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Nature Report Flanders 2020

Facts & figures for a new biodiversity policy

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KEY MESSAGES

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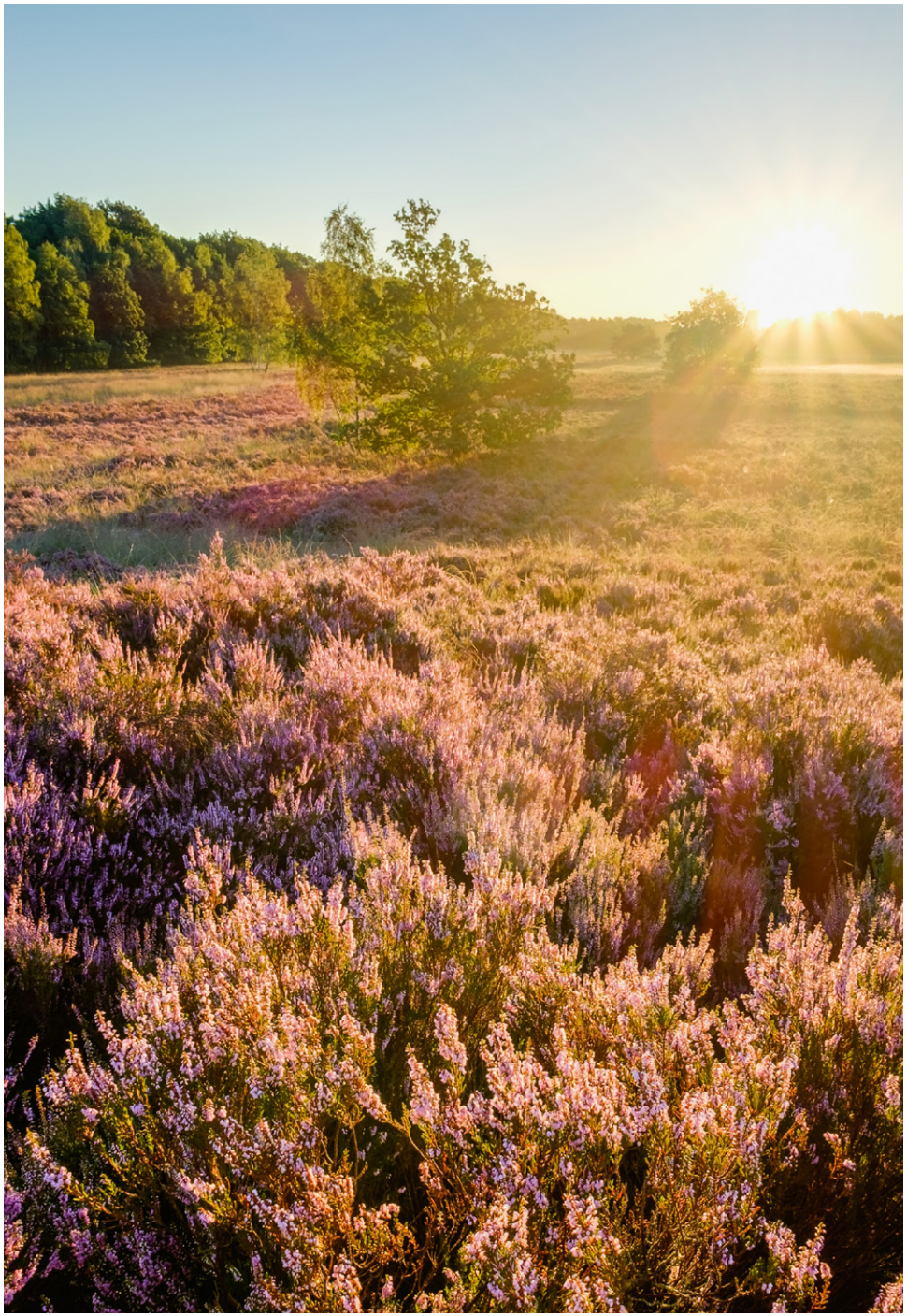

A Biodiversity: the foundation of our ecosystem

Biodiversity is the natural engine of our ecosystems. Biological diversity, or biodiversity, is the variety of life forms that have evolved on Earth over the course of 3.6 billion years. This variety is of vital importance for humans and for every other organism. It determines how our ecosystems – such as forests, marshland, grassland, cities, gardens, ponds or rivers – function and what processes take place in them. Greater biodiversity ensures a wider variety of processes and life strategies, increasing the resilience of our ecosystems in a rapidly changing environment. In short, resilient ecosystems need rich biodiversity.

We belong to and are profoundly dependent on ecosystems. Especially in a densely populated region such as Flanders, humans are an integral part of ecosystems. Landscapes with a history of agriculture such as heathland and species-rich grasslands have developed over the centuries into some of Flanders' most valuable natural areas, and today, and today enjoy European protection. In order to achieve Flemish and European biodiversity targets, these ecosystems need to be continuously restored and permanently managed. At the same time, we are highly dependent on healthy, well-functioning ecosystems for our well-being, health and prosperity. Ecosystems provide us with numerous benefits or 'ecosystem services': they produce food, wood and raw materials for medicines, they provide cooling during heat waves and places to relax, they ensure natural pest control, they purify the air and the water, they break down waste materials and so on.

Using ecosystems: not without social or ecological costs. In Flanders, the demand for ecosystem services has outstripped the supply. Flanders also has relatively few natural ecosystems compared to other densely populated, prosperous regions. To compensate for this, we encourage certain ecosystem services at the expense of others, or replace them with the help of technology or with raw materials from abroad. We use high-tech facilities to treat our wastewater and process our waste, we increase our food production with the help of fertilisers and specialised agricultural machinery, and we import wood and animal feed from abroad. Innovative interventions can reduce the environmental impact of intensive activities in Flanders, but by maximising just one or a few ecosystem services and importing raw materials, we disrupt biodiversity, both close to home and in ecosystems elsewhere in the world.

When organisms vanish from an ecosystem due to increasing pressure or when species become locally extinct, the mutual interactions between species and between ecosystems change. This sets in motion a chain of reactions in which ecological networks become unbalanced: diseases and pests have more opportunity to spread, competitive species gain the upper hand, and ecosystems become more homogeneous and vulnerable. If entire groups of species with a similar function, such as pollinators, carnivores or pest control agents, disappear, the survival of the entire ecosystem and of the services it provides us is endangered. Such drastic changes are difficult or irreversible and entail significant social costs.

The frame of reference is shifting. In densely populated Flanders, the pressure on biodiversity has been too great for centuries. This makes it increasingly difficult to protect biodiversity and ensure the long-term survival of our ecosystems and the services they provide. Each new generation sees the recent past as the new normal, and perceptions of ongoing biodiversity loss are constantly being adjusted: gradually, the perceived extent diminishes and the level of ambition for biodiversity restoration decreases. This shifting frame of reference or '*shifting baseline*' also has implications for the interpretation of the biodiversity trends in this report. A (slight) increase in biodiversity does not automatically raise the prospect of healthy and resilient ecosystems: the conclusions that are drawn depend on the starting point of the trend. Wherever possible, the frame of reference that is used is therefore explained.

Indicators help to support biodiversity policy, but only reveal part of the story. The indicators in this Nature Report give an idea of the state of and trends in biodiversity in Flanders, describing the pressures involved and their effects on our ecosystems. They provide figures to underpin future choices concerning the conservation and restoration of biodiversity. However, our knowledge of biodiversity in Flanders is incomplete. The indicators show the state of and trends in the main natural or semi-natural ecosystems in Flanders, and only well-researched plant and animal species are discussed. Knowledge and indicators concerning genetic diversity, soil biodiversity or biodiversity outside protected areas are limited, and there is also little coverage of ecological processes. All these elements play an important role in the functioning of ecosystems and the services they provide us, but are not monitored sufficiently in Flanders to be included in this report.

B 2020: a pivotal year

The European biodiversity targets for 2020 have not been achieved. 2020 is a pivotal year for biodiversity policy at all policy levels. It represents the end point of the current global and European biodiversity strategy. Work is being pursued actively on follow-up strategies that will help shape Flemish biodiversity policy.

The global Convention on Biological Diversity came into being within the United Nations in 1992. Following on from it, a strategic plan has been developed every ten years that sets global biodiversity targets for the next decade. The European Biodiversity Strategy 2020 translates the global Aichi targets for 2011-2020 into six targets that provide direction for European biodiversity policy. The first target is to fully implement the existing Birds and Habitats Directives. The second target is about restoring degraded ecosystems and creating a green-blue network. The third target focuses on increasing the contribution of agriculture and forestry to biodiversity recovery. The fourth target aspires to sustainable fisheries. The fifth target concerns reducing the pressure from invasive alien species. The sixth target seeks to limit Europe's impact on global biodiversity. Each of the targets is followed up on in a series of European and Flemish policy initiatives. The evaluations of the European and global biodiversity strategies both show that the targets set for 2020 have not been achieved.

Europe is raising its level of ambition. The European strategy for 2030 sets the bar even higher. It is part of the European Green Deal, the roadmap towards a sustainable economy and a climate-neutral Europe. Among other things, there is a plan to protect 30 percent of land and sea in Europe. More concrete goals – such as planting an additional 3 billion trees, restoring 25,000 kilometres of rivers to a free-flowing state and halving pesticide use – should help accelerate efforts for biodiversity. The pressure exerted by Europe on biodiversity at home and abroad must be greatly reduced. Economic recovery is linked to climate goals and the recovery of biodiversity. A transformative change in the way we produce, consume and trade is coming to the fore.

The Flemish contribution to European biodiversity targets has been inadequate. On the basis of indicators of Flemish biodiversity and environmental pressure, this report examines Flanders' contribution to the European biodiversity targets for 2020. Our contribution to each of the European goals has been very limited so far. In some specific aspects, such as the state of a number of habitat types and species of European importance, the expansion of areas with effective nature management and the implementation of the European directive on invasive alien species, slight progress can be seen. For other elements, such as the state of most European habitat types, corridors between protected areas and the pressure we exert on biodiversity abroad, we are still a long way from achieving the European and Flemish goals.

