

# Biodiversity Indicators

# 2010

State of Nature in Flanders (Belgium)



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The State of Nature in Flanders (Belgium)

Report of the Research Institute for Nature and Forest.  
INBO.M.2010.3

# Colofon

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## Executive summary

Flanders has endorsed the European objective to halt the loss of biodiversity by 2010. This report evaluates the present state of nature in Flanders by reporting on 21 biodiversity indicators which give the closest interpretation of the 26 European biodiversity indicators proposed by the European Environment Agency (EEA, 2007).

### Components of biodiversity and integrity of ecosystems

Very specific habitats degrade to more common, usually nutrient-rich habitats. As a consequence, many rare species, restricted to these specific habitats, are declining. Examples are the species mentioned in the Annexes of the Habitats Directive. Many farmland species are also suffering from habitat loss. On the other hand, a number of common species and some alien species are increasing. As a result, variation in biodiversity decreases. This process is called homogenisation. Freshwater biodiversity (e.g. fish, water plants) declined sharply during the last century, although a significant improvement has been noticed during the last decade (e.g. fish, dragonflies). After a decade of increase, numbers of overwintering waterfowl have started to decline, particularly along the Sea Scheldt. Numbers are dropping due to a decreased food supply as a result of improved water quality. As such, the decline is a part of the ecosystem restoration. Woodland birds have also fared better in recent times.

### Protected areas and sustainable management

Flemish nature policy, increasingly guided by European policy, includes a mix of instruments for the conservation and sustainable use of biodiversity. The Flemish Environmental Policy Plan (2003-2010) sets a number of targets for 2010. The reduction of nitrogen residues in agricultural soils and the uptake of agri-environmental schemes for field margins, pools, hedges and wooded banks are on track to meet those targets. The targets set for conservation management and the exceedance of the critical load for nitrogen are expected to be achieved during the next decade. Delays of several decades are predicted in meeting targets for reversing watercourse fragmentation and improvements in water quality. The area covered by agri-environmental schemes for species conservation seems to be static. Flanders has designated 7,5 % of its territory as Sites of Community Interest under the EU Habitats Directive. Conservation goals for these sites are now being set.

### Threats to biodiversity

Protected areas are small and fragmented. Flemish agriculture is amongst the most productive in Europe, but it scores badly in terms of farmland biodiversity. Sprawling urbanisation and intensifying agriculture exacerbate the negative impact of habitat fragmentation. Nitrogen residues on arable land, atmospheric nitrogen deposition, and phosphorus concentrations in rivers are amongst the highest in Europe. Thanks to policy efforts, nitrogen and phosphorus emissions have decreased, although the decline has halted in recent years. Meanwhile, evidence that climate change is starting to affect nature in Flanders is mounting and the number of alien species in Flanders increases by 25 species per year. Management of both these threats is particularly difficult given the global scale of the processes involved.

### **Footprint and public support**

The consumption footprint of an average Flemish inhabitant is greater than our planet can offer everyone. Membership of nature related societies is increasing, although the number of visits to forests and natural areas is declining slightly.

An overall assessment of the 21 reported biodiversity indicators suggests that without extra interventions the loss of biodiversity in Flanders will not be halted by 2010. It is important to tackle the various negative influences more thoroughly (such as detrimental land use, nitrogen, phosphorus and greenhouse gas emissions and the import and export of species). Sufficiently large natural areas should be managed to achieve explicit nature goals, while outside those areas, a basic quality of nature should be maintained. The latter allows, amongst other things, for the dispersal of populations when habitats become unsuitable.

## Introduction

In 2001 the European Union committed itself to halting the loss of biodiversity within its territory by 2010. In 2003 this target was accepted on a pan-European scale. In May 2006, the European Union reconfirmed this commitment (European Commission, 2006). The Flemish region adopted it as a long-term biodiversity objective in its Flemish Environmental Policy Plan (2003-2010). During the United Nations environmental summit in Johannesburg (2002), the participating countries agreed to significantly reduce the loss of biodiversity on a global scale by 2010.

In 2004, the SEBI 2010 process ('Streamlining European Biodiversity Indicators') was established to monitor progress towards the 2010 biodiversity objective. For that purpose, 16 'headline indicators' were developed. In 2007, a provisional set of 26 European biodiversity indicators was proposed by the European Environment Agency (EEA, 2007).

This report evaluates the status of biodiversity in Flanders by means of 21 biodiversity indicators, which are closely linked to the aforementioned 26 European biodiversity indicators. The set of 21 biodiversity indicators is used to evaluate the Flemish progress towards the 2010 target. For each indicator a description of relevant policy targets is given together with status, trends and, when data is available, an international comparison.

The 21 Flemish biodiversity indicators are published and regularly updated on the biodiversity indicators website ([www.biodiversityindicators.be](http://www.biodiversityindicators.be)) and the environment indicators website ([www.milieurapport.be](http://www.milieurapport.be)).

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(\*) Flemish biodiversity indicator is tuned to proposed European indicator.



# Flanders at a glance

Ongoing state reforms over the last 35 years have transformed Belgium into a federal state, giving its three regions increasing responsibilities. Flanders, Wallonia and Brussels have their own governments, parliaments and administrations. Nature conservation and forest management have been a regional responsibility since 1988. Major milestones have been the Decree on Forests in 1991 and the Decree on Nature Conservation in 1997. Their goals were further elaborated in the 1997-2001 and 2003-2010 Flemish Environmental Policy Plans.

Flanders is a densely populated and economically very active region. Nearly a quarter of the area is urbanised and about half of its surface is occupied by agriculture. The Flemish landscape is the most fragmented in Europe.

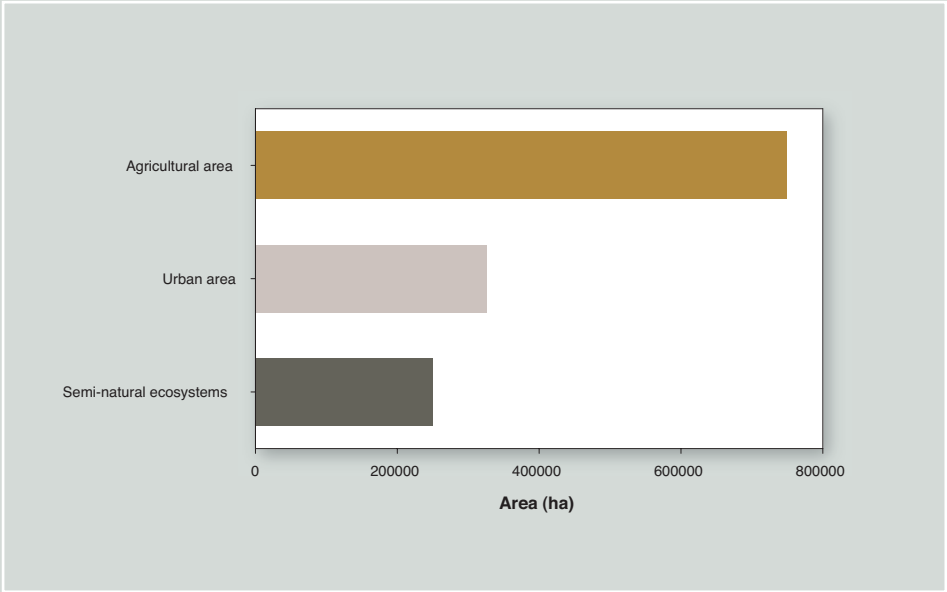
Basic statistics of  
Flanders, Belgium  
and Europe  
(EU-15)

	Flanders	Belgium	Europe
Area (km <sup>2</sup> )	13.522	32.545	3.246.462
Population (inhabitants)	6.162.000	10.667.000	380.000.000
Population density (inhabitants/km <sup>2</sup> )	455	340	120

