile Middle Belgium, some 10,000 years ago, at times of the emergence of the actual fauna and flora. It is clear that the biological diversity of Middle Belgium has always been highly influenced and conditioned by the agro-pastoral practices occurring since the Neolithics. However, more recently, a 1,000 year old human intervention, especially through agricultural and forestry developments, radically modified the natural landscapes of Belgium and its biological diversity. Moreover, during the last 100 years, wildlife, plants, and ecological processes have been threatened by pollution of water, air and soils. From 1950-60 onwards intensive agricultural practices based on monoculture, sustained by pesticides and fertilizers, have endangered the components of biological diversity of the previous semi-natural agricultural ecosystems. Moreover reduction in the overall size of nature areas and their fragmentation has rapidly increased as a result of urban expansion and road construction. During the past four decades a significant number of wild species has disappeared. This is particularly well-documented for higher plants, vertebrates, various insect groups, spiders and non-marine molluscs. In recent years however a recovery of formerly declining populations in various groups has been observed, most probably as a result of many conservation regulations and actions.

1.4. Political framework

Belgium gained its independence in 1830. In recent years, the country has rapidly evolved, through four sets of institutional reforms (in 1970, 1980, 1988-89 and 1993) into a federal structure. As a result, the first article of the Belgian Constitution states today: "Belgium is a Federal State which consists of Communities and Regions".

The redistribution followed two broad lines. The first concerning linguistic matters and, more broadly, everything relating to culture. It gave rise to the Communities, a concept which refers to cultural bounds such as language. Belgium is situated at the junction between the Germanic and Latin languages: Dutch, French and German. Thus Belgium has three Communities today, based on language: the Flemish Community, the French Community and the German-speaking Community. These correspond to population groups.

The second main line of the State reform is historically inspired by economic concerns, expressed by Regions who wanted to have more autonomous power. This gave rise to the founding of three Regions: the Flemish Region, the Brussels Capital Region and the Walloon Region. To some extent Belgian Regions are similar to the American States or the German 'Länder'. The country is further divided into 10 provinces (since 1 January 1995) and 589 communes or cities.

Because of this state reform Belgium has a very distinct and unusual character. Under the level of the Federal Government are situated two lower, subordinate levels of government: that of the Regions and that of the Communities, each with their own parliament and government. The six different authorities [the Federal State, the Flemish Region (same authority as the Flemish Community), the Walloon Region, the Brussels Capital Region, the French Community and the German-speaking Community] all have private, well-defined sets of competences. The 'legislation' adopted at the different levels is considered legally equal. Since 1980, nature conservation has been a shared responsibility of the Federal Government and the Regions. The succeeding constitutional changes included an even more comprehensive transfer of environmental competences to the Regions.

The Federal State level retains important areas of competence including: foreign affairs, defense, justice, finances, social security, important sectors of public health and domestic affairs, etc. The Regions are competent in the fields of nature and water management, land zoning and nature conservation, spatial planning and public works. This covers important parts of the Convention on Biological Diversity. Other competences of the Regions are related to housing, agricultural policy, economy, energy management, local authorities, employment, transport, research and development. Furthermore the Regions and Communities are entitled to run foreign relations in those areas where they are competent.

Although the nature conservation policy is mostly a regional matter, co-ordination bodies, under the authority

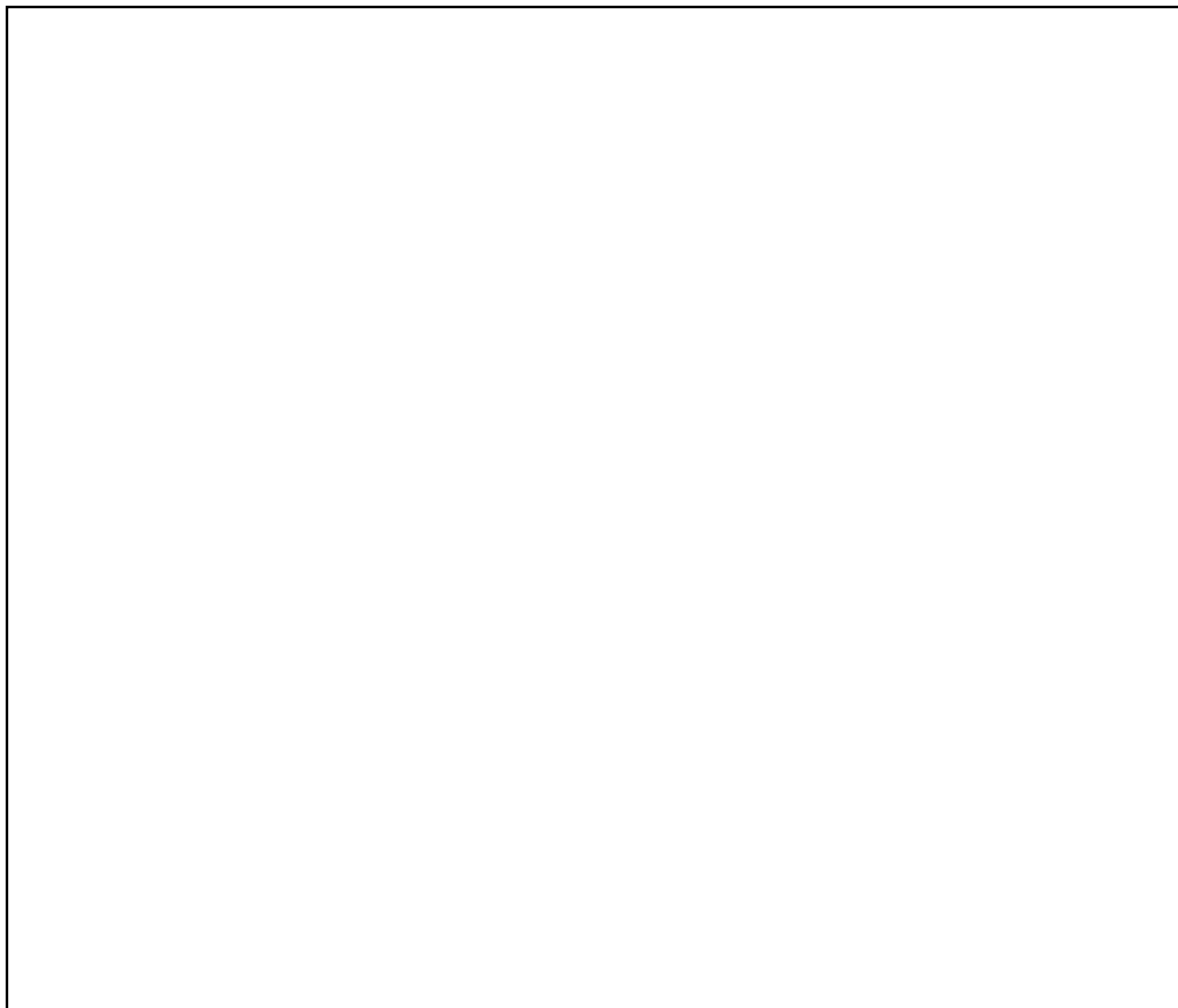


Fig. 1.1. Belgium, a Federal State which consists of Communities and Regions.

of the Federal State Secretary for the Environment, are in charge of its international aspects. For environmental matters the federal co-ordinating body is the Co-ordinating Committee for International Environmental Policy (CCIEP), composed by representatives of all the federal and regional competent administrations. This body functions under the high level authority of the Interministerial Conference for the Environment (ICE), chaired by the Federal State Secretary for Environment.

1.5. The Convention on Biological Diversity

Belgium signed the Convention on Biological Diversity (CBD) on 5 June 1992, the first day of the UN Conference on Environment and Development (Rio de Janeiro). Due

to the fourth set of the institutional reform (1993) the ratification process was complex. The instrument of ratification of Belgium was deposited at the United Nations in New York on 22 November 1996. Belgium became hence a Contracting Party to the Convention on that day. In pursuance with Art. 36, point 3, of the Convention, the Convention on Biological Diversity entered into force for Belgium on 20 February 1997.

In July 1995, the CCIEP designated the Royal Belgian Institute of Natural Sciences (RBINS) as the National Focal Point for the follow-up of the CBD. One of the priorities was the setting up of a Belgian Clearing-House Mechanism. It was launched on the Internet on 7 October 1996. For all matters related to the Biosafety Protocol the Scientific Institute of Public Health - L. Pasteur was designated as the National Focal Point. A proper website was launched on the Internet at the end of 1997. (See also chapter 8).

Several steering committees are currently operating

under the direct authority of the CCIEP, one of these is the Steering Committee 'Biodiversity Convention'. The terms of reference for this steering committee, priority was given to the preparation of the First National Report and to the preparation of a Country Study on Biological Diversity.

1.6. Overview of competent federal bodies

As mentioned above, the implementation of article 6 of the Convention on Biological Diversity is mostly a Regional competence. The objectives, strategies and action plans of the Regions are developed in their respective chapters. However, several federal bodies also have an important role in the achievement of the aims of the Convention. These federal bodies are mainly the Ministry for Social Affairs, Public Health and Environment, the Ministry for Scientific Policy, the Ministry for Small Enterprises, Traders and Agriculture and the Ministry for Foreign Affairs, Foreign Trade and Development Co-operation.

The Ministry for Social Affairs, Public Health and Environment has a number of competences related to the implementation of the Convention on Biological Diversity. In the field of environmental matters, the Ministry is in charge of the elaboration of norms to which goods and products have to comply in order to be allowed on the market (including ecolabels). The impact assessment on biological diversity will be one of the criteria for the evaluation and the risk reduction of the use of chemical products, including pesticides, and will be inserted in the federal legislation shortly. Also under the authority of this Ministry, the Scientific Institute of Public Health - Louis Pasteur (IPH), formerly Institute for Hygiene and Epidemiology, is in charge of the scientific support to the federal biosafety policy. The Section of Biosafety and Biotechnology of the IPH was designated Belgian Focal Point for Biosafety under the CBD (see also 8.3.).

The Ministry for Scientific Policy is in charge of the scientific aspects of sustainable development at the federal level and of the implementation of the international obligations contracted during the Rio Conference on Environment and Development. Its administration, the Federal Office for Scientific, Technical and Cultural Affairs (OSTC), has launched and is managing a long-term plan for scientific support of the federal sustainable development policy. This plan, based upon a budget of 3 billion BEF, assures the financing of research activities

and makes 156 million BEF available for the implementation of the Convention on Biological Diversity, *inter alia* through the programs Global Change, North Sea, Telsat and Antarctica.

In addition to a number of research contracts depending on this plan, the Ministry overarches ten scientific institutions, including the Royal Belgian Institute of Natural Sciences (RBINS) and the Royal Museum for Central Africa (RMCA) (see also 1.5., 7.3., 7.4. and 8.1). These institutions represent an important part of the Belgian scientific expertise in the field of biological diversity, namely in taxonomy, systematics, ecology and nature conservation, necessary for the implementation of the first objective of the Convention, at a Belgian as well as at an international scale. The protection and the sustainable development of the North Sea ecosystem is entirely a federal competence. The leading role is played by the Management Unit of the Mathematical Models of the North Sea and the Scheldt Estuary, from 01.01.98 onwards a new department of the RBINS (see also chapter 5).

The Ministry for Small Enterprises, Traders and Agriculture is in charge of the follow-up of FAO activities, *inter alia* the International Undertaking on Plant Genetic Resources for Food and Agriculture (IUPGR) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and possesses its own research centres such as the Agricultural Research Centres at Gembloux (CRA) and at Ghent (CLO), the Centre of Agricultural Economics (CAE), the Sea Fisheries Department (DZ) and the National Botanic Garden (NBGB) (see also 7.3).

The P 62 Service of the Ministry for Foreign Affairs, Foreign Trade and Development Co-operation assures the political follow-up of the international agreements contracted by Belgium, including the Convention on Biological Diversity. The Belgian Agency for Development Co-operation assures among others the Belgian financial contribution to the GEF (see also chapter 6).

The implementation of the Convention on Biological Diversity is a very complex matter, with many cross-sectoral issues, and needs a good interdepartmental co-ordination and multidisciplinary approach. The federal law of 5 May 1997 allowed the creation and the functioning of the Federal Council for Sustainable Development and of an Interdepartmental Commission in charge of making a federal plan for sustainable development. It is obvious that the set up, at the federal level, of a strategy for the conservation and the sustainable use of biological diversity will take place within the framework of this plan.

2. The Flemish Region

Preface

As stated before, the Rio Conference and the signature of the Convention on Biological Diversity were important moments for all parties involved. Due to the particular political framework in Belgium, a great responsibility in fulfilling the obligations of the Convention lies within the different regions and communities. Flanders and the other regions have the almost exclusive responsibility in the fields of environmental management, land zoning and nature conservation; indeed covering essential parts of the Convention.

Being Flemish minister for the environment and nature conservation I realise there is a great deal of work left to be done if we wish to conserve and improve environmental quality and biological diversity. In line with the provisions of the Convention we are endorsing the ideas about international co-operation and about a more systematic policy planning. In recent years Flanders has been very active in concluding co-operation agreements sharing expertise in for example water treatment or regulation of industrial emissions with other countries.

Following AGENDA 21 and the spirit of the two conventions concluded in Rio, Flanders has worked out a system of environmental planning, based on a decree of 1995. Future policy will be based on three cornerstones: an environment report, an environmental policy plan and annual environmental programmes. Recently two reports were published (1994 and 1996), a plan has been drawn up for the period 1997-2001 and a first programme for 1998 is being carried out. This contribution by the Region of Flanders will contain many references to the Flemish Environmental Policy Plan 1997-2001. This is logical since sustainable development has been the basic principle throughout the plan's concept. Furthermore, a lot of attention was directed towards the conservation of biological diversity. The Convention and the decisions in the different COPs served as a basis for this. In accordance with article 6 strategies, plans and programmes are thus developed in Flanders. The plan was adopted and is supported by the entire Government of Flanders, so that by making and implementing these plans the integration into other relevant sectors is insured.

Flanders has taken another important step in implementing the Convention on Biological Diversity. In 1997 a new decree on nature conservation was adopted. With this decree a legal basis is created to establish an ecological network with core areas and the necessary stepping stones. The decree also provides instruments to rehabilitate and restore degraded ecosystems as well as to protect threatened species. Mechanisms are introduced to provide a better quality of the environment in areas important for nature conservation. As in the Flemish Environmental Plan 1997-2001 the assessment of biological diversity is encouraged so that Flanders can contribute to the process of identification and monitoring of the relevant components.

The following text is the Flemish contribution to meet the obligations agreed upon during COP-2. It also gives insight in the Flemish environmental policy, in particular with regard to the conservation of biological diversity. I firmly believe that the development of strategies and the exchange of information about these strategies is vital in implementing the Convention on Biological Diversity. National (and regional) reports can ensure an active participation by all parties. They also allow us to learn from each other and provide a platform for future co-operation.

Theo KELCHTERMANS
Regional Minister for the Environment and Employment

2.1. Introduction

2.1.1. A Flemish chapter ?

Belgium, as a federal State, has a very distinct and unusual constitutional character. As mentioned before, not only is there a federal government, but there are also Regions (and Communities), which have an own Parliament and Government. The northern part of Belgium is the Flemish Region or Flanders. Its specific features make it necessary to devote a separate part of this report to Flanders.

2.1.2. The Flemish Region's environmental institutional framework

2.1.2.1. Authority

The authority plays an important role in the conservation of biodiversity in Flanders. Not only in outlining strategies, but also in the management on the field and in the scientific research. All services of the Flemish Region and the Flemish Community are concentrated in one ministry, which consists of 7 departments, divided into administrations and sections.

investment programmes for the purification of sewage water. The **Flemish Public Waste Agency** (OVAM) tries to prevent or manage waste.

In addition to **AMINAL**, there are two more institutions dealing with particular environmental matters: the **Institute of Nature Conservation** (IN) and the **Institute for Forestry and Game Management** (IBW). The **IN**, incorporated in 1986, conducts an applied ecological and ecohydrological research with a view to nature conservation, recovery and management. It also turns the available scientific knowledge about the existence and the functioning of nature into policy. The **IBW**, incorporated in 1991, has a similar function for forests, game management and freshwater fishery.

2.1.2.2. Others

Some non-governmental organisations (NGO's) are especially active in nature conservation. They buy and manage valuable nature reserves with financial support of the authorities, keep a close eye on nature policy and organise educational activities for a large public. Divisions of **Natuurreervaten** and **De Wielewaal** are spread all over Flanders. Other associations, such as the **Stichting Limburgs Landschap**, are more regional. At last, we also mention the **Bond Beter Leefmilieu** (BBL),

AMINAL

Nature Division: nature policy preparation and evaluation, management and purchase of natural areas, education, subsidising nature organisations;

Forests and Green Spaces Division: the preparation and evaluation of the policy in forests, green spaces, game management, bird protection and freshwater fishing, the acquisition of forests and the management of public forests, subsidising and advising private forest owners;

Europe and Environment Division: participation to international environmental co-operation and monitoring the implementation of the international conventions;

other Divisions (land, water, inspection, permits,).

The department of the ministry dealing with environmental matters, is also competent in spatial planning, transport and waterways. Everything that has to do with environmental management and nature conservation has been united in **AMINAL** (Environment, Nature, Land and Water Management Administration).

There are three more public agencies, each concentrating on one specific environmental problem. The **Flemish Land Agency** (VLM) plays an important role in the protection of the environment against eutrophication. It makes a geographical information system for Flanders and it is the driving force behind land use planning. The **Flemish Environmental Agency** (VMM) sets up and operates the monitoring networks for the surface water quality and the air quality, as well as the

which is an umbrella organisation and forms the bridge between nature and environment.

Finally, diverse social groups dispose of official platforms to raise their voices. In 1991, the **MiNa-Council** (MINA-Raad) was established. In this council we find representatives of *i.e.* the environmental associations, the farming organisations, the industry and the universities. The MiNa-Council gives advice on all matters relating to the environment and nature conservation, either on its own initiative or on demand of the Flemish Government. The other advisory councils, the so-called Supreme Councils, are rather sectoral. There are four **Supreme Councils**: the **Supreme Forest Council**, the **Supreme Council for River Fishing**, the **Supreme Hunting Council** and the **Supreme Council for Nature Conservation**.

2.1.3. Budget

To finance the environmental policy, a special fund was created in 1991. This so-called **MINA-fund** collects all environmental taxes, mainly levies for water pollution and for the prevention and management of wastes. Many expenses of the administration of the public institutions and the environmental management derive from this MINA-fund.

For the time being, the total expenses for the environment in Flanders fluctuate around **25 billion BEF/year**. Approx. **2 billion BEF** is destined for nature and forest policy. This amount can roughly be divided as following: 400 million BEF for the implementation of the first Nature Development Plan; 250 million BEF for managing wildlife and forest areas; 850 million BEF for the acquisition of nature and forest areas; 200 million BEF for supporting local administrations; 100 million BEF for supporting associations; 100 million BEF for auxiliary policy research; 150 million BEF for the two scientific institutions.

2.1.4. Project Environmental (and Nature) Planning

In former years, there was no systematic environmental planning in Flanders (and in Belgium). In 1989, the minister of environment presented the **MINA-2000** plan as a first step towards a valuable environmental policy planning. Initiatives and other aspects of the environmental and nature policy were bundled in this document. Within the year, the **Environmental Policy and Nature Development Plan**, simply MINA-plan, was published. These texts still have a descriptive character.

These and other initiatives (for instance the **Waste plan**) clearly show the need for a legally embedded and integral environmental policy planning. Its foundation was laid by a decree of 1995. Every fifth year, a strategic plan, including an action programme, will be created. As to their contents, these plans are supported by environmental and nature reports (MIRA), which are published every two years. Up till now, two reports (**MIRA 1** and **MIRA 2**) have already appeared.

The first **Environmental Policy Plan**, drawn up for the period 1997-2001, was adopted on 8 July 1997. The plan tries to improve effectiveness and efficiency and to enhance integration within the Flemish environmental policy. It also tries to build a bridge between the nature policy in the strict sense, and the environmental policy. Thus an environmental problem, such as 'the loss of biodiversity', can be treated widthways. It is one of the thirteen themes which are treated. The strategic options and the concrete actions of the plan are further developed in annual Programmes. These **Environmental Annual Programmes** make it also possible to report on the implementation of the plan and to adjust it when necessary.

2.2. Status

Certain species in Flanders are threatened with extinction. Not only the species are running out, the decrease of biodiversity also occurs within ecosystems. Lime swamps, infertile but non-acid meres, moors, dry lime grasslands, spontaneous communities of calcareous fields, and other have almost disappeared in Flanders. The protected areas are small and the valuable areas are shattered. Semi-natural landscapes, such as flowery meadowlands, cove and vale grasslands, old coppice forests, etc. are under great pressure of a quickly changing and increasing intensive land use, increasing dehydration, eutrophication, etc..

2.2.1. Natural structures and ecosystems

The **coast** and the **coastal dunes** are very rich in species. For instance, 862 species of higher plants (67% of the Flemish totality) are found on a surface of 7,500 ha (0.55% from the Flemish area). About 75% of the summer birds of the region are also regular sitting birds on the coast. The highly specified environment and the many area-specific species and biotic communities make the area very important. It is however increasingly disturbed by recreation, building-on and infrastructure. The **part of the river Scheldt which is influenced by the tide** is an exceptionally dynamic ecosystem. This zone is under pressure by loss of area, the modified use of the salt marshes, the disturbance of the water balance and pollution. **River forelands** are not very common in Flanders. The forelands of the Grensmaas are deteriorating by intensified agriculture, rigid river management and exploitation.

Grasslands have a wide variety of closely related biotic communities. Of the total area of Flanders, 30% to 40% is taken up by grasslands. Due to the agricultural practice, only 2% is rich in species. The state of grasslands gives a good picture of the relation between agriculture and nature; in particular of the impact of agriculture on nature. The estimated area of **heathlands** (including meres and drifting dunes) in Flanders measures between 10,300 ha and 13,000 ha (almost 1% of the total area); 3,500 ha of that area is protected. Thus lowland heaths enclose about 1/3 of the total surface of protected nature in Flanders.

The **forests** in Flanders are strongly fragmented. Over 50% of the forests are smaller than 100 ha. The proportion of forested areas in Flanders is estimated at 8-10%, which is low compared to other areas of Europe. Approximately 70% of this is private property. The Flemish Region or the Federal State owns 15%. Approximately 75% of the soils in the forests are affected by acidification.

Much attention is given to water quality of **brooks** and **rivers**. Despite of these efforts, site-specific species disappear while common ones gain the upper hand. This is

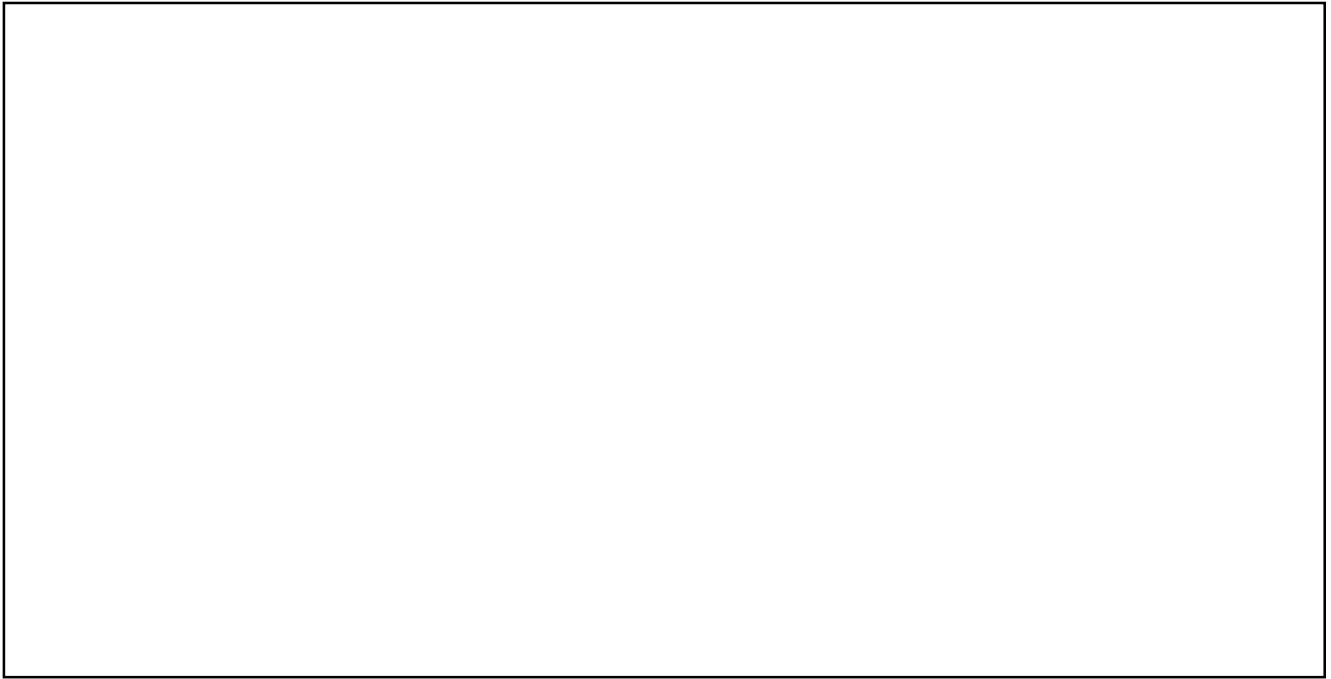


Fig. 2.1. - Natural structures and ecosystems in Flanders
(Institute of Nature Conservation).