How can Flanders turn the tide and make an effective contribution to the new Biodiversity Strategy 2030? In order to bring the Flemish contribution to the new European targets to the required level, those goals need to be further detailed in Flemish policy frameworks and plans and strictly monitored. A thorough overhaul of our biodiversity policy, including the far-reaching integration of biodiversity in other policy areas, is vital.

THE SIX TARGETS OF THE EUROPEAN BIODIVERSITY STRATEGY 2011-2020

EU TARGET FOR 2020			STATE IN 2020
1  **FULLY IMPLEMENT THE HABITATS AND BIRDS DIRECTIVES** **HALT THE DECLINE AND ACHIEVE A SIGNIFICANT AND MEASURABLE IMPROVEMENT IN THE STATE OF SPECIES AND HABITATS**	Most habitats and species of European interest are in an unfavourable state. Several of these habitats and species have improved thanks to restoration and management measures, but some have deteriorated further.	↗	**The Flemish policy goals for 2020 have not been achieved, and insufficient progress has been made.**
	By 2020, 16 selected habitats in Flanders should be in a favourable or improved conservation status relative to 2007. Only half of the habitats are at present definitely in a favourable or improved condition relative to 2007. There has been further deterioration in 1 habitat.	↗	
	In order to achieve good conservation status for all habitats and species by 2050, the impact of environmental pressures needs to decrease much faster than is currently the case. Following decreases in environmental pressures, stabilisation has occurred in recent years.	≈	
2  **MAINTAIN AND RESTORE ECOSYSTEMS AND ECOSYSTEM SERVICES BY 2020**	Flanders has a very high land take compared to other prosperous and densely populated regions. Increasing land take and the disappearance of permanent grassland are reducing both open space and connectivity between natural ecosystems.	↘	**The open space between protected areas is decreasing and fragmenting.** **The goal for natural interweaving is far from being achieved.** **There have been local successes through nature restoration and more sustainable forest management, but many pressures remain at a high level or are growing.**
	6,300 ha of nature interweaving area have been demarcated. This is 8% of the goal set in the Spatial Structure Plan for Flanders.	≈	
	Compared to other countries and regions, Flanders has relatively little forest and other terrestrial natural ecosystems. However, the expansion of protected areas, sustainable forest management and green infrastructure within urban and agricultural areas is creating more opportunities for threatened ecosystems and species.	↗	
	The supply of most ecosystem services is low. The rising demand for ecosystem services is widening the gap between supply and demand.	↘	

EU TARGET FOR 2020			STATE IN 2020
3a  **INCREASE THE CONTRIBUTION OF AGRICULTURE TO BIODIVERSITY**	Biologically valuable grasslands and permanent grassland are decreasing in area, although the rate of decrease has slowed.	↘	**The pressure from agriculture is not decreasing enough.**
	The biodiversity of most agro-ecosystems is low and continuing to decline. However, farmers are voluntarily entering into more biodiversity-supporting management agreements. Organic agriculture is also increasing in area. However, the proportion of the total area in both cases is still low.	↘	
	Eutrophication and acidification have fallen sharply, but the decrease has tailed off, so biodiversity targets are not being achieved.	≈	
3b  **INCREASE THE CONTRIBUTION OF FORESTRY TO BIODIVERSITY**	The total forest area remains stable, but the afforestation rate remains very low and 10,000 ha of forest expansion has not been achieved.	≈	**Biodiversity in forests is improving slightly, but not enough.**
	The species richness of trees, degree of naturalness and functional diversity of forests are increasing. However, the pressure remains high, and the number of damaged trees is therefore rising.	↗	
4  **ENSURE SUSTAINABLE USE OF FISH RESOURCES** **IMPROVE THE MANAGEMENT OF FISHED STOCKS AND REDUCE THE ADVERSE EFFECTS ON FISH STOCKS, SPECIES, HABITATS AND ECOSYSTEMS**	Plaice is fished sustainably. Sole is also doing well. Stocks of dab, turbot, brill and flounder have improved in recent years. The cod stock has declined sharply again in recent years.	≈	**The pressure on the seabed remains high, especially due to seabed disturbing fisheries.**
	The Belgian part of the North Sea is not yet in 'good environmental status' as described in the Marine Strategy Framework Directive.	?	

COLOUR OF THE RING = STATE
- unfavourable
- stable
- favourable

SYMBOL IN THE RING = TREND
- ↘ declining
- ≈ stable
- ↗ increasing
- ? not known

COLOUR OF THE STATE IN 2020
- goal not achieved
- goal partly achieved
- goal achieved

THE SIX TARGETS OF THE EUROPEAN BIODIVERSITY STRATEGY 2011-2020

EU TARGET FOR 2020			STATE IN 2020
5  **IDENTIFY AND PRIORITISE INVASIVE ALIEN SPECIES AND THEIR INTRODUCTORY PATHWAYS** **MANAGE PRIORITY INVASIVE ALIEN SPECIES AND TAKE ACTION TO PREVENT THEIR INTRODUCTION AND ESTABLISHMENT**	The European regulation on invasive alien species has been in force since 2015. It imposes obligations regarding prevention, monitoring and management. In Flanders, the regulation has been implemented via the Species Order.	≈	**The implementation of the European regulation needs to be accelerated at member state level.** **The number of alien species is still increasing.**
	The number of alien species is increasing exponentially. Belgium has the highest number of species of EU concern on its territory.	↗	
6  **STEP-UP ACTION TO TACKLE THE GLOBAL BIODIVERSITY CRISIS**	Flemish consumption is responsible for considerable environmental pressure and biodiversity loss, especially abroad. The pressure exceeds ecological limits. The carbon footprint, a measure of one of the pressures, is increasing. An increasing proportion is generated abroad. The trend of biodiversity loss is not known.	?	**Global biodiversity loss due to Flemish consumption is too high.** **The pressure on biodiversity is greater outside Flanders than within Flanders.**
	Funding for development cooperation targeting biodiversity restoration and development did not increase between 2010 and 2020. About 1% of official Belgian development aid goes to biodiversity. No data is available on other forms of funding for global biodiversity.	≈	

COLOUR OF THE RING
= STATE
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COLOUR OF THE STATE IN 2020
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C General state and trends in Flanders

There are plenty of opportunities for rich biodiversity in Flanders, but they are thwarted by intense pressure on the environment. Flanders is naturally home to a wide variety of habitats for plants, animals and micro-organisms. With its very varied combinations of climate, geomorphology, soil and hydrological conditions, it has great potential biodiversity. At the same time, human pressure on biodiversity is particularly high, even compared to other densely populated European regions. This makes our starting position considerably less favourable in practice.

Nearly a third of our species are on a Red List. The trends concerning more common species show a variable picture. Seven percent of the 2,727 plant and animal species investigated in Flanders have become regionally extinct in the course of the past century. Nearly 30 percent are on the Red List of species that have been hit hard in recent decades, that are vulnerable or that are in danger of extinction. Another 16 percent are 'near threatened'. The trends concerning common species are slightly more positive. Among plant species, the upward and downward trends balance each other out. Overall, the trend was stable between 1950 and 2018. For animal species, the overall trend between 1990 and 2018 was slightly positive. There has been a clear downward trend in common breeding birds over the past ten years, especially among species linked to agricultural areas. The limited fluctuations in the trends are partly explained by the low starting point in Flanders.

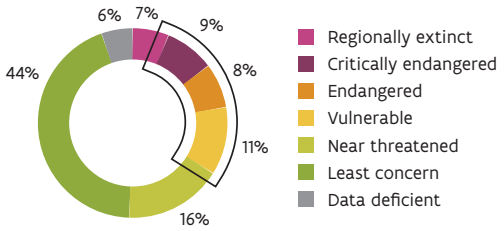
Nature of European importance is making slight progress. Flemish nature of importance for Europe is taking some modest steps in the right direction. Thanks to restoration and conservation measures, some habitats and species are making progress. However, nature enjoying European protection is not flourishing, despite the strong focus of Flemish nature policy on implementing the Birds and Habitats Directives. Only a small number of habitats and species are currently in a favourable state, and some are continuing to deteriorate. The Flemish policy goals for 2020 have not been achieved. In order for all habitats and species to evolve towards a favourable state – the objective set out in the European directives – extra efforts are necessary, both within and outside nature and forest policy.

A quarter of Flanders enjoys some form of nature conservation. The area of nature under management is increasing, but nature corridors have yet to be created. One way of restoring biodiversity is to protect and manage it better. In about 26 percent of Flanders, nature has some form of legal protection. A quarter of this area – around 7 percent of Flanders in all – is managed in a nature-oriented way. The area of nature under management is increasing. Over a ten-year period, some 40,000 additional hectares have come under effective nature management in Flanders. Areas with national or international protected status account for 14 percent of Flanders. Just 2 percent of Flanders has nature or forest reserve status, which offers the strictest natural protection.

It was internationally agreed that by 2020, 17 percent of the land surface and inland waters should be conserved through well-connected systems of protected areas that are effectively managed in a nature-oriented way. There is no immediate prospect of that goal being achieved in Flanders. In particular, the connections or corridors between protected areas have yet to be created. The robust ecological network provided for more than twenty years ago in the Spatial Structure Plan for Flanders does not yet exist. The demarcation of the Integral Interweaving and Supportive Network (IVON) has made little progress in recent years. Only 8 percent of the 80,000 hectares of nature interweaving area planned by 2012 has been demarcated.

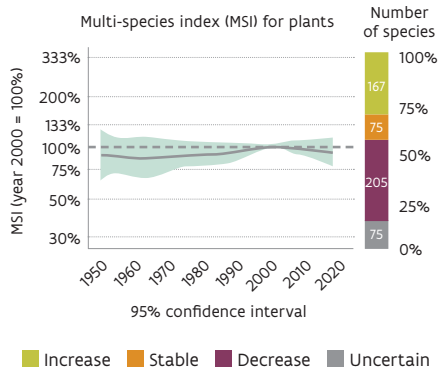
BIODIVERSITY IN FLANDERS

ENDANGERED SPECIES IN FLANDERS



7% of the species in Flanders are regionally extinct. 28% are critically endangered, endangered or vulnerable. Their populations have declined sharply in recent decades or have reached a critical minimum, placing the survival of the species under threat.