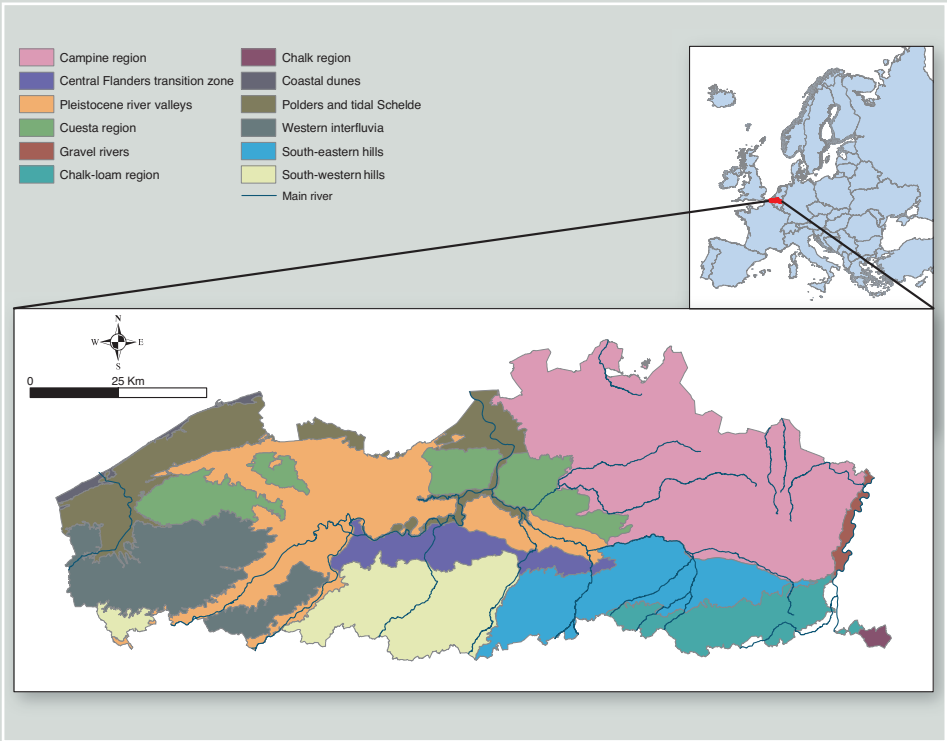
Flanders is located in the Western European lowland and belongs almost entirely to the Atlantic biogeographic region. The only exception is the far eastern area of Flanders, which belongs to the Continental biogeographic region. Flanders has 65 km of seashore. There are coastal dunes, alluvial clay soils in the coastal Polders and along the Sea Scheldt, and sandy soils upstream in the Pleistocene river valleys and in the Campine region in the east. In the south of Flanders, the landscape is undulating and the soils are loamy and increasingly calcareous towards the south east. The altitude ranges from a few meters above sea-level in the Polders to 288 m above sea-level in the south-eastern exclave. The Scheldt basin covers the major part of Flanders. The Meuse is a gravel river in the east.

Approximately 40 000 indigenous plant and animal species are found in Flanders, of which 1 % are vertebrates, 75 % invertebrates, 8 % vascular plants, mosses and lichens, and 16 % fungi.

Major land uses in Flanders (year 2000).



Ecoregions and main rivers in Flanders



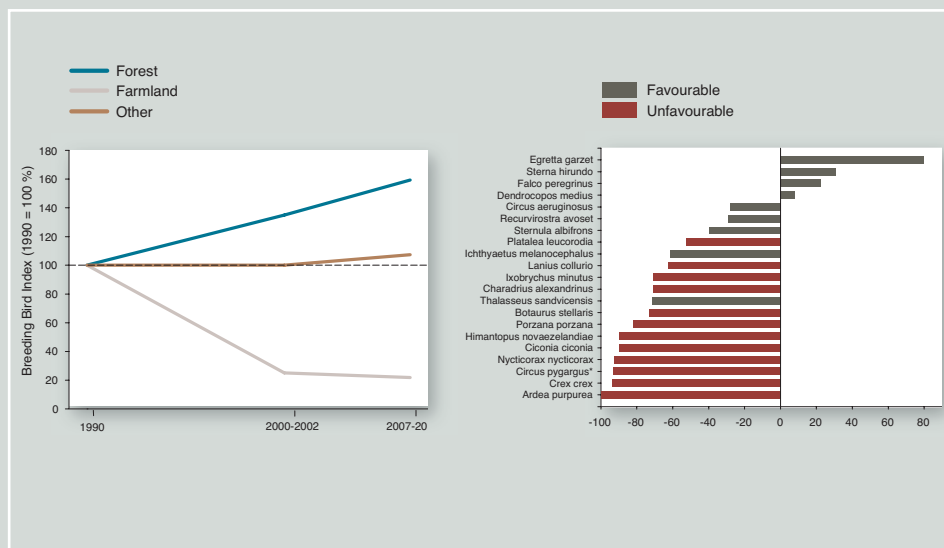
## 1 Breeding birds

The European common breeding bird index describes the trend for a selection of European common breeding birds based on monitoring in the member states. There are three subcategories: farmland birds, woodland birds and other common birds, usually generalist species.

**Farmland birds in Flanders declined markedly during the last decade** due to intensification and scale consolidation of agriculture. The decline is stronger than in surrounding countries. **The state of woodland birds improved.** The latter might be explained by several factors, such as increased afforestation, a more natural composition and structure of woodlands and forests, and the maturing of trees. **Other common birds, usually generalists, have also shown an overall increase.**

For the breeding birds on the annex I list of the Birds Directive population targets have been set. The actual breeding population is compared with the target population for species where sufficient data is available. Four of the 21 species reach the target population. In 2007 nine species were considered to have a favourable conservation status. Five species are now below the target population. This can be explained by changing breeding conditions and natural population fluctuations.

Trends in the abundance of woodland, farmland and other common birds in Flanders (left) and distance to target population for breeding birds of the Birds Directive annex I (right).

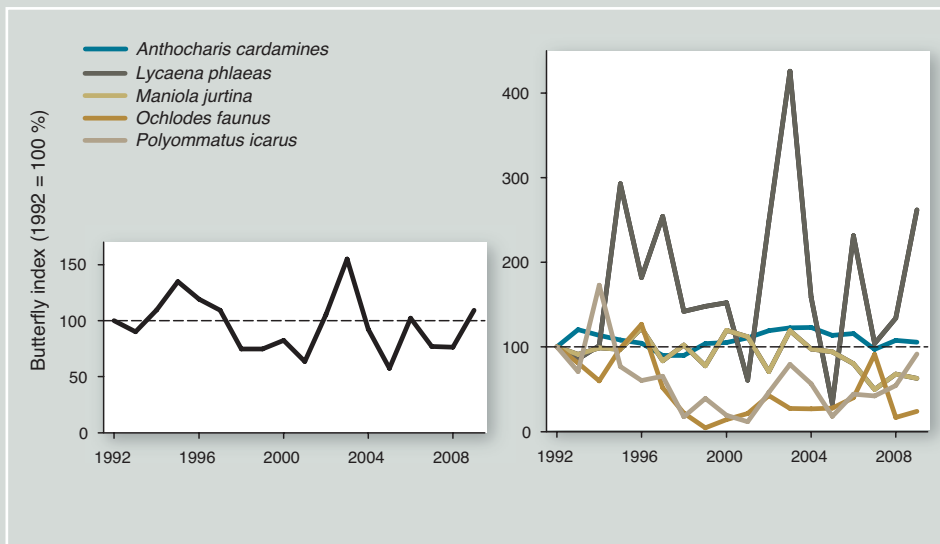


Source: SOVON, BTQ, Vansteenkoven (2006), Vermeersch et al. (2004), INBO

## 2 Grassland butterflies

The European butterfly index describes a number of butterfly populations in several European countries based on a standardised monitoring system. In Flanders sufficient data are available for five common species: Meadow brown (*Maniola jurtina*), Large skipper (*Ochlodes faunus*), Common blue (*Polyommatus icarus*), Small copper (*Lycaena phlaeas*), Orange tip (*Anthocharis cardamines*).

**The Flemish data fluctuate.** In 2009, the index reached the same level as during 1992, the initial year of recording. Some species such as Small Copper show strong fluctuations while Large skipper and Meadow brown are declining. Orange tip is stable and Common blue is increasing again after a strong decline.



Abundance of grassland butterflies. Left: aggregated. Right: individual species.

Source: Butterfly working group Natuurpunt, INBO

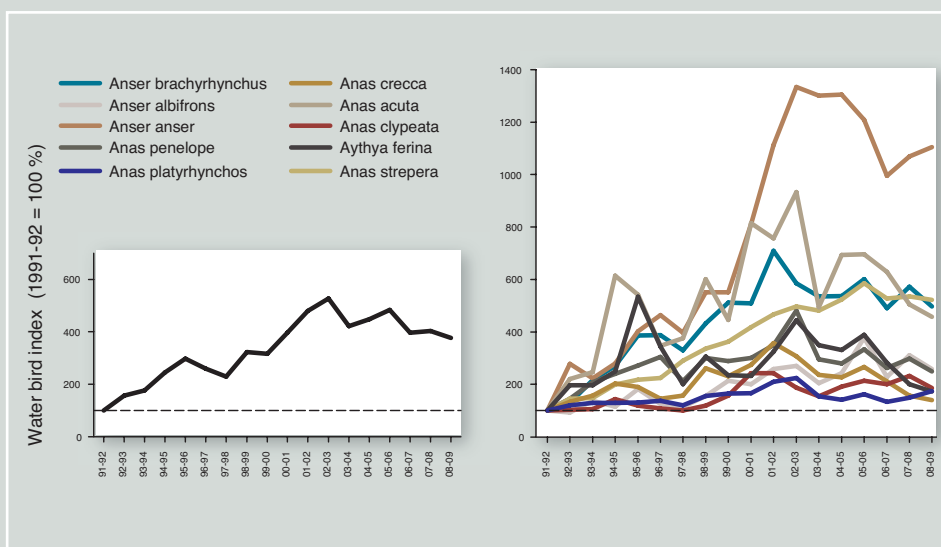
### 3 Overwintering waterfowl

The overwintering waterfowl index describes the number of overwintering waterfowl based on 6 mid-monthly surveys.