Fig. 2.2. - Total number and situation of some important species in Flanders
(Institute of Nature Conservation).

explained by the fact that 67% of the brooks have a uniform profile. 47% of the Flemish watercourses are of poor or very poor biological quality (situation in 1995). Only 2% are of extremely good quality.

2.2.2. Species

2.2.2.1. General

For a number of animal and plant species in Flanders surveys are available. Fig. 2.2. reflects a limited part of the available data.

2.2.2.2. Plants

The distribution and status of **higher plants** are well known in Flanders. The standard list of Flemish staff plants comprises 1,279 species, of which 363 have declined after 1972. The status of other species looks the same or is even improving after this date.

2.2.2.3. Animals

Mammals are important for the description of the state of nature. 30 species of the total of 68, once present in Flanders, are nowadays on the Red List. In the meantime, 11 species have disappeared completely, of which 4 in the last decade (large horseshoe-nose bat, pug bat, otter, bottle-nose dolphin).

Recent data from the Flemish Avifauna Commission show that of the current 161 **summer bird species** in Flanders, 20 are seriously threatened, 18 are vulnerable and 53 have declined. Since 1960, a minimum of 14 bird species have completely disappeared as summer birds in Flanders. 47 summer bird species (28%) have increased in population since 1945.

Only 5 species of **amphibians** are widely distributed in Flanders (Alpine water salamander, small water salamander, ordinary toad, brown frog and green frog). These are not threatened. Of the other 14 species, two are vulnerable (fire salamander and slippery salamander), two are threatened (nurse frog and garlic frog), two are threatened with extinction (adder and tree frog), and two are extinct (yellow-bellied fire toad and ring snake).

Among the **invertebrates**, insects are relatively well-studied. Of the 352 indigenous **sand and ground beetles**, 201 are considered threatened. The Red List of the **day butterflies** mentions 46 species as threatened. This represents 66% of the 70 indigenous species.

2.3. Activities and threats

The high population density (430 inhabitants/km²) and economical and industrial activities, put pressure on the

available area and the environment. Other human activities, such as motorised movements, intensive agriculture and recreation, contribute to the decline of natural resources and biodiversity. The threats can be divided into three categories: the use of the area itself, the use of natural resources and pollution.

2.3.1. Use of the area

Because of the high population density, the available space is very limited in Flanders (almost 6 million people for 13,522 km²). The total build-over area represents more than 14% of the total territory, while 62.4% is occupied by agriculture. The remaining open area is more and more covered by gardens, parks, buffer zones, verges, etc. This all leads to a severe reduction of the available area for natural ecosystems. Moreover, the agricultural practices changed and the natural elements were removed for reasons of economical efficiency. Examples are the straightening out of rivers and the extinction of wood sides and tree row plantations. 70% to 95% of the marginal overgrowths of the parcel disappeared in the last century.

An important additional characteristic of land use in Flanders is the high level of fragmentation. Industrial areas are dispersed. The building-on is strongly unfolded; 40% of this building-on is located outside urban areas. A part of this consists of the typical Flemish row of houses along roads (the so-called ribbon development) with a total length of 2,000 km. For Flanders, the average fragmentation index was calculated at 44.3/km². This index gives the number of transects per km by highways and railways, channels and high-voltage wiring.

The large fragmentation, together with the intensive use of the soil has led to the fact that nature and forest areas are generally small and isolated in the landscape. The average surface of a forest complex amounts 19 ha.

2.3.2. The use of natural resources

Recreation and the use of natural resources, such as water, soil, trees and other living organisms, have obvious consequences for the natural ecosystems.

2.3.2.1. Water

The needs for water are complied with groundwater (56%), surface water (32%), input (11%), and precipitation (1%). The household consumption amounts to about 29% and the non-household consumption to about 61%. The rest can't be assigned. The average water use of the population fluctuates around 120 liter per person per day. These amounts and the ways of delivering cause even more problems. Not only does the exploitation of groundwater increase, the recharge of rain water to the ground-

waterreservoir is declining. In time, this phenomenon leads to dehydration.

2.3.2.2. Forests

In Flanders, more and more social groups claim the limited areas of forests for specific functions (economical, scientific, ecological, social-educational, ...). At many places, the pressure on forests is far too strong. Nevertheless, the own timber production covers only 11% of the needs. Contrary to the large consumption (6 million m³/year), there is a limited standing volume (estimated at 10 million m³).

2.3.2.3. Soil

Reclaimed areas amount to more than 12,360 ha in Flanders. Of these, approximately 8,000 ha are still qualified for exploitation. The removing of earth and the extraction of **gravel, sand, clay and loam** exceeds 11 million m³ a year. Such level of extractions causes changes in relief and ecological disruptions, which makes the soil unsuitable for other purposes.

2.3.3. Polluting activities

A lot of human activities cause undesired effects. The quality of the natural environment is always affected, with consequences on all biodiversity levels. A part of these effects can be described as eutrophication, acidification and dispersion.

2.3.3.1. Eutrophication

Eutrophication is the disruption of ecological processes and cycles by an inordinate supply of nitrogen (N), phosphorus (P) and potassium (K) in the environment. In the period of 1991-1994, the total supply of fertilisers in the environment has declined, especially due to a reduced use of chemical fertilisers. More than 60% of the pollutants that cause eutrophication are originating from agriculture.

2.3.3.2. Acidification

Acidification is the process in which acidifying substances from agriculture, industry and traffic influence the ecosystems. Because of this, the vitality of plants deteriorates and the groundwater is contaminated. Approximately 75% of the Flemish forest soils are somewhat acidified.

The total acidifying emission in Flanders declined between 1980 and 1994 with 46% to an amount of approximately 13,000 million acid equivalents. The de-

cline in the relative share of SO₂-, NO_x- and NH₃-emissions (mostly from animal manure) from respectively 70%, 19% and 11% to 47%, 31% and 22%, is very important. The share of traffic and cattle breeding in the acidifying emissions has doubled since 1980.

2.3.3.3. Dispersion

Dispersion of environmental dangerous substances deteriorate the environmental quality and is mainly caused by heavy metals, volatile organic compounds (VOS), pesticides and other poisonous substances. In Flanders, 96% of the VOS-emissions is caused by human activities, to a large degree by traffic. In addition, various heavy metals enter the environment from many different sources. In the period of 1985-1995, there has been a considerable decrease of emissions of heavy metals.

2.4. Objectives

2.4.1. Global objectives

In the past, vague policy objectives were promoted from different angles at different moments. Recently, the environmental and nature policy aims at a clear and uniform way of formulating its objectives. Since it has been established that the underlying causes of loss of biodiversity and of other environmental problems are the same, a co-ordinating vision has been preferred. For the Flemish environmental and nature policy, the three following objectives were explicitly and unambiguously stipulated by law:

- . **the management of the environment by the sustainable application of raw materials and nature;**
- . **the protection of man and environment against contamination and extraction, and especially the protection of the ecosystems which influence the functioning of the biosphere and are related to food supply, health and the other aspects of human life;**
- . **the nature conservation and the promotion of the biological and scenic diversity, in particular by the conservation, restoration and development of the natural habitats, ecosystems and landscapes with ecological value; and the preservation of wild species, especially those who are threatened, vulnerable, rare or endemic.**

In pursuing these objectives, much attention is paid to integration, involvement of target groups, the steering authority, prevention and healthy finances.

In the Flemish Environmental Policy Plan 1997-2001 these objectives and principles are translated into a strategy and an action plan with no less than 179 actions. Environmental problems are addressed in thirteen themes: Depletion of the ozone layer, Changes of the atmosphere by the greenhouse effect, Pollution by photochemical substances, Acidification, Eutrophication, Dis-

persion of environmental dangerous substances, Pollution by wastes, Contamination of the surface water, Dehydration, Noise nuisance, Odour, Fragmentation and Biodiversity loss.

Furthermore there are specific chapters on Target groups, Area-oriented approach, Instruments, Costs and Financing, Co-operation with other authorities and the Process of Environmental Planning itself.

2.4.2. Specific objectives

The Flemish general and, certainly, environmental policy has been evolving for a long time following the direction indicated by the Convention on Biological Diversity. After evaluation of the current bottlenecks and problems the strategy adopted in the Flemish Environmental Policy Plan 1997-2001 provides a number of initiatives which will continue this course. Theme 13 of the Flemish En-

vironmental Policy Plan (Biodiversity loss) joins immediately in the Convention on Biological Diversity.

Despite the uncertainties regarding the appropriate level of biodiversity, the following long term objective is put forward:

the improvement of the biodiversity, taking into account the individuality of the spatial and non-biotic environment.

In short terms this means: Conservation, protection, restoration, development and management of nature and the natural environment; Promotion of the sustainable use of biological diversity components; Integration of European and international initiatives for the conservation and development of the global biodiversity.

An important aspect of this strategy is the creation of

Flemish Impulse Programme Nature Development

In 1996 a research programme was started up under the name: **Flemish Impulse Programme Nature Development** (VLINA). This impulse programme means a stimulation for the ecological and sociological research on nature conservation in Flanders. By emphasising policy support and improved co-ordination, the scientific research can form a solid base for nature conservation. Within a period of five year, 500 million BEF will be released. Five themes are treated:

- Indicators for biodiversity and nature-orientated quality standards;
- Ecological aspects of nature development;
- Social aspects of nature development;
- Ecohydrological aspects;
- Habitat fragmentation.

Biodiversity in forests

One of the first ascribed research assignments is: *“The selection and the evaluation of indicators, and the work out of a practical methodology for the assessment of the biodiversity in forests”*.

From political as well as scientific point of view, there was a clear need for a well-defined, practical and scientifically correct methodology for the evaluation of the biodiversity in the Flemish forests.

In the first phase, the existing techniques for biomonitoring in forests will be investigated. In order to obtain a concrete survey of proposed species and groups of species, a list of selection criteria will be made and a selection procedure will be developed.

In a second phase the existing inventory techniques will be examined, as well as the practical realisation of these techniques in experimental inventories. Therefor assessment criteria will be formulated and the diverse techniques will be evaluated.

In a last phase, a standardised methodology for the examination of forests by means of biodiversity indicators will be set up. It should serve as a manual for the quantitative and the qualitative evaluation of biodiversity in forests.

The final results of this research will be used in a nature-orientated policy for forests. The comparison between treated and untreated forests will be valuable in evaluating the influence of a specific action on biodiversity.

ecological networks. In Flanders, a network of 125,000 ha will be created within a period of 5 year. This network will be completed and supported in the same period by 150,000 ha of so-called nature interweaving areas. These areas feature combined land use, where nature enjoys a protected status. The planned initiatives are specialised in answering three crucial questions: **where?**, **what?** and **how?** For specific areas, this will lead to:

- a demarcation, indicating the possibilities of conservation, restoration and development of nature values;
- the forming of a vision determining what is possible in a specific area;
- implementing measures, indicating how possibilities of nature can be realised in the field by incl. rehabilitation and management.

For these three objectives, 20 actions are drawn up. These have to be completed at the end of the year 2001. These actions can only be successful when the following conditions are met:

- Explanation and acceptance of the relation ‘nature - environment’;
- Appreciation of ‘nature’ as a valuable element in other policy sectors (spatial planning, economics, ...);
- Enhancement of the social commitment and acceptance;
- Optimisation of the co-operation with the nature associations;
- A guaranteed effective juridical infrastructure;
- Sufficient resources and capable staff;
- Contribution and tuning of the local initiatives;
- Possibility of measuring ‘nature’ on a permanent base;
- Improved participation on international level;
- Continuation of a more systematic and projectwise approach of the area-orientated policy;
- Acquisition and availability of the knowledge about the causes of the biodiversity loss.

2.5. Strategy and Action plan

In the text below, some actions are printed in bold type. These are copied from the Flemish Environmental Policy Plan 1997-2001, which was determined by the Flemish government on 8 July 1997.

2.5.1. Nature conservation

2.5.1.1. Old legislation

In the past Flemish nature policy was mainly based on the Belgian Nature Conservation Act of 1973. This law focused on the conservation of the own constitution, the diversity and the undamaged character of the natural environment. It offered diverse possibilities to protect not only valuable areas, but also individual animals and plants.

Additional measures were taken to protect a number of listed plant and animal species. Legislation also created the possibility to designate areas of considerable natural value as national nature reserves or to recognise them as nature reserves. For all these areas, which are exclusively in function of nature, management plans are being drawn up.

In Flanders, there are 29 national nature reserves with a collective area of **3,556 ha**. These areas are owned by the Flemish Region and managed by its personnel. The ‘Kalmthoutse Heide’ is with its 914 ha the largest and probably the most well-known among these. We are talking about a varied heath landscape with dunes, dry and wet heath, meres and forests. Also nature organisations are, with financial support of the Flemish Region, active in the acquisition and the management of valuable areas. Additionally, they manage around 8,000 ha of natural area, of which **3,229 ha** was recognised as nature reserve at the end of 1997. The average surface area of these recognised nature reserves, of only **29 ha**, reveals how extreme fragmentation is.

Action for the period 1997-2001: Optimise the instrument ‘recognition/indication of nature reserves’ and refine the acquisition of nature and forest areas.

A testable and top-quality management is pursued. The current activities of diverse persons concerned must be geared to one another. In the long term, 50,000 ha nature reserve should be built out. For this purpose, the rhythm and the volume of acquisition of natural areas is increased. In the next 5 years, approx. 1 billion BEF will be set aside extra for this action.

In Flanders, regulation of the management of the verges was elaborated on a legal basis. Measures were provided with regard to the mowing policy (mowing time, frequency,). Moreover, a licence duty to change ecologically valuable vegetation and linear and pointed landscape elements was introduced.

The coastal dunes set a specific problem. The natural values are suffering strongly under the recreation pressure and the corresponding building activities. Very recently, parts of the coastal dunes were legally protected. For approx. 1,000 ha of dunes, a total building ban was imposed in view of the protection, the development and the management of the marine dune area.

2.5.1.2. Special projects

Since long, Flanders is aware of the fact that the deterioration of the biodiversity cannot be stopped by solely protecting areas and/or species. The problem needs an integral approach (ecosystem level, with the target groups, thematic,). In the year 1990, a lot of new initiatives showed up. Thus, the idea of systematic environmental policy planning was launched, as well as the idea to build out an ecological network. Furthermore ecological impulse areas and regional landscapes were started up and protection plans for species were worked out.

The 'ecological impulse areas' are pilot projects bundling means and people of the authorities and the private sector. The aim is to obtain concrete results on short term of works on the field. For all the impulse areas, a policy vision as well as an operational programme was created with special attention to the acquisition and management of representative natural areas, and to education and public sensibilisation. All the existing impulse areas have a relatively large surface.

The 'regional landscape' is a form of collaboration to promote the specific character of an extensive area. It is aimed at the consultation of and the co-operation with the target groups involved. For the promotion of nature conservation, natural education and natural recreation, the local social, economic, cultural and historical conditions are taken into account.

To protect an animal or a plant species, it obviously isn't sufficient to enter it in a protection list. At least as important is the attention given to the living conditions and the habitat. Therefore integral **species protecting plans** must be used. These plans concentrate on specific species in a specific area. Such plans have already been worked out for the badger, the toad, the partridge and the nurse-frog. A study on bats is being applied. For the implementation of these plans a strong instrument to organise the habitats and the forage areas is being worked out.

Action for the period 1997-2001: Support projects for the promotion of general nature quality; promote co-operation between the local authorities, the environmental and nature societies and the other partners.

2.5.1.3. Local administrations

Co-operation between the Flemish Region and the municipalities was defined by the end of 1991. 294 of the 308 municipalities signed a Municipal Environmental Covenant, valid for a period of 5 year. An important part of this covenant was the obligation, for the municipalities, to draw up a nature development plan (GNOP), containing an inventory of the natural elements, an analysis of pressure points, a list of objectives and an action programme. In return the Region gives financial support. The Nature Division of AMINAL takes care of the co-ordination and the evaluation.

In the beginning of 1997, a new covenant with the municipalities was concluded, based on the previous one. During the next period, the municipalities will have the opportunity to apply projects which fit in with their action plans. Therefor they will receive a subsidy of 50% of the total cost price for the application of these projects. Additional employment in implementing plans will also be subsidised.

Action for the period 1997-2001: Draw up an additional stimulation programme for the local environmental policy.

Action for the period 1997-2001: Finance and guide actions in GNOP-focus areas.

Interesting projects, which apply to the strategy developed in the Flemish Environmental Policy Plan, receive additional support.

2.5.1.4. International aspects

Initiatives concerning the conservation of the biodiversity were also taken on European level. The EU Bird-Directive 97/43/EC obliges the member states to take special protection measures for a number of bird species. In Flanders, 23 special protection zones with a total surface of **102,000 ha** were demarcated. In 1992, a new directive (92/43/EEC) regulated the conservation of the natural habitats and the wild flora and fauna. For Flanders, 40 protection zones totalling up to **57,400 ha** were presented. Some of these zones overlap the bird protection zones.

Flanders closely watches the outcome of the Ramsar Convention. In the Flemish Region, 5 wetlands of international importance were indicated, with a total area of 7,500 ha. Some of these are of the most famous nature reserves (e.g. 'Het Zwin' and 'De Blankaart').

Finally, Flanders wants closer co-operation with other regions or countries. This co-operation has materialised in a number of cross-border natural areas (e.g. consultation with The Netherlands with respect to the Kalmthoutse Heide). Co-operation agreements have been concluded with different countries in the field of environment and the nature.

Action for the period 1997-2001: Indicate additional strategic regional cross-border nature projects.

Action for the period 1997-2001: Work out policy visions with regard to international institutions and processes and make up a financing plan for the international environmental policy.

2.5.1.5. New legislation

After almost 25 years, the existing legislature was no longer able to anticipate new challenges (incl. in international and European context) and ideas (large organisation projects, ecological networks, nature policy planning and reporting, ...). Since 21 October 1997, there is a new decree on Nature Conservation and the Natural Environment.

Action for the period 1997-2001: Implement the decree on nature conservation; start up projects for integral management of the Flemish Ecological Network and for the realisation of natural interweaving areas.

Along with the first decisions of the Government of Flanders, implementing the decree, some of the new instruments become operational. The first projects for nature rehabilitation will be started in 1998. At the same

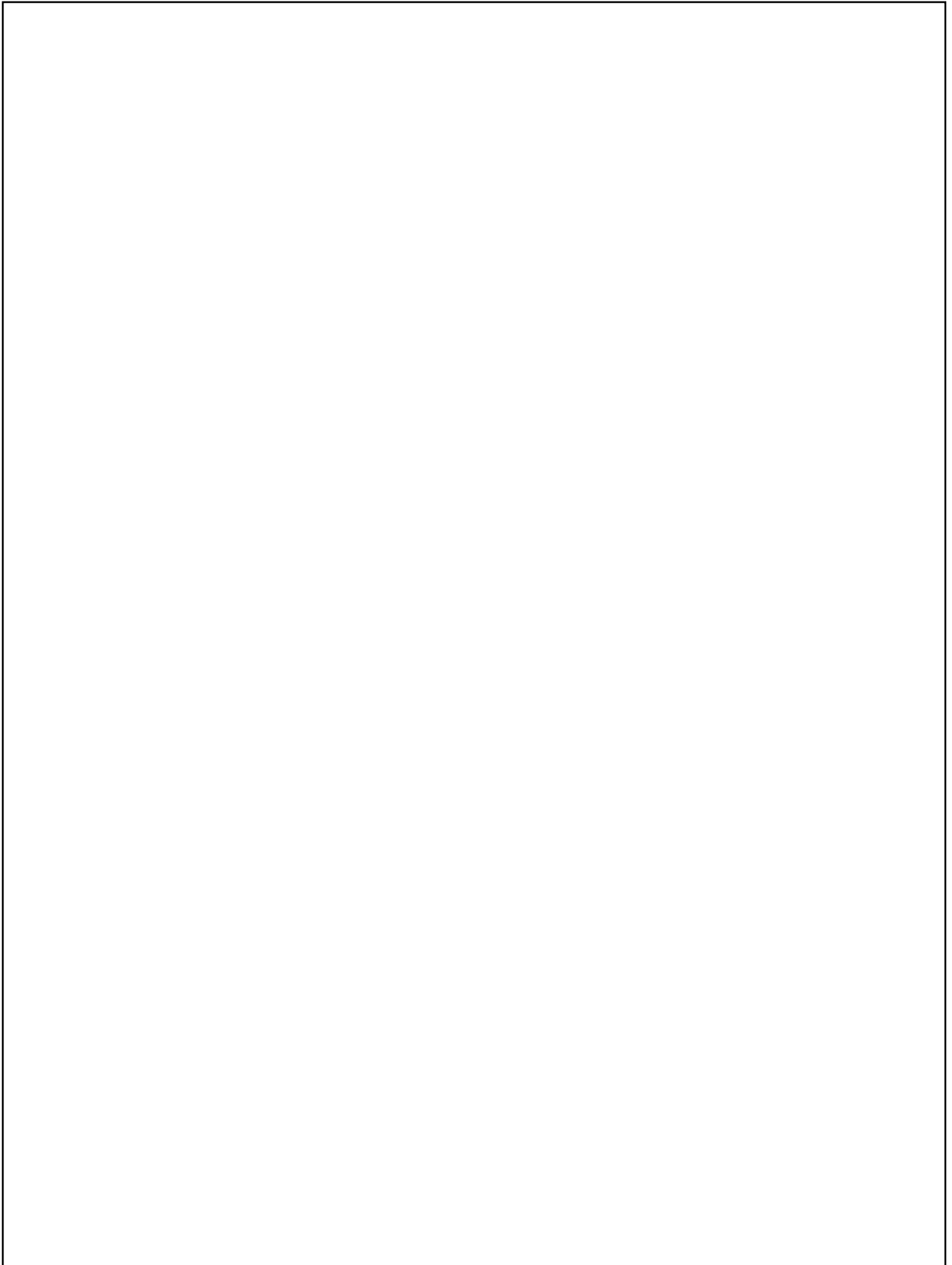


Fig. 2.3. Designated Areas of International Importance
(Institute of Nature Conservation).

A new decree

The '**Decree on nature conservation and the natural environment**' replaces almost completely the former legislation on nature conservation and sets a number of clear new outlines.

Objectives

This decree lays down the objectives of nature conservation unambiguously. The policy will focus on '**the protection, development, management and restoration of nature and the natural environments**', but also on '**the preservation or the restoration of the required environmental quality**'. Furthermore, '**the creation of a wide-ranging social basis**' is pursued. Moreover Flanders will participate in the larger international nature policy, in which the conservation and promotion of the biodiversity take priority.

Outlines

The new decree provides for a programmatic and methodical development. Nature policy will further be inserted in environmental policy. Every two years a **Nature Report** will be drawn up and enclosed in the Environmental Report (MIRA). Every fifth year, a **Nature Policy Plan** will be integrated in the Environmental Policy Plan.

An other important novelty is the elaboration of a legal framework that gives shape to area-orientated policy. With this, Flanders gives in to international regulations enforcing the indication of a coherent whole of protected areas. In 2002 a **Flemish Ecological Network (VEN)** with a total area of **125,000 ha** will be demarcated. This is a coherent and organised whole of open spaces in which a specific policy with regard to nature conservation is pursued. This network is supported by an **Integral Interweaving and Supporting Network (IVON)**. It will have a total area of **150,000 ha** and is composed by natural interweaving areas, which will also be marked out in 2002, and natural connecting areas, necessary for the migration of plants and animals. The Flemish Land Agency can assert the **right of pre-emption** in order to quicken the acquisition of valuable natural areas in the Flemish Ecological Network and in some other, well-defined zones. For the management of all these areas nature orientation plans will be made. The policy on **nature reserves** will be continued. The provisions already stipulated in the old law remain practically unchanged. To take the interests of the farmers into maximum consideration, a few conditions are build in for the recognition of nature reserves in the agricultural area.