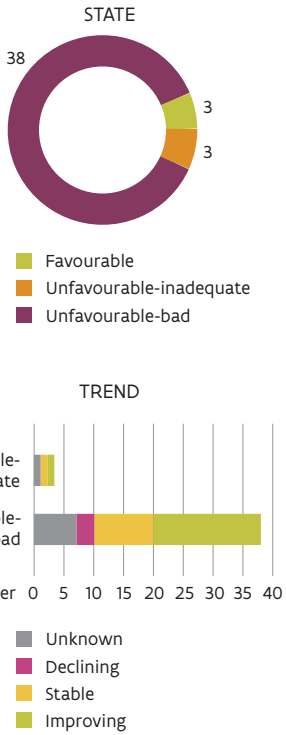
CHANGES IN FLORA



The long-term trend of common plant species remains stable. The 167 species whose status is improving balance the 205 species showing a downward trend.

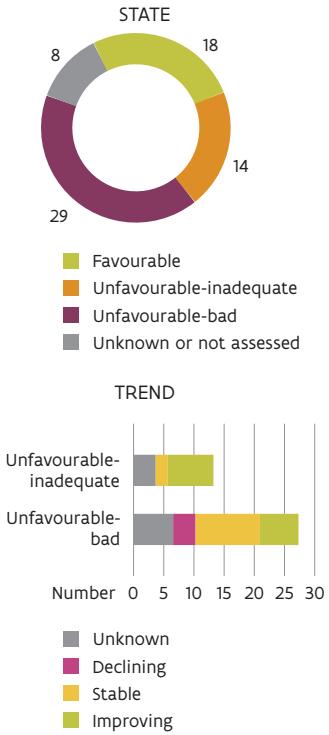
HABITATS DIRECTIVE HABITATS AND SPECIES

Habitats (n=44)



Only 3 of the 44 habitats of European interest in Flanders assessed have favourable conservation status. However, 46% of the habitats whose status is unfavourable-inadequate or unfavourable-bad are improving (19/41).

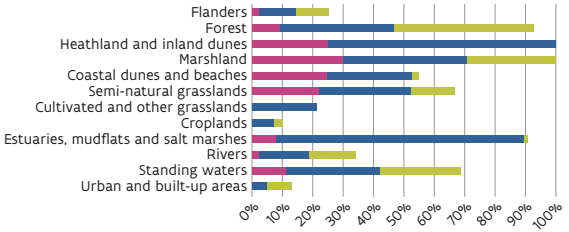
Species (n=69)



18 of the 69 Habitats Directive species that occur in Flanders have a favourable conservation status. Of the species whose status is unfavourable-inadequate or unfavourable-bad, 35% are improving (15/43) and 9% are declining (4/43).

BIODIVERSITY IN FLANDERS

NATURE PROTECTION

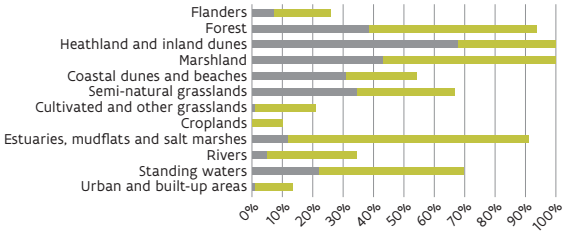


CUMULATIVE SHARE WITH NATURE PROTECTION STATUS (%)

- Share of nature or forest reserves
- Extra share of areas other than nature reserves with a national/international protected status
- Extra share of other protection measures outside 'protected' areas

In 26% of Flanders, nature is legally protected as reserves, as areas with some other national/international protected status or by other measures.

PROTECTION AND MANAGEMENT OF NATURE

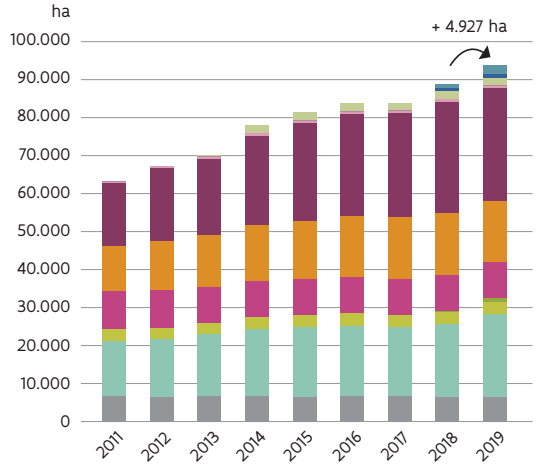


CUMULATIVE SHARE WITH NATURE PROTECTION/ MANAGEMENT (%)

- Legally protected and managed
- Legally protected only

1/4 of the protected area, or about 7 percent of Flanders, is under nature management.

NATURE MANAGEMENT



- Flemish nature reserve
- Recognised nature reserve
- Forest reserve (Flemish government)
- Nature management plan type 4
- Military land with nature management
- Domain forest with extensive forest management plan
- Forest owned by third parties with extensive management plan
- Third-party park with approved management plan*
- Park owned by Flemish government with approved management plan*
- Nature domain with approved management plan
- Nature management plan type 3
- Nature management plan type 2

In 2019, 94,129 hectares in Flanders had an approved nature or other management plan or extensive forest management plan in accordance with sustainable forest management criteria. In some of these areas, nature is the main function. Other areas are managed multifunctionally, with the nature function being interwoven with other functions.

D Biodiversity under pressure

The combination of pressures in the fragmented Flemish landscape has a persistently negative impact on biodiversity. The solution to this lies largely outside the protected areas.

Urbanisation and the intensification of agricultural land use are putting great pressure on biodiversity in Flanders. Compared with other densely populated, prosperous regions in Europe, the proportion of urban and built-up areas is high and Flanders has little nature. Our natural or semi-natural ecosystems are also small: 89 percent are in areas of less than 1 hectare. These fragments of nature are often scattered across an intensively used landscape, making Flemish nature extra vulnerable to environmental pressure from the surrounding area.

A number of pressures, such as eutrophication, acidification and pollution, are decreasing as a result of specific, often technological measures in agriculture and the urbanised area, but they are still too pronounced to ensure the survival of vulnerable nature, either on land or in the water. Urbanisation continues, climate change is making itself felt, the problem of desiccation is increasing and the number of alien species that pose a threat to Flemish biodiversity is growing. We also generate environmental pressure beyond our borders, which continues to increase.

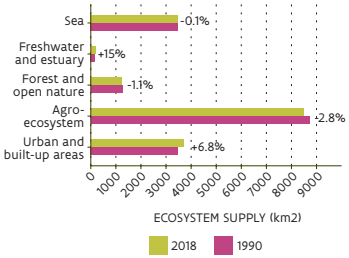
The pressures and their effects are closely interrelated and can reinforce each other. For example, the influence of fragmentation cannot be seen in isolation from the impact of environmental pollution, and the increase in certain alien species is closely related to climate change. The ultimate result of the combination of pressures on species and ecosystems is hard to predict, but the risk of species dying out locally is increasing and the survival of some habitats is threatened.

Traditional nature policy measures are not enough to restore biodiversity in the longer term, or to make it sufficiently resilient to the effects of climate change. For these things to happen, more space needs to be created for nature and natural processes, and the pressure from outside the protected areas needs to decrease. At the same time, traditional measures such as demarcating protected areas, managing them in a nature-oriented manner and protecting them from external pressures remain essential to the preservation of our ecosystems, such as the cultural-historical agricultural landscapes, coastal dunes and old-growth forests. They are helping Flanders to preserve a number of endangered natural values for the time being.

BIODIVERSITY UNDER PRESSURE

LAND USE CHANGE

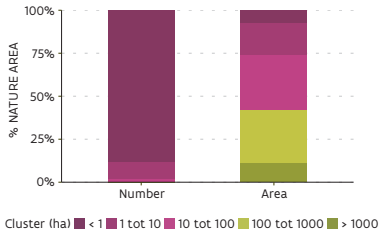
Urbanisation continues.



The increase in urban and built-up areas and the decline of agriculture are the main land use changes.

FRAGMENTATION

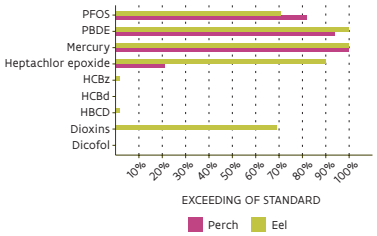
The degree of fragmentation of nature is very high.



Almost 90% of nature clusters are less than 1 ha in extent and 27% of the total nature area is divided into areas of less than 10 ha.

POLLUTION

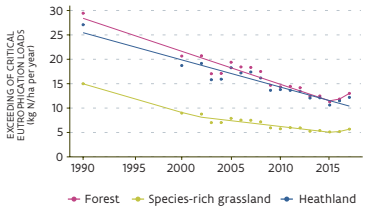
Hazardous substances are still present.



Perch and eel contain excessive concentrations of poorly biodegradable substances.

EUTROPHICATION AND ACIDIFICATION

The sharp decline in eutrophication has tailed off.

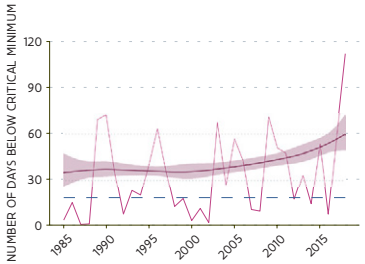


The critical load for eutrophication has fallen sharply, but is stagnating and is still too high to achieve biodiversity targets.

BIODIVERSITY UNDER PRESSURE

DESICCATION

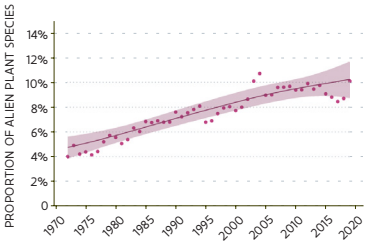
Desiccation is increasing.



Increasingly, the groundwater level in areas of groundwater-dependent vegetation is below a critical threshold value.