**The abundance of waterfowl increased fivefold between the winter of 1991-1992 and the winter of 2002-2003, but declined again afterwards.** The last five years the trend varies between stable and decline.

The abundance of waterfowl in Flanders is a combined effect of north-western European and regional factors. The spectacular increase of the past 20 years occurred all over north-western Europe. Possible causes are better protection of the species (reduced hunting) and their habitat (protection of wetlands), increased food availability (as a result of eutrophication), but also a north-western shift of south-eastern populations. The recent decline is a consequence of various factors. In a number of important areas the carrying capacity has been reached and numbers have stabilised or even dropped. Along the Sea Scheldt, numbers declined considerably due to changes in the food supply as a result of improved water quality.

Abundance of overwintering waterfowl in Flanders.  
Left: aggregated.  
Right: individual species.

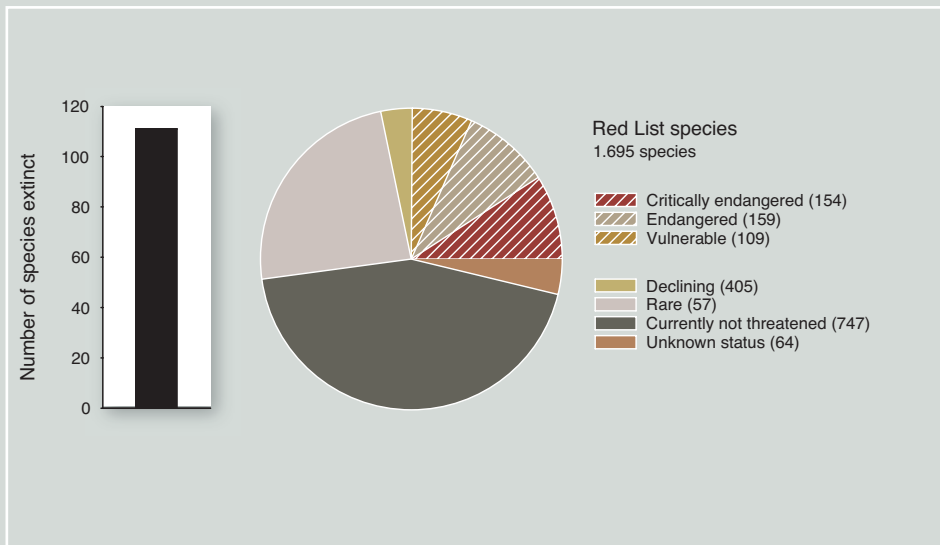


Source: INBO, Wetlands International, van Roomen et al. (2006)

## 4 Species status

The status of a species is based on the categories defined by the International Union for the Conservation of Nature (IUCN). Red List species belong to the categories 'Critically Endangered', 'Endangered' and 'Vulnerable'. Knowledge of the status of species in Flanders is strongly biased towards vertebrates and vascular plants, and the status is known for 100 % and 58-70 % of the species respectively. Fungi (10 %) and invertebrates (5-6 %) are hardly documented. The present Flemish indicator is based on validated Red Lists only. Validated Red Lists exist for amphibians, breeding birds, butterflies, vascular plants, dragonflies, ground beetles, reptiles and orthoptera (crickets, grasshoppers and locust).

**Of the 1.806 species on validated Red Lists, 111 became locally extinct during the last century. A total of 422 species (25 %) are on the Red List and are vulnerable to extinction if necessary measures are not taken.** The decline of these species is the result of the decreasing habitat area and a decline in habitat quality. Species associated with farmland are increasingly present on the Red List. Species associated with farmland are increasingly appearing on the Red List.



Status of all validated Red List species in Flanders. (2010).

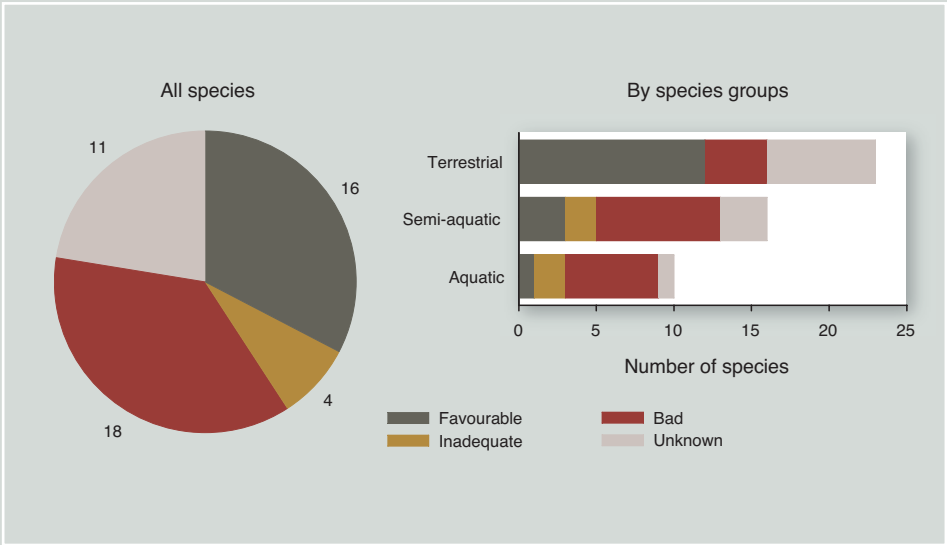
Source: INBO

5 Conservation status of species of European interest

The main goal of the Habitats Directive is to maintain a ‘favourable’ conservation status of selected species. These species are assumed to be threatened and Europe has an important role in their global conservation. Generally these are species living in specific habitats. The evaluation of their conservation status is based on four criteria set down by Europe. These are the population of the species, its distribution, the state of its habitat and its future prospects.

**One third of the species (16 species, 33 %) have a favourable conservation status. For 4 species (8 %) the conservation status is inadequate and for 18 species (37 %) the status is bad.** For eleven species there was insufficient data to evaluate the status. The status of aquatic species gives the greatest cause for concern, with only one of the 10 species being considered as having a favourable status. Water pollution and eutrophication are the main threats reported for most species.

Conservation status of species of the Habitats Directive. Left: aggregated. Right: per species group (2007).

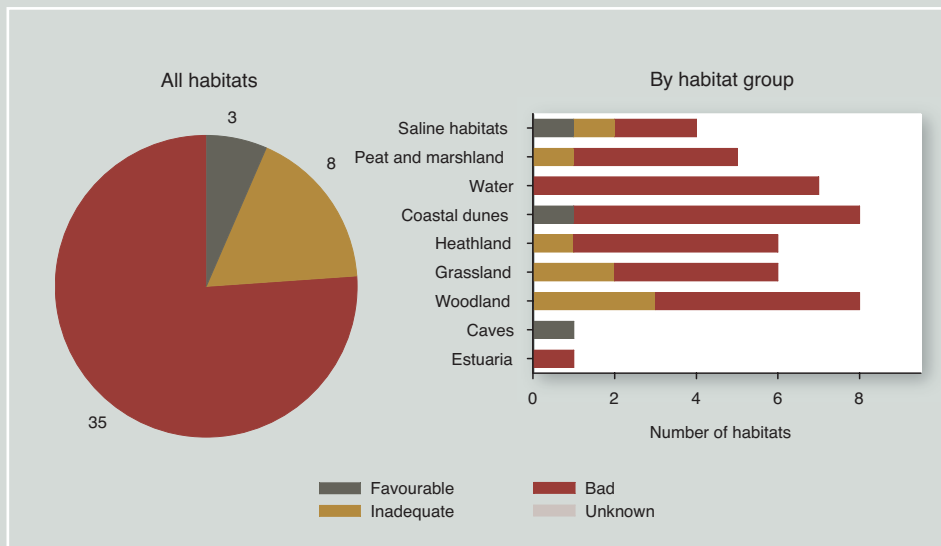


Source: INBO, Paelinckx et al. (2008)

## 6 Conservation status of habitats of European interest

The main goal of the Habitats Directive is to maintain a 'favourable' conservation status of selected habitats. These habitats are assumed to be threatened and Europe has an important role in their global conservation. Generally they are very specific habitats. The evaluation of the conservation status is based on four criteria set down by Europe. These are the area of the habitat, its distribution, its quality and its future prospects.

**Three-quarters of the habitats (35 habitats) are of poor conservation status** and 8 habitats (17 %) have an inadequate conservation status. The latter comprise one silt habitat, one peat and marsh habitat, one heathland habitat, two grassland and three woodland habitats. Consequently, only three habitats have a favourable conservation status, these being one saline habitat (Mudflats and sandflats not covered by seawater at low tide), one coastal dune habitat (Dunes with Sea Buckthorn) and the cave habitat. All aquatic habitats are of a poor conservation status. Water and air pollution pose the most serious threats for most habitats.



Conservation status of the habitats of the Habitats Directive. Left: aggregated. Right: per habitat group (2007).