Next to the attention paid to valuable areas, there are general measures for the conservation of the existing nature. First of all the decree introduces **the overall duty to maintain nature**. This means that every citizen is obliged to take all measures within his power to prevent, restrict or restore damage to nature. A **Code of good nature practice** will make this principle more tangible. In addition to this a ban on changing some valuable vegetation types is imposed. For other types and in some specific zones permits are made necessary. If the government grants a permit or imposes conditions, she has to take care that no avoidable damage to nature can originate. In some cases compensatory measures can be enforced. Based on the **stand-still-principle**, the conservation of the environmental quality is taken into account too. The **voluntary management agreements** are of considerable importance within the whole range of stimulating measures. The decree provides for a framework in which special efforts of individuals can be rewarded. At last, a new instrument was created: **nature rehabilitation management**. This instrument makes it possible to start up concrete action plans to safeguard the present natural values, to repair nature and to implement redevelopment programmes.

time the first phase of demarcation will be completed, including e.g. 60,000 to 80,000 ha of Flemish Ecological Network. All this will be underpinned by the first Nature Report and by an updated Biological Valuation Map for the Flemish Region. For this action too, an extra amount of 1 billion BEF will be provided for the period 1997-2001.

2.5.2. Sectoral integration

2.5.2.1. Environment

Safeguarding environmental quality (air, water, soil) requires other instruments than those used for taking care of nature and forests. Moreover the policy in these sectors might concentrate exclusively on public health. Still, the relationship between the environmental quality and the conservation of the biological diversity is crucial. A survey of all the different threats shows that a bad environmental quality is often, directly or not, the cause of deterioration.

In the definition of the environment, as it has recently been noted by law, the dichotomy between nature and environment no longer exists. From now on, the environment is described as “**the atmosphere, soil, water, flora, fauna and other organisms except man, the ecosystems, landscapes and climate**”. In the Environmental Policy Plan 1997-2001, nature occupies an essential and a valuable place. In the treated themes, the relationship between the environment (in the strict meaning of the word air, soil, water) and nature is a starting point.

Action for the period 1997-2001: Make up and implement specific action plans for a particular environmental quality.

Signal maps indicate in each theme (dehydration, contamination of the surface water, eutrophication, acidification and dispersion of environmental dangerous substances) where vulnerable and/or harmed ecosystems are situated. In 2002, specific action plans must be implemented for 10% of the indicated areas.

Action for the period 1997-2001: The development of a policy plan with regard to the scientific support of environmental quality standards.

2.5.2.2. Forests

Though the forest policy takes into account the altering needs of society, it considered that forest use is inferior in importance to the conservation and the protection of the forest.

With the Decree on Forestry, Flanders has its own forestry legislation since 1990. In Europe it is considered as pioneering, because of its juridical base for forest functions, its clear ecological foundation and its focus on nature. The ecological function also includes the management of the flora and fauna. On the base of this

forest decree, the management of the public forests increasingly stresses the promotion of the forests natural fauna and flora; including indigenous and habitat-appropriate trees, mixed uneven-aged, well developed and structured forests, natural forest-regeneration and a durable ecological balance. In managing the domanical forests (state owned), the policy guidelines are the principles of a close-to-nature forest management, such as the one established by the NGO ‘Pro Silva Vlaanderen’:

- trees should grow old;
- indigenous tree species are the base of the forest ecosystem;
- forests must have a varied structure;
- selfregulating processes are basic;
- timber harvesting must harm as little as possible;
- adjusted management for small elements with a high natural value;
- clearcutting should be avoided;
- a close-to-nature managed forest contains dead wood;
- undesirable vegetation should be controlled by mechanical or biological means.

In Flanders, the forest areas are not only small; but there is also fragmentation in property. A multitude of private owners owns about 75% of the Flemish forests. The forest decree gave managers and owners of private forests more scope in defining the ecological forest function. Still, in using different instruments, the authorities try to direct them towards a forest practice with ecological boundary conditions aimed at sustainability. A more extensive forestry, which uses the spontaneous natural processes in a sensible way, can yield quality timber relatively cheaply.

According to the Decree on Forestry, the Flemish forest policy is based on a long-term planning. Action plans give implementation to the long-term vision of planning.

Action for the period 1997-2001: Make and implement an action plan ‘forestry’.

The planning starts from a profound analysis of the initial situation. Then a strategic policy plan for forestry in the medium-long and in the long term is elaborated. The plan should cover 20 years. Finally concrete actions are formulated in order to realise the objectives. The guidelines in the policy document are ‘quality’ and ‘quantity’. Throughout the plan, attention is paid to forest expansion, to the realisation of forest reserves and to the linking of true-to-nature forestry and liveable productivity.

2.5.2.3. Spatial planning

In Belgium, spatial planning is one of the oldest area protection methods. Rules on this subject were imposed in 1962, when soil destinations were established by law. Several categories of destination relate to natural areas. Reserves and Natural areas (**112,000 ha**) were

distinguished as well as Forest areas (**43,000 ha**) and other Green areas such as parks (**34,000 ha**). These destinations have direct consequences. Building permits for green spaces are for example not granted. They also have indirect consequences. There are for example rules regarding the minimal distances to the green destinations when dealing with exploitation licences for companies.

Despite this legislation, problems were frequently treated '*ad hoc*'. The **Spatial Structure Plan Flanders** has recently changed this. All future decisions related to spatial planning will be examined for their compatibility with this plan. It works towards an 'open and urban' Flanders. Over the years all functions and activities were spread in space. The open and the urban spaces were therefore not clearly separated. The typical ribbon development (stretches of houses along the roads) emphasises this phenomenon. Inevitable consequences are larger flows of traffic and a severe pressure on the Open Space. For the outside area, conservation and reinforcement are pursued as well as a bundling of life and work in the centres.

Space will be redistributed by the year 2007 on the base of the needs of the different sectors. To this end the plan unconditionally supports the formation of an ecological network. In order to provide sufficient space for this, the Reserve areas and the Natural areas will be extended with **38,000 ha** and the Forest areas with **10,000 ha**.

2.5.2.4. Landscapes

Flanders' specific policy regarding valuable landscapes is based on a law of 1931, which enabled protection for historical, aesthetic or scientific reasons. It was quite a novelty that natural areas or 'scenic beauty' could be protected. While in former years protection was exclusively passive (by prohibitory measures), it now can be active. Since 1996 the Flemish Region applies a new legislation which strongly emphasises the management of protected landscapes. For each protected area management commissions are to be established and management plans worked out. Moreover, the Flemish Region grants subsidies for maintenance, restoration and for research and education.

Action for the period 1997-2001: Make an inventory of important Flemish landscape elements and work out a vision on these elements.

2.5.2.5. Infrastructure

In 1990, an interdisciplinary Ecological Engineering Working Group was officially set up in Flanders in order to achieve close communication and enforced co-operation between the different administrations of the Environment and Infrastructure Department. The agreement involved the integration of ecology into infrastructure.

The main purpose of ecological engineering is always to optimise the changes or the potential of nature. If nature can be used in the realisation of infrastructure works, then it is good to do so.

In order to be able to realise the objectives within an acceptable period of time, it was decided to immediately divide up the Ecological Engineering Working Group into five steering committees: navigable watercourses, roads, unnavigable watercourses and local roads, management, and wastewater treatment. It was also decided to produce one or more manuals. Different nature-friendly techniques are presented in these manuals in order to realise the integration of ecology into infrastructure in practice.

It is not always a simple task to convince the infrastructure sector to integrate ecology into infrastructure. Pilot projects are therefore extremely important for spreading the ideas of the Ecological Engineering Working Group. A number of pilot projects have been selected in order to clarify the possibilities and problems of ecological engineering in practice. In these pilot projects the development of more nature was a precondition in the planning and implementation of the infrastructure works.

Action for the period 1997-2001: Expand and implement the pilot projects ecological engineering for watercourses and roads; implement projects for the recovery of the river, ameliorate the fish migration and construct mate places.

An other instrument that we use is the EIA. EIA stands for Environmental Impact Assessment and tries to lessen the impact of i.a. works of infrastructure. For some works of infrastructure in specific areas (bird directive areas, nature reserves,) and for civil building works an EIA is required before a building permit or environmental license can be obtained. These assessments always include a chapter on fauna and flora.

2.5.2.6. Agriculture

In Flanders like anywhere else, agriculture has considerable repercussions on nature; not only because of the struggle for space, but also because some agricultural methods are harmful to nature. On European level, it was tried to reduce these repercussions by equipping the Communal Agricultural Policy with an ecological section, which resulted in 1992 in two regulations: one on the integration of forestry in agriculture and the other on the introduction of agricultural production methods which are compatible with the demands of environmental protection and nature management.

Flanders took additional measures. It has been applying since quite a time the principle of **land consolidation** to the organisation of areas with a mainly agricultural destination. In the past, the agricultural-economical objective has often be privileged. Today more attention is given to other interests, such as nature conservation, environmental protection and passive recreation forms. The general plan-

ning and the adapted environmental-effect-report in research procedures support these broader and integral objectives of land consolidation.

An instrument with general objectives is the **land use**, tuning the different claims on open space at the development level. An overall vision, worked out in a 'steering plan', should create chances for development for all the different functions in the open space (nature, agriculture, forest, landscape, infrastructure, recreation,). The projects will be realised through consultation and co-operation with all persons concerned. The realisation of four projects involves some 100,000 ha.

In Flanders, the idea of **interweaving** (of for example agriculture and nature) is very new. Interweaving is possible when places where agriculture and nature management are being practised, converge or influence one another. This instrument is further elaborated in the Spatial Structure Plan Flanders as well as in the new legislation on nature conservation. Within five years, a surface of **150,000 ha** will be assigned as nature interweaving area. For each area, nature orientation plans will be made within a period of ten years. These plans should indicate how nature and agriculture can strengthen each other. In many cases management agreements will be useful.

Flanders furthermore launched an investigation on how and to what extent environmental-friendly measures can be worked out in agriculture. Possible measures are alternative weed combating, ground covering measures, application of manure which is poor in emission and conservation of the genetic diversity of agricultural pets. These measures should take concrete shape in provincial recognition points where farmers and horticulturists can obtain information on the integration of the issue of biodiversity agricultural management.

Action for the period 1997-2001: Formulate a Code of good agricultural practice.

The code creates a management instrument, which fully inserts environmental aspects (minerals, pesticides, water-use).

Action for the period 1997-2001: Work out a legal and organisational framework for voluntary management agreements.

2.5.2.7. Hunting and river fishing

The hunting season, the hunting ground, the animals that can be hunted, and the hunt equipment are subject to legislation. Each hunter must have a hunting licence, obtained after an official hunting examination. The law also sets the base for the integral management of hunting grounds. Flanders has a great number of game management units. These are collaborations of hunters which can be subsidised by the authorities for working out the management plans which contribute to the creation of an ecologically justified game population.

The river fishing is still regulated by the Belgian law of 1954. Similar to the Game Law, this law on freshwater fishing prescribes when, where, how and what can be fished. The number of fish species for which a total fishing ban is declared, has considerably been increased. Furthermore a Fishery Fund was set up, of which the revenues are used to repopulate rivers and strengthen supervision on fishery.

Action for the period 1997-2001: Evaluate and adjust the game management units in view of nature conservation and the ecological fitting-in of the river fishery.

2.5.2.8. Biosafety

In Flanders, the extensive regulation on the environmental licences treats an important aspect of biosafety. According to a European directive, a licence obligation was elaborated for the limited use of genetically modified organisms. The Scientific Institute of Public Health takes part in the evaluation of the notifications. It tests the applications for activities against the existing rules and represents Flanders on international meetings.

In 1997, the Flemish Region, the other regions and the federal state concluded an agreement on the administrative and scientific co-ordination in the field of biosafety. The agreement involves the realisation of a common evaluation system with regard to biosafety, the so-called **Biosafety Council**. This council will, among other things, give advice on the commercialisation of products with GMO's.

Action for the period 1997-2001: Make a framework of considerations for the introduction of exotic or changed biota.

2.6. Monitoring and evaluation

2.6.1. Collection of data

There has been a lot of biodiversity-related research in the past. Until today several actors have collected and are collecting data (Institute of Nature Conservation, Institute for Forestry and Game Management, universities, nature organisations, Royal Belgian Institute of Natural Sciences, National Botanic Garden,). The status of a few groups of species has been monitored and certain biotic communities and areas have been described in detail. In spite of this, there was no systematic description of nature in relation to the environment and the land use. At this moment there is a strong need for the development of a specific ecological monitoring system. A more systematic collection of data and the use of well-chosen indicators should make it possible to create time series. The objective is not only to describe the biodiversity, but also to explain and evaluate the assessed changes.

Action for the period 1997-2001: Build out an integrated ecological monitoring system.

Action for the period 1997-2001: Improve and complete the existing monitoring networks and statistics.

2.6.2. Policy planning and evaluation

The process of environmental and nature planning, evaluating and adjusting is even more important than the policy plans themselves. In Flanders a serious effort is being made to make this process possible. A network of co-ordinators is established for the follow-up of the first Environmental Policy Plan. Within the network the co-ordinators will keep an eye on the implementation of the various actions of this plan. This monitoring is totally different from the collecting of field data, but equally important. A report on the progress and the obstacles will be presented in the yearly Environmental Programme. This programme creates the possibility to adjust the planned actions. At the same time within the framework of the Environmental and Nature Report, a global environmental policy evaluation will be held. Furthermore,

when measuring the progress in the environmental policy, it is necessary to check other policy sectors on sustainability. This can only be done by means of holistic indicators. Such indicators will allow conclusions on a more global level (for example a society).

Action for the period 1997-2001: Build out a permanent structure for planning.

This structure will prepare, support and implement the process of environmental planning. Ways of involving other sectors, institutes and policy levels will be worked out.

Action for the period 1997-2001: Refine and draw up the Environmental Programmes.

Action for the period 1997-2001: Develop relevant indicators for sustainability.

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3. The Brussels Capital Region

Preface

Is an urban environment compatible with wildlife?

In the context of an urban environment, is there any point in even mentioning biodiversity ?

Such questions have been asked more than once. The human-urban habitat is very different indeed from the habitat of wild flora and fauna. Where else than in the urban environment are nature and biodiversity subjected to such continuous and severe pressure ? Any discussion concerning biodiversity in urban environment, particularly on the scale of the Brussels Capital Region, could seem trivial. However, at times where almost half of the world's population lives in urban areas, such a debate becomes inevitable. The Brussels Capital Region has been discussing this subject for some time. It should be highlighted that it is one of the few large cities running an information network on urban flora and fauna, and in which biodiversity plays a central role.

Nevertheless, the debate on urban biodiversity is complicated. It not only consists in preserving and protecting relics of nature in urban areas by strict regulations; it consists in far more than that. It takes that biodiversity into consideration, which develops as a result of the many possibilities of contact and exchange which are typical of, yet unique to, cities. This makes cities suitable for a high level of biodiversity. Such biodiversity, while implying enrichment, can however also result in a threat to native diversity. Needless to say, this type of biodiversity is of a different scale compared to that encountered in unspoilt rain-forests...

It is important to realise that in the context of urban environment, the issue may not be biological diversity itself, but rather the development of a pleasant living environment, a fundamental part of this being the 'biodiversity' found therein. In this regard, it is essential to make the public aware of the wealth of biodiversity which surrounds them in their own city. This is merely the first step towards recognizing the importance of the biodiversity of unspoilt forests, wetlands, ...

Biodiversity in the urban environment makes sense; recognition of biodiversity on a world scale surely must start at home. Are people even aware of those common swifts flying around our rooftops ?

Didier GOSUIN

Regional Minister for Environment, Renovation, Culture, Tourism and Welfare

3.1. Introduction

3.1.1. Administration and competences

The Brussels Capital Region holds a distinct position due to its limited surface area (+/- 160 km²), the very high urbanisation level, the high population density (about 1 million inhabitants), the tight infrastructure network and the intense economic activity that takes place there. The Region has, like the others, extensive competences in the area of the environment.

These activities are carried out by the **Brussels Institute for Management of the Environment (BIME)**¹, which is a para-regional institution that serves as the environmental administration of the Brussels Capital Region. The BIME collects and analyses the environmental data, distributes the information, gives advice and draws up plans of action, defines the strategy to be followed, intervenes in the fieldwork, promotes the environmental awareness etc. Given the complexity of the urban environment, the BIME is forced to collaborate with all sectors and to take a multi-disciplinary approach. Spatial planning and land policy activities are carried out by the **Administration for Urban Planning and Zoning**².

3.1.2. Official advisory bodies

A prominent role is played by the **Environmental Council**³. Here, both the associative societies and the companies, the social partners and the scientific experts give advice on government decisions that have been enacted. For nature conservation matters, this Council consults the **Brussels Higher Council for Nature Conservation**⁴.

3.1.3. Associations

The Brussels Capital Region has a number of associations for the environment in general, which are organised in the federatif associations Inter-Environnement Bruxelles (IEB) and Brusselse Raad voor het Leefmilieu (BRAL).

¹ Institut Bruxellois pour la gestion de l'environnement (IBGE)
Brussels Instituut voor Milieubeheer (BIM)

² Administration de l'Urbanisme et de l'Aménagement du Territoire
Administratie voor Stedebouw en Ruimtelijke Ordening

³ Conseil de l'Environnement
Raad van Leefmilieu

⁴ Conseil Supérieur Bruxellois pour la Conservation de la Nature
Brusselse Hoge Raad voor het Natuurbehoud

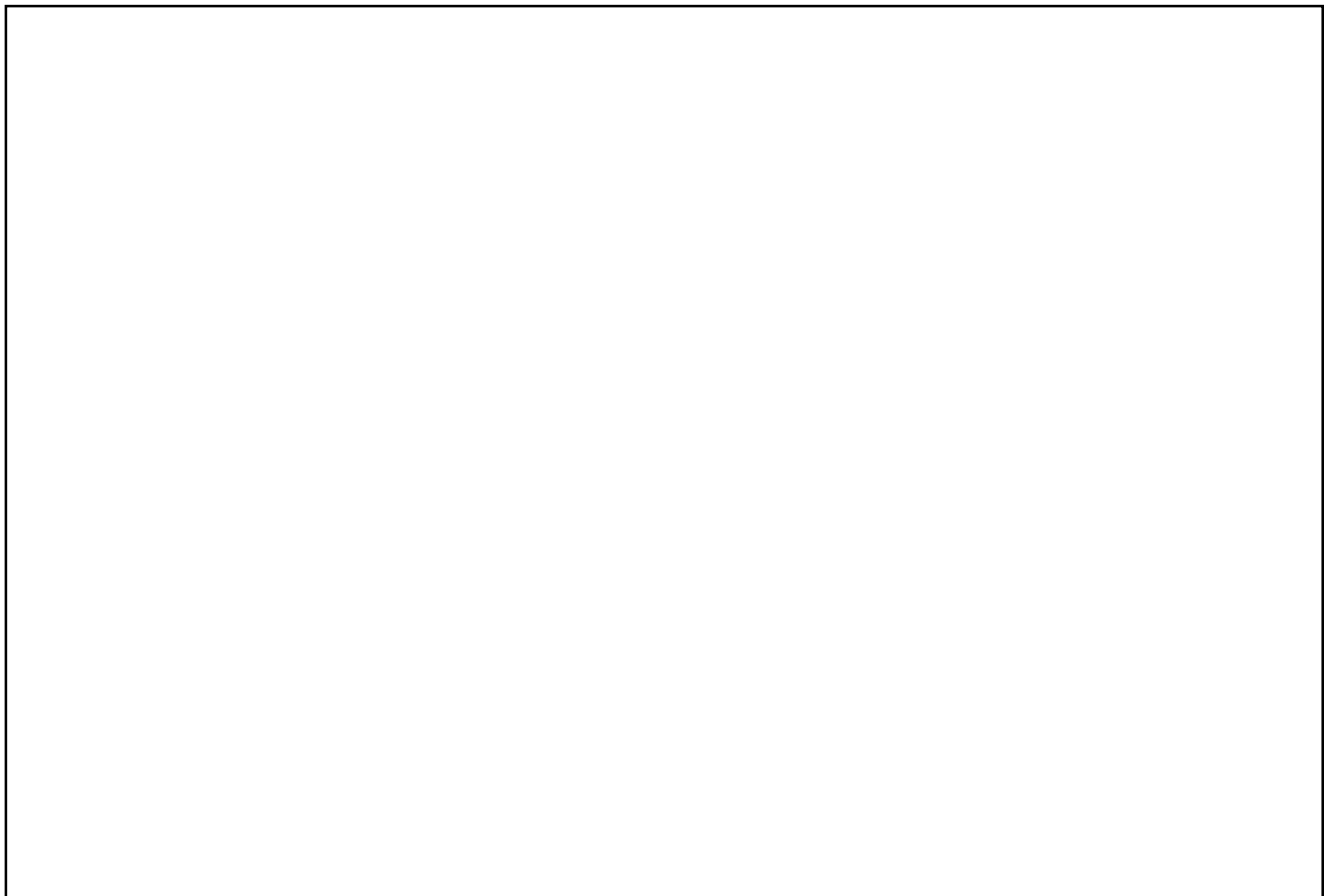


Fig. 3.1. Types of green spaces in % of total open and green surface area (8,563 ha) of the Brussels Capital Region (IBGE-BIM)

A number of smaller associations focus their attention in particular on nature conservation in the Brussels area; they are often very site-specific or species-group specific.

3.2. Ecosystems and species in the Brussels Capital Region: the particular status of the Region

In light of the particular status of the Brussels Capital Region - a small, highly urbanised island embedded in the Flemish Region - the term 'biological diversity' and the development of a policy aimed at preserving and increasing biological diversity must be put in a broader perspective here. Yet, contrary to popular belief, the flora and fauna in the urban environment is anything but poor or trivial. The great diversity of biotopes, both relict and newly developed and typically urban ones, the great dynamism, the good contact and exchange possibilities, lead to a typically urban biological diversity that has its own ecosystems and its own species diversity.

3.2.1. Ecosystems

In the Brussels Capital Region, it is not evident to speak of 'present ecosystems', since these always exist in a relict and disturbed form. Relevant data has not yet been processed in a systematic manner from a regional perspective. Given the urban nature of the Brussels Capital Region, it is more appropriate to talk about the policy in terms of remaining, open green spaces, which play a role in the conservation of that specific urban biological diversity.

3.2.1.1. The open and green spaces

The Region provides anything but a uniform urban landscape picture. One can distinguish 4 zones, which are determined by the presence of water (web subregion), the city and its building (densely urbanised subregion), the forest (forest subregion) and the rural relics (rural subregion) at the periphery.

Despite the high level of urbanisation, it is a very 'green' Region: **the open, green (non built-up) spaces in the region cover a surface area of 8,563 ha, which is the equivalent of 53% of the Region's surface area** (see Fig. 3.1.). However, these green spaces are very unevenly distributed, both from a quantity and quality point of view.

3.2.1.2. The blue spaces

The presence of water is essential to preserve the diversity. The only major open waterway is the canal. In

addition, there are a number of rivers and brook systems, which are included in the city's park systems, as well as the numerous ponds in the forest and parks. Open water covers a surface area of 172 ha (about 1% of the Region's surface area).

3.2.1.3. The areas with a biological value

The majority of the green spaces with presumed ecological importance were studied to ascertain their 'biological value'. They are mostly situated at the periphery of the Region. The initial approximate survey shows that **the areas representing a high to very high biological value make up about 2,540 ha**. This means, on a total surface area of green spaces without the purely private gardens, of some 5,770 ha, about 44% comprises a high biological value, which equals about **15% of the Region's surface area** (see Fig. 3.2.).

Note. The majority of these spaces have the 'green area' status as planning destination. Nevertheless, a number of very important areas have so far been denied this elementary protection: **a total of about 10% (247 ha) of the areas with biological value do not have this essential protective destination status**. The building pressure on these areas constitutes a real threat.

3.2.2. Species

Reliable overview data about species in the Brussels Capital Region is available for the following groups: higher plants, mosses, avifauna, herpetofauna, mammals. Since 1990, these data are collected in a co-ordinated fashion in the context of the establishment of a bio-indicator-information-network, based on a collaboration between volunteers and professionals (see also 3.5.4.).

Due to the island position of the Brussels Capital Region in the Flemish Region, with which it forms a biogeographic entity, the interpretation of flora and fauna data may not be useful from a scientific perspective. It is however useful from a political perspective. Indeed, the main green spaces run across region borders (*e.g.* Forest of Soignes), and a number of species groups are dependent on the ecosystems that are present in the surrounding area (*e.g.* avifauna).