INVASIVE ALIEN SPECIES

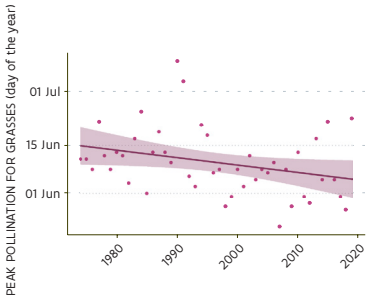
Invasive alien plant and animal species are a growing threat.



The share of alien plant species per km^2 is increasing.

CLIMATE CHANGE

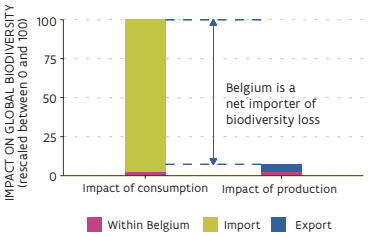
The timing of seasonal natural processes is changing, and this is disrupting the balance of ecological networks.



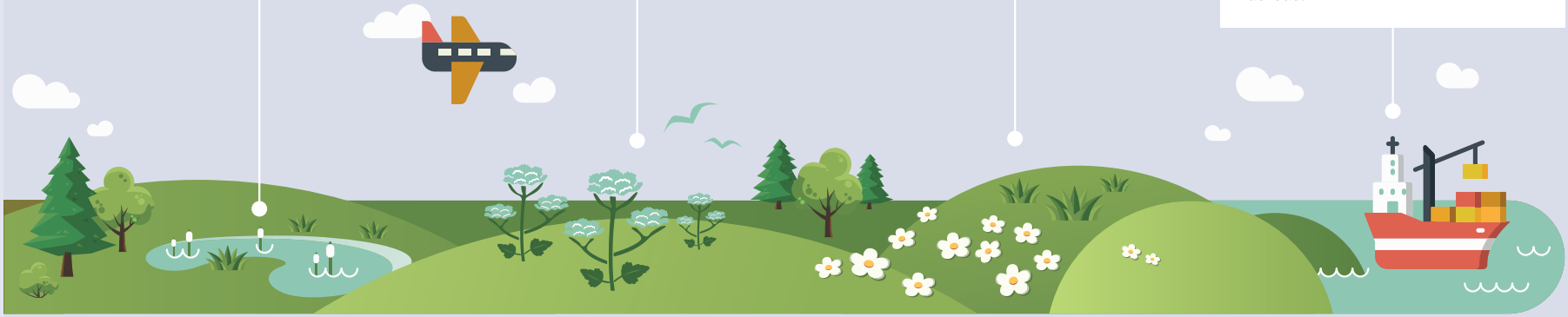
Peak pollination is occuring earlier in the season.

PRESSURE ON BIODIVERSITY WORLDWIDE

Our consumption, production and trade are putting biodiversity in other parts of the world under increasing pressure.



More than 95% of the biodiversity loss due to our consumption occurs abroad.



Our fast-changing land use is causing habitats to disappear and preventing significant biodiversity from developing. The solution is to oppose further urbanisation and create multifunctional landscapes.

Land take in Flanders is increasing. The urban and built-up area grew by 6.5 hectares per day between 2013 and 2016, and this trend appears to be continuing unabated. The demand for intensification in the urban environment is growing, but is at odds with the urgent need for more 'green-blue veining' in the built-up area. The area of permanent grassland is decreasing by 11 hectares per day. Land use in agricultural areas is becoming more homogeneous and more intensive. Permanent grassland is being converted into temporary grassland, and grassland/cropland mosaics are turning into croplands. Natural or semi-natural ecosystems such as heathland, wetlands and coastal dunes remain stable in terms of their area or are expanding slightly, but their ecosystem quality has suffered from changes in land use. The net area of forest and woody vegetation remained unchanged between 2013 and 2016, but this preservation of the status quo was the result of several thousand hectares of deforestation and afforestation offsetting each other. Such changes of land use adversely affect the development of old-growth forests with their characteristic high levels of biodiversity.

In many cases, they lead to habitat loss, and thus also hinder nature-based solutions to current challenges such as desiccation, the urban heat island effect, increased flooding risks and poor water quality. The continuing intensification of land use within agro-ecosystems has a negative impact on the basic ecological quality of open space.

In order to cut down on further land take and safeguard open space from further urbanisation, the strategic vision of the Flanders Spatial Policy Plan must be implemented as quickly as possible. The principle of multifunctional landscapes is paramount in the planning of open space, as they maintain or restore ecosystem services and link natural ecosystems together to form robust green-blue networks. A precondition for achieving this transformation is that farmers must be able to earn a living income.

Fragmentation is particularly pronounced in Flanders and is still increasing, as is the risk of species becoming locally extinct. It is therefore essential to enlarge and connect protected areas.

Flanders is one of the most fragmented regions in Europe, and the degree of fragmentation has increased even further in recent years. Our extensive road network, densely built-up areas and intensive agriculture mean that our protected areas are small and isolated. Nearly 90 percent of nature clusters in Flanders are less than 1 hectare in extent. Disruptive factors such as light pollution exacerbate the isolation of species by making migration between areas harder.

Small habitats are often home to residual populations of particular species which are at greater risk of dying out due to chance effects. Isolation impedes exchanges between subpopulations, increasing the risk of genetic impoverishment and making it hard for abandoned habitats to be recolonised. In addition, fragmented ecosystems have relatively pronounced edge effects, thus increasing the impact of external pressures. Residual populations are subject to 'extinction debt': they are too small and isolated to survive. Unless the living conditions change, they will eventually disappear.

To counter the effects of fragmentation on biodiversity, it is important to enlarge habitats and to improve the links between them. 'Green-blue veins' and defragmentation measures such as ecoducts are essential to create a functional ecological network. In addition to corridors between protected areas on land, the elimination of migration barriers for fish is also high on the Flemish and European biodiversity agenda. The highest-priority migratory barriers on the rivers must be removed by 2021. In Flanders, only 28 of the 51 highest-priority barriers have been eliminated so far.

The effects of pollution on biodiversity are largely unknown. Environmental quality standards are exceeded in many places, although a change for the better is in prospect for certain pollutants. Investment in knowledge-building and the banning of the most harmful chemicals are recommended.

The risk to human health and the environment of an estimated 70,000 of the 100,000 chemicals in use in Europe is unknown. However, more information is available about the risks of 50 key pollutants for surface water and groundwater. The concentrations of 14 of these problem chemicals exceed environmental quality standards at various locations in Flemish surface waters. Fifty-eight percent of the water bodies in the Scheldt river basin and 69 percent of those in the Meuse river basin do not achieve the prescribed 'good chemical condition'; and 40 percent of the Belgian North Sea contains too many problem chemicals to accommodate healthy ecosystems. Concentrations of metals in the surface water remained almost at the same level between 2000 and 2019. The pressure on aquatic life from crop protection products has fallen sharply over the past thirty years, due to decreased use and a ban on the most toxic chemicals.

However, this reduction in pressure has come to a standstill in recent years. Heavy metals, crop protection products and poorly biodegradable organic substances accumulate in aquatic sediments, partly as a result of past contamination. Both positive and negative trends can be noted for poorly biodegradable organic substances. The situation for heavy metals has remained virtually stable in recent decades, with only nickel and mercury pollution showing clear decreases. The prevalence of pollution of aquatic sediments by crop protection products is decreasing.

Organisms are damaged by exposure to pollution: plastics and chemicals can be toxic, accumulate, disrupt the hormone system or interfere with digestive processes. The consequences are both acute and chronic and affect the entire food web. For example, in predatory fish such as perch and eel, concentrations of persistent chemicals are found in many places that exceed the quality standards for human consumption. Sea birds in the North Sea have plastic in their stomachs, and the bioaccumulation of persistent chemicals in eggs is at higher levels than the set standards.

The government cannot completely prevent pollutants from entering ecosystems, as certain products are important to our economy and well-being. But in order to limit the loss of biodiversity, it is necessary to ban the most toxic products, reduce the use of harmful products that are not banned, seek alternatives where possible, restore polluted ecosystems and perform risk assessments of priority substances at a faster pace.

The reduction of eutrophication and acidification of ecosystems has come to a standstill. The remaining pressure is still too high for many ecosystems in Flanders. More radical systemic changes are required to achieve the biodiversity targets.

The pressure exerted on biodiversity by the chemicals responsible for eutrophication and acidification through air and water pollution has fallen sharply in recent decades. For the last few years, however, this pressure has fluctuated around a level that is still too high to restore natural or semi-natural ecosystems on land and in the water. The critical threshold value for eutrophication via the air is exceeded for all forests, all heathlands and almost half of species-rich grasslands in Flanders, meaning that these habitats will incur damage in the long term. Eutrophication is one of the main reasons why habitats of European interest have not attained their desired state and why their future prospects are also unfavourable. Acidifying air pollution exceeds the critical damage threshold in 28 percent of forests and species-rich grasslands and in 9 percent of heathlands. The number of water bodies in which nutrient concentrations exceed the environmental standards has fallen slightly in the last ten years, but is still very high: 91 percent of assessed water bodies for phosphorus and 38 percent for nitrogen.

Excessive hydrogen ions due to acidification and excessive nutrients due to eutrophication cause direct damage to organisms. The composition of biological communities is also changing: species associated with nutrient-rich environments are increasing and rare or demanding species from nutrient-poor environments are decreasing, and a process of homogenisation is occurring. In lakes, rivers, estuaries and the North Sea, eutrophication is an especially important pressure factor. The excess of nitrogen causes floating algae and blue-green algae to predominate, disrupting the entire food web. Fewer than half of the water bodies are assessed favourably for this group of species. The assessment is also unfavourable for about 30 percent of the Belgian part of the North Sea, where the higher water temperatures and lower water levels which are increasingly frequent due to climate change have reinforced the effect of eutrophication and partly offset recent positive developments.