Source: INBO, Paelinckx et al. (2008)



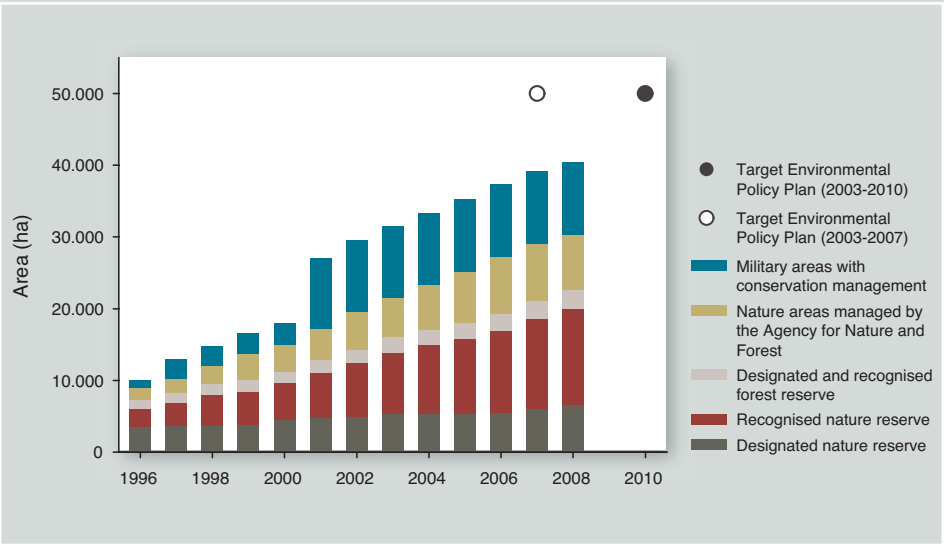
7 Area with conservation management

The Flemish Environmental Policy Plan (2003-2010) targeted 50.000 ha with active conservation management by 2007. These areas include the officially recognised nature and forest reserves managed by non-governmental organisations, local authorities or private owners, the nature and forest reserves managed by the Flemish government and the military sites mainly managed for conservation.

At the end of 2002 the area with conservation management covered 29.480 ha, or 59 % of the target. By the end of 2008, 40.358 ha, or 81 % of the target had been reached. The increase in 2008 was the smallest in 13 years. More than 800 ha was achieved via recognised nature reserves managed by non-governmental organisations. **If the present trend continues, the target will be achieved by 2014.** However, if the decline in funds for nature acquisition continues, there will be a further delay.

At the end of 2008, 6.579 ha had been designated by the Flemish government as Flemish nature reserve and was managed by the Agency for Nature and Forest. A further 13.435 ha was officially recognised and funded as nature reserve and managed by non-governmental organisations. In addition, there are 2.547 ha of forest reserves. The Agency for Nature and Forest also manages about 10.000 ha of military land, with a nature protocol agreed with the federal government.

Area with conservation management.



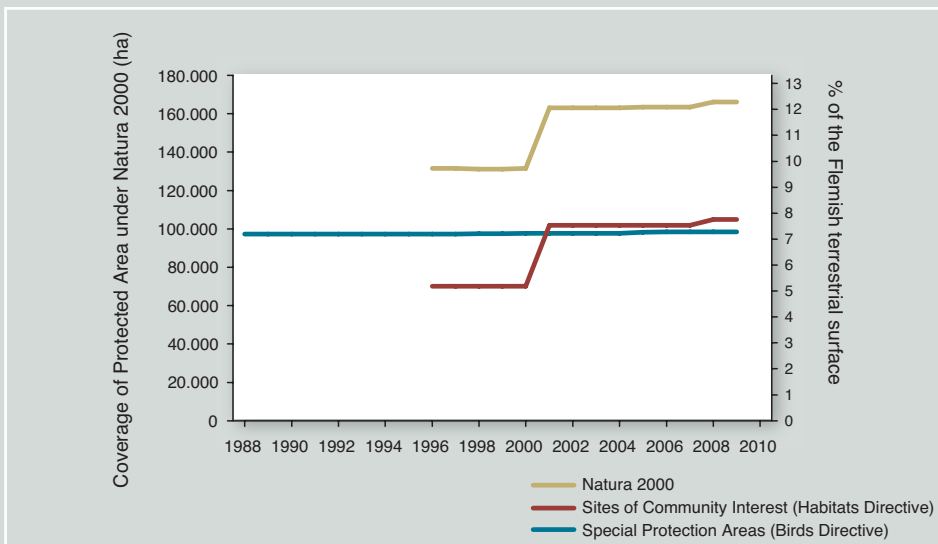
Source: ANB, non-governmental organisations for nature conservation, INBO

## 8 Sites designated under the EU Habitats and Birds Directives

The goal of the Birds and Habitats Directives is to protect a number of species and habitats which are threatened and for which Europe has an important role in their global conservation. To achieve this goal, the European ecological network 'Natura 2000' is being delineated. It consists of 26.000 areas designated according to the Birds Directive (Special Protection Areas) and the Habitats Directive (Sites of Community Interest). Together they cover 18 % of the land surface of the EU.

In Flanders, 24 Special Protection Areas have been designated with a total area of 98.423 ha, or 7,3 % of the Flemish territory. There are 38 sites designated and put on the list of Sites of Community Interest by the European Commission. The Sites of Community Interest have a total area of 104.888 ha, or 7,8 % of the Flemish territory. The total Natura 2000 area comprises 166.187 ha (12,3 % of the Flemish terrestrial area). Marine areas are not included, as they are under the jurisdiction of the Belgian federal government. In 2008, there was an increase in the Sites of Community Interest. The main channel of the Sea Scheldt and IJzer were included on request of the European Commission. Further expansion of the Natura 2000 area is not expected.

**An international comparison shows that a coverage of 7,8 % by Sites of Community Interest is low in comparison to the European average, but high when compared to neighbouring densely populated regions.**



Source: ANB, INBO

Special Protection Areas, Sites of Community Interest and Natura 2000 in Flanders.

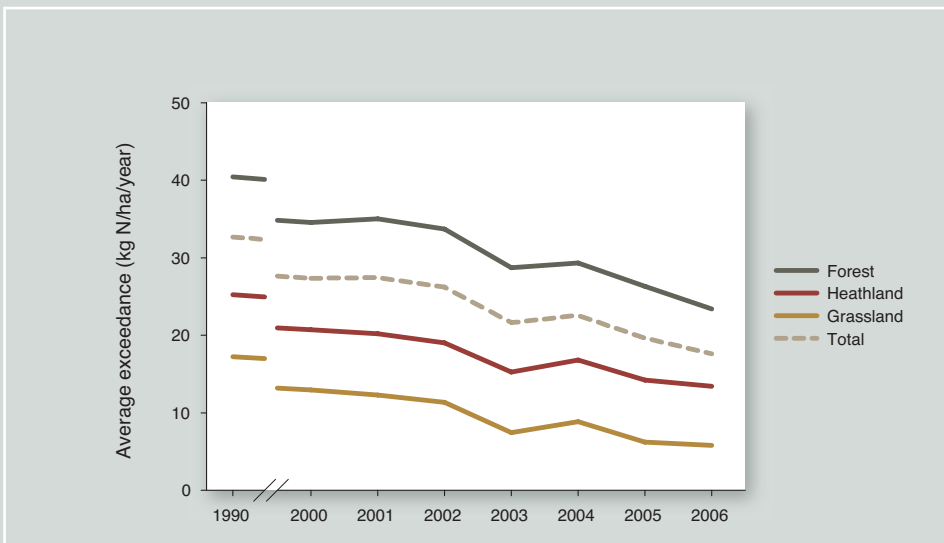
## 9 Critical load exceedance for nitrogen

Eutrophication has been one of the most important factors influencing biodiversity during the last century. The critical load exceedance for nitrogen indicates the potential disturbance by atmospheric nitrogen deposition. The critical load is the maximum deposition level that, based on current understanding, does not adversely affect biodiversity in the long term. Ecosystems which are sensitive to nitrogen such as forests, heathland and species rich grasslands are characterised by a low critical load. The Flemish Environmental Policy Plan (2003–2010) aims to reduce nitrogen deposition to levels below the critical load by 2030. This is a prerequisite for conserving nitrogen sensitive ecosystems. Nitrogen deposition should be monitored in conjunction with the state of the nitrogen sensitive biodiversity.

Atmospheric deposition of nitrogen in Flanders amounted to an average of 37,0 kg N/ha in 2006, a reduction of 33 % compared to 1990. In 2006, nitrogen deposition exceeded the critical load in 100 % of forest, 100 % of heathland and 68 % of species rich grassland areas. Together, this amounts to 91 % of the nitrogen sensitive areas. The exceedance in 2006 averaged 17,6 kg N/ha. The mean exceedance is highest in forests (+23,4 kg N/ha in 2006), followed by heathlands and species rich grasslands (+13,4 and +5,8 kg N/ha respectively in 2006). The exceedance of the critical loads in Flanders is one of the highest in Europe (European Environment Agency, 2005).

**The average exceedance of the critical load has been decreasing since 1999 (trend 2000–2006: -1,7 kg N/ha/year). If this trend continues, there will be on average no more exceedance of the critical load by 2016.**

Mean critical load  
exceedance for  
nitrogen.