The interpretation of criteria such as rarity, vulnerability, threatened status... is thus a very complex matter and must be adapted to the specific context of the urban environment, on a Brussels scale. The urban environment is also by nature the privileged immigration place of species, which moreover gives rise to typical urban biodiversity (*e.g.* bats, fox). However, in recent years, it has appeared that precisely a number of these phenomena have negative consequences on indigenous species diversity: the threat of exotic species, which get optimum opportunities in the disturbed, contact-rich urban environment (*e.g.* exotic birds, as collar parakeet, Egyptian

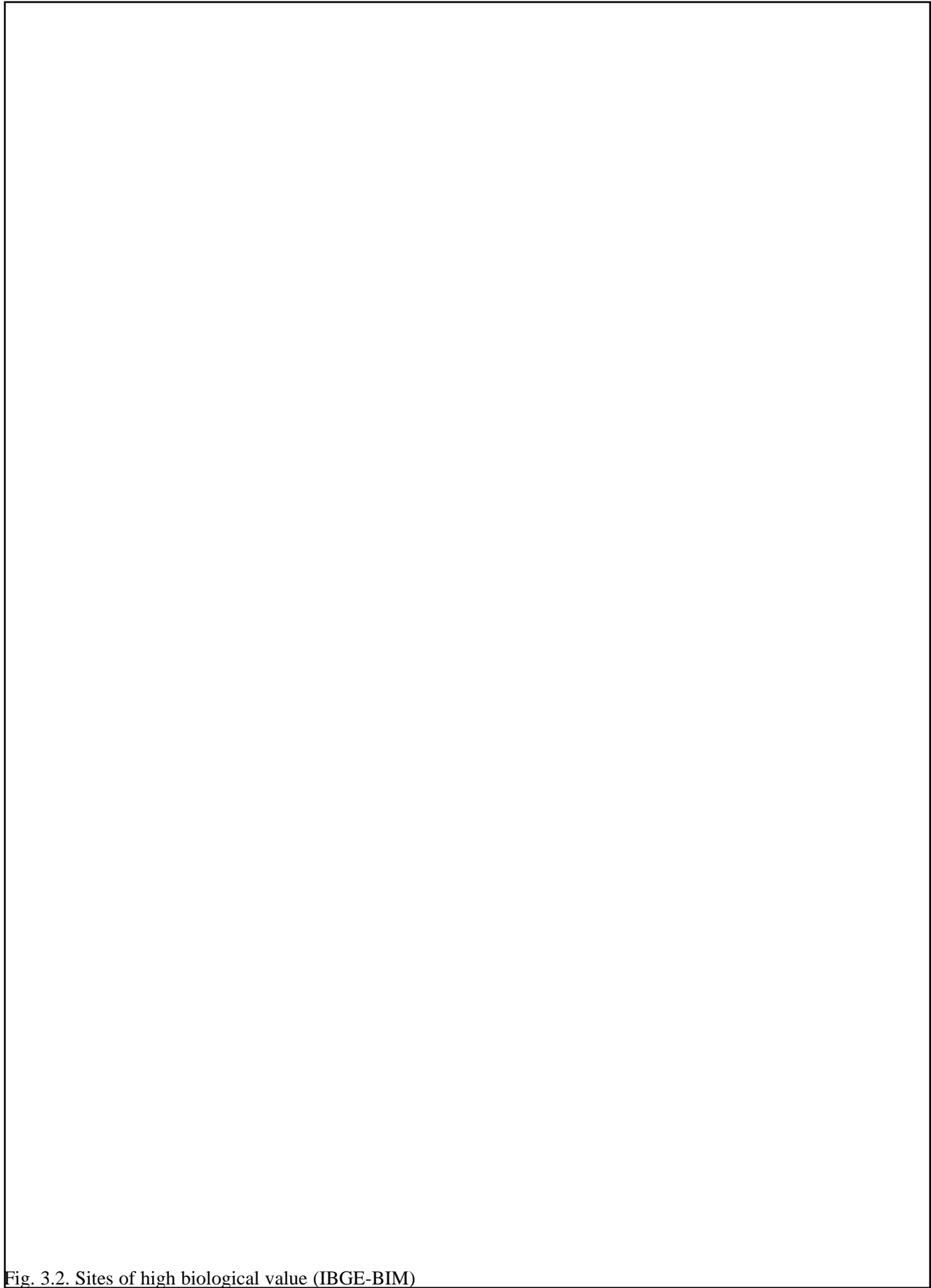


Fig. 3.2. Sites of high biological value (IBGE-BIM)

goose; Californian water turtles; plants as Japanese Knotweed, Big Hogweed; ...).

Table 3.1. - Situation of some important groups in the Brussels Capital Region.

	Total number of species	Indigenous species	Endangered species	Vulnerable species	Declining species
Mammals	46 (?)	44 (?)	?	?	?
Birds	92	85	9	16	24
Higher plants	723	568	65	62	?
Mosses	223	/	49	67	?

3.3. Activities and threats

As a result of the predominantly urban nature of the Brussels Capital Region and its social-economic context, the **threats to the biodiversity** are very **intense** due to the concentration of the population and the **high building degree**, which translates into a **high concentration of threatening activities and a high recreation pressure**.

3.3.1. The high population density

The Brussels Capital Region presently has about 950,000 inhabitants. This means an average regional density of 59.2 inhabitants/ha, who are however unevenly distributed. In addition, there is also a real pressure from the commuters, whose number is estimated at least at 250,000 per day.

3.3.2. Occupation of the space

About half (47%) of the Region's surface area (16,138 ha) is built-up. Of this 2,485 ha, equalling 15%, is taken up by traffic infrastructure (2,000 km of canal, roads, railways). Car parks and infrastructure for public transport increase this proportion to 21%. The remainder is taken up by buildings of all kinds: residential, industrial, commercial, for public services, thus totalling 26% of the region's total surface area. Although there is still non built-up land that is being converted into built-up land (1990-95; + 2.7% built-up land, +1.2% traffic infrastructure), this trend is slower than in the 1980s (+ 9 and 11.6%, respectively). Indeed, there is ever less 'open' space available.

3.3.3. Threatening activities

3.3.3.1. Atmospheric pollution

Traffic and domestic heating have replaced industry as the main source of atmospheric pollution. More than 90%

of air pollution is due to energy consumption. The remaining 10% is attributed to certain industrial production procedures. It concerns in particular SO₂, NO_x, Ozone, CO, heavy metals such as lead, volatile organic substances, dust, black smoke as a result of diesel use,...

3.3.3.2. Water pollution

Water pollution constitutes a main problem in the Brussels area; water treatment installations are just now under construction. The waterways still used for discharge of waste water are therefore of very poor water quality. A number of surface waters nevertheless show excellent water quality.

3.3.3.3. Soil pollution

The soil pollution is mainly of historic origin: old industrial sites, often also old dumps.

3.3.3.4. Noise nuisance

The sources of sound nuisance are mostly situated in transport (the most important source), industrial activities, construction sites, neighbourhood noise.

3.3.3.5. Water catchment

The extraction of natural resources, such as the extraction of sand limestone and sand in the past, is presently restricted to a limited extraction (4% of needs) of groundwater. The effect of the water catchment on the forest ecosystem is not apparent, although it has never really been examined.

3.3.4. The high recreation pressure

A typically urban threat to biodiversity is the growing and changing recreation need of the inhabitants. The population pressure on the remaining open space is high: about 950,000 inhabitants basically rely on 8,563 ha of green space, of which almost half (4,718 ha) is public, although not always accessible. Recreation pressure is a real threat to the biological diversity of the area. In particular, it causes severe degradations reaching alarming levels in larger green areas, on the periphery of the Region, especially the forests.

The urban context can also induce, as a result of a recreation need, an unexpected threat to semi-natural areas:

- the 'park transformation' of semi-natural areas
- the taking up of such areas for the creation of private vegetable gardens.

3.4. Objectives

What does the Brussels Capital Region want to do with its biological diversity?

What with the Convention on Biological Diversity?

The guidelines 'for the development of biological heritage' are incorporated in the **Plan of Regional Development (PRD-GEWOP)**⁵, the policy plan of the Brussels Government, of which the finalising was announced in the first Brussels policy declaration (18 October 1989). The PRD-GEWOP pursues a **durable management of the urban development, for the protection and improvement of an attractive living area for the population.**

This positive attitude is clearly included in the **Government declaration of 18 June 1995**. In relation to the management of Green Spaces (including Nature conservation) priority is given to:

- the development of the 'green network' concept, adapted to the Brussels entity, and this in accordance with the cornerstones of the PRD;
- the protection of (statutory) green spaces from building pressure;
- the upgrading of waterways through the green spaces;
- the making available of the necessary resources to implement the forest decree (which regulates traffic and recreation in the forest);
- the reinforcement of the protection of the ecological resources in the urban environment.

It clearly reveals two axes:

- on the one hand, it is obvious that the emphasis is not limited to the **protection of the existing green spaces**, both through their explicit management and by controlling the recreation pressure on them, but includes the **further development of a 'green network'**. While given the urban context the concern is first and foremost social, these objectives are crucial in reinforcing the urban green web as a carrier of biological diversity;
- on the other hand, there is the explicit willingness to **reinforce the ecological resources.**

These two objectives lay a **solid foundation** allowing the development of an **urban biodiversity policy**. In this respect, it is particularly important to realise that, in view of the entire urban context, 'biological diversity' in itself may not be the most important thing, but rather the **development of a pleasant environment** to live in, a pleasant living area, that is determined in part by the development of 'biodiversity' in the surrounding environment. In this regard it is essential to **raise the public's awareness of this biodiversity 'on the doorstep'**, also in their own urban environment.

⁵ Plan of Regional Development
Plan Régional de Développement (PRD)
Gewestelijk Ontwikkelingsplan (GEWOP)

3.5. Strategies and management

It must be stressed that the Brussels Capital Region so far has not developed a specific 'biological diversity plan'. Indeed, in its view, the conservation and the further development of its own typical urban biological diversity is part of its policy aimed at green spaces. Therefore, there is no specific biological diversity budget. This policy has various aspects: planning, active management, adaptation of the instruments, monitoring and study, information.

3.5.1. Planning

The working out of a high-quality and durable policy relating to green spaces in the urban environment, which also pursues the development of biodiversity, is not feasible without a concrete collaboration between the various sectors concerned. The principal collaboration exists:

- between the various regional administrations;
- between regional, municipal and federal administrations;
- between administrations and non-governmental organisations;
- between administrations and other public institutions (e.g. railway service...).

3.5.1.1. Creation of the green network

The concept emphasises the cohesion and the continuity of the green spaces in the urban environment. The intention is to integrate the numerous functions of green spaces in the city, the aesthetic, recreative, urban development as well as the ecological ones. As far as the development of the ecological function is concerned, a great deal of attention is paid to the increase of biological diversity. The accomplishment of this green network amounts to the creation of a strategy in different stages:

- 1) the creation of planning instruments: the detailed inventory of all open and green spaces (specifically allocated budget for 1996-97: 6 million BEF);
- 2) the analysis of this database: this stage is currently being worked out (specifically allocated budget for 1997-98: 6 million BEF);
- 3) the proposing of solutions via adequate field actions (budget to be integrated in the budget for development and management of green spaces as from 1998-99).

3.5.1.2. Creation of the blue network

Simultaneously with the creation of the green network, the Region has also taken the initiative of developing the 'blue network'. The purpose is an integrated, durable and ecologically justified management of the smaller open

waterways in the Region. This is a highly interdisciplinary project requiring active co-operation between the various sectors, in particular between the managers of the green spaces and the services of 'public works'. At present, the preparatory phase is underway (identification of ecological problems).

3.5.1.3. Integration of the concept of the blue and green network in the drawing up of new urban development and sectoral environment plans

The concept of the green and blue network is only useful within a legal framework. A crucial element in the strategy is that the concept and its proposals should be integrated in the urban development plans, presently being drawn up in the Brussels Capital Region.

In particular the Regional Soil Destination plan (PRAS-GBP)⁶ and the Municipal Development Plans (PCD-GOP)⁷ will form the foundation of the legal framework for spatial planning of the Brussels Capital Region in the next few decades.

3.5.2. Management

3.5.2.1. Adapted ecological management in the urban green spaces for the promotion of biological diversity

The concept of 'ecological park' or 'semi-natural park' adopted a few years ago in the Brussels Capital Region is a fairly new approach for the urban environment in the laying out of green spaces. In this concept, the starting point for (re)-development is the conservation of the original landscape and vegetation and its optimum development.

The Brussels Capital Region has a number of scenic landscape parks with a high ecological value. The ecological management is here as well implemented and/or further expanded for the promotion of biological diversity, both for flora and fauna, for the conservation and/or development of semi-natural grassland, shrubs and ponds.

The Brussels Capital Region has also a substantial surface area of public forest (1,735 ha, of which the Forest of Soignes alone covers 1,642 ha). It concerns mostly ancient forest that was planted with beech in the 18th century, containing relic alluvial alder and ash forests in the valleys. The management focuses on the gradual transformation into more natural forests, whereby

the development of a maximum biological diversity is essential. The main problem resides in the intense recreation pressure. One attempts to solve these problems through adapted regulations (see below).

In these public park and forest areas, the challenge is especially the integration of differentiated management. The basic strategy is to draw up adapted management plans for each area.

Finally, one must not overlook the substantial share of the private green spaces (gardens and large domains), which constitute privileged areas in the city for the conservation and development of biological diversity. Since 1992, the Brussels Capital Region has supported a project whereby owners of private gardens are given advice about a more natural management of their garden.

3.5.2.2. Adapted flora and fauna management

The undesired invasion of aggressive plant and animal species threatening the indigenous biodiversity requires efficient management and good information towards managers and the population. The express purpose is to combine local and specific interventions into a global plan of action for the control of undesired species. In addition, there are initiatives aimed at preserving and promoting the typically urban (Brussels) biological diversity, whereby the raising of awareness of the urban population is of vital importance.

3.5.3. Urban nature conservation policy

The majority of the nature conservation instruments were inherited from the federal structure. As a result of this, many laws are either outdated and/or not adapted to the urban nature conservation. Within the administration, efforts are being made to adapt these laws to Brussels reality, with regard to the optimum protection of the sites of high biological interest and the indigenous wild flora and fauna.

3.5.3.1. General

The federal '*Nature Conservation Act*' (13 July 1973) was supplemented in 1995 by the '*Regional Law pertaining to the conservation and protection of the environment*' (27 April 1995). Further efforts are being made for a better integration of the aspects of nature conservation as part of the general environmental policy.

3.5.3.2. Species-oriented protection

Fauna

The '*Regional Law pertaining to wild fauna and hunting*' (29 August 1991) protects all vertebrates, except fish, and

⁶ Regional Soil Destination Plan
Plan Regional d' Affectation du sol (PRAS)-
Gewestelijk Bodembestemmingsplan (GBBP)

⁷ Municipal Development Plan
Plan Communal de Développement (PCD) -
Gemeentelijk Ontwikkelingsplan (GEMOP)

bans all hunting. A number of amendments are in the works, most particularly as part of the preservation of biological diversity:

- proposals for a few specific deviations, for *i.e.* exotic animal species threatening indigenous fauna and flora;
- proposal for specific protection of some rare species.

Flora

Wild flora is only protected by the federal law '*pertaining to measures aimed at protecting certain plant species growing in the wild*' (16 February 1976), which is not adapted to the urban rare flora and its threats. The amendment is in the works.

3.5.3.3. Sites-oriented protection: purchase of areas and granting of nature reserve status

Under the '*Nature Conservation Act*' (1973) as early as 1989, and subsequently in 1992, a number of biologically valuable areas received the status of **nature reserve**, providing an optimum management according to biological diversity. It concerns mostly a few forest areas and one diverse relic farming area with forest and marsh.

Of course, the assigning of the status of regional nature reserve requires that it concerns areas which are owned by the Region. In the years 1988-91, some budgetary space was available allowing the purchase of a few strategic areas, subsequently given the status of nature reserve. As huge amounts were involved, this budgetary space is no more available and purchase of areas is currently out of question.

A strategy that can be adopted in this respect is the 'ordering of areas', on the basis of the '*Regional Law pertaining to the conservation of immovable patrimony*' (4 March 1993). This strategy has already been used on several occasions to protect a number of large threatened semi-natural areas. This status however does not always allow the necessary management.

The initiatives taken recently which will grant the status of nature reserve to a few important areas relate therefore to areas of public property, that are not threatened in a direct way.

Areas which are not the property of the Region qualify for the status of 'recognised nature reserve'. So far however, due to the high cost price of land, there is not a single application for the recognition of a private area as nature reserve, by virtue of the '*Regional Law pertaining to the recognition and subsidising of nature reserves*' (25 October 1990).

3.5.3.4. A few specific preservation measures

Pesticides ban

The Brussels Capital Region has a ban on the use of pesticides by public institutions on public properties.

Only a handful of exceptions are admitted ('*Regional Law pertaining to the use of pesticides*', 2 May 1991).

Visiting of the forests

In order to counter the increasing threats by recreational pressure on Brussels forests, regulations were defined, which are reflected in the '*Regional Law pertaining to the visiting of Forests in the Brussels Capital Region*' (30 March 1995). Based on this, '**special protection zones**' can be defined, where access is strictly regulated. The regulation, however, does not appear stringent enough.

3.5.3.5. Conservation and application of the EEC directives relating to nature conservation

As regards the application of the **Bird Directive (97/43)**, the Regional Law of 29 August 1992, pertaining wild fauna and hunting, protects all wild birds and their environment. This allows an easy follow-up of the guideline, as no bird guideline areas were defined (criteria not satisfied). As regards the application of the **Habitat Directive (92/43)**, in May 1996 a number of areas were suggested to become a part of the Natura 2000 network. Although the Habitat-directive criteria are not adapted to the urban situation, an effort was made to incorporate the key areas in the network; notably the Brussels Forest of Soignes and three complexes of valley and forest zones. In total, it concerns 1,871 ha.

3.5.4. Study & monitoring

Continuity in the research of the biological diversity in the Brussels Region

Since 1991, there has been co-ordinated research in the field of the biological diversity in the Brussels Capital Region, notably in the context of the establishment of a bioindicator-information-network. The principal goal of this research is to achieve concrete recommendations in terms of the urban environment, and to be able to meet the legal obligation of drawing up the two-yearly statement of the environment ('*Regional Law pertaining to the drawing up of a report on the state of the Brussels Environment*', 4 June 1992). The idea is to draw up a periodical statement on the condition and the quality of the biological environment. For this, the most representative groups of organisms that can be studied and monitored easily are the following: birds, herpetofauna, mammals, higher plants, fungi. The data of this convention makes it possible to draw important conclusions about the biodiversity, such as:

- evolution of certain species, status quo, progress, deterioration, ...;
- evolution of certain sites;
- disappearance of species, emergence of others;

that allow recommendations to be formulated relating to the management, conservation or protection of biological diversity, either by taking direct action on the species, or via the areas where the species exist. The current monitoring programme is carried out with a very limited annual budget of 3.3 million BEF. At present, there continues to be a shortage of budgetary resources in the environmental sector.

3.5.5. Information and education

A precondition for the success of a policy aimed at promoting biodiversity is good information and education of the population, especially to raise awareness of the presence of biodiversity 'close at home'. In relation to

nature conservation, the Brussels Capital Region spends about 30 million BEF a year on the development of environment-educational programmes, directed at school children and adolescents as well as adults, by granting subsidies to universities, institutes, education centres, nature conservation organisations, etc.

At present, the foundation for intense co-operation with the Royal Belgian Institute of Natural Sciences is being laid as part of an exhibition programme on urban biodiversity (fauna in the city).

Machteld GRYSEELS
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4. The Walloon Region

Preface

As our natural heritage is endangered by an unreasonable exploitation of most resources, nature appears more than ever as an essential aspiration, in view to restore the lost harmony with our living environment. This sudden awareness makes us work towards a new kind of development which allows at the long term, economical and social growth and a better preservation of our environment and natural resources. So appeared the concept of sustainable development which the Convention on Biological Diversity, ratified by the Walloon Region on 6 April 1995, is aiming to promote.

The Environmental Plan for Sustainable Development in the Walloon Region (PEDD), adopted by the Walloon Government on 9 March 1995, constitutes a planning tool aiming to secure the preservation of natural resources in the perspective of sustainable development. This long-term policy requires the coordination of the different actions undertaken concerning all the aspects of environment and the integration of environmental considerations into each sectoral policy issue. The Walloon Region pays particular attention to this integration. The revision of the Walloon Code of Town and Country Planning, Urban Development and Heritage is an example of that attention taking into account the interesting natural zones during land management operations.

In the nature conservation sector, the aim of the PEDD is the realisation of a Nature Action Plan which will draw up the frame and objectives for the actions to be undertaken within a time schedule of five years. The global objective will be the establishment of an ecological network which is the central concept of the environmental policy conducted by the European Community. Besides the creation of nature reserves on the sites of high biological interest, the Walloon Region contributes to the set up of an ecological network by adoption of measures involving the whole territory: agri-environmental measures, subsidies for hedge plantations, late cutting roadsides. Nature preservation also requires an active participation of each partner, the Walloon Region therefore promotes the co-operation of local partners involving both public and private actors. In this way several innovative experiences allow an important place to public consultation: municipal nature development plans, river contracts, nature reserves...

If the favourable evolution of mentalities may please us, it is still essential to pursue and amplify the actions and programmes which develop public awareness, information and education. These actions and programmes are among the major objectives of the PEDD.

Finally, as biological diversity ignores borders, international programmes centred on nature conservation become particularly important. The Walloon Region, complementary with the Flemish Region, is therefore satisfied to affirm and demonstrate the active engagement of Belgium in the implementation of the Convention on Biological Diversity at the European and Paneuropean scale.

Guy LUTGEN

Regional Minister for Environment, Natural Resources and Agriculture

4.1. Introduction

4.1.1. Administration

In the Walloon Region, the administration of nature conservation is entrusted to the **Nature Conservation Department** (Office for Nature and Green Space Conservation, Nature and Forestry Division, Directorate-general for Natural Resources and the Environment of the Ministry of the Walloon Region).

The main assignment of the Nature Conservation Department is the implementation of the legislation concerning nature (see also 4.5.1.). Nevertheless, the department further endeavours to establish collaboration with other administrative departments to include biological diversity conservation measures in sector-related policies. This concerns more particularly forestry, town and country planning and agro-environmental policy,... (see also 4.5.2.).

The Nature Conservation Department also initiates innovative projects for nature protection outside protected areas (ecological management of roadsides, municipal nature development plans, hosting wild fauna in attics and belfries,...). It also grants subsidies to encourage biological diversity restoring actions: for instance the planting of hedgerows (see also 4.5.2.).

4.1.2. Scientific support

As far as scientific support is concerned, the **Gembloux Scientific Centre**, which depends on the Nature and Forestry Division, conducts or co-ordinates various studies. At the biological diversity level, the main lines of research are:

- the inventory and the monitoring of biological diversity (Observatory of Fauna, Flora and Habitats - OFFH) (see also 4.6.);
- the monitoring of aquatic organisms (fish, macro-invertebrates) (Hydrobiology section);
- the monitoring of the management of protected areas (Biological research centre);
- the permanent inventory of forests that recently includes parameters relating to biological diversity;
- the genetic improvement of the main forest species grown in the Walloon Region (study of origins, selection of seeding plantation areas, individual selection, locating and protecting plantation areas to be conserved,...).

The different universities also play a great part in research on biological diversity conservation, either independently (dissertations, theses,...) or through research agreements with the Walloon Region.

4.1.3. Consultation and opinion

A **Walloon Senior Nature Conservation Council** (*Conseil Supérieur Wallon de la Conservation de la Nature - CSWCN*) and **State Nature Reserve Management Consultative Commissions** (*Commissions Consultatives de Gestion des Réserves Naturelles Domaniales - CCGRND*) issue opinions and make suggestions.

4.1.4. Non-governmental organisations

Many non-governmental organisations form another pillar of the biological diversity conservation in Wallonia. They are more particularly involved at the level of the

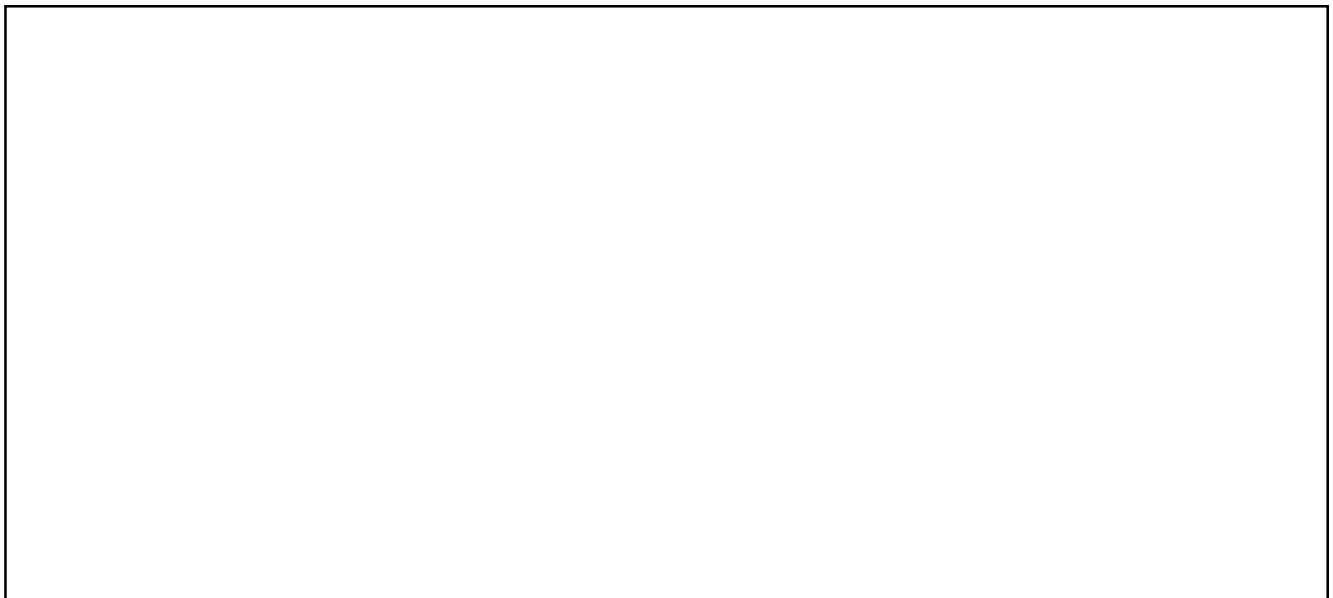


Fig. 4.1. Main types of land use in the Walloon Region (DGRNE).

control of areas (creation and management of nature reserves), of **legislative changes** (pressure groups), of the implementation of new ideas (*e.g.* river contracts). It is also worth emphasizing the important activity of nature societies that produce a large amount of **biogeographical data** allowing the evolution of biodiversity to be better determined.