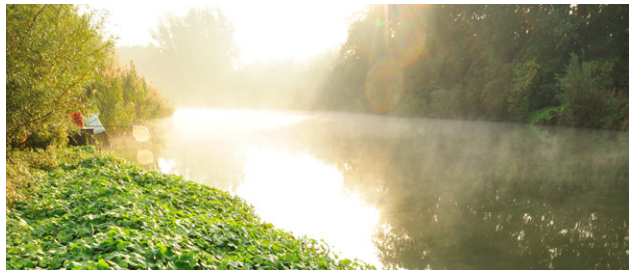
A great deal of effort has been made to reduce the pressure from agriculture, industry and households on terrestrial and aquatic ecosystems. Stricter standards and technological improvements are bearing fruit, but their effect on environmental pressure has tailed off in recent years. To achieve the objectives of water, air and biodiversity policy, more radical changes are needed in our agricultural and food system, in our transport system and in various household practices.

Flanders is increasingly and systematically drying out. Many of its wetlands have disappeared, the flow rate of rivers has changed drastically and the water shortage is even putting drier ecosystems under pressure. Restoring the natural water balance across the landscape can offer relief for people and nature.

This desiccation is the result of human disturbance of the natural water cycle. The pumping of ground and surface water, soil sealing, river straightening and Flanders' impact on the global climate mean that less and less water is available. There is very little fresh water available per inhabitant in Flanders. Water use is high relative to the annual volume supplied by precipitation and rivers. Widespread drainage practices, extensive use of hard surfacing and drastic interventions in Flemish watercourses have made the water system vulnerable. Since the 1980s, the precipitation deficit in the growing season has increased significantly. Long periods of drought are becoming more frequent. Groundwater levels in areas of groundwater-dependent vegetation such as marshland, wet heathland and wet grassland are falling. Water use has remained stable over the past twenty years, but climate change is expected to cause further water depletion in the future.

In addition to its direct effects on the functioning of organisms, desiccation also has indirect effects such as soil salinisation in the coastal region, heightened risk of forest and heathland fires, increasing decomposition of organic material in marshlands, a growing concentration of pollutants in surface waters and greater susceptibility to erosion on slopes in agricultural use. Three-quarters of all wetlands that existed in Flanders in the 1950s have now disappeared. No Flemish watercourse has a natural discharge regime any longer. Watercourses running dry and acute water quality problems have been common in recent years. Drier ecosystems are under pressure too. Recently, the restoration of the natural hydrology of ecosystems has received more attention. By measures such as filling in drainage canals, giving rivers more space, no longer clearing or mowing river beds and banks and limiting groundwater abstraction, rewetting projects in various places have succeeded in restoring the groundwater table locally and creating a more natural river system. As a result, some wetland types are slowly gaining ground again.

If the intensive restoration of the natural water balance continues across the landscape, Flanders can make its ecosystems more resistant to drought. They will then be better able to play their role as a water reservoir, sponge and water purification system. As well as being good for biodiversity, this will also help to limit the water shortages and flooding with which various social sectors are already struggling.



The growing invasion pressure from alien species is threatening native biodiversity. Preventing new introductions is essential. Flanders must take swift action to implement the European regulation with a species list adapted for Flanders.

Due to the increase in trade, tourism and transport, more and more alien species worldwide are ending up outside their native range. In Flanders, the number of reports of new alien plant species has risen sharply in the last fifty years. The number of alien animal species has also grown exponentially in all ecosystems in recent decades. Although not all introduced alien species behave invasively and hence put pressure on native biodiversity, the number of alien species within an ecosystem is a good measure of invasion pressure. Most of the invasive alien species in Flanders end up in the wild accidentally. Escapes are the main source of new introductions; unintentional movements of species, as contaminants of goods or as stowaways, are another important source. As an international transit country, with its ports and its dense rail and road networks, Flanders is very vulnerable to the introduction of invasive alien species.

Invasive alien species pose a direct threat to native species through predation, competition for space and food, or crossing. They can also bring diseases with them that cause a high mortality rate among native species, as well as radically altering the natural processes and structures of the ecosystem in which they occur. Numerous examples of all these developments can be found in Flanders.

Since 1 January 2015, a European regulation has been in force that introduces measures to prevent or limit the introduction, establishment and spread of invasive alien species. The regulation, transposed in Flanders as the Species Order, applies to the European Union List. This list brings together the alien species that Europe, on the basis of a risk analysis, considers to be a threat to European biodiversity and whose impact can be limited by cooperation at European level. However, as the EU List is not representative of all actually and potentially problematic alien species in Flanders, an approach on a Flemish scale is imperative. There is a need for integrated prioritisation that takes into account species, introduction routes and the specific elements of protected nature that are threatened by species invasions. Additional research, horizon scans and risk analyses are needed.

The consequences of climate change are gradually becoming apparent. Species are relocating, adjusting their timing, adapting their processes or at risk of disappearing. Strategies that increase the resilience of our nature can offer a way out.

The climate is changing around the world, including in Flanders, faster than ever before in human history. The annual mean temperature in Uccle is 2.6°C higher today than it was when measurements began in the nineteenth century. Heat waves have been increasing in frequency, duration and intensity since 1970. The number of days with heavy precipitation is rising and winter precipitation is increasing significantly. Potential evaporation is increasing faster than precipitation, especially during the growing season, reducing water availability and heightening the risk of drought stress in plants. The sea temperature is rising and the sea level at Ostend is now 13.4 centimetres higher than it was in the 1950s. Mathematical models predict that these trends will continue for decades to come.

Climate change in Flanders is putting extra pressure on systems that are already struggling. It has direct consequences, but also numerous indirect consequences, for the functioning of organisms.

Precipitation, drought, flooding, heat stress, fires and storms influence processes such as plant growth, the decomposition of organic matter and wind and water erosion, and can contribute to pollution, eutrophication, acidification and soil salinisation. The interplay of these developments can shrink or, conversely, expand suitable habitats and create new living conditions. Organisms and species can adapt by shifting their habitat. For example, heat-loving plant and animal species are more common in Flanders today than in the 1980s and 1990s. Other species adjust their timing or adapt their processes. In Flanders, the peak pollen season of grasses and trees has been significantly earlier since 1975. Leaves and flowers open earlier or later in the year and migratory birds return from the south earlier. Organisms that fail to adapt are at risk of disappearing. These various changes disrupt the interactions between species, producing winners and losers. The speed of the changes and their combination with other pressures, such as changes in land use and fragmentation, reduce the chance that species and ecosystems will be able to adapt in time without major losses in ecosystem quality.

To limit the effects on biodiversity, a flexible strategy is required that focuses on measures to increase the resilience of our nature. This strategy must transcend the traditional division between environmental compartments, policy areas and sectors. The measures put forward by the Flemish Energy and Climate Plan 2021-2030 and the accompanying climate adaptation plan should be implemented as soon as possible.

Consumption in Flanders is responsible for considerable environmental pressure and biodiversity loss, especially abroad. Indicators that provide a better picture of the impact are indispensable for an effective Flemish biodiversity policy.

Consumption and production in Flanders put considerable pressure on ecosystems at home and abroad. That pressure far exceeds the capacity of our planet. If every global citizen consumed as much as the Flemish, we would emit ten times more greenhouse gases worldwide, use three times more materials and occupy five times more bioproductive surface than what is sustainable. Most (65-90%) of our environmental pressure is exerted abroad. While greenhouse gas emissions in Flanders have decreased in recent decades, the carbon footprint of Flemish consumption rose significantly between 2003 and 2010. Flanders is shifting a growing proportion of its footprint abroad.

All these pressures are together causing a loss of biodiversity. According to all available models, Belgian consumption has a far greater impact on species loss in other parts of the world than at home: between 60 and over 95 percent of the species loss caused by our consumption occurs abroad. Almost every study shows that the Belgian impact per inhabitant is at or above the European average, and almost invariably above the world average. The consumption of bio-based goods such as food, wood, fibres and fuels in particular makes a major contribution to this. Food alone causes about half of the biodiversity footprint of Belgian consumption. The impact is greatest in countries such as the US, France and China, from which we import large quantities of products that require intensive land use (such as grain, maize or rice). There is also a clear impact on countries which are home to a relatively high proportion of vulnerable species, such as Brazil, Australia and Congo.

To make it possible to conduct an appropriate policy on this issue, indicators are needed that provide a better picture of the cross-border impact of Flemish consumption and production. Much of the effort that Belgium and Flanders are already making to mitigate their impact on biodiversity abroad is based on the voluntary efforts of social actors. A legally binding framework may be appropriate for certain goods with a significant and persistent impact. A stronger focus on biodiversity in trade agreements and development cooperation would also represent an important step forwards. Only by thoroughly addressing key sectors and working together with all partners in the chain – from local producers and governments to trading partners, Flemish producers, processing companies and traders – can Flanders and Belgium meet their international commitments on biodiversity and sustainable development.

E Trends per ecosystem

Woodland, marshland, heathland, coastal dunes and semi-natural grassland together account for about 15 percent of the land area of Flanders. These ecosystems, which were an important part of the local economy and agriculture until the twentieth century, were greatly shaped by humans. In order to be conserved, they need to be expanded and connected.

The extent and area of distribution of woodland, marshland, heathland, coastal dunes and grassland have fallen sharply over the centuries due to developments in agriculture such as scaling up and drainage, and the emergence of new industrial production processes that replaced local artisanal production. The result is small, highly fragmented ecosystems surrounded by an intensive landscape matrix.

In most of these natural or semi-natural ecosystems, the state of biodiversity has stabilised or slightly improved. However, as the starting position was very poor in most cases, this slight improvement has not led to properly functioning ecosystems. Just 3 of the 46 European protected habitat types are in a favourable state or 'conservation status'. Despite the marked improvement in water quality, not a single river assessed in Flanders has achieved a good ecological condition. Habitat-typical species such as farmland birds, and species found in marshland, heathland and drifting dunes are in decline or are seriously endangered. Nitrogen-loving plant species are gaining ground in most ecosystems.

The high degree of fragmentation of the ecosystems leaves them extra vulnerable to pressures and makes it hard to maintain healthy populations. The high pressure means that many natural or semi-natural ecosystems can only be maintained through intensive management: intervention or the decision not to intervene can have a positive effect on the biodiversity of an ecosystem. Forest management has resulted in greater species richness of trees and greater functional diversity. In marshland, heathland and coastal dunes, landscaping and management have ensured that certain habitats are maintained or expanded. In each of those ecosystems, tardy management is one of the reasons for less positive future prospects.