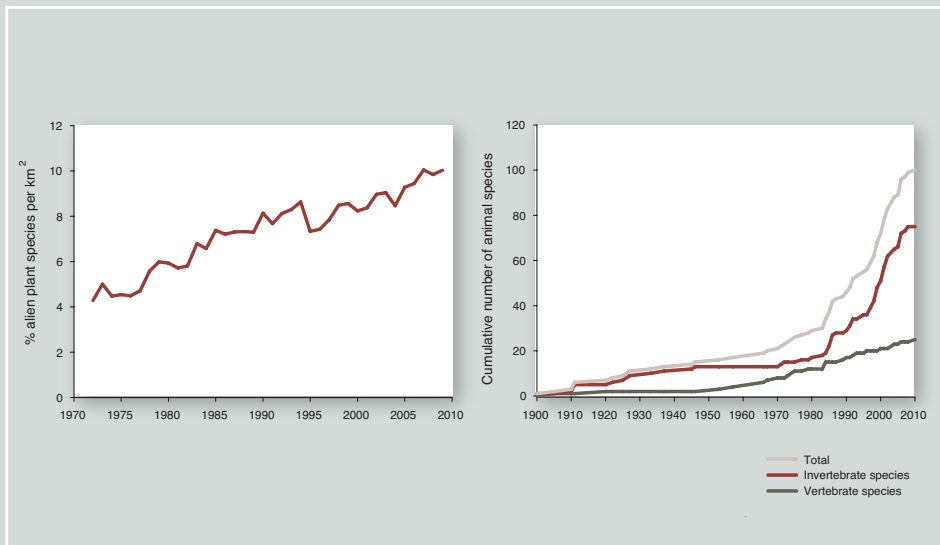
Source: VMM - MIRA

## 10 Alien species

Due to the increasing mobility of humans and goods, more and more plant and animal species are - deliberately or otherwise - imported and exported. Imported alien species can become invasive in nature and pose an increasing threat to the indigenous biodiversity. The rising number of alien species increases the risk of problematic invasive species. An indicator for the damage caused by invasive alien species is still to be developed.

The proportion of alien plant species within the global plant species composition has doubled since the 1970s from 5 % to almost 10 %. Alien plant species are continuously introduced unintentionally (e.g. international transportation of goods) or intentionally (e.g. gardens and horticulture). Only part of these introduced species establish a permanent population and only some of these naturalised species subsequently spread spontaneously. Between 1900 and 2010 about 100 alien animal species have established permanent populations in Flanders. The number of alien animal species increases exponentially. Whether these species will disappear or spread far beyond their place of introduction, is unknown at the moment.

**During the last five years, the number of alien plant and animal species has increased drastically in Flanders.** The increase of alien species increases the risk of invasive alien species. The cost of controlling present invasive species (e.g. Black Cherry, Canada Goose) is already high.



Cumulative number of alien vascular plant species (left) and vertebrate and invertebrate animal species (right).

Source: National Botanic Garden of Belgium, Verloove (2002), INBO

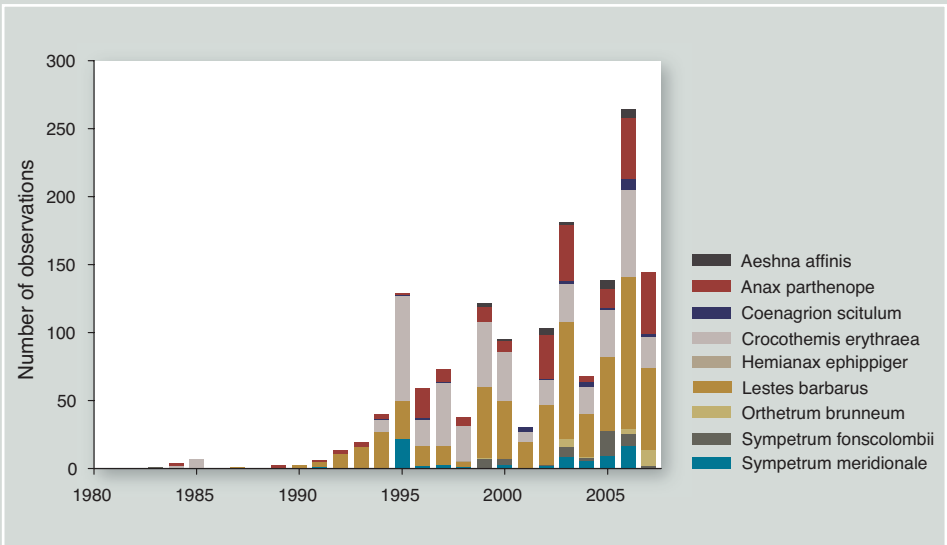
## 11 Southern-European dragonflies

There is increasing evidence that climate change affects nature in Flanders. The arrival date of migratory birds and the first appearance of butterflies and dragonflies in spring is advancing.

Not only the phenology, but also the geographical range of species is changing. Southern species are expanding northwards. Some southern European dragonflies are increasingly observed in Flanders. The number reported in 2006 was the highest since the start of recorded observations. Some species that were only occasional visitors in the past, such as the Migrant Spreadwing (*Lestes barbarus*), now have permanent populations.

**Since some species adapt better than others, there is a risk of changes in the foodweb and/or ecological cohesion of ecosystems.**

Observations of dragonflies and damselflies from southern Europe.



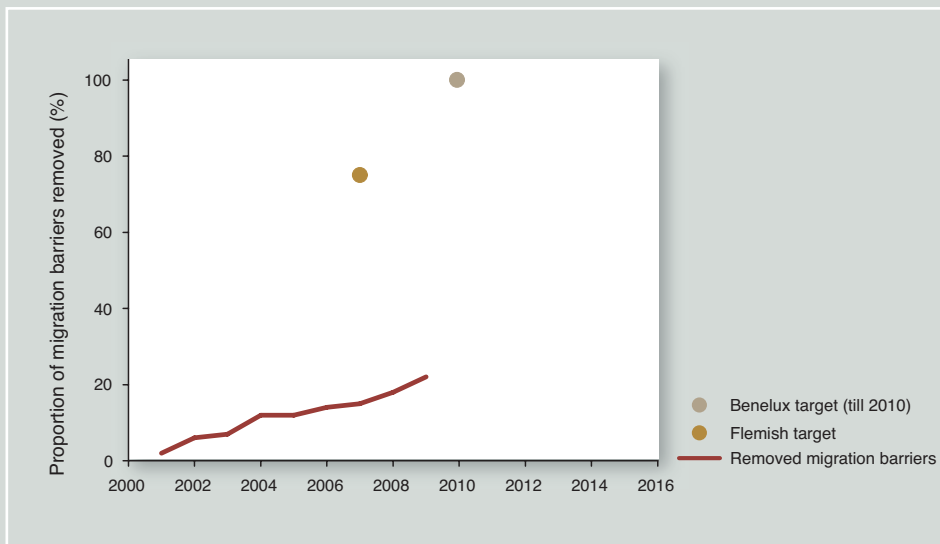
Source: LVV

## 12 Defragmentation of rivers

Fragmentation of watercourses by weirs and sluices, together with the degradation of water and habitat quality, is an important problem for the conservation of aquatic species, in particular fish. In 1996, Benelux countries announced their intention of achieving free fish migration in all water catchments by 2010. This target was incorporated in the Flemish Decree on Integrated Water Policy and the Flemish Environmental Policy Plan (2003–2010).

An evaluation of the Benelux situation shows that restoration is in progress, but far too slow to achieve the 2010 target. The target is postponed and synchronised with the European Water Framework Directive.

In recent years the restoration was focussed on a priority network of rivers of about 3.000 km. **By the end of 2009, 171 of the 789 barriers (22 %) along this network had been dealt with.** If the present trend continues, the fish migration barriers on the priority network will only be removed after 2030. This is much later than the present target. Obstacles to a swifter achievement are lack of budget, work force and social complications. Meanwhile, migratory fish species are recovering slightly, probably as a result of improved water quality.



Number of fish migration barriers removed in 3.000 km of the most important breeding sites and migratory routes in Flanders.

Source: VMM

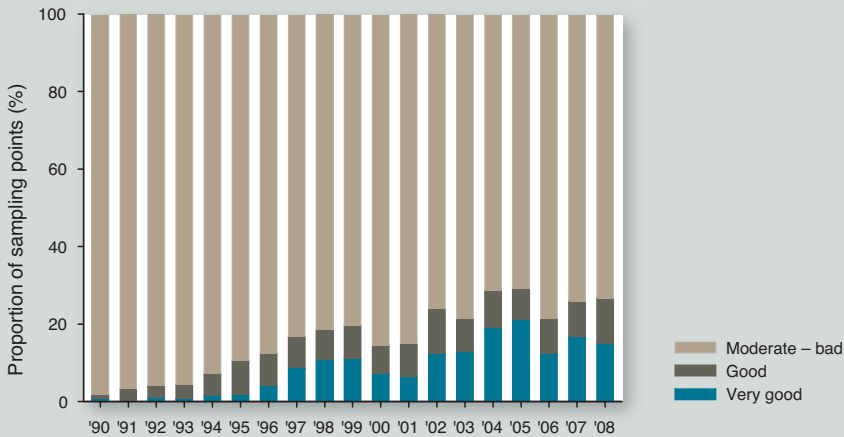
### 13 Phosphorus concentrations in rivers

According to the European Water Framework Directive a "good ecological status" should be achieved in all natural surface waters by 2015. Sufficiently low phosphorus concentrations are an important precondition for obtaining this status. In accordance with the Water Framework Directive, two target values for phosphorus have been set for each Flemish river type: one to obtain very good ecological conditions, and another to obtain good ecological conditions. These targets are a prerequisite for the recovery of aquatic communities. The indicator reports on the share of survey points where these standards are achieved.