4.2. Status

Although covering only 16,844 km², Wallonia occupies a privileged position in Europe. It is at the crossroads of Atlantic and continental biogeographical influences. This special position and the existence of a significant, topographical, climatic and geological gradient are at the origin of a **great diversity of habitats and species** over a very small territory.

This fundamental diversity combines with the diversity that man himself has produced through his many activities, in particular, the farming, grazing and forestry activities that used to prevail before the mechanization of farming and forestry.

4.2.1. Habitats

In the Walloon Region, the main types of land use (see Fig. 4.1.) are broken down as follows:

- 924,991 ha (55% of the territory) of farm and market gardening land, pasture land and meadows, gardens and parks, orchards and nurseries including 742,361 ha farmed by professional farmers and horticulturists, most often intensively;
- 530,600 ha (32% of the territory) of forest including 486,900 ha of productive area (247,653 ha of coniferous trees and 239,236 ha of broad-leaved trees). Nearly half of the forests belong to public owners (236,306 ha) and are managed by the Nature and Forestry Division;
- 206,480 ha (12.3% of the territory) of built-up areas.

A considerable part of biological diversity is however located in much less extended environments, the specificities of which make them biotopes offering favourable conditions for particular fauna and flora. These are a series of natural habitats: waterways, ponds, wet areas, peat bogs, rocks, karstic areas... but also habitats resulting from a number of human activities.

In this way, past farming, forestry and grazing activities (roving pasture land, reaping, grubbing, burning, clearing, charcoal production,...) gave rise to a series of environments termed semi-natural (limestone surfaces, moors, mowing meadows, copses,...). These environments some of which experienced a considerable extension in the past have all receded as the activities which gave rise to them and kept them going were gradually abandoned.

Industrial activities as well have created environments

of significant biological interest. Let us mention: dams formed for operating mills, slag heaps, calamine surfaces, stone, sand and clay quarries, settling basins,...

4.2.2. Species

The wealth of biogeographical information in the Walloon Region allows the evolution of biodiversity to be grasped relatively well. A comparison between the situations before and after the period 1950-1960 (a turning point corresponding to the industrialization of farming and to considerable urban development and to the expansion of transport infrastructure) emphasizes a **sharp decline in biological diversity**. The table below presents the balance sheet for some groups.

Table 4.1. Status of some groups in the Walloon Region.

	mammals	Birds	Fishes	Butterflies	Carabids	Dragonflies	Liverworts	Mosses
Total number of known species	68	339	53	114	338	66	161	522
number of extinct species	2	0	8	14	39	5	12	32
number of endangered species	5	20	7	15	34	8	7	64
number of vulnerable species	11	45	14	45	65	14	31	58

A more detailed analysis of trends for each biogeographical region shows that the Hainaut-Brabant plateau and the Sambre and Meuse river valleys (northern part of the Walloon Region) are the biogeographical regions most affected by disappearing or declining populations.

Species which have disappeared or are presently declining have a very specialized way of life and are very demanding as far as the quality of their habitats is concerned. We therefore witness a real retraction of the areas of distribution of these 'specialist' species, which are often the most remarkable or wonderful representatives of flora and fauna. Some of them play a major part in the ecosystems, and it is to be feared that this decline will continue because of the disappearance of essential links and of spiral effects.

Species which show a very clear relative expansion are generally less demanding, less specialized and more widespread. The relative character of this expansion is important since the sampling pattern is often more intense and geographically better spread than in the past.

The relative decline of a large number of rare species and the relative expansion of a small number of widespread species are at the origin of a significant homogenization and standardization of plant and animal communities. The biological wealth and the natural heritage of Wallonia have suffered such extensive damage in less than 40 years that the restoring potentiality may be jeopardized.

The most recent data seem to indicate that the phenomenon of geographical decline further affects many species. These are most often 'specialist' species living on the fringe of their area of distribution, with continual deterioration of the conditions necessary for their survival. For other groups, the area of distribution remains unchanged but a disturbing decrease in population levels is noticed (e.g. *Hirundo rustica*, *Delichon urbica*, *Streptopelia turtur*).

Some species are clearly expanding either because they adapt to human activities (ubiquitous and anthropophile species: e.g.: *Vulpes vulpes*, *Sturnus vulgaris*, *Laridae*) due to the habitat increase resulting from the development of human activities (e.g. species connected with conifers: *Parus cristatus*, *Parus ater*, *Regulus regulus*, *Regulus ignicapillus*, *Nucifraga caryocatactes*,...).

A particular and unequivocal case of clear extension is that of species introduced accidentally or intentionally. When they succeed in settling in, some of these introduced species show an explosive extension which may cause problems for native species.

The overall situation is rather alarming. It is however encouraging that **some species which have heavily declined, have their populations restored as a result of the measures taken to counter the causes of decline** (e.g. protection of piscivorous birds (*Podiceps cristatus*, *Ardea cinerea*, *Phalacrocorax carbo*,...), protection and anti-rabies vaccination (*Meles meles*), control of environments favourable to some species of butterflies,...

4.3. Pressures and threats

The analysis of changing trends compared with the information available on the ecology of species allows to determine the main causes of the decline of biological diversity. This forms the basis of an effective conservation policy.

Many indicators linked to the ecology of species reveal that **the main cause of decline is the change, the fragmentation and the disappearance of natural and semi-natural habitats, or in a broader sense, of all wildlife spaces.**

Some particular environments of great biological interest disappear because farming, grazing and forestry activities which created and maintained them do no longer exist. This is the case for moors, limestone surfaces, mowing meadows and, to a lesser extent, copses and clearings. Mechanization and economic progress have led to the reduction or even the disappearance of these environments together with the species depending on it.

Other environments have almost been systematically destroyed to give them an added economic value. As an example, hydraulic development works (draining, straightening of waterways, filling, ...) were undertaken to speed up waterflow or to recover land to allow the urban development of it or more profitable farming or forestry operations. Such works led to a heavy reduction

of wetlands (peat bogs, pools, marshes, wet meadows,...), stream and river environments (specific large plant habitats), flooding areas.

Urban development has strongly progressed over the last decades (average growth estimated at $\pm 1,950$ ha/year) both for accommodation and infrastructure (main arteries 3.95 km of roadway per km² of territory), buildings for economic activities, buildings for services to the community, ...).

On the whole, the new means of production and ground occupation lead to a homogenization of environments. From a biological point of view, this involves a reduction of the number and the diversity of ecological niches and consequently of the host potential for wildlife.

This problem is obviously connected with the nature of human activities. In Wallonia due to the high impact factor of these activities populations of wild species are prevented from surviving, even on a very local base.

As a matter of fact, the systematic development of available space for farm production, forestry work, the expansion of urban and industrial areas and transport infrastructure, are such that it leads to the exclusion of many forms of wildlife in Wallonia. The consequences of the destruction of natural and semi-natural spaces are accentuated by fragmentation. Exchanges of individuals between isolated populations are becoming increasingly rare, preventing the recolonization and the restoring of populations and causing a loss of biological diversity.

Pollution, in all its forms, is an additional cause of the banalisation of flora and fauna because the most sensitive species are affected first.

Since the end of the Second World War, fertilizers and herbicides have been used on a large scale and in large amounts (nearly 10,000 t of active matter sold on the Belgian market in 1993). Lack of accurate studies makes the role of these products difficult to assess. It is however certain that they have had (and still have) a significant role in the decline of many species particularly those connected with cultivated land (e.g. annuals that grow among cereals).

The massive use of fertilizers has also altered the chemical characteristics of soils and has resulted in the decline of species connected with poor soils.

Waterways and ornamental lakes are polluted by the discharged water and by the widespread pollution linked to human activities. The extent of pollution of waterways varies. Waterways situated to the north of the Sambre and Meuse river valleys are mostly of mediocre to bad quality. In the south, a good to average quality is generally maintained. Generally speaking, toxic waste connected with industry has declined over the last few years whereas eutrophication is increasing.

Atmospheric pollution, especially acid rain, has consequences which are still not well known.

In the Walloon Region, **leisure and tourism** also exert significant pressure on environments. There are an increasing number of 'nature' activities and more and more people are involved in them. This causes serious problems to fragile or/and overused environments: suburban

forests, underground cavities, waterways (trampled vegetation, disturbing fauna). New regulations are needed to control this phenomenon.

Direct removal by man of **specimens** from populations during harvesting, hunting and, until 1994, bird-catching, still limit the population size of some species. Special attention was focused on this problem and successive legislative measures, over the last 3 decades, have reduced harvesting pressure on these species.

4.4. Objectives

Ideas concerning nature conservation have progressed. In short, three stages can be distinguished.

First a number of precious plots of land were selected for special protection. This materialized in the implementation of integral protection measures (**creation of nature reserves, legal protection of species**).

Secondly, measures were taken to maintain a number of these protected areas at a particular stage in their evolution, in order to conserve their biological interest. The implementation of these measures gave rise to the concept of 'managed nature', which materialized in the development of management plans for nature reserves.

As far as the species are concerned, the consciousness arose that legal habitat protection was also necessary. The concept of 'biological diversity', which appeared more recently, further broadened the scope of reflection.

From now on, the aim is to integrate concern for the preservation of ecosystems, environments, species, populations, ... into all human activities having an impact on the territory and to take this into account over the whole of the Region.

The tools to be implemented are more complex, they require a **multifunctional approach to the territory, a multidisciplinary view of problems** and they have to call on a **many-sided partnership**.

The **Environmental Plan for Sustainable Development** adopted on 9 March 1995 by the Walloon Government sets the following objectives:

1. *maintaining, restoring and developing the host potentiality for wildlife over the whole of the territory;*
2. *maintaining and restoring the natural constituent elements of our urban and rural landscapes;*
3. *generalisation of nature education.*

The priority actions selected are:

- *to continue the inventory and the charting of areas of biological interest and provide them with legal protection;*
- *to acquire further areas of biological interest and ensure the management of them;*
- *to make good use of the host potentiality for wildlife over the whole of the space;*
- *to provide for the setting up of the ecological network;*
- *to restore, manage and develop landscapes by integrating elements of the natural setting;*

- *to limit the use of fertilizers and pesticides in the natural environment;*
- *to encourage research into biological diversity;*
- *to establish connections between nature conservation law and other legislation;*
- *to strengthen the role of municipalities;*
- *to strengthen the authorities;*
- *to generalize nature education.*

In order to plan these objectives, a first, 5-year action plan is being drawn up. It will be based on the **ecological network notion** taking shape in three concrete forms:

• Core areas

These are areas of great biological interest; they are hosts to many species or particular species (rare species adapted to special living conditions, on the limit of the distribution area,...). These are 'biological diversity reservoir' areas. An inventory and a monitoring of these areas are co-ordinated by the OFFH (see § 4.6.). The protection of these areas is a priority objective.

• Development and linkup areas

These are 'hull' or 'buffer' areas for the core areas, *i.e.* where measures have to be taken so that the core areas are not endangered and where the species from the core areas may possibly extend, if they have a positive impetus. Land surveys have already been carried out more particularly with a view to integrating these ecological network elements into space planning (see § 4.5.2.).

• Everywhere, elsewhere, over the whole of the territory

At this level, the aim is to develop the host potential for wildlife by working with the administrators of the economic activities that occupy the land (farming/agri-environment; forestry/forestry development; waterway management/hydraulic development,...).

The action plan for nature will also comprise a chapter devoted to raising awareness, education and training.

4.5. Management

4.5.1. Protective statuses

4.5.1.1. Protection of habitats

The protection of habitats must be ensured through several statuses:

• the government nature reserve

This is a protected area, laid out on lands belonging to the Walloon Region, leased by the Region or made available to it for that purpose.

On the date of 30 September 1997, there were 61

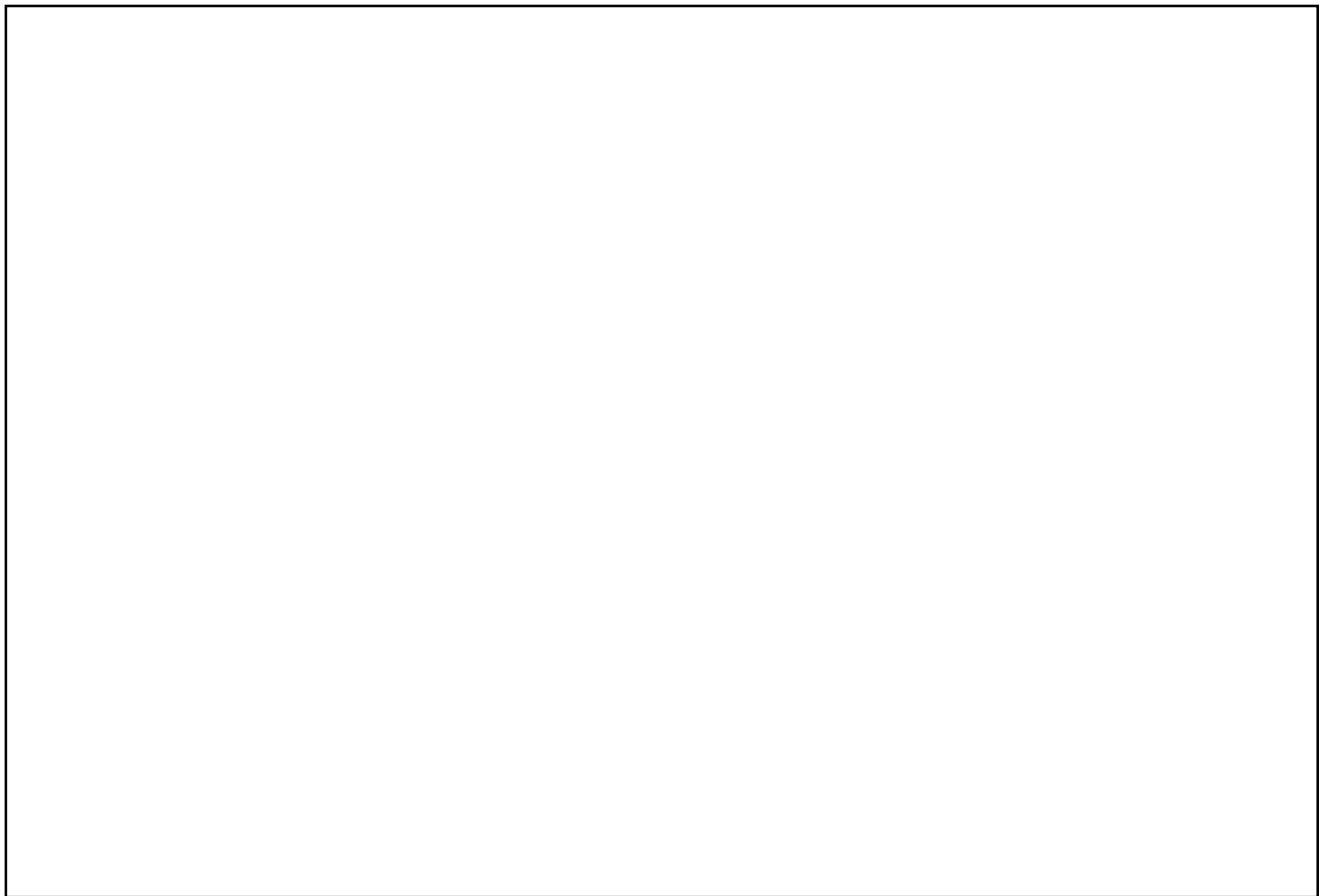


Fig. 4.2. Location of the nature reserves identified in Southern Belgium (DGRNE).

government nature reserves, including underground cavities (caves, quarries, cellars). The 53 government nature reserves on the surface totalize 5,204 ha (see Fig. 4.2.).

- **the chartered nature reserve**

This is a protected area, managed by a natural or artificial person other than the Region and recognized by the Ministry, at the request of the owner of the lands and with the agreement of the occupier. In practice, nature protection associations may apply for the status of chartered nature reserve for the areas that they manage (more than 5,000 ha of purchased or leased areas). The status of these sites is therefore strengthened and subsidies are granted for the purchase and the management of lands.

On the date of 30 September 1997, there were 89 chartered nature reserves for a total of 732 ha (see Fig. 4.2.).

- **the forestry reserve**

This is a forest or a part of a forest, protected with the aim of safeguarding characteristic or remarkable facies of plantations of indigenous species and protecting the integrity of the surrounding soil and environment.

On the date of 30 September 1997, there were eight forestry reserves totalling 244 ha (see Fig. 4.2.).

- **the wet area of biological interest**

This status allows the protection of wet areas of biological interest to be ensured.

On the date of 30 September 1997, there were 17 recognized wet areas of biological interest, totalling 728 ha.

- **the underground cavity of scientific interest**

This status allows underground cavities of scientific (biological, geological, petrographical, mineralogical or pre-historic) interest to be protected.

On the date of 30 September 1997, one site was officially recognized.

- **the special protection area**

In pursuance of the **directive 97/43/EC** concerning the conservation of wild birds, special protection areas were named by the Walloon Regional Executive. These are rather vast framework-perimeters in which the habitats that must be the subject of special protection and the most sensitive areas (core areas) are determined.

Fig. 4.3. Special protection areas in the Walloon Region (DGRNE).

Thirteen special protection areas covering 3,295 km² have been named; as for core areas, they represent 6,850 ha (see Fig. 4.3.)

- ‘special conservation areas’ / ‘Natura 2000’ network

In pursuance of the **directive 92/43/EEC** concerning the conservation of natural habitats as well as wild fauna and flora, the Walloon Region has filed a first list of 57 areas (1,443 ha) likely to be integrated into the European network.

4.5.1.2. Protection of the species

As far as protection of species is concerned, a large number of them are legally protected, either totally (protection decrees) or by regulations on specimens (laws on hunting, fishing). Legal protection however is not enough to safeguard the conservation of species for which the main problem lies in the disappearance of habitats. This explains why the measures taken are increasingly tending towards the protection of habitats.

4.5.2. Taking nature into account outside protected areas

- Town and country planning policy

In the Walloon Region, land use is planned: 23 sector plans cover the whole of the territory and define the potential occupation of the territory. Some statuses have been specified in order to maintain environments considered of biological interest. These are green areas “*intended for maintaining, protecting and regenerating the natural environment*” and among these, more particularly, nature areas and nature areas of scientific interest or nature reserves.

Farming and forestry areas are dedicated to their specific activities and may in theory not be subject to urban development.

The **Walloon code of town and country planning, urban development and heritage** has just been revised. It redefines more particularly area divisions with a view to a future revision of sector plans.

As far as nature preservation is concerned, the code plans another specific nature area where the priority will be given to nature conservation and, superimposed on

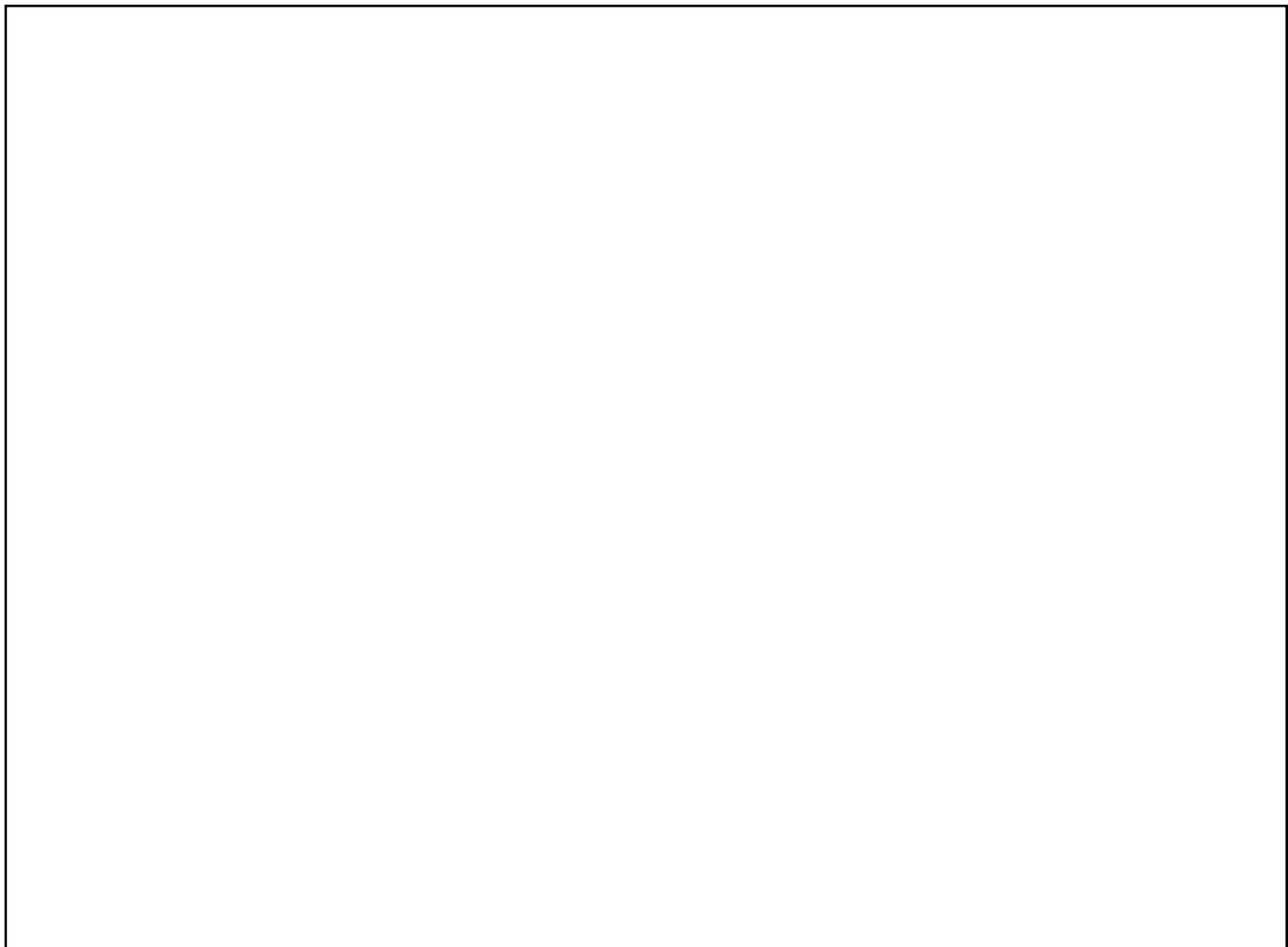


Fig. 4.4. Natural parks in the Walloon Region (DGRNE).

that, protection areas affected by the legislation concerning nature protection.

• **Natural parks**

The decree of 1985 concerning natural parks, stipulates that the “*natural park is a rural territory of high biological and geographical interest, subject to measures intended to protect its environment in harmony with the aspirations of the population and the economic and social development of the territory concerned*”.

It therefore involves searching for a harmonious integration of human activities and the protection of the natural heritage.

At present, there are five, officially recognized, natural parks (see Fig. 4.4.):

- the national natural park of Hautes-Fagnes Eifel;
- the natural park of the valleys of the Burdinale and of the Mehaigne;
- the natural park of the valley of Attert;
- the natural park of the plains of the Escaut;
- the natural park of the Hill country (*pays des Collines*).

• **River contracts**

The river contract is a voluntary agreement, between the whole of public and private actors, on objectives aimed at reconciling the many functions and uses of waterways, of their approaches and of catchment basin water resources. It therefore also deals with biological diversity.

The approach is based on a twofold principle: a necessary integrated approach of the waterway management on the one hand, involvement and consultation of all parties concerned on the other hand. This is basically a process where decisions are reached by consensus among the political, associative, scientific bodies about various objectives and proposing actions.