In order to maintain ecosystems and their functions over time and in a changing climate, those ecosystems must be enlarged and connected. Open ecosystems in particular can only survive through active management. Policymakers must therefore continue to put aside a sufficient budget for this or develop a different financing model. Some of the environmental problems can be remedied through management, but a truly sustainable solution requires a fundamentally different approach to consumption and production (see F. Recommendations).

ECOSYSTEMS IN FLANDERS

COASTAL DUNES

- Coastal dunes and beaches form a 67-km stretch along the coast; their area is stable
- Dynamic processes and habitats are deteriorating; almost 40% of the typical dune biodiversity has disappeared, or is critically endangered, endangered or vulnerable

<0,5%

MARSHLAND

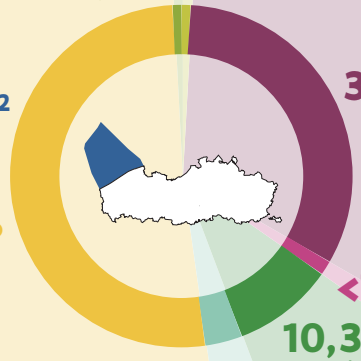
- Since 1950, 95% of the area has been lost
- Marshland areas are small and fragmented; the survival of typical species is under threat

<0,5%

NORTH SEA

- Poor environmental status
- The seabed is seriously disrupted by fishing, installation of wind farms, pipelines and sand extraction

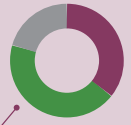
3.454 KM²



URBAN AND BUILT-UP AREAS

- 1/3 of Flanders consists of urban and built-up areas
- In 12-18% of Flanders, the ground is effectively built on or under hard surfacing

33%

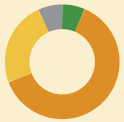


36% Built on or under hard surfacing
44% Vegetation, water of agriculture
20% Unknown

53%

AGRO-ECOSYSTEMS

- Area of species-rich/permanent grasslands is declining, but less sharply in recent years
- This ecosystem has a negative impact on other ecosystems
- Biodiversity is low and still declining



6% Semi-natural grassland
63% Cropland
24% Cultivated grassland
7% Other

<1%

HEATHLAND

- Area is growing slightly due to restoration measures
- Typical species are endangered

10,3%

2,4%

SURFACE WATERS

- 24,000 km of watercourses and 16,000 ha of standing waters
- <1% is in good ecological state; due to poor structural quality and pollution, quality goals are far from being achieved

FOREST

- The total area is stable, but highly fragmented
- Slight improvement in naturalness and species richness
- The proportion of damaged forest trees is increasing

16% Old-growth forest

Flanders remains one of the least forested regions in Europe. Profound fragmentation makes its forests vulnerable to climate change and eutrophication. Better protection, additional afforestation and sustainable forest management are crucial.

Woodland is by far the largest natural or semi-natural ecosystem in Flanders, accounting for 10.3 percent of the land area. Despite this, Flanders is one of the least forested regions in Europe. The projected increase in the area of woodland of 10,000 hectares by 2012 was not achieved. Although the total woodland area in Flanders remains virtually the same, this disguises significant internal changes; yet continuity is important for ecological development. Only 16 percent of the forest area has been forest continuously since the end of the eighteenth century. These old-growth forests are home to typical species that do not occur in young forests and cannot simply be replaced. Forty-eight percent of forest habitats with European protection lie in a Special Area of Conservation.

Over the past twenty years, the functional diversity and the degree of naturalness of all forest types in Flanders have increased and the average species richness of trees has improved.

In regions with sandy soils, this is mainly due to the conversion of homogeneous pine stocks to mixed broad-leaved trees. The eight forest habitats of European importance together account for 28 percent of the forest area in Flanders. They are all in a very unfavourable conservation status.

Woodland in Flanders is highly fragmented: half of it is 75% peripheral habitat, leaving it vulnerable to pressures such as climate change and eutrophication. Despite decreasing pressure, the critical threshold value for eutrophication is exceeded in all forests. The proportion of damaged forest trees rose again in the last decade and is now around 23 percent. Climate change, fungi and diseases can also affect forest health.

To achieve the targeted forest expansion, forests need to be better protected in tough spatial planning. There is also a great need for additional afforestation efforts. From an ecological point of view, forest expansion should preferably be connected to old forest cores, so that typical forest plants can spread more easily. If forest cores are enlarged and closed forest cores are safeguarded through management, their microclimate will be protected and their resilience to climate change increased.

Heathland is of great cultural-historical value and is one of the last refuges for the life forms of a nutrient-poor environment. It is particularly under pressure from eutrophication and tardy management. It is therefore important for atmospheric nitrogen deposits to decrease.

Heathland was once an important link in the agricultural system. Today it is particularly important for its natural and cultural-historical value, for recreation and for water supply. The area of heathland has fallen by 95 percent since 1850 and currently comprises less than 1 percent of Flanders. Heaths are home to 15 percent of all Flemish Red List species; despite their relatively small area they are therefore very important for the preservation of biodiversity. With 100 percent of its area enjoying protection, including 25 percent with reserve status, heathland is one of the most protected ecosystems in Flanders.

Despite this high level of protection, all heathland habitats of European importance are in a very unfavourable conservation state, due to their insufficient size, poor habitat quality and unfavourable future prospects. Of the 238 examined plant and animal species that are associated with heathland, 13 percent are extinct in Flanders, 50 percent are on the Red

List (critically endangered, endangered or vulnerable) and 15 percent are near threatened.

Eutrophication is an important pressure for a nutrient-poor system such as heathland. Although the pressure is decreasing, nitrogen deposits from the air still exceed the critical load in all heathlands. Heathland can only be preserved through adapted nature management, replacing the former extensive agricultural management. The natural evolution from heathland vegetation to forest is enhanced by eutrophication and the emergence of invasive alien species. Longer periods of drought due to climate change and groundwater abstraction endanger the conservation of groundwater-dependent habitats such as wet heath. They also present a growing risk to drier habitats, for example due to the increasing risk of fire.

In order to bring the heathland to a favourable conservation status, its extent needs to increase further and nitrogen deposits in Flanders must continue to decrease. In addition, there is a need for intensive nature management based on a landscape ecology approach. Funding from the Flemish government remains vital for the survival of the heathland.

Marshland is the rarest ecosystem in Flanders. It is an ally in the fight against drought, flood risk and climate change. The structural restoration of our marshlands requires changes to land use across the landscape.

Marshlands are the rarest ecosystem in Flanders, accounting for less than 0.5 percent of its land area. Since 1950, 95 percent of the marshland area has been lost. Most of the remaining areas are small and highly fragmented. Four-fifths of them consist of reedbeds, while the rest are peat habitats with a high conservation value. Fourteen percent of all Flemish Red List species are associated with marshlands. Marshland vegetation is legally protected throughout Flanders. About 30 percent of the marshland area is in nature reserves.

The seven marshland habitats of European importance are all in a very unfavourable conservation status. They are too small and fragmented, the habitat quality is poor and their future prospects are unfavourable. The trend in three habitats is slightly improving. Of the 358 examined plant and animal species that are associated with marshland, 7 percent are extinct in Flanders, 31 percent are on the Red List (critically endangered, endangered or vulnerable) and 18 percent are near threatened. Success stories such as the Grote Nete valley, the Demerbroeken and the Zwarte Beek valley show that the restoration of marshlands is possible.

For the time being, however, the increase in extent and quality of these areas is too limited to structurally improve the conservation status of Flemish marshlands in general.

Eutrophication via air, water and soil is the main pressure on marshland habitats. Even when deposition rates are falling, the effects of historical pollution can linger for a long time. Eutrophication reinforces and accelerates processes of natural succession, such as reed formation and degradation, making more intensive management necessary. In addition to eutrophication, marshlands are also suffering from desiccation as a result of water extraction and changes in hydrology due to drainage. Climate change has amplified this effect.

Marshlands offer nature-based responses to various societal issues. Their sponge-like behaviour slows down the discharge of water at times of heavy rainfall and helps to limit flood risks. Because they release water gradually, they also relieve drought stress. Marshland soils hold significant carbon stocks, so protecting them contributes in the short term to the climate objectives. Restoring marshlands gives nature a boost and safeguards important water-related ecosystem services. Because marshlands depend on groundwater, their conservation is largely determined by land use and water management outside protected and managed areas. Their structural restoration requires changes to land use across the landscape.

Coastal dunes are dynamic ecosystems that make an important contribution to natural coastal protection. In order to maintain this ecosystem, intensive nature management is imperative.

The Flemish coastal dunes and beaches form a 67-kilometre stretch along the North Sea. From the end of the nineteenth century, the coastline experienced intense urbanisation, with about half of the dunes making way for buildings, roads, gardens and recreational areas. Since the 1990s, the remaining dunes have been largely protected by the dune decrees. Nearly a quarter of the area of beach and dunes (mainly dunes) falls under reserve management. Nature-oriented protection of the beach is confined to a few zones along the IJzer estuary, the Baai van Heist and the Zwin. As well as being important for biodiversity conservation and tourism, the dunes provide an ecosystem service, coastal protection, which is of increasing importance due to rising sea levels. There is also a freshwater lens under the beach and the dunes that protects the agricultural soils in the polders behind against salinisation.

Flanders has nine beach and coastal dune habitat types of European importance. Together they account for less than 0.5 percent of the area of Flanders. The lower beach and sea buckthorn thickets have a favourable conservation status. The other dune habitats have a conservation status of unfavourable-inadequate or unfavourable-bad due to their insufficient size, poor habitat quality and unfavourable future prospects. Five habitats show an improving trend, while the drifting dunes are deteriorating. Of the 138 examined plant and animal species that are associated with beach and dunes, 8 percent are extinct in Flanders, 31 percent are on the Red List (critically endangered, endangered or vulnerable) and 30 percent are near threatened.

The high degree of urbanisation has fragmented the dune landscape and significantly changed the hydrology. As a result, there is not enough space for landscape-forming dynamic processes that maintain dune formation, drifting and open habitats. In combination with other pressures such as eutrophication and invasive alien species, this has led to the fixation of drifting dunes and degradation and shrub encroachment on dune grassland, dune heathland and wet dune valleys, making it harder for managers to maintain these habitats. The increasing use of the beach and dunes for recreation purposes and non-selective beach cleaning and reprofiling have had an adverse impact on the strandline (accumulations of organic material) and pioneer vegetation, which are important for the formation of embryonic dunes and are also the basis of natural coastal defences.