An increase in water purification capacity and the introduction of lowphosphate detergents at the beginning of the 1990s resulted in improvements. Since 1998 the indicator has shown yearly fluctuations, but there is no clear increase of the number of survey points with a good or very good ecological status. **In 2008, 27 % of the survey points achieved a good or very good ecological status. To achieve the target (100 % in 2015) significantly stronger measures on a larger scale will be needed.** The phosphorus concentrations in Flemish rivers are among the highest in Europe (EEA, 2001, 2008).

Plants sensitive to high phosphorous concentrations show a negative trend. Phosphorous concentrations in nutrient-poor brooks and rivers are often too high to attain a favourable conservation status for aquatic habitats and species (NARA 2007).

Phosphorus concentrations in rivers with regard to ecological quality.



Source: VMM

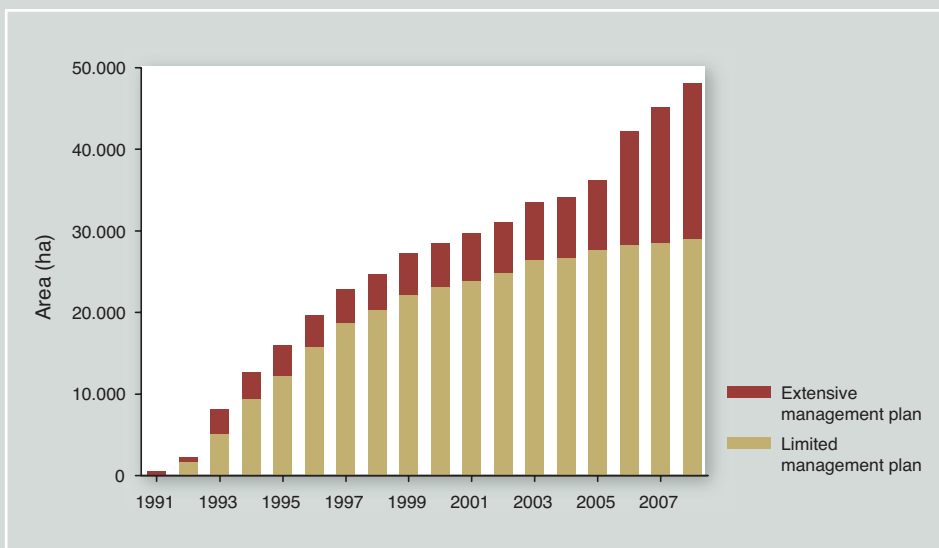
## 14 Forest: Area with management plan according to the criteria for sustainable forest management

A forest management plan is important in order to achieve sustainable forestry. The Flemish Forest Decree allows two types of management plan: limited and extensive. Limited management plans need to comply with only minimum standards, while extensive management plans need to comply with the criteria for sustainable forest management. These approximately follow the guidelines of the Forest Stewardship Council (FSC), whose certificate can then be easily obtained.

Forest management plans are compulsory for all forests larger than 5 ha. Private owners are offered the choice between limited and extensive management plans, whereas extensive management plans are compulsory for public forests. They are also compulsory for private forests located within certain nature oriented land use planning areas. The other private owners are encouraged to develop extensive management plans through grants and forest owner groups.

Between 1990 and 2008, 48.089 ha of forest management plans were approved (19.101 ha extensive and 28.987 ha limited). **Around 32 % of the 150.000 ha of Flemish forest area is now covered by approved management plans.** Nature conservation management is applied in 15 % of the forest area.

The steady increase of the area with extensive forest management plans increases the potential for a better forest quality. It is expected that this will have a positive effect on biodiversity and ecosystem services. An analysis shows that limited forest management plans gradually increase their attention towards the ecological functions of forests (NARA 2007).



Area of limited and extensive forest management plans.

Source: ANB



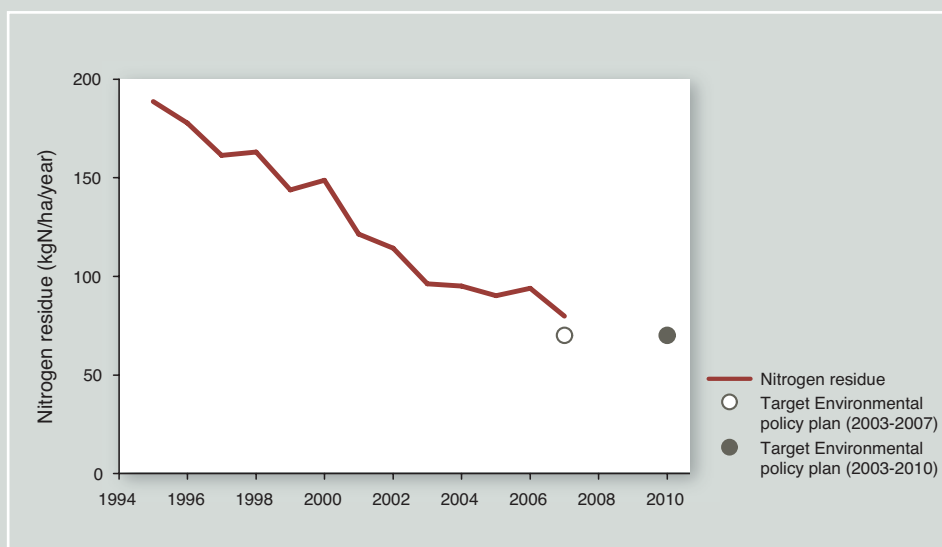
## 15 Agriculture: Nitrogen residue in agricultural soils

The nitrogen (N) balance of agricultural soils is calculated as the difference between nitrogen input (fertilisers, atmospheric deposition, biological nitrogen fixation, seeds) and nitrogen output (plant nutrient uptake, ammonia emission from soil and fertiliser and other emissions to the environment passing through the farmland soil). The emissions through the soil (N accumulation in soil, N losses from soil to water) constitute the nitrogen residue, an indicator for the loss of nitrogen from agricultural soils to the environment. The transfer of N from soil to surface water and ground water increases with increased soil nitrogen residue. High N residues also lead to eutrophication of agricultural soils. The 2010 target in the Flemish Environmental Policy Plan (2003-2010) is 70 kg N/ha.

The nitrogen residue decreased by 58 % between 1990 and 2007 due to reduced livestock numbers, reduced chemical fertiliser use, increased processing of animal manure, increased feeding efficiency and an increased nitrogen uptake and removal associated with yield increases. In 2007 the total N residue in Flanders amounted 80 kg N/ha, excluding ammonia emissions. This is 10 kg N/ha short of the target. **If the measures are continued in the next years, the target should be achieved.**

The current nitrogen residues in Flemish agricultural soils, as well as the ammonia emissions from agricultural land use, are among the highest in Europe (EEA, 2005).

Average annual  
nitrogen residue  
in agricultural  
soils in Flanders.



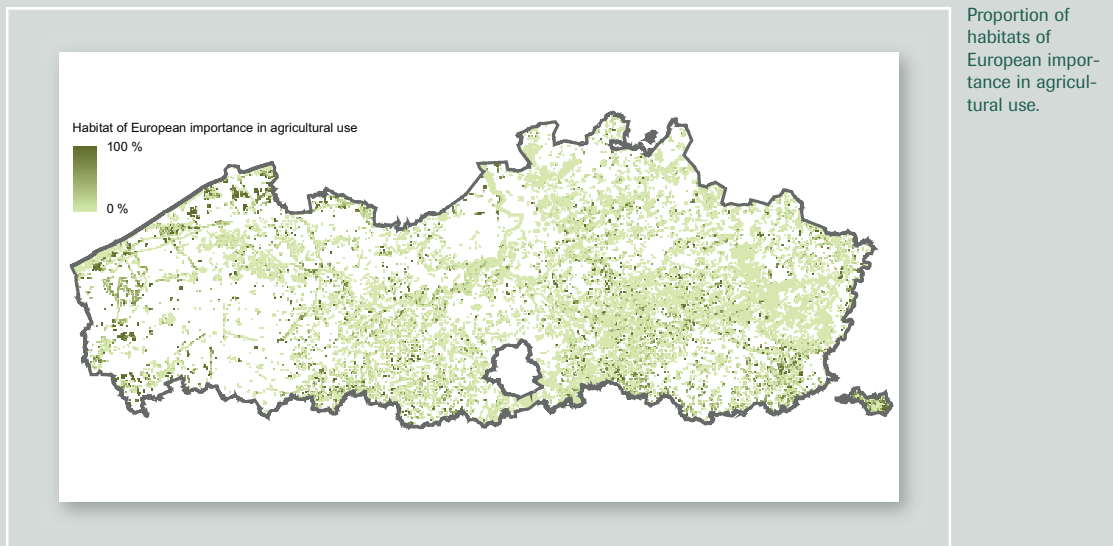
Source: VMM-MIRA

## 16 Agriculture: Area of high nature value farmland

Extensive agricultural land use in the past has shaped a variety of our characteristic, rare or European important habitats for plants and animals. Intensification and specialisation of agricultural practices have led to habitat loss in agricultural landscapes and to the abandoning of agricultural land. Some heathland and grassland habitats of European interest (Habitat Directive) originate from extensive agricultural practice. These habitats are protected by the Habitat Directive and can be considered as high nature value farmland (Danckaert et al., 2009).