Seven river contracts exist in Wallonia, two are being drawn up, they concern:

- the stream of Fosses;
- the Dendre;
- the Haute-Meuse;
- the Munos Bassin;
- the Semois;
- the Hoëgne and the Wayai;
- the Dyle;
- the Sambre (being drawn up);
- the Ton (being drawn up).

• **Municipal Nature Development Plans (*Plans Communaux de Développement de la Nature* - PCDN)**

PCDNs were launched from the point of view of sustainable development. It involves safeguarding or developing nature diversity at municipal level, in co-operation with all parties concerned and by taking the economic and social development of the community into account.

The means implemented on a local scale were the establishing of partnerships bringing together persons and

associations, the drawing up of an inventory of the nature and landscape heritage and the drawing up of a long-term biological diversity development plan.

At present, more than twenty municipalities have launched their PCDNs. They are the municipalities of Anthisnes, Beaumont, Beauvechain, Bertrix, Braine-le-Comte, Chastre, Chaudfontaine, Comblain-au-Pont, Couvin, Eupen, Flémalle, Gerpinnes, Grez-Doiceau, Liège, Ottignies-Louvain-La-Neuve, Pont-à-Celles, Rebecq, Saint-Hubert, Seneffe, Sivry-Rance, Stoumont, Viroinval, Virton, Welkenraedt.

• **Management of roadsides and public spaces**

Since 1984, the use of herbicides on public property has been regulated. In particular the use of herbicides is banned in the Walloon Region on verges, embankments, berms and other land of state property and are part of the road system or adjacent to it, including motorways; in public parks; on waterways, ponds, lakes and their banks when they are public property.

The use of herbicides is however still authorized for weeding paved areas, or areas covered with gravel, areas situated less than a metre from a railway track and graveyard paths.

The ban on using herbicides to maintain roadsides led to roadside cutting. The idea of cutting roadside vegetation late in the season, a practice more favourable to biological diversity, gradually gained ground. After an experimental phase and its application to regional roads, the Nature Conservation Department provided a new impetus by launching a campaign ‘Late cutting- Refuge area’ among municipalities. Several dozens of them signed an agreement with the Walloon Region.

By signing the ‘Roadside’ agreement:

- the municipality undertakes to draw up a management plan defining areas where roadside cutting will be intensive, and others where it will be extensive while taking a number of provisions into account (cutting height above or equal to 10 cm, cutting dates,...);
- the Walloon Region provides the municipalities with the road signs ‘late cutting-refuge area’, leaflets for distributing information in all letterboxes and topographical maps to 1/10,000 covering the whole of municipal territory.

• **Agro-environmental measures**

Agro-environmental measures are specific grants intended to remunerate farmers for their contribution to the quality of the environment. The specified subsidies include an incentive share but are especially intended to compensate the income that the farmer agrees to lose compared to a more intensive use of the soil.

The following measures have been adopted by the Walloon Region and are applicable everywhere on a voluntary basis:

- late cutting;
- conservation transition strips (edges of fields sown with grass or farmed extensively (without inflows) and

- extensive meadow strips (located along waterways, farmed without inflows and mowed late in the season);
- keeping and maintaining hedges and wooded strips;
- keeping livestock populations low;
- rearing local endangered breeds.

In areas defined as being sensitive or priority areas, farming operations may be further assisted technically and subsidized to improve the overall environmental impact of farming (reduction of inflows, traditional cultivation and old varieties, late cutting,...).

• Forestry policy

Nearly half the area of Walloon forests (236,306 ha) belongs to public owners and is administered by the Nature and Forestry Division. These woods are managed on the basis of management plans called 'forestry developments'. These firstly consist of drawing up an inventory by collecting a maximum of information about the forest. They then fix objectives to fulfil the different functions. They lastly determine means by defining the future forest, by choosing the methods of development and by drawing up the operating regulations and the work programmes.

The new developments must take into account priority forestry conservation vocations, water and soil protection and production. These vocations do not exclude each other but indicate a priority objective.

The conservation vocation comprises biological, genetic, climatic and forestry subvocations. It tries more particularly to safeguard the conservation of rare forestry formations, seeding plantations, para-natural formations and plantations with scientific, educational or historic value.

The water protection vocation concerns the areas bordering on waterways, spring areas, catchment wells and dam lakes. It aims at preserving a quantitative and qualitative water supply. Restrictions involve the limitation of clearings, the banning of draining or inflows and the type of treatment.

As for the soil protection vocation, it concerns hydromorphous soils with temporary or permanent ground-water, peaty or peat-like soils and sloping soils. Restrictions involve the absence of forestry (where peaty soils are concerned), the limitation of clearings, the banning of draining in some cases, the method of regeneration, the density of plantations and the choice of species.

As far as general forestry measures are concerned, the main measures recommended are:

1. choice of tree species adapted to stations;
2. adoption of a stable and balanced plantation structure. Forests with trees of many ages are preferred without excluding regular forests. Priority is given to natural regeneration;
3. mixture of tree species;
4. dynamic forestry (wider spacing, large clearings).

Specific measures connected with nature conservation are taken: conservation of dead trees, old trees and epiphytes, management of areas of reproduction of endangered ani-

mal species, work timetable in relation to nesting periods, Forest edges are taken into account, glades are maintained and some forest areas are assigned a 'non-management' status.

Measures are provided in connection with cultivation care, the choice of tree species and treatment in order to favour the habitat of wild ungulates.

Lastly, the circular includes measures of landscape types to make the forest more attractive to its users. The opening of the forest to the general public aims at encouraging slow traffic, respectful of the forest ecosystem. Areas accessible to youth movements are not overlooked.

Subsidies are granted to private owners to encourage the implementation of these measures in private forests.

• Thematic operations

A number of nature conservation actions initiated by the Nature Conservation Department or by non-governmental organisations are structured around a particular objective. Let us mention as examples:

- the attics and belfries operation: launched as part of European Nature Conservation Year among municipalities, its aim is to develop the access of wild fauna (bats and chouette effraie) to the attics and belfries of public buildings;
- the operations '*Ciconia nigra*', '*Crex crex*', 'Chiroptera' (jointly funded by the LIFE programmes) aim at purchasing natural areas favourable to these species;
- the 'Wild Gardens' operation aims at encouraging management more favourable to biodiversity in the gardens of private citizens (choice of plant species, upkeep, development of ponds,...);
- the 'Underground cavities' operation aims at listing and protecting underground cavities of great biological interest, in particular of chiropteran interest.

• Subsidies for the planting of hedges and wooded strips

Subsidies are granted to encourage the replanting of hedges, subject to compliance with conditions that guarantee its biological interest and a life expectancy of at least 20 years.

• Production of seeds of wild plants and indigenous trees

Seeds of indigenous wild plants are used increasingly for sowing after work has been done, when farmland is let to lie fallow or even for laying out wild gardens.

A programme aimed at the production of seeds of indigenous origin has been launched, so as to avoid the introduction of exotic species and preserve local ecotypes.

At forestry level, research into genetic matters is carried out at the Gembloux Scientific Research Centre. A Forestry Seed Centre (Forest counter of Marche-en-Famenne) has been recently set up. It takes part in maintaining the genetic diversity of Walloon forests through the collection of seeds over a maximum of species, a maximum of origins and a maximum of trees.

- **Regulation of leisure activities**

The strong pressure exerted by leisure activities on the natural environment led to various regulations. The use of motor-driven vehicles outside public thoroughfares is limited to authorized circuits.

The Walloon Government decree (AGW) of 30 June 1994 regulates the movement of boats and divers on and in waterways. It limits activities to certain times, to certain seasons and to certain sections of waterways as long as the flow reaches a minimum level.

The decree of 7 February 1995 regulates forest traffic. The provisions are summarized in the table 4.2.

Table 4.2. - Concise presentation of the regulations concerning forest traffic (Source DNF).

	Outside paths(*)	On paths (*)	On tracks (*)	On roads (*)	Waiver
pedestrians (art. 192)	no	yes	yes	no	- legitimate reasons - on signposted areas
Cyclistes, skiers, horse riders (art. 193)	no	no	yes	yes	- on signposted paths - on paths, other areas - for listed reasons
motor-driven vehicles (art. 194)	no	no	no	yes	- on signposted paths and tracks only as a temporary measure - on tracks, paths, other areas - for listed reasons

(*) open to public traffic.

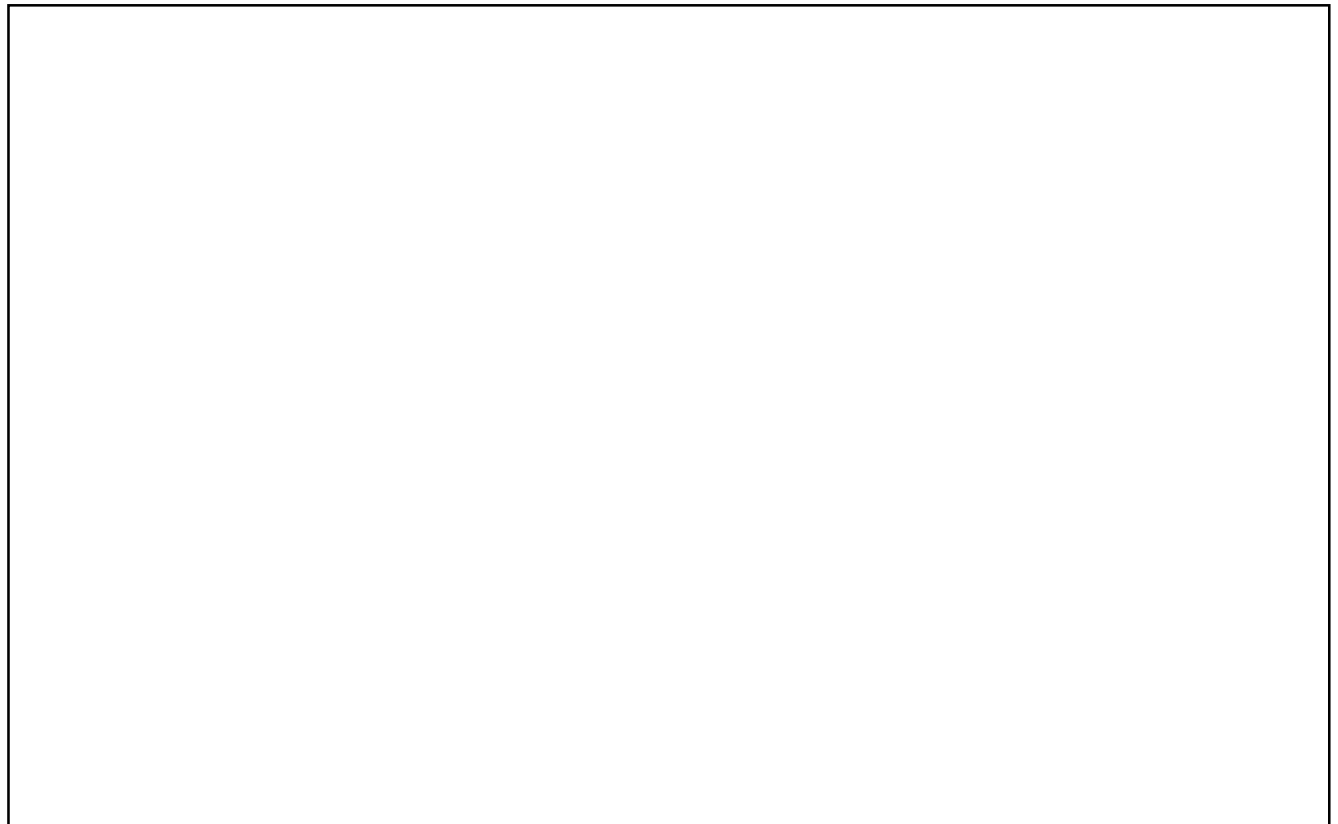


Fig. 4.5. Information system structure presenting the main levels and the information flow from the field works to the diffusion (DGRNE).

4.6. Monitoring

An **Observatory of Fauna, Flora and Habitats (OFFH)** has been set up. It takes care of collecting and analyzing data relating to biological diversity, and this is done through the collaboration of a wide network of naturalists, scientists and officials of the Nature and Forestry Division.

The programmes define a set of biodiversity state indicators as well as indicators of the state of the Walloon environment (bioindicators), and meet the requirements of the Office for Nature and Green Space Conservation, those of the Walloon Senior Nature Conservation Council or of international bodies such as the European Union or the Council of Europe.

The basic assignments of the OFFH are:

- organizing and co-ordinating the collection and the analysis of biological data in order to gather information about the state of biodiversity in Wallonia and to define the main lines of a strategy for its conservation and to assess the effectiveness of it;
- standardizing, recording and managing biological data collected within the scope of agreements or subsidies by the Walloon Region;

- disseminating information, encouraging interaction and organizing exchanges between specialists, nature lovers, authorities, universities and the general public.

The aim for the years to come is to continue to develop four work programmes (see Fig. 4.5.):

- The **‘Inventory and Monitoring of Biodiversity-Monitoring of the state of the environment through bioindicators’** (ISB-SURWAL) Programme: the general aim is to describe and monitor the distribution of species belonging to various major biological groups. The regularly monitored biological groups are birds, dragonflies, butterflies, orchids, reptiles, amphibians and bats. Monitoring is organized in collaboration with naturalist associations. This choice allows a wide range of expertise to be maintained (many collaborators, diversity of monitored taxons and widespread coverage of the territory) and enables naturalist associations to be helped in developing their activities. The network of collaborators formed in this way is also regularly questioned by authorities (requests for opinions, expert appraisal of areas, lists of species,...).

- The **‘Inventory and Monitoring of Habitats’** (ISH) Programme: the general aim is to make an inventory and monitor the distribution of habitats. This programme is in the process of being developed; it will lead, on the one hand, to standardizing the way in which habitats are described and mapped out and, on the other hand, to monitoring the evolution of landscapes. An ambitious project for the inventory and monitoring of habitats combining ground plotting and satellite data is being prepared.

- The **‘Inventory of Sites of Great Biological Interest’** (SGIB) Programme: the general objective is to gather information concerning areas that harbour species and habitats of great biological interest and integrate it into a standardized system. After having gathered existing information together, a second phase will be implemented to assess priorities as far as initiatives for the conservation and management of the natural heritage are concerned.

- The **‘System of information about Biodiversity in Wallonia’** (SIBW) Programme: the aim is to disseminate information collected within the scope of the first three programmes and all available, pertinent ‘nonsensitive’ information. Information is filed in order to provide a real tool for helping authorities in decision-making and an information tool for the general public, by disseminating raw information or by indicating the sources where detailed information can be obtained (bibliography, experts, associations, ...). The objective is to continue to integrate the whole of available information into a standardized information processing system and above all to structure information flow to ensure that it is updated.

4.7. Awareness, education and information

Local and regional centres of initiation to environment

A network of local and regional centres of initiation to environment is being set up. These centres will raise awareness of and disseminate information to the educational system and the general public.

‘Green week’, ‘Wood’s week’

Each year these operations are centred on a particular topic. The green week aims at promoting awareness and educational actions while the aim of the wood’s week is to promote ecological planning of sites. Young trees are distributed during the wood’s week. Subsidies enable to sustain projects coming from schools, municipalities and non-governmental organisations.

‘Nature documentation department’ of the Directorate General for Natural Resources and Environment

The Ministry of Environment disposes of a service in charge of the distribution of all publications coming from the department of the Directorate General for Natural Resources.

Environment websites

The Walloon Region widely distributes her information on the following sites:

- Cabinet site: legislation, newspaper’s articles and all kind of information
<http://envagri.wallonie.be/>
- Administration site: legislation, publications, reports, address lists
<http://www.rw.be/mrw/dgrne/home.htm>
- ‘Biodiversity in Walloon Region’ site: habitats, species, legislation
<http://www.rw.be/mrw/dgrne/sibw/>

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5. The North Sea

5.1. Introduction

Belgium is a federal state divided in different regions. In matters of environmental protection, the federal government is competent for dealing with pollution at sea, marine nature conservation, fisheries, etc.. Other aspects concerning the North Sea are dealt with through co-operation agreements, established between the Federal State and the Flemish Region. The responsibility for planning and implementing the national policy concerning the North Sea is thus shared by the federal and regional governments, and is co-ordinated by the *'Technical Commission for the North Sea'*, which also participates in the *'Federal Council for Sustainable Development'*.

The competences and rights of the federal authorities are different according to the zone of the North Sea: territorial sea, continental shelf, exclusive economic zone (EEZ) or fishery zone. Belgium has not yet declared an EEZ, but intends to do so in the near future.

5.2. Status

5.2.1. Habitats

The natural coastal habitats occurring in Belgium consist of dunes, sandy beaches, and shallow subtidal sandbanks. Due to intense use, most of these habitats have reduced in quality and extent. The remaining areas are subject to several forms of disturbance. The subtidal area consists mainly of deposits of soft sediments. At some locations, small areas with habitats of intertidal mudflats, salt marches and estuaries can still be found. Artificial substrates along the coast include groynes, breakwaters, dikes and wrecks. These form a habitat for a community typical for rocky shores, with a high species diversity.

Especially the western area of the coast with very shallow subtidal sand and gravelbanks has an important ecological value. Because benthic species sometimes occur in great densities, they are very important in the food web. The dependence of the ecosystem on these few species makes it very vulnerable. The main threats for the ecological features of the marine habitats are fisheries, mineral extraction, dredging, pollution and recreation. Habitats of intertidal mudflats and sandflats have declined severely through harbour construction works and port development.

5.2.2. Species

As a consequence of overfishing in the North Sea a significant decrease in the population size of many fish

species has been observed. This is particularly obvious for slowly reproducing species such as sharks, rays and skates, but also stocks of cod, herring, mackerel, plaice and sole have shown a serious decline. The decline of some fish stocks had its consequences for other species preying on them. The depletion of the herring stock for instance is probably one of the reasons for the severe decline in the population of the harbour porpoise, which has become rare in our waters. Other possible reasons are pollution and bycatch. Another cetacean that used to frequent our waters is the bottlenose dolphin, which is now an extremely rare visitor. The common seal had also virtually disappeared, but recently showed a slight recovery.

River construction works and pollution have caused the decline or complete disappearance of diadromic fish species (using either the sea for spawning and the fresh water environment for growing up, or vice versa). Species that became extinct in our waters are sturgeon, houting and salmon. Diadromic fish that declined, in some cases to an alarming level, are sea lamprey, lampern, eel, allis shad, twaite shad and smelt.

The probable reason for the complete disappearance of the dogwhelk, an animal of hard intertidal substrates, has been identified as TBT, used as an antifouling agent on ships' hulls. The use of TBT has now been regulated to a certain extent.

In winter internationally important numbers of birds, especially common scoter, occur at the western part of the coast. These ducks probably feed primarily on bivalve molluscs. Other birds wintering here, or at least using the area as a temporary resting place during migration, include velvet scoter, widgeon, eider duck, guillemot, razorbill, and divers. The Belgian coast is also an important wintering area for great crested grebes. From autumn till spring relatively large numbers of little gulls can be found while sandwich, little, and common terns are feeding around the port of Zeebrugge, which holds important breeding colonies of these birds. The whole year round other seabirds such as gulls, gannets and fulmars can be found at sea.

5.3. Activities and threats

5.3.1. Fisheries

The Belgian part of the North Sea is small compared to that of the other states surrounding it. The Belgian fishing fleet is the smallest of all North Sea states, with less than 1% of all catches. It is however an important economic activity for some local communities. The number of fishing vessels has shown a remarkable decrease (Fig. 5.1.), whereas the mean engine power increased from 97 kW per ship to 426 kW per ship.

The main fishing methods used off the Belgian coast are beam and otter trawling aimed at demersal fish and beam trawling for brown shrimp. To a much lesser extent bottom set gill nets are used, and only very occasionally

Fig. 5.1. Marine fisheries in Belgium: landings and fleet size from 1950 tot 1996 (Welvaert, 1997).

fishermen use pelagic pair trawls. Total catches are around 30,000 tons (Fig. 5.1.). The most important fish species caught in Belgian waters are plaice, sole and cod. Valuable bycatches consist of whiting, turbot, brill, common dab, lemon sole and rays. Inshore, a relatively important directed fishery exists for brown shrimp.

Sports fishermen use rod and line, and very short bottom set gill nets, both predominantly in the vicinity of wrecks. Some recreational fishermen use bottom gill nets and fykes, set and emptied from the shore at low tide. Recreational shrimp fishery exists both from the shore and in using small boats. Catches of sports fishermen are

insignificant compared to the catches of professional fishermen.

5.3.2. Sand and gravel extraction

Oil and gas exploration does not exist in Belgian waters. Besides fisheries, the only other natural resources exploited are minerals. Considerable amounts of sand and gravel are landed each year (Fig. 5.2.) and used for building and beach replenishment. Occasionally these minerals are used for port construction works.

Fig. 5.2. Marine mineral extraction in Belgium from 1979 to 1996 (MUMM).

Fig. 5.3. Amount of dredge spoil dumped at sea in Belgium from 1975 to 1996 (MUMM).

5.3.3. Dredging

The Belgian coast is situated near the Channel, one of the worlds busiest shipping routes. Some ports, especially Zeebrugge and Antwerp are economically very important. In order to keep navigational channels and ports accessible for large ships, sustained dredging is required (Fig. 5.3.).

Dredging activities can have a direct and indirect impact on living organisms.

Physical impacts:

- Change in the sediment composition, not limited to the dredge site or dump site.
- Increase in turbidity of the water column.

Chemical impacts:

- Spreading of pollution, when present in the dredge spoil.
- Increase of pollutant content of the seawater through mobilisation of pollutants.

Biological impacts:

- Impact on the benthic community (especially sedentary) and spawning areas.
- Ecotoxicological impact on species.

5.3.4. Pollution

Different human activities cause different kinds of pollution. In order to counteract pollution, different measures need to be taken according to each specific activity. The source of pollution can either be ship-based (litter, oil,...) or land-based (litter, harmful substances, nutrients, ...).

5.3.5. Recreation

In summer, the Belgian coast is flooded with hundreds of thousands of tourists, mainly attracted by the natural values of the area (dunes, sandy beaches, sea). This has a very significant economic consequence, which cannot be ignored in preparing the environmental policy.

The marina of Nieuwpoort is among the largest to be found in the North Sea area. Many thousands of yachts - mainly sailing ships- have their mooring here. Smaller marina's are situated at Oostende, Blankenberge and Zeebrugge.

5.4. Objectives

While conservation and restoration of ecological values are important issues, marine environmental management should also be aimed at a sustainable continuation of recreation, fisheries and other legitimate uses of the sea. Therefore a more holistic approach is needed. Administrations of the federal and regional authorities have thus started working together on an integrated management of the coastal zone. Because of the international character of the sea, objectives and management measures are usually set in an international framework (sometimes making it a very slow process). Measures agreed upon on an international level are to be taken up in national policy.

5.4.1. International treaties

The Belgian policy of sea management is based on the United Nations Convention on the Law of the Sea

Fig. 5.4. Location of the Special Area of Conservation (shaded area) proposed by Belgium for the NATURA 2000 network (MUMM).

(UNCLOS; soon to be ratified by Belgium), the commitments of the International Conferences of the North Sea (NSC) and the regulations agreed on in the Oslo and Paris Conventions for the prevention of marine pollution (OSPAR). As a member of the European Community, Belgium also executes the Directives of the European Commission (EC). Other Treaties concerning nature conservation ratified by Belgium and relevant for the marine environment are ASCOBANS (Agreement on the Conservation of Small Cetaceans of Baltic and North Seas; concluded under the Bonn Convention) and the Ramsar Convention.

Under the Ramsar Convention the coastal sandbanks west of Oostende are protected as '*Wetland of International Importance for Bird Species*'. In accordance with the EC Habitats Directive, Belgium proposed a large part of the western part of the coast to be included in the NATURA 2000 network as a '*Special Area for Conservation*' (Fig. 5.4.: shaded area). As a consequence of the NSC and ASCOBANS, an intervention network for scientific research on cetaceans washed ashore on Belgian beaches has been established. For live stranded animals emergency equipment is available at Oostende. The intervention network is also dealing with scientific research on seals and stranded seabirds.

5.4.2. Marien Milieu Marin

The international framework forms the basis of a new law concerning the protection of the North Sea which is being prepared by the federal ministry responsible for marine environmental protection. This '*Marien Milieu Marin*' (MMM) bill was approved by the Cabinet on 25 July 1997. The new law will provide for:

- the obligation for all users of the marine environment to take account of the principles of prevention, precautionary approach, sustainable management, compensation for damage and the pollutant pays-principle;
- the creation of marine protected areas of five possible types;
- the effective protection of a number of species;
- the prohibition of introduction of 'alien' species organogenetically modified organisms;
- ship traffic schemes to preserve protected areas;
- contingency planning for accidental pollution as well as a regime of compensation and restoration;
- a procedure of environmental impact statements and studies for activities subject to a licence or authorisation;
- enforcement through a reinforced control and high penalties.