Nature-based solutions for coastal defence, low-impact recreation and the restoration of endangered natural characteristics can be perfectly compatible. Landscaping projects such as the restoration of dune drift dynamics and the connection between the upper beach and the dunes in De Westhoek demonstrate how this can be done. Such measures also yield social and economic benefits. The restoration of the coastal ecosystem's natural capital requires intensive nature management over a larger area. It is also important for goals for biodiversity and ecosystem services to be more generally included in spatial, water, tourism and climate policy.

Agro-ecosystems occupy the largest proportion of open space in Flanders. Their biodiversity value is usually limited and is decreasing even further. Agriculture remains one of the main sources of eutrophication in other ecosystems. The transformation of the sector has the potential to remedy this situation.

Agro-ecosystems include all grassland, scrubland, fields and orchards under agricultural or nature management. They cover 53 percent of the territory and by far the largest proportion of open space in Flanders. Historic agro-ecosystems, such as semi-natural and species-rich grasslands and farmland with numerous small landscape features, are home to many of Europe's endangered habitat types and species. These agricultural systems with an important biodiversity value account for just 5.3 percent of the land area. Just over half of them are located in a nature reserve

or other protected area, and another 26 percent enjoy some form of protection under the Nature Decree or agricultural legislation. Most cropland (90%) and permanent cultivated and other grassland (79%) do not have protected status, but in some cases are partly protected by requirements imposed by agricultural policy. Intensive agriculture exerts significant pressure on the system itself and on other ecosystems, especially through eutrophication, acidification and drainage. For example, 95 percent of ammonia emissions in Flanders and 60 percent of the nitrogen input in aquatic systems derive from agricultural activities.

Despite the size of the agro-ecosystem, few indicators of the state of biodiversity in agricultural areas are available. Important functional groups, such as insects and soil organisms, are missing from the series of indicators. With a few exceptions, farmland birds have declined sharply over the past decade, a trend consistent with the sharp decline during the period 1970-2000. Among plant species, there are winners and losers. Species associated with nutrient-rich and degraded grasslands and plants associated with intensive crop production are gaining ground at the expense of species found in nutrient-poor grasslands and more specialised meadow flowers such as cornflower. All grassland habitats of European importance are in a very unfavourable condition and their future prospects are very unfavourable.

Semi-natural and species-rich cultivated grasslands are threatened by urbanisation and conversion into gardens or croplands. The area of permanent grassland decreased by 38 percent in the period 1980-2018, but the decrease seems to have stabilised in recent years. Grasslands are also deteriorating in quality due to eutrophication and acidification. In 2017, the standards for acidification and eutrophication were exceeded in 28 and 44 percent of grassland areas respectively. Grassland habitats of European importance, with the exception of hydrophilous tall herb fringe communities, are too fragmented to achieve good conservation status. The intensity of farm management increased systematically between 1980 and 2018. The carbon content in the soils of grasslands and arable land decreased between 1960 and 2006. Falling carbon stocks in the soil cause a decrease in soil biodiversity and threaten soil fertility and hence food production.

A significant proportion of biodiversity in Flanders is linked to the agro-ecosystem. This biodiversity is essential for agricultural production, but is also under pressure from intensive farming. To reconcile a viable agriculture with a food system within ecological boundaries a transformative change is needed (see F. Recommendations). The European 'Farm to Fork' strategy maps out such an approach and should be supported by the instruments of the Common Agricultural Policy. In addition, the most vulnerable semi-natural and species-rich permanent grasslands need to be better protected and nitrogen emissions must be reduced below the critical threshold values.

Most aquatic systems in Flanders have been significantly reshaped by humans over the centuries. The water quality has improved since the 1990s, but due to poor structural quality, diffuse pollution and poorly biodegradable substances, the quality goals are still far from being achieved. To do so will require hydrological restoration across the landscape.

Flanders has approximately 24,000 kilometres of watercourses, and an area of almost 16,000 hectares (1.2% of the territory) is covered by standing waters. Due to their hydrological links with the wider environment, surface waters are very sensitive to all kinds of human influences. They tend to be places where sediment, nutrients and pollutants from higher ground accumulate. The European Water Framework Directive requires all watercourses to achieve good status by 2027 at the latest. Slightly less than 70 percent of standing waters and 35 percent of rivers are located in an area with national or international protected status or covered by some other protection regime. Due to its unique freshwater tidal area, the Scheldt estuary has a high degree of protection: just over 90 percent is located within protected areas or protected by other measures.

Less than 1 percent of the investigated water bodies are in a good ecological condition. However, a slight improvement

was recorded in the period 2013-2018 compared to the period 2007-2012: progress was recorded on four of the five biological quality criteria that determine ecological status (phytobenthos, aquatic plants, invertebrates and fish). The deterioration in the state of phytoplankton is probably due to the dry summer months of recent years, which have caused algal blooms. Only 7 percent of the watercourses have good structural quality. The number of barriers to fish migration is steadily decreasing, and in combination with improving water quality this has led to a modest recovery for migratory fish. The 11 aquatic habitats of European importance have a conservation status of unfavourable-inadequate or unfavourable-bad.

Over the centuries, the structure of most of the watercourses in Flanders has been substantially affected by straightening, embanking, damming, widening and other interventions. As a result, many watercourses have lost their natural function, with the result that their self-cleaning capacity has decreased and specific habitats and species have disappeared. Thanks to the development of the water treatment infrastructure, the number of point discharges has been significantly reduced and the wastewater treatment rate rose from 26 percent in 1991 to 84 percent in 2018. This has led to great improvements in the oxygen balance. Diffuse pollution by nitrogen and phosphorus, especially from field run-off, remains a significant problem, however. More than half of the water bodies exceed the standard for heavy metals or one or more crop protection products. Some toxic substances, such as PCBs, are very difficult to break down, which means that they are still present in the environment in high concentrations decades after being banned.

The ecological restoration of surface waters cannot be considered in isolation from hydrological restoration across the landscape. Soil sealing and the drainage of water-rich ecosystems must be restricted and water/groundwater extraction must be adapted more closely to the capacity of the system. Re-meandering watercourses, reconnecting them with their natural floodplains and restoring bank zones gives natural river processes more space again. In order to achieve the water quality targets, water treatment must also be further developed and improved and a source-oriented manure policy is required. Restoring rivers, lakes and estuaries is not only essential for biodiversity, but also has benefits for society. Well-functioning water systems act as a buffer in both periods of drought and periods of flooding, have a significant self-cleaning capacity and are more attractive for leisure activities.

The Belgian North Sea is largely protected, but the impact of human activities on life on the seabed remains significant. International cooperation across different policy sectors is crucial.

The Belgian part of the North Sea (BNS), with an area of 3,454 square kilometres, forms a modest part (0.5%) of the North Sea as a whole. Typical characteristics of the area include sandbanks, strong currents due to tide and wind and high turbidity. This small area is used intensively for shipping, sand extraction, fishing, wind energy production, recreation and other purposes. Thirty-seven percent of the area, including the Baai van Heist marine reserve, falls within a Special Area of Conservation of the Natura 2000 network.

The goal of the Marine Strategy Framework Directive – the attainment of a good environmental status for European marine waters by 2020 – was not achieved in the BNS. In particular, the soft-bottom and gravel-bed habitats and the associated marine life are seriously disturbed and have an unfavourable status. The European Union's Common Fisheries Policy states that populations of commercially exploited species must remain within safe biological limits. Despite considerable efforts, only plaice is fished sustainably. Stocks of dab, turbot, brill and flounder have improved in recent years, but the cod stock has declined sharply since 2016. Although numbers of most non-scavenging sea bird species, such as common terns and guillemots, are falling in the BNS, good environmental status was achieved every year in the period 2011-2016. Long-term changes in the presence of these species often indicate changes in the local food supply.

Biodiversity in the BNS is under severe pressure from local human activities, such as sea-bed disturbing fishing, sand extraction and the construction of wind farms. On the other hand, the wind farms have a slightly positive effect on biodiversity due to the ban on fishing in the zone around the wind turbines. Eutrophication also affects the state of biodiversity in the North Sea. The nutrients in the southern part of the North Sea come from atmospheric deposition and are also introduced from river basins around the North Sea. Eutrophication causes excessive algal blooms, which disrupts the food chain and in some cases leads to a lack of oxygen. Due to the thorough mixing of the seawater off

our coast, there is no shortage of oxygen, but the foam that forms when the algae die can disrupt leisure activities. In the zone nearest to the coast in particular, eutrophication poses a threat to the achievement of good environmental status. Beyond the first nautical mile off the coast, the situation is improving and good environmental status has been achieved beyond the 12-mile zone.

Although the BNS is largely a federal competence, a number of the most important pressures (fishing and eutrophication) are controlled at Flemish policy level. Agreements on fishing are made at European level and the eutrophication of the North Sea is a cross-border problem. International cooperation across different policy sectors is therefore crucial to bring the marine ecosystem to a good environmental status. More than a third of the BNS has protected status under the European Bird and Habitat Directives, but active fishing is allowed in these areas. Under the current marine spatial plan, a number of zones must be demarcated within which fishing is limited to protect biodiversity on the seabed. This demarcation must take place as soon as possible and management plans must be defined for the protected areas. Research needs to be conducted together with the fishing industry into fishing techniques that will have less impact on the seabed. The planned expansion of the wind farms offers an opportunity to combine biodiversity recovery with renewable energy targets. This can be done by adding elements to the design of wind farms that provide a suitable habitat for species or communities. Research into such nature-inclusive designs must take feasibility into account.

F Recommendations

Many of the findings of this Nature Report were also mentioned in earlier Nature Reports. This makes it clear that traditional nature policy, despite its merits, lacks the power to tackle the causes of the decline in biodiversity effectively.

Strategic decisions need to be made at Flemish level. On the eve of a new European Biodiversity Strategy, this Nature Report sets out recommendations for a thorough approach to the biodiversity issue. Their implementation is a task not just for policymakers, but for all social actors involved. The recommendations are structured according to the four pillars of the European Biodiversity Strategy 2030:

1. protecting, enlarging and connecting protected areas more effectively,
2. working to restore biodiversity outside as well as within protected areas,
3. making transformative change possible in order to tackle the societal causes of the pressures effectively,
4. increasing the commitment to global biodiversity.

A fifth set of recommendations deals with the knowledge gaps that need to be filled in order to make a substantiated and effective biodiversity policy possible.

Create a network of protected areas

Enlarging protected nature areas and creating ecological corridors between these areas improves the ability of species and ecosystems to withstand current pressures and future developments such as climate change.

- **Enlarge protected areas and bring more areas under nature management.** The European Biodiversity Strategy 2030 aims to place 30 percent of the land and sea area of the European Union under legal protection and 10 percent under strict protection. The protection of primary forests and carbon-rich ecosystems is a priority here. **Giving strict protection** to and where possible extending at least the **old-growth forests** in Flanders will safeguard and strengthen both significant biodiversity hotspots and carbon stocks. River restoration and rewetting of valleys allows other carbon-rich ecosystems, such as permanent **grassland and wetland**, to grow. A ban on the conversion of permanent grassland and better enforcement of such a ban can protect the most valuable grasslands. For the **North Sea**, plans have been drawn up to demarcate zones where fishing is restricted. For the biodiversity of the seabed in particular, it is important to establish these protected areas quickly.
- **Provide ecological corridors between the protected areas.** Ecological corridors between protected areas are extremely important for Flanders, because they make migration and movements of species between these areas possible. These movements are vital for the survival of populations and become even more important in the context of stress caused by a changing climate. In addition, nature corridors are **multifunctional areas** that can also respond to other societal needs with multiple ecosystem services and nature-based solutions. Highlighting these opportunities and developing incentives will increase support for ecological corridors. The European Biodiversity Strategy 2030 both emphasises the importance of ecological corridors and attributes an important role to agriculture in this context. In highly urbanised Flanders, 'green-blue veining' in urban and built-up areas is also indispensable to connect together fragmented natural areas.

Develop a joint Flemish plan for the restoration of nature on land and at sea

Sufficiently large, protected nature areas that are linked together by ecological corridors are necessary but not sufficient to improve the precarious state of Flemish biodiversity. To restore our biodiversity, it is at least as important to reduce the pressure from outside the protected areas. The European Biodiversity Strategy 2030 focuses on restoring ecosystems and their services both within and

outside the protected areas. Sustainable use of ecosystems is becoming the norm and environmental pressure must be minimised. A Flemish biodiversity restoration plan is urgently needed. This report has eight recommendations that can help shape such a plan:

- **Convert the goals of international treaties and European strategies more quickly into concrete Flemish policy plans.** The effectiveness of policy depends on a well-functioning compass that displays the goals and clearly indicates how far we are from achieving them. The goals and indicators from the European Biodiversity Strategy 2020 were not all translated to the Flemish level. The next decade offers Flanders the opportunity to make the sustainable development goals for 2030 and the new European Biodiversity Strategy 2030 concrete in a strategic Biodiversity Plan 2030 with clear, measurable, supported and time-specific objectives and indicators.
- **Stop and reverse land take.** Increasing land take is causing irreversible loss of ecosystems and exacerbating fragmentation. This not only hampers the restoration of biodiversity, but also puts the viability of agriculture under further pressure and is one of the causes of both water scarcity and flooding in Flanders. Working to expand and ensure the quality of greenery within built-up areas will enhance the quality of life in our cities.
- **Tackle eutrophication and acidification at source, and mitigate their consequences where possible.** Eutrophication and acidification have proved to be wicked problems and the improvements that started in the 1990s have come to a standstill over the last decade. Part of the problem can be remedied through technological improvements in agriculture, better manure processing, buffer zones around sensitive areas, the further development of the water treatment infrastructure and an approach to overflow problems, for example. However, fundamental changes in our food production are also needed to solve the pressing problems of eutrophication and acidification in Flanders.
- **Encourage and broaden the role of farmers as stewards of the landscape and biodiversity.** Agricultural activities have a major impact on protected areas and the biodiversity value of the intensive, homogeneous agricultural landscapes in Flanders is low. As well as further reducing the use of pesticides and fertilisers, the new Biodiversity Strategy proposes the diversification of production methods and giving farmers an active role in landscape management. Organic farming must account for 25 percent of the agricultural area by 2030. The more extensive forms of farming can form a buffer zone around protected areas to reduce the impact on biodiversity.
- **Work on hydrological restoration.** Drastic hydrological changes are the cause of many biodiversity problems in Flanders. Restoring a more natural hydrological system is also crucial for a number of societal issues, such as water treatment, drinking water supply and the increasing risks of desiccation and flooding. It is essential to address hydrological restoration at the landscape scale and to take the physical characteristics of the landscape fully into account.
- **Increase the area of forest coverage by at least 10,000 hectares and make sustainable forest management the norm.** Forest protection and increased forest coverage are two spearheads of the European Biodiversity Strategy. A pre-emptive right for afforestation projects around cities and the relaxation of afforestation rules in agricultural areas will facilitate the planned forest expansion. In addition, it is important for the government to define and maintain sustainable forest management as the norm in order to consolidate the recovery that has started in the ecological quality of Flemish forests.
- **Increase nature's resilience to climate change and protect the carbon stocks in ecosystems.** Our small, isolated protected areas are particularly vulnerable to climate change. Moreover, climate change is increasing other pressures, such as eutrophication and desiccation. The disappearance of carbon-rich ecosystems such as peatlands or marshland forests contributes in turn to climate change. Certain recommendations in this Nature Report, such as the enlargement and connection of protected areas, hydrological restoration and the protection of carbon-rich ecosystems, are also spearheads of the Flemish Energy and Climate Plan. The rapid implementation of this plan is crucial for biodiversity conservation and restoration.
- **Step up the fight against invasive alien species and develop a Flemish approach.** European legislation refers the fight against invasive alien species to the member state level. However, a number of alien species that pose a specific threat to biodiversity in Flanders are not included in European legislation. Through the Species Order, the Flemish government can develop a suitable approach to these species. Another important task is to raise public awareness in order to prevent new introductions, help detect new invasions and increase support for combating them.

Enable significant changes

The state of and the pressure on biodiversity are intimately bound up with our culture and consumption patterns, with investment decisions by economic actors and with choices in policy areas other than nature and forest policy. The downward trend in pressures such as eutrophication, acidification and pollution has come to a halt because the most feasible measures have already been taken. In addition, the decrease in impacts on the environment in Flanders was partly achieved by shifting pressure abroad.

- **Commit to transformative change and step up cooperation between social sectors and policy domains.** A further decrease in environmental pressure requires systemic changes across sectors such as households, agriculture, energy, industry, transport and trade. Such transformative changes are not a task for the government alone. They necessitate a social debate about an equitable distribution/redistribution of consumption possibilities between social groups, regions and generations. They challenge policymakers, businesses, investors, the scientific community and every citizen to re-examine habits, enter into dialogue with each other and develop solutions together. Within its areas of competence, the Flemish government can facilitate this dialogue by focusing even more on cooperation between entities, across the boundaries of policy areas such as the environment, agriculture, health and the economy.
- **Take the value of biodiversity into account in order to improve the economic compass.** Market-correcting initiatives are also needed to help shape transformative changes. The adverse environmental and social side effects of our choices can be partly prevented or remedied by making products and services with a larger ecological footprint more expensive and their sustainable alternatives cheaper. In addition to regulations that limit environmental pressure, economic incentives and market-based policy instruments are needed in order to make sustainable production methods, for example in agriculture and fisheries, economically viable and attractive.
- **Make a good quality of life within ecological limits the new normal.** Lasting systemic change requires a change in our habits, social norms and cultural preferences. Along with businesses, NGOs, schools and others, it is up to the Flemish government to drive this change through universally accessible actions. In urban and built-up areas, for example, there are opportunities to create more space and tolerance for natural processes. Often, the seeds of such urban change are already present in the form of nature-friendly park management, nature-inclusive agriculture, ecological gardens, green school playgrounds, sustainable business parks and so on, but tend to still be confined to small local niches. These niches now need to be expanded and scaled up. This requires a shared positive vision based on the opportunities and solutions presented by different social perspectives on nature.

Develop an ambitious worldwide biodiversity agenda

Much of the pressure we exert on biodiversity is felt abroad. Like many other countries, we cause far more biodiversity loss in other parts of the world than at home. To work out effective solutions for this, systemic change on an international scale is needed. Flanders has a number of levers in its hands to shape this transformation and to influence international decision-making. It is in our own interest to do so, because global biodiversity loss has the potential to bring about large-scale, hard-to-reverse processes whose effects will also be felt in Flanders. Examples include climate change, desertification or outbreaks of new infectious diseases.

- **Identify the impact of consumption and production choices and make them more sustainable.** Indicators that make the cross-border impact of our production and consumption choices on biodiversity more visible are necessary for the conduct of a relevant policy. They can help raise consumers' and producers' awareness. Voluntary sustainability standards and labels that take account of biodiversity effects can also influence biodiversity-friendly production and consumption choices. A legally binding framework may be the solution for goods with a significant and persistent impact. In addition, more attention needs to be paid to biodiversity in trade agreements and development cooperation. Only by thoroughly addressing key sectors and working together with all partners in the chain can Flanders and Belgium meet their international commitments on biodiversity and sustainable development.
- **Play a role as an advocate for international biodiversity action.** Flanders has a number of unique strengths that make it internationally significant, such as our role as a trading hub, our knowledge-based and innovation-driven economy and our well-established tradition of political and social dialogue. We can use those strengths to develop a more sustainable and biodiversity-friendly economic and social model. By doing so, we can put our region on the map as an innovative model region. In this way, Flanders will build credibility abroad and can help move forward and support the ambitious European and global biodiversity agenda.

Address knowledge gaps

Data and knowledge are indispensable for an effective, efficient and equitable biodiversity policy. However, they are not always available in Flanders. This colours our perception of the state of biodiversity, has an impact on policy choices and makes it hard to develop concrete management strategies. This Nature