**About 2 % (1.350 ha) of the 68.400 ha habitats of European importance in Flanders is in agricultural use.** The majority are grassland habitats (1.125 ha). Besides these habitats there is also 820 ha of habitats of regional importance in agricultural use. Most of these regional important grassland biotopes are half natural permanent grasslands which are little fertilised and only used extensively. In June 2008, 91 ha (7 %) of the grassland habitats of European importance and 126 ha (15 %) regional important grassland biotopes are under agri-environmental schemes.

A study of the EEA and the Joint Research Centre (Parrachini et al., 2008) used a combination of the CORINE land cover dataset and biodiversity data to estimate the potential surface of high value nature farmland on a European scale. Within the EU-27, Belgium is among the countries with the least high value nature farmland (19,7 %). **For Flanders the high nature value farmland is estimated to be 7,1%.**



Source: INBO, Department of Agriculture and Fisheries

## 17 Agriculture: Area with agri-environmental measures that support biodiversity

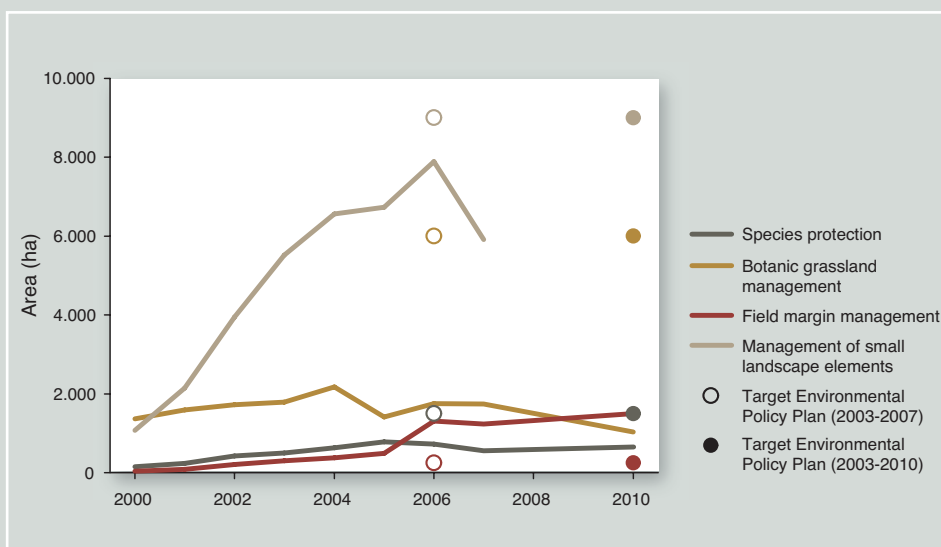
In the framework of the Flemish programmes for rural development (2000-2006, 2007-2013), farmers get the opportunity to sign up for agri-environmental schemes, in which they commit themselves to do more for the environment, nature and the landscape than is legally required. The Flemish Environmental Policy Plan (2003-2010) aims to have 16 750 ha of agricultural land under agri-environmental schemes by 2010.

**Schemes for field margin management and for the management of small landscape elements** (pools, hedges, wooded banks), which aim to strengthen the ecological infrastructure in farmland areas, **have been widely adopted by farmers**. In 2010, 1,441 ha of field margins (5,9 times the target) had been installed and schemes for 96,1 ha of wooded banks and 194 km of hedges were in place.

**The agri-environmental schemes aimed at the development, conservation and restoration of specific farmland species and communities have been far less successful.** In 2010 only 37 % of the intended 1.500 ha for species protection (meadow birds and Common Hamster) and 24 % of the intended 6.000 ha for botanical grassland management had been realised.

Information to evaluate the ecological effectiveness of the agri-environmental schemes and their management prescriptions is lacking due to the absence of appropriate monitoring.

Area with agri-environmental measures that support biodiversity.



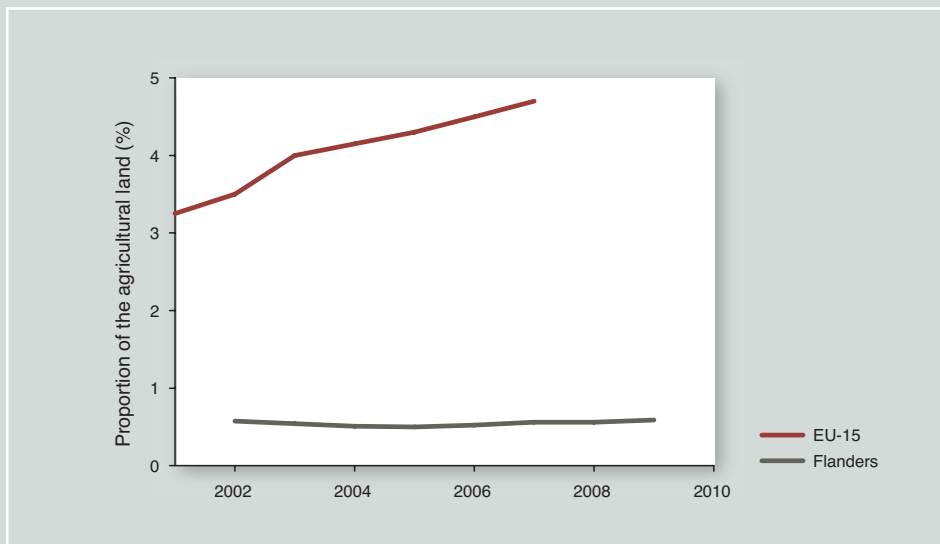
Source: VLM

## 18 Agriculture: Area under organic farming

Organic farming focuses on renewable resources and natural systems to prevent or control pests and diseases of crops and livestock. Synthetic pesticides, chemical fertilisers, antibiotics and genetic modification are banned. Organic farming contributes to the conservation of ecosystems, usually harbours higher biodiversity and has a lower environmental impact than traditional agricultural practices.

The area under organic farming remained more or less stable between 2002 and 2009. Between 2002 and 2005 the total area and the number of organic farms decreased slightly. In 2006 this trend was halted and in 2009 the organically farmed area reached 3.659 ha. This area corresponds to about 0,6 % of the total farmland area in Flanders. Several socio-economic factors underpin the stagnation. Firstly, biological farmers have experienced difficulties in marketing their products. Secondly, traditional farming organisations erroneously uphold the idea that organic farming is technically and economically less sustainable. **The stagnation of organic farming in Flanders is in contrast with the strong increase in organically farmed area in the EU-15, where organic farms comprised 4,7 % of the total farmland area in 2007.**

Since mid 2008, the Flemish government is seeking to stimulate organic farming with a new action plan aimed at achieving noticeable growth.



Proportion of agricultural land under organic farming in Flanders and in the EU-15.

Source: Eurostat, Department of Agriculture and Fisheries

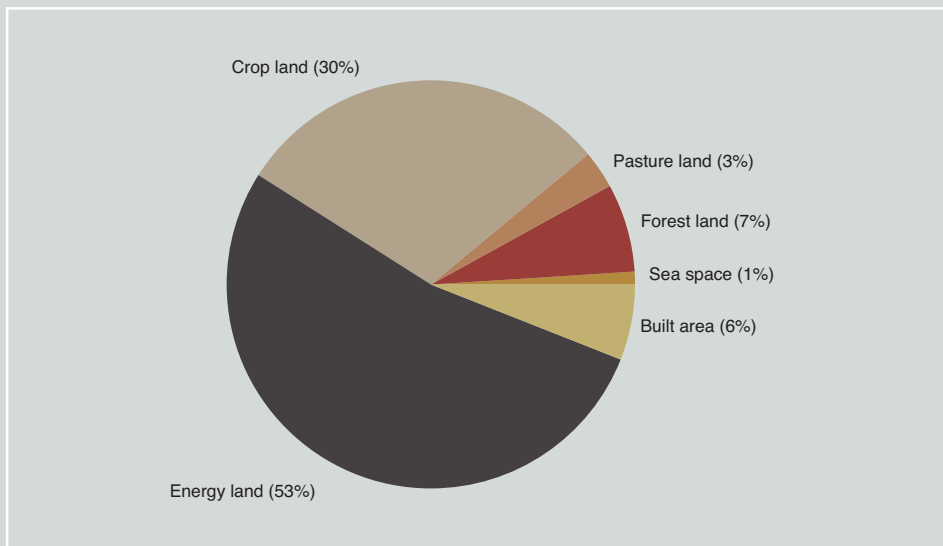
## 19 Ecological footprint

The ecological footprint is an integrated sustainability indicator that includes the use of land (infrastructure, recreational facilities, ...), the use of biomass (wood, crops, fish, ...) and CO<sub>2</sub> emissions (fossil fuels). The ecological footprint is measured in 'global hectares'. This refers to the world average biological productivity of one hectare. The footprint contains six land use types: cropland, pasture land, forest land, sea space, built area and energy land (Bruers & Verbeek, 2010).

**The Flemish ecological footprint is five times higher than the biocapacity (the available supply of natural resources).** The Flemish footprint per capita is 6,3 gha. However, the Flemish biocapacity only reaches 1,3 gha. The ecological deficit is no less than 5 gha per capita. The world average biocapacity is approximately 1,8 gha per capita. **The ecological footprint of Flanders is mainly energy related.** 53 % of the ecological footprint is 'energy land'. This is the forest area needed to compensate the CO<sub>2</sub> emission of fossil fuels. 41 % of the footprint is composed of renewable materials (crop land, forest land, pasture land and sea space). 6 % is built area.

90 % of the consumption of renewable materials is based on crop land and forest land located abroad. This shows that Flanders depends highly on other regions for its renewable resources. The ecological footprint can be reduced by decreasing energy consumption, reducing meat consumption, adopted feeding for cattle and recycling.

Ecological footprint per land use type (%)



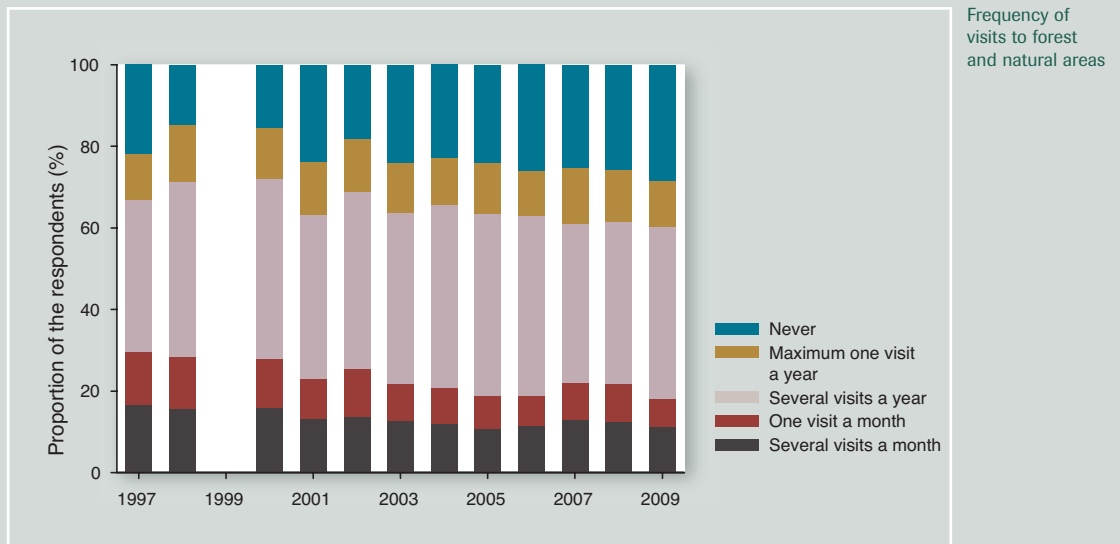
Source: VMM-MIRA, Ecolife

## 20 Frequency of visits to forest and nature areas

According to Flemish Nature policy, access to nature and forest areas is considered as a stimulating measure in order to increase public support for nature and forest. The Flemish Government Agreement (2004-2009) pleads for an increased public accessibility of nature and forest areas. The annual survey of the Flemish Government monitors public visits in forest and natural areas (Beyst & Pickery, 2006).

**Within a sample of 1.500 people, 60 % visit a forest or natural area at least several times a year. Over the last ten years, the frequency of visits has decreased slightly.** The proportion of people that never visit forests or natural areas increased from 22 % to 28 %. The proportion of regular visitors (at least several times a year) has decreased since 1997 from 30 % to 18 %.

In 2008 the Flemish Government adopted a resolution to harmonise the regulations for public accessibility of forests and nature reserves. The aim is to valorise the recreational potential of forests and nature reserves. Where public access is allowed, land managers must try to reconcile the needs of the public with the ecological carrying capacity of the visited areas.



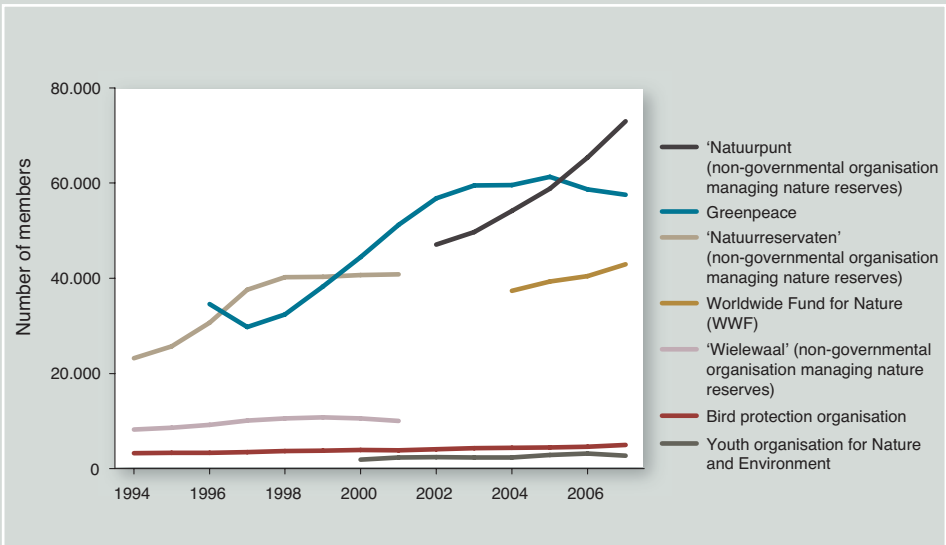
21 Membership of NGOs for nature conservation

The size of membership of nature organisations is considered a good indicator of public interest in nature and of support for nature conservation in Flanders. However, this indicator is also influenced by the intensity and efficiency of the recruitment campaigns which these organisations organise. The Flemish Environmental Policy Plan aims to increase the role of nature organisations in the realisation of nature policy targets.

**Membership of the nature organisations which are active within Flemish territory, shows a mixed picture.** The membership of Natuurpunt, WWF and Bird Protection is steadily increasing, while Greenpeace and JNM (Youth organisation for Nature and Environment) have recently lost members.

Natuurpunt was established in 2002 when two local non-governmental organisations decided to join forces ('Natuurreservevaten' and 'De Wielewaal'). Since then, its membership has steadily increased with an average of 7.000 members per year. In 2009 Natuurpunt reached 87.000 members (or 3,3 % of Flemish households).

Membership of nature organisations



Source: nature organisations

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## Abbreviations

<b>ANB</b>	Agency for Nature and Forest
<b>BTO</b>	British Trust for Ornithology
<b>EEA</b>	European Environment Agency
<b>LNE</b>	Department of Environment, Nature and Energy
<b>L&amp;V</b>	Department of Agriculture and Fisheries
<b>MIRA</b>	Environment Report
<b>SEBI</b>	Streamlining European 2010 Biodiversity Indicators
<b>SOVON</b>	Bird research Netherlands
<b>VITO</b>	Flemish Institute for Technological Research
<b>VLM</b>	Flemish Land Agency
<b>VMM</b>	Flemish Environment Agency

The Research Institute for Nature and Forest (INBO) is the Flemish research and knowledge centre for nature, sustainable management and sustainable use. It carries out research and provides knowledge to all of those involved with governmental policy.

As a leading scientific institute, INBO primarily reports to the Flemish government, but it also provides information for international reports and deals with queries from local administrations. In addition, INBO supports organisations working for, amongst others, nature management, forestry, agriculture, hunting and fishing. INBO is part of national and European research networks and also communicates its results to the general public.

There are approximately 250 INBO staff, most of whom are scientists and technicians. In addition to its main office in Brussels, INBO has sites in Geraardsbergen, Groenendaal and Linkebeek.

The website [www.biodiversityindicators.be](http://www.biodiversityindicators.be) provides a large set of indicators that report on the state of nature in Flanders. This report presents 21 Flemish biodiversity indicators according to the focal areas of the Convention on Biological Diversity and the EU biodiversity headline indicators.

All publications are available at [www.inbo.be](http://www.inbo.be)



Flemish Government