5.5. Strategy and Action plan

5.5.1. Fisheries management

Belgian fisheries are regulated through the EC's '*Common Fisheries Policy*' (CFP). Despite a lot of measures in

force, the exploitation rate on some fish stocks is still too high. Besides the management measures taken by the EC, some additional regulations are in force in Belgium, the most important one being the prohibition of directed fishery on 'sessile species', such as bivalve molluscs. In spite of this, research is being carried out for the economical and ecological viability of a fishery directed at trough shell. If this fishery is practised, it will have to be managed appropriately in order to avoid adverse effects to the environment as much as possible (applying the precautionary principle).

Concern is growing about the impact of fisheries on the ecosystem of the North Sea as a whole. Therefore it was decided at the fourth NSC to hold a Ministerial Meeting on fisheries and the environment. Ministers responsible for both fisheries and environmental policies sat together at this meeting in March 1997 and made commitments to the integration of fishery management and environmental policy.

5.5.2. Management of mineral extraction

Mineral extraction is subject to a system of licensing, following the '*Code of Practice for the Commercial Extraction of Marine Minerals*' (ICES, 1991). OSPAR as well pays attention to marine aggregate extraction.

Each ship needs to be equipped with a 'black box', an automatic registration system which makes it possible for the authorities to control the amount of sand and gravel extracted, and the location of the extraction site. Mineral extraction is only allowed in two zones off the Belgian coast. These are carefully monitored for the morphological and sedimentological effects of the extraction activities, and the effects on fish species and benthic organisms. Because of the granulometry and the instability of sand banks, these exploitation zones are faunistically poor compared to the surrounding seabed. If severe adverse effects on the environment were to become apparent, the Belgian authorities have the possibility to react immediately.

5.5.3. Environmental management of dredging activities

Environmental effects of dredging activities are carefully assessed. Possibilities for the reduction of the impact of dredging and the dumping of dredge spoil are being examined. These include technical and geographical (choosing of the dump-site) measures and alternative uses for dredge spoil. The use of the best available technology is promoted and further investigated in an international framework.

Dredging in harbours and navigational channels is a competence of the Flemish Region. In order to do everything possible in protecting the marine area from adverse effects of dredging activities, a co-operation agreement was signed between the federal and regional authorities.

The policy of the Flemish Region concerning the pollution of rivers and harbours is leading to an improvement of the quality of the sediments in ports. This will lead to a lower level of pollution present in dredge spoil. National and regional authorities have decided in concert not to continue the direct dumping into the sea of dredge spoil heavily contaminated with TBT and polyaromatic hydrocarbons. Feasibility studies of physical, chemical and biological treatment of heavily polluted dredge spoil are being carried out.

5.5.4. Management of pollution

5.5.4.1. Pollution from ships

Belgium signed and ratified the '*International Convention for the Prevention of Pollution from Ships*' (MARPOL 73/78). This convention contains five Annexes, each dealing with a different type of cargo or waste, and establishes rules and levels for their discharge. It also contains technical measures to prevent accidental and intentional pollution. Under Annex V of MARPOL, the North Sea has been indicated as a '*Special Area*'. This means that the discharge of garbage, except for food remains, is not allowed. Also for Annex I and II (oil and chemicals) the North Sea may in the future become a Special Area.

The policy of the regional government concerning litter, is first of all aimed at a reduction at the source. Following the designation of the North Sea as a Special Area under Annex V of MARPOL, all ports have facilities to deal with garbage generated on board ships.

Since 1990, the Management Unit of the North Sea Mathematical Models (MUMM) carries out an intensive programme of aerial surveillance of the Belgian zone of interest in the North Sea (according to the Bonn Agreement) to monitor illegal discharges of oil and other harmful substances by ships. In the marine area controlled by Belgium, illegal operational discharges probably still occur every day (Fig. 5.5.). By means of the national MARPOL - Law of 1995, it has been made easier to legally charge any ship caught redhanded, but it is clear that control alone is insufficient. An increased international co-operation between port authorities is vital to prevent illegal discharge of used oil, or the cleaning of oil tanks at sea. In Belgian ports, reception facilities are available for ships to deposit used oil. Encouraging ships to make use of these facilities might reduce illegal discharge.

5.5.4.2. Pollution from land-based sources

Guidelines for the reduction of sea pollution through discharges coming from rivers are set in the framework of OSPAR. The Regions have legal competency for dealing with land-based activities indirectly causing marine pollution. This is why a consultative process was set up between the competent federal and regional authorities. In this process problems concerning certain emissions, mainly of harmful substances and nutrients, are identified. A programme for the reduction by 50% of inputs of 36 hazardous substances (metals, solvents, pesticides, dioxines) in the North Sea was drawn up (1985-

Fig. 5.5. - Number of oil slicks observed by Belgium and number of slicks per flight hour from 1991 to 1995 (Schallier *et al.*, 1996).

1995). Efforts to reduce pollution are pursued. Marine pollution from land-based sources is assessed through monitoring and mathematical modelling. Data are stored in an extensive database, held by MUMM.

5.5.5. Management of recreation

One part of a project co-funded by the EC LIFE-Nature programme consists in the assessment of human activities and their impact on the environment in the proposed Special Area of Conservation. Based on these assessments, possible management measures will be proposed for the conservation of this site, and where necessary and feasible, for the restoration of the natural values of this site, and possibly for the larger part of the marine area.

Due to the economic importance of tourism at the Belgian coast the restoration of beaches to their original ecological function is difficult. Animals which require undisturbed beaches, such as some bird species and seals, have virtually disappeared. Possibilities to establish an integral nature reserve, including both the terrestrial and marine part of the environment, are investigated.

Marina's are well equipped to deal with garbage and used oil. The main negative impact on the environment to be feared from yachting, is the disturbance of wintering birds. It is not allowed to use a jetski in Belgian waters.

5.6. Monitoring

5.6.1. Indicators

Seabirds are the most conspicuous victims of oil pollution. Each year some two thousand birds wash ashore on Belgian beaches. A large proportion of these are victims of oil pollution. Some oiled birds found alive are taken to a rehabilitation centre. To assess the level of oil pollution at sea, the Institute for Nature Conservation, in co-operation with numerous volunteers, has been organising for several years regular counts of beached seabirds and is as such contributing to the 'International Beached Bird Surveys'. These counts have been carried out since the 1960's and are essential to provide us with data on trends of oil pollution.

Marine mammals and seabirds are at the top of the foodchain, so toxic substances such as heavy metals and PCB's are concentrated in their tissues. Tissues of all marine mammals washed ashore dead, and a lot of seabirds, are analysed to determine the level of toxic sub-

stances. Pathological research is also being done, providing in some cases useful indicators of the ecosystem's health. Various types of litter can cause illness or even death of marine mammals and seabirds, a negative impact which is also carefully monitored.

The research of the benthic communities (macro-, meio- and hyper-) is perhaps even a better way to identify problems. Benthic animals are abundant and their sampling is very easy. Because most do not migrate very far, they show a picture of long-term pollution. In the research programme on sustainable management of the North Sea, a selection will be made of individual species that can be used as indicators for ecosystem health.

5.6.2. Monitoring of alien species

More than 20 plant and animal species now living in our marine waters have been identified as being introduced by human activities. Some of these 'alien species' were introduced hundreds of years ago, such as the sand-gaper *Mya arenaria*. Alien species living on hard substrates include the Pacific oyster *Crassostrea gigas* and the ascidian *Styela clava*. The American razor clam *Ensis directus* is a very recent introduction, yet it has become very abundant. Another very recent introduction is the blue crab *Callinectes sapidus*, but it is still unclear if this animal can reproduce in our waters. A research project confirmed that alien species, including potentially toxic phytoplankton, are still transported to Europe in ballast water.

5.6.3. Programmes

To investigate the human activities and their possible negative impact on the environment of the ecologically most valuable part of the marine area, a LIFE-Nature project (covering also the terrestrial part of this area) was set up in 1997. The project, co-funded by the EC, is carried out by Flemish and Federal administrations and two NGO's ('World Wide Fund for Nature' and 'Natuurreservaten vzw').

The Federal Government funds a number of research and monitoring projects dealing with the sustainable management and the conservation of natural values of the marine environment. These programmes last for two to five years (1997-2001) and form a scientific support for the environmental policy of the government.

Thanks to the Federal Government an oceanographic vessel ('BELGICA') is available for research and monitoring projects of universities and other institutions.

MOLLUSCS

Trough shell	<i>Spisula subtruncata</i>
Dogwhelk	<i>Nucella lapillus</i>
Sand-gaper	<i>Mya arenaria</i>
American razor clam	<i>Ensis directus</i>
Pacific oyster	<i>Crassostrea gigas</i>

CRUSTACEANS

Brown shrimp	<i>Crangon crangon</i>
Blue crab	<i>Callinectes sapidus</i>

FISH

Sea lamprey	<i>Petromyzon marinus</i>
Lampern	<i>Lampetra fluviatilis</i>
Sturgeon	<i>Acipenser sturio</i>
Houting	<i>Coregus oxyrhynchus</i>
Salmon	<i>Salmo salar</i>
Allis shad	<i>Alosa alosa</i>
Twaite shad	<i>Alosa fallax</i>
Smelt	<i>Osmerus eperlanus</i>
Cod	<i>Gadus morhua</i>
Whiting	<i>Merlangius merlangus</i>
Herring	<i>Clupea harengus</i>
Mackerel	<i>Scomber scombrus</i>
Eel	<i>Anguilla anguilla</i>
Plaice	<i>Pleuronectes platessa</i>
Sole	<i>Solea solea</i>
Turbot	<i>Psetta maxima</i>
Brill	<i>Scophthalmus rhombus</i>
Common dab	<i>Limanda limanda</i>
Lemon sole	<i>Microstomus kitt</i>

BIRDS

Common scoter	<i>Melanitta nigra</i>
Velvet scoter	<i>Melanitta fusca</i>
Widgeon	<i>Anas penelope</i>
Eider duck	<i>Somateria mollissima</i>
Great crested grebe	<i>Podiceps cristatus</i>
Divers	<i>Gavia stellata</i> and <i>Gavia arctica</i>
Guillemot	<i>Uria aalge</i>
Razorbill	<i>Alca torda</i>
Little gull	<i>Larus minutus</i>
Sandwich tern	<i>Sterna sandvicensis</i>
Little tern	<i>Sterna albifrons</i>
Common tern	<i>Sterna hirundo</i>
Gannet	<i>Sula bassana</i>
Fulmar	<i>Fulmaris glacialis</i>

MAMMALS

Harbour porpoise	<i>Phocoena phocoena</i>
Bottlenose dolphin	<i>Tursiops truncatus</i>
Common seal	<i>Phoca vitulina</i>

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6. Development co-operation

6.1. Introduction

This chapter presents an overview of the Belgian development aid through contributions to financial mechanisms and transfer of technology, including international training programmes, in order to support developing countries in their quest for economic, social and institutional growth, bearing in mind the sustainable development for future generations.

The Belgian Federal Government is strongly committed to the principles and guidelines contained in the Declaration of Rio (UNCED 1992) and has started to implement them in its development assistance programmes ever since.

Belgium also adheres to the co-ordinated approach of donor countries, through an active participation in international fora, such as the European Union and the OECD. Considering the global character of the loss of biodiversity, only a well co-ordinated, international strategy may stand a chance of success.

6.2. Contributions to financial mechanisms

6.2.1. Belgian Official Development Assistance

As a whole, the Belgian Official Development Assistance (ODA) disbursements for 1995 amounted to 1.03 billion US\$, representing 0.38% of the gross national product (GNP). This percentage led Belgium to occupy the 8th place among the OECD/DAC-countries. An average of 40% of total ODA goes to multilateral contributions.

6.2.2. Belgian Agency for Development Co-operation

Among the multilateral financial mechanisms, the Global Environmental Facility (GEF) receives 1.68% of its total Core Fund budget from the Belgian Federal Government through the Belgian Agency for Development Co-operation (BADC), summing up 1.1 billion BEF, paid in cash, for the period from 1 July 1994 to 30 June 1997, distributed as follows:

1994-1995:	320,000,000 BEF
1996:	390,000,000 BEF
1997:	390,000,000 BEF

During the GEF Pilot phase, Belgium contributed 198,532,682 BEF (4,420,900 SDR) to the Core Fund

and additionally co-financed a solar water heating project in Tunisia and a West African community-based natural resources and wildlife management project in Burkina Faso and Ivory Coast up to 247,270,324 BEF, overhead costs included (5,000,000 SDR).

Belgium is member of a group of bilateral donors which contribute to the 'Regional Environmental Information Management Project' in the Central African Region, with an amount of 30,000,000 BEF. The project aims at improving the planning and the management of the natural resources in the Congo Basin, with a particular focus on the preservation of biological diversity.

Since the prevention of further loss of biodiversity and the restauration of already lost resources is part of the solution, efforts made in the field of forestation, reforestation and the combat against desertification should also be reported.

Over the last 10 years the Belgian Federal Government has supported the Special Programme for Africa (phase I and II) with roughly 1.8 billion BEF, through the International Fund for Agricultural Development (IFAD). Field projects comprise rural development, water management, forestation, soil degradation, in those areas of Sub-Saharan Africa that are especially vulnerable to drought, desertification and climate change.

Within the countries belonging to the Southern African Development Community (SADC), a similar initiative is under way through bilateral co-operation projects, totalling close to 300 million BEF for the period 1993-1997.

As of 1996 a voluntary contribution, amounting to 2,000,000 BEF per year, is also made to the interim Secretariat of the Convention to Combat Desertification.

6.2.3. Federal Office for Scientific, Technical and Cultural Affairs

6.2.3.1. Joint research projects

Joint research projects are also initiated by the Federal Office for Scientific, Technical and Cultural Affairs (OSTC) within the frame of bilateral agreements with i.e. China, Poland and Russia consisting in a transfer of Belgian know-how which has been developed through the national R&D programmes implemented by the OSTC. Yearly the financing of bilateral projects related to biodiversity and environmental protection amounts to ca. 10,000,000 BEF. Examples of such co-operations are the joint study of the endemic fauna (invertebrates) of Lake Baikal (since the beginning of the 90s the OSTC also supplied a contribution of 200,000 USD to the Baikal International Centre for Ecological Research (BICER)); the establishment of a forest database, using remote sensing techniques, for the monitoring of stands in the Kozienice Landscape Park and Zawierce Forest in Poland; the study and conservation of specific groups of actinomycetes and microfungi from the Yunnan province and Changhai region in China.

Technology transfer to Central and Eastern European countries is also provided for by the OSTC through the granting of research fellowships to post-doc scientists from these countries allowing them to stay in Belgian laboratories during 6 to 12 months. The Belgian host units are those which are involved in the execution of the R&D programmes of the OSTC. Since 1991, 35 (out of 286) fellowships were situated in the field of biological resources (on average 5 yearly).

6.2.3.2. TELSAT research programme

Via the TELSAT research programme, techniques are developed for monitoring at local, regional and global scale of several issues (in)directly related to biodiversity: land cover and land use changes (patterns and evolution in time), land degradation in (semi-) arid regions, landscape morphology, habitats of endangered species or indicator species for biodiversity.

Earth observation data at different geographic scales, related to other data sources via 'geo-information' systems contribute to understanding and monitoring driving forces for changes in the ecosystems. Development of spatial models allows to conduct simulations of likely impacts of human actions leading to a transformation of the landscape on key landscape attributes such as biodiversity.

Some demonstration studies regarding landscape and habitat monitoring were conducted in Belgium and at a Western European scale. Several research projects, conducted with local services for natural resources management in Western and Central Africa, and/or with international organisations such as the Worldbank/Environment, FAO/Forest, IUCN and WWF International, permit a notable transfer of technology with regard to improved techniques for monitoring and planning purposes concerning the sustainable management of natural resources.

The issues 'contribution to environmental accounting' as well as environmental impact assessment of develop-

ment projects are also part of the research agenda of the TELSAT programme.

6.3. Future resource allocations

The exact amount and type of future contributions are rather difficult to predict, but it is fair to state that the Belgian Federal Government will continue to live up to its commitments under Agenda 21 in general and the ones already established. In this respect Belgium is considering to increase its contribution to the second replenishment of GEF, to be finalised shortly, by some 10% with regard to GEF-1, i.e. over 1.2 billion BEF.

6.4. Technology transfer and capacity building

At the federal level, the BADC has always included the aspects of technology transfer and capacity building in its bilateral agreements. Transfer of environmentally sound technology should allow rapid growth of developing countries while safeguarding the general environment and natural resources. Capacity building serves the same purpose, as it prepares the individual countries for dealing with the wide array of international agreements, national plans, technology evolution, etc.

BADC also supports International Course Programmes and International Training Programmes at Belgian universities, featuring topics such as biotechnology applied to agriculture, biostatistics, fundamental and applied marine ecology, tropical molecular biology, etc.

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7. Ex-situ collections

7.1. Introduction

Although the Convention on Biological Diversity evidently underlines the prime need for *in-situ* conservation of biological diversity (art. 8), it equally recognizes the important role of ex-situ conservation of components of biological diversity and genetic resources (art. 9). These collections of living and/or dead specimens cover a wide range of biotics, from micro-organisms to animals and plants, including both endemic and non-endemic species. Unavoidably, only some of the main collections have been touched upon in this synoptical report. It is anticipated however that future publications (e.g. country study) will be more complete.

7.2. Micro-organisms

The Belgian Federal Office for Scientific, Technical and Cultural Affairs (OSTC) has, since 1983, been financing the **Belgian Co-ordinated Collections of Micro-organisms** (BCCMtm), a consortium of four complementary culture collections at the service of the scientific and the industrial communities. This consortium holds circa 18,000 bacterial strains, 31,000 filamentous fungi or yeast strains and 1,650 plasmids (as pure DNA), as well as some 10 cDNA libraries. The preserved patrimonia of

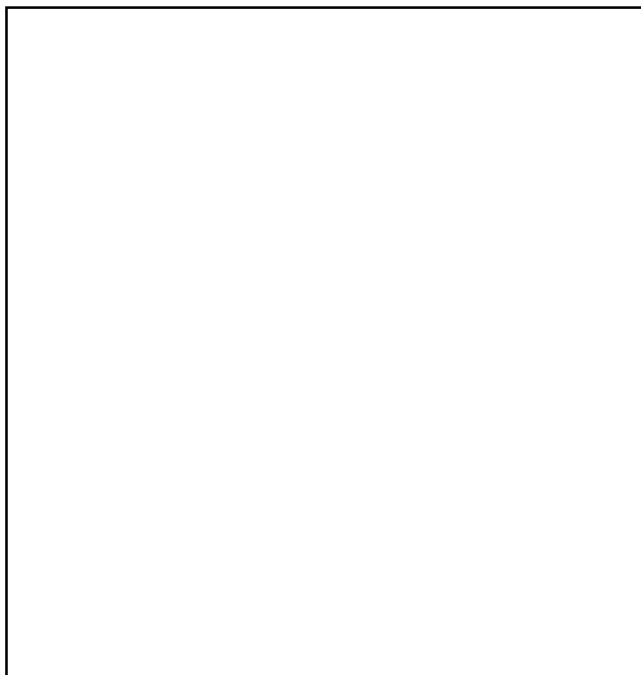


Fig 7.1 - The spectacular macroscopic development of one of the 28,600 fungal BCCMtm-cultures (*Isaria* sp.)

bacteria and filamentous or yeast-like fungi are among the top five on a world-wide scale. Both printed and electronic catalogues (<http://www.belspo.be/bccm>) are available.

BCCMtm/IHEM at Brussels holds 5,500 strains, representing 327 genera and 962 species of filamentous and yeast-like fungi of public health and related environmental interest.

BCCMtm/MUCL at Louvain-La-Neuve holds over 25,500 strains representing 1,018 genera and 3,421 species of filamentous and yeast-like fungi of all major taxonomical groups, mainly of biotechnological or (agro)industrial importance. The herbarium counts over 39,500 species.

BCCMtm/LMG at Ghent holds over 18,000 strains representing 249 genera and 1,348 species of bacteria encompassing plant-associated and phytopathogenic bacteria, bacteria of medical and veterinary importance, marine bacteria and various groups of biotechnological importance.

BCCMtm/LMBP at Ghent holds over 1,650 plasmids and 10 cDNA libraries derived from a variety of organisms.

The BCCM collections are registered at the World Data Centre, and have from 1992 onwards, as a consortium, the status of International Depository Authority (IDA) in the framework of the international patent legislation (Budapest Treaty, World Intellectual Property Organisation). Moreover, they have as of 1996 the MIRCEN-status (UNESCO) and are since long active members of the World Federation for Culture Collections (WFCC) and of the European Culture Collections Organisation (ECCO).

The BCCM is setting up a programme for technology transfer and capacity building in the spirit of the Convention on Biological Diversity (art. 15& 16); and is coordinating the international MOSAICC-project (Micro-organisms Sustainable Use, Access Regulation and International Code of Conduct), financed by the Commission of the European Union (CEU).

Those major service culture collections are complemented by many smaller and bigger research culture collections that are hosted in a large variety of research institutions. The algae's collections of the University of Liège and the microbial collections of the Institute of Tropical Medicine in Antwerp (ITM) are good examples of such collections. As such, the fungus/yeast collection of ITM, known as RV-collection (Raymond Vanbreuseghem), contains 11,500 cultures of medical interest from all over the world, including the largest collection of *Cryptococcus neoformans* in the world. It has recently been transferred to the Scientific Institute for Public Health - Louis Pasteur (IPH), holding yet the BCCMtm/IHEM-collection.

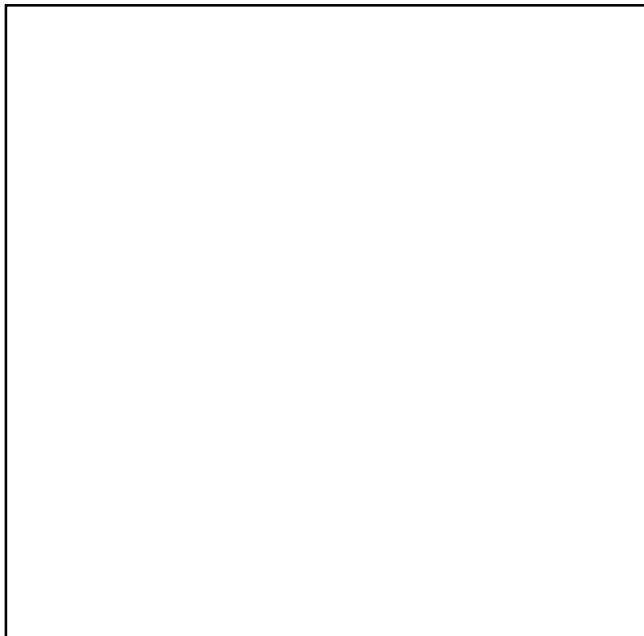


Fig 7.2 - View on the Herbarium, a systematic garden of temperate herbaceous plants; in the background the 'BALAT Greenhouse', designed by Alphonse BALAT, the architect of the Royal Greenhouses at Laken.

7.3. Botanical collections

The **National Botanic Garden of Belgium (NBGB)** maintains, since a long time, a vast collection of living plants. Some 18,000 taxa, representing 36,000 introductions, are cultivated in greenhouses or in the open-air. The greenhouses hold 10,000 plants of tropical and subtropical regions. The gene bank of wild Phaseolineae is recognised as a base collection by the International Plant Genetic Resources Institute (IPGRI). As to its holdings of living plants, the NBGB belongs to the top 7 of botanic gardens of the world. The herbarium, being in the top 25 on a world-wide basis, holds 2.5 million specimens, with very important collections from Central and Tropical Africa. These collections cover phanerogamic and cryptogamic plants as well as fungi. The NBGB participates actively in seed exchange schemes. Since quite some years, scientific programmes are developed related to e.g. in vitro culturing, seed banking of native wild plants as well as educational programmes.

Besides the NBGB, a panoply of larger and smaller botanic gardens and parks, some related to the main universities, others to the private sector, is established in Belgium. The research stations of the **Federal Ministry of Agriculture in Gent and Gembloux** have major collections of grasses, fodder plants, vegetables, chicorea, fruit trees and conifers. A special reference has also to be made to the so-called **International Network for the Improvement of Banana and Plantain (INIBAP)** Transit Centre, hosted by the Catholic University of Leuven;

and to the poplar variety collections (some 140 genotypes of *Populus nigra*, some 1,000 genotypes of *Populus deltoides*, and more than 2,000 genotypes of *Populus trichocarpa*) held by the Flemish Institute for Forestry and Game Management and the Walloon Forestry Research station.

The **Royal Museum for Central Africa (RMCA)** houses an important collection of hard wood samples (xylarium) from world-wide tropical and subtropical areas totalizing more than 56,000 samples and more than 13,000 recent species together with many fossil and prehistoric wood samples; the Museum also has an important collection of pollen on mounted slides, as well for recent as prehistoric species and samples.

7.4. Zoological collections

The largest collections of dead animal specimens are held by the **Royal Belgian Institute of Natural Sciences (RBINS)** and the **Royal Museum for Central Africa (RMCA)**.

Parts of the collections of the RBINS go back to the middle of the 18th century. In the second half of the 19th century the collections grew rapidly through the acquisition of large quantities of fossils. The most important of these are the remnants of Tertiary faunas exhumed during the construction of the military forts around Antwerp, and the Cretaceous skeletons discovered in a coal mine in the village of Bernissart. At the beginning of the 20th century the collections grew further

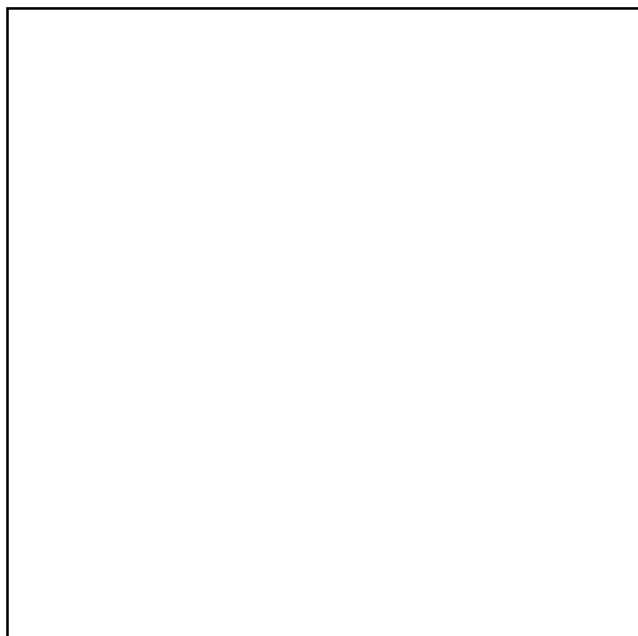


Fig 7.3. - Part of the wet zoological collection of the Royal Belgian Insittute of Natural Sciences.

through the addition of material from faunistic surveys of the national territory and the southern North Sea. Subsequently, huge numbers of specimens were acquired as a result of expeditions to Indonesia, Central and Western Africa, Amazonia and more recently to Papua New Guinea, Antarctica, Gulf of Mexico, Lake Baikal, etc. Consequently the RBINS currently houses a diverse and exceptionally rich zoological (inclus. paleontological) collection completed by a large number of prehistoric items and an exceptionally diverse mineral collection, the grand total of which is in the order of +36,000,000 specimens or items. This undoubtedly ranks the Institute within the top ten of the world. Some specialized collections rank even higher e.g. the cetacean collection and the mollusc collection. The latter includes some 9,000,000 specimens representing more than 45,000 species and is to be ranked in the top five world-wide. Other important collections are the insect collection, estimated at a 12,000,000 specimens and the vertebrate collection exceeding 1,000,000 specimens. The latter includes important numbers of freshwater fishes from Africa and South America, a rich collection of European birds and bird's eggs and a collection of extinct birds and mammals e.g. a complete skeleton of a dodo (*Raphus cucullatus*) and one of the two known specimens of warrah (*Dusicyon australis*).

From 1991 onward a frozen tissue collection of vertebrates and invertebrates is being built up for molecular research.

The collections of the RMCA contain 1,000,000 vertebrate specimens, corresponding to ca. 6,000 species, including a very large and therefore unique collection of the pygmy chimp (*Pan paniscus*), the common chimp (*Pan troglodytes*) and the gorilla, both mountain (*Gorilla gorilla berengei*) and lowland gorilla (*G. g. gorilla*). Furthermore these collections include more than 500,000 African freshwater fishes (the largest and most important collection in the world for that group), and



Fig 7.4. - Goliath beetles (*Goliathus goliathus*) stored in a hermetic box (Royal Museum for Central Africa)

more than 80,000 African rodents, also a unique collection. The collections hold 16,000,000 invertebrate specimens (mostly insects), belonging to ca. 120,000 species. With more than 13,000,000 African insects these collections are among the most important in the world. The African spider collection (250,000 species) is also among the world's most important. The Museum also houses a collection of 200,000 fossil samples from Africa.

Besides the collections in these major institutes, several major zoological collections (some with specimens of historical importance too) are held in universities.

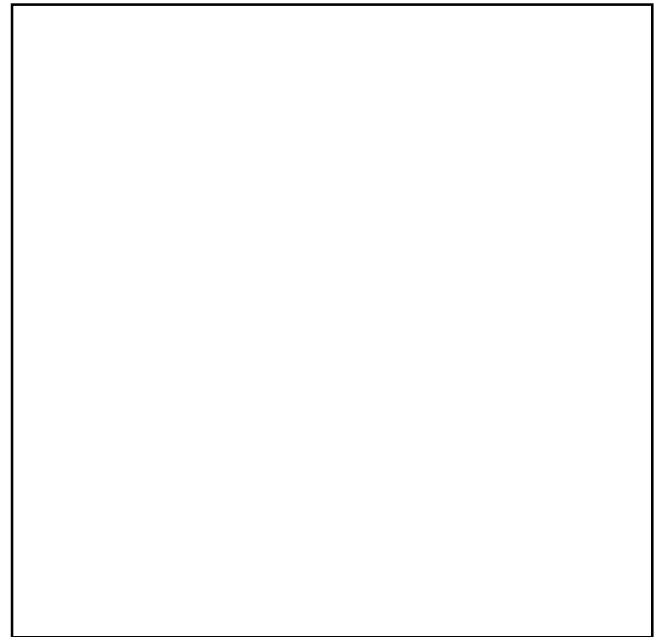


Fig 7.5. - Young and female okapi (*Okapia johnstoni*), Antwer Zoo, Royal Zoological Society of Antwerp.

Belgium counts seven main public and private zoos, belonging to and complying with the rules of the European Association of Zoo Associations (EAZA). The **Royal Zoological Society of Antwerp** (RZSA), often referred to as the National Zoo, held in 1996 more than 6,000 living vertebrates, representing ca. 800 species. The RZSA participates in the European Endangered Species Programme (EEP) and the Species Survival Programme (SSP), and keeps the international studbooks of the okapi (*Okapia johnstoni*), the bonobo (*Pan paniscus*), the golden-headed lion tamarin (*Leontopithecus chrysomelas*) and the Congo peafowl (*Afropavo congensis*) and also the European studbook of the Mexican military macaw (*Ara militaris mexicana*). The RZSA further participates in numerous breeding programmes with partners from all over the world and is involved in many veterinary, ethological and socio-ecological research projects.

Besides the zoos, one could further mention the **Aquarium of the University of Liège**, involved in ethological and ecological research on marine vertebrates, holding some 250 taxa of which about 15 are bred as a measure to counteract in-situ capture.

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8. Belgian Clearing-House Mechanism

8.1. Homepage of the Belgian Clearing-House

Following decision II/3 of COP-2 (Jakarta, 6-17 November 1995) and in accordance to recommendations made by SBSTTA-2 (Montreal, 2-6 September 1996), the Royal Belgian Institute of Natural Sciences, National Focal Point to the Convention on Biological Diversity, has launched as of 7 October 1996 the website of the Belgian Clearing-House on the Internet. Belgium was the second country of the EU and the fifth of the world to do so.

The Belgian website was gradually enhanced and was the second to be added to the official list of National Focal Point Clearing-Houses by the Secretariat of the Convention (July 1997). The Belgian Clearing-House provides several options for searching through the available information on biological diversity in Belgium and world-wide

(<http://www.kbinirsnb.be/bch-cbd/homepage.htm>).

Graphically the Belgian Clearing-House homepage consists of two basic parts:

- a Belgian window,
- a selection of hyperlinks giving direct access to other national, regional, sectoral and thematic clearing-houses as well as to the CBD Secretariat and Clearing-House and to UNEP, CSD and other relevant sites.

The Belgian window is subdivided into two parts (Fig. 8.1.):

- in the right column, an overview of the Belgian implementation process of the Convention is given with *inter alia* direct links to the competent servers of the Walloon Region, the Flemish Region and the Brussels Capital Region and to thematic sites *e.g.* North Sea, Belnet biodiversity, Belgian Biosafety Server;
- in the left column, a selection of facilities given by the Belgian National Focal Point as a service to all those involved with the Convention (*e.g.* direct links to all Belgian universities and relevant scientific institutions, ministries and ministerial administrations, collections, vast bibliographies, Belgian experts, ...).

A striking example of this service are the pages 'Acronyms related to the CBD' and 'Glossary of terms related to the CBD' to which webmasters of other Clearing-Houses have made a hyperlink, bearing in mind that it is better to take maximum profit of the work done elsewhere instead of doubling the efforts.

Another example: Belgium is one of three CHM-NFPs offering a partnering service for non-webconnected NFPs, which means that Belgium is ready to 'parent' for a certain time some general information for a non-webconnected National Focal Point as a kind of bilateral

collaboration. It aims to facilitate the National Implementation of the Clearing-House Mechanism by all Parties. The CBD Secretariat is playing the co-ordinating role.

Evidently the Belgian Clearing-House website is and will be under permanent development, particularly in responding to priority settings by COP decisions (*e.g.* matters related to biotechnology, taxonomic expertise, etc). Moreover the website will be developed in synergy with the relevant activities of the Belgian Federal Office for Scientific, Technical and Cultural Affairs (OSTC).

8.2. The Belnet Biodiversity Server

Within the framework of the BELNET Workgroup on Biodiversity (<http://www.belspo.be/biodiv/>), the OSTC is funding an on line inventory of the resources concerning biodiversity available in Belgium (<http://www.br.fgov.be/BIODIV/>). This inventory is not limited to the biodiversity of the Belgian territory. It concerns specialists (both professional and private), research programmes at universities, research institutes and elsewhere, collections, botanical gardens, zoos, museums, existing databases and their contents, associations and administrations involved in the study and conservation of the diversity of living organisms in all its aspects, from the genome to the biome level, on a planetary scale.

8.3. The Belgian Biosafety Server

The Belgian Biosafety Server (<http://biosafety.ihe.be/>) is the website of the Biosafety Advisory Council. It is designed and administrated by the Service of Biosafety and Biotechnology acting as the Secretariat of the Council. It is hosted by the federal Scientific Institute of Public Health - Louis Pasteur (IPH, Brussels), which acts under the responsibility of the Ministry for Social Affairs, Public Health and Environment. This website is primarily focusing on all scientific and regulatory aspects of biological safety regarding human activities using pathogenic and genetically modified organisms. A chapter (<http://biosafety.ihe.be/Menu/Biodiv.html>) is dedicated to biosafety aspects of biodiversity, focusing mainly on the UNEP International Technical Guidelines for Safety in Biotechnology (full text available on-line) and on the current negotiation process aiming at developing a protocol on biosafety, specifically focusing on the transboundary movement of Living Modified Organisms.

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Fig. 8.1. - Belgian window on the homepage of the Belgian Clearing-House Mechanism.

Acronyms used in the report

AGW	Arrêté du Gouvernement wallon (Walloon Government decree)
AMINAL	Administratie Milieu-, Natuur-, Land- en Waterbeheer van het Vlaams Gewest (Environment, Nature, Land and Water Management Administration)
ASCOBANS	Agreement on the Conservation of Small Cetaceans of Baltic and North Seas
BADC	Belgian Agency for Development Co-operation
BBL	Bond Beter Leefmilieu
BCCM	Belgian Co-ordinated Collections of Micro-organisms
BELNET	Belgian Research Network
BICER	Baikal International Centre for Ecological Research
BIME	Institut Bruxellois pour la Gestion de l'Environnement (IBGE) Brussels Instituut voor Milieubeheer (BIM) (Brussels Institute for Management of the Environment)
BRAL	Brusselse Raad voor het Leefmilieu
CAE	Centre of Agricultural Economics
CBD	Convention on Biological Diversity
CCGRND	Commissions Consultatives de Gestion des Réserves Naturelles Domaniales (State Nature Reserve Management Consultative Commissions)
CCIEP	Co-ordinating Committee for International Environmental Policy
CEU	Commission of the European Union
CFP	Common fisheries policy
CHM	Clearing-House Mechanism
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CLO	Centrum voor Landbouwkundig Onderzoek (Agricultural Research Centre)
CO	Carbon monoxide
COP	Conference of the Parties
CRA	Centre de Recherches Agronomiques (Agricultural Research Centre)
CSD	Commission on Sustainable Development
CSWCN	Conseil Supérieur Wallon de la Conservation de la Nature (Walloon Senior Nature Conservation Council)
DAC	Development Assistance Committee of the OECD
DGRNE	Direction générale des Ressources naturelles et de l'Environnement (Directorate General for Natural Resources and Environment)
DNA	Deoxyribonucleic acid
DNF	Direction de la Nature et des Forêts (Direction of Nature and Forests)
DZ	Sea Fisheries Department (formerly Fisheries Research Station)
EAZA	European Association of Zoo Associations
EC	European Commission
ECCO	European Culture Collections Organisation
EEC	European Economic Community
EEP	European Endangered Species Programme
EEZ	Exclusive economic zone
EIA	Milieu-effectrapport (Environmental Impact Assessment)
EU	European Union
FAO	Food and Agriculture Organization
GEF	Global Environment Facility
GMOs	Genetically modified organisms
GNOP	Gemeentelijk Natuurontwikkelingsplan (Municipal Nature Development Plan)

GNP	Gross national product
IBW	Instituut voor Bosbouw en Wildbeheer (Institute for Forestry and Game Management)
ICE	Interministerial Conference for the Environment
ICES	International Council for the Exploration of the Sea
IDA	International Depository Authority
IEB	Inter-Environnement Bruxelles
IFAD	International Fund for Agricultural Development
IHEM	Institute for Hygiene and Epidemiology
IN	Instituut voor Natuurbehoud (Institute of Nature Conservation)
INIBAP	International Network for the Improvement of Banana and Plantain
IPGRI	International Plant Genetic Resources Institute
IPH	Scientific Institute of Public Health - Louis Pasteur
ISB-SURWAL	Inventaire et Surveillance de la Biodiversité - Surveillance de l'état de l'environnement par bioindicateur (Inventory and Monitoring of Biodiversity - Monitoring of the state of the environment through bioindicators)
ISH	Inventaire et Surveillance des Habitats (Inventory and Monitoring of Habitats)
ITM	Institute of Tropical Medicine
IUCN	International Union for Conservation of Nature and Natural Resources - The World Conservation Union
IUPGR	International Undertaking on Plant Genetic Resources
IVON	Integraal Verwervings- en Ondersteunend Netwerk (Integral Interweaving and Supporting Network)
MARPOL	International Convention for the prevention of pollution from ships
MINA-fund	Fonds voor Preventie en Sanering inzake Leefmilieu en Natuur (Flemish Environmental and Nature Fund)
MINA-plan	Milieubeleidsplan en Natuurontwikkelingsplan voor Vlaanderen (Flemish Environmental Policy and Nature Development Plan)
MiNa-Raad	Milieu- en Natuurraad van Vlaanderen (Flemish Environmental and Nature Council)
MIRA	Milieu- en Natuurrapport van Vlaanderen (Flemish Environmental and Nature Report)
MIRCEN	Microbiological Resources Center
MMM	Marien Milieu Marin
MNZ	North Sea Technical Commission
MOSAICC	Micro-organisms Sustainable Use, Access Regulation and International Code of Conduct
MUMM	Management Unit of the Mathematical Models of the North Sea and the Scheldt Estuary (from 01.01.98 onward a department of the Royal Belgian Institute of Natural Sciences)
NBGB	National Botanic Garden of Belgium
NFP	National Focal Point
NGO	Non-governmental organisation
NO _x	Nitrogen oxides
NSC	North Sea Conference
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
OFFH	Observatoire de la Faune, de la Flore et des Habitats (Observatory of Fauna, Flora and Habitats)

OSPAR	Oslo and Paris Conventions for the prevention of marine pollution
OSTC	Belgian Federal Office for Scientific, Technical and Cultural Affairs
OVAM	Openbare Afvalstoffenmaatschappij voor het Vlaamse Gewest (Flemish Public Waste Agency)
PCB	Polychlorinated biphenyls
PCD-GOP	Plan Communal de Développement - Gemeentelijk Ontwikkelingsplan (Municipal Development Plan)
PCDN	Plans Communaux de Développement de la Nature (Municipal Nature Development Plans)
PEDD	Plan Environnemental pour le Développement Durable (Environmental Plan for Sustainable Development)
PRAS-GBP	Plan Régional d'Affectation du Sol - Gewestelijk Bodembestemmingsplan (Regional Soil Destination Plan)
PRD-GEWOP	Plan Régional de Développement - Gewestelijk Ontwikkelingsplan (Plan of Regional Development)
RBINS	Royal Belgian Institute of Natural Sciences
RMCA	Royal Museum for Central Africa
RV	collection Raymond Vanbreuseghem collection
RZSA	Royal Zoological Society of Antwerp
SADC	Southern African Development Community
SBSTTA	Subsidiary Body on Scientific, Technical and Technological Advice
SDR	Special drawing rights
SGIB	Inventaire des Sites de Grand Intérêt Biologique (Inventory of Sites of Great Biological Interest)
SIBW	Système d'Informations sur la Biodiversité en Wallonie (System of information about Biodiversity in Wallonia)
SO ₂	Sulphur dioxide
SSP	Species Survival Programme
TBT	Tributyltin
TELSAT	Teledetection by Satellite
UNCED	United Nations Conference on Environment and Development
UNCLOS	United Nations Convention on the Law of the Sea
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
VEN	Vlaams Ecologisch Netwerk (Flemish Ecological Network)
VLINA	Vlaams Impulsprogramma Natuurontwikkeling (Flemish Impulse Programme Nature Development)
VLM	Vlaamse Landmaatschappij (Flemish Land Agency)
VMM	Vlaamse Milieumaatschappij (Flemish Environmental Agency)
VOS	Volatile organic substances
WFCC	World Federation for Culture Collections
WWF	Worldwide Fund for Nature

References

1. References related to The Flemish Region chapter

Vlaamse Milieumaatschappij, 1994. Leren om te keren, Milieu- en Natuurrapport Vlaanderen.

Vlaamse Milieumaatschappij, 1996. Leren om te keren, Milieu- en Natuurrapport Vlaanderen.

Vlaamse Regering, 1997. MINA-plan 2, Het Vlaamse milieubeleidsplan, 1997-2001.

Internet sites: <http://www.vmm.be/>
<http://www.vlaanderen.be/>
<http://www.instat.be/>

2. References related to The Brussels Capital Region chapter

BIM-IBGE, 1995. Verslag over de Staat van het Leefmilieu in het Brussels Hoofdstedelijk Gewest, 1994. BIM-rapport, 9: 349 pp.

IBGE-BIM, 1995. Rapport sur l'Etat de l'Environnement en Région de Bruxelles-Capitale, 1994. Les Cahiers de l'IBGE, 9: 343 pp.

BIM-IBGE, 1997. De Staat van het Leefmilieu in het Brussels Hoofdstedelijk Gewest, 1996. De Schriftjes van de Dienst Milieustatistiek, nrs. 3 tot 11.

IBGE-BIM, 1997. L'Etat de l'Environnement en Région de Bruxelles-Capitale, 1996. Les Carnets de l'Observatoire, N^{os} 3 à 11.

Gryseels, M., 1995. Orientations for the promotion of the Biological Heritage in the Brussels Capital Region. Proceedings XVIIth IFPRA-World Congress - VVOG, pp. 5.30-5.34.

Gryseels, M., 1996. Data on Animal and Plant Populations in the Brussels Capital Region. OECD and EUROSTAT environmental data base, 1996 questionnaire. Partim: Wildlife (Fauna and Flora). 30 pp. Brussels Institute for Environmental Management. Technical Report.

IBGE-BIM., 1992. Réseau d'information et de surveillance de la biodiversité et de l'état de l'environnement de la Région de Bruxelles-Capitale. Rapport de la Convention BIM/IBGE-UCL/FBDB. Rapport technique.

IBGE-BIM., 1993. Idem.

IBGE-BIM., 1994. Idem.

IBGE-BIM., 1995. Idem.

IBGE-BIM., 1996. Idem.

IBGE-BIM., 1997. Idem.

Internet site: <http://www.ibgebim.be/>

3. References related to The Walloon Region chapter

Dufrêne, M., 1997 (ed.). Rapport de l'état des populations d'espèces menacées en Wallonie. Questionnaire EUROSTAT-OCDE. Ministère de la Région wallonne, DGRNE, Observatoire de la Faune, de la Flore et des Habitats, 16 pp.

Gerard, E., 1997. La nouvelle circulaire relative aux aménagements dans les bois soumis au régime forestier. Résumé de la communication présentée au colloque « Biodiversité en forêt wallonne », Gembloux, les 27 et 28 novembre 1997.

Hallet, C. (ed.) 1993. Flore-Faune. In: Dachelet, A., Hallet, C. & Petitjean, M. (eds). Etat de l'Environnement wallon. - Ministère de la Région wallonne, Cabinet du Ministre de l'Environnement, des Ressources naturelles et de l'Agriculture, Bruxelles & Direction générale des Ressources naturelles et de l'Environnement, Jambes, pp. 115-207.

Hallet, C. & Ledent, A. (eds) 1996. Etat de l'Environnement wallon, 2. Agriculture. - Ministère de la Région wallonne, Cabinet du Ministre de l'Environnement, des Ressources naturelles et de l'Agriculture, Bruxelles & Direction générale des Ressources naturelles et de l'Environnement, Jambes, 98 pp.

Hallet, C. & Malaisse, F. (eds) 1996. Etat de l'Environnement wallon, 3. Forêt et Sylviculture. - Ministère de la Région wallonne, Cabinet du Ministre de l'Environnement, des Ressources naturelles et de l'Agriculture, Bruxelles & Direction générale des Ressources naturelles et de l'Environnement, Jambes, 121 pp.

Ministère de la Région wallonne, 1997. Circulaire n 2619 relative aux Aménagements dans les bois soumis au régime forestier. Division de la Nature et des Forêts, 112 pp.

Serussiaux, E. & Gathoye, J.-L., 1992. Patrimoine naturel. In: Etat de l'Environnement wallon. - Bureau du Plan, section Régionale wallonne, Bruxelles, Ministère de la Région wallonne, Cabinet du Ministre de l'Environnement, des Ressources naturelles et de l'Agriculture, Bruxelles & Direction générale des Ressources naturelles et de l'Environnement, Jambes, pp. 77-126.

Stein, J. (ed.) 1995. Le grand livre de la Nature en Wallonie. - Ministère de la Région wallonne, Jambes, 243 pp.

Internet sites:

Système d'information sur la biodiversité en Wallonie
<http://www.rw.be/mrw/dgrne/sibw/>

Direction générale des Ressources naturelles et de l'Environnement

<http://www.rw.be/mrw/dgrne/home.htm>

Cabinet du Ministre de l'environnement, des ressources naturelles et de l'agriculture
<http://envagri.wallonie.be>

4. References related to The North Sea chapter

ICES (International Council for the Exploration of the Sea), 1991. Code of Practice for the Commercial Extraction of Marine Minerals.

Schallier, R., Lahousse, L. & Jacques, Th., 1996. Toezicht vanuit de lucht: zeeverontreiniging door schepen in de Belgische belangzone van de Noordzee. Rapport Beheerseenheid Mathematisch Model Noordzee en Schelde-estuarium.

Welvaert, M., 1997. De Belgische Zeevisserij: aanvoer en besomming, 1996. Ministerie van Middenstand en Landbouw, Dienst Zeevisserij.

Internet site: <http://www.camme.ac.be/>

5. References related to the federal level chapters

Diensten van de Eerste Minister - Federale diensten voor wetenschappelijke, technische en culturele aangelegen-

heden, 1997.-Opdrachten en Activiteiten.- DWTC, Brussel, 182 pp.

Services du Premier Ministre - Services fédéraux des affaires scientifiques, techniques et culturelles, 1997. - Missions et Activités.- SSTC, Bruxelles, 182 pp.

Van Goethem, J.L., 1998. The Convention on Biological Diversity and the Role of the Royal Belgian Institute of Natural Sciences in Biodiversity Research. In: Demarée, G., Alexandre, J. & De Dapper, M. (eds). Proceedings of the International Conference 'Tropical Climatology, Meteorology and Hydrology' (Brussels, 22-24 May 1996). Royal Academy of Overseas Sciences, 17 pp.

See also 4.

Internet sites:

Belgian Clearing-House Mechanism
<http://www.kbinirsnb.be/bch-cbd/homepage.htm>

Belgian Biodiversity Resources
<http://www.br.fgov.be/BIODIV/>

Belgian Biosafety Server
<http://biosafety.ihe.be/Menu/Biodiv.html>

The Belgian Co-ordinated Collections of Micro-organisms
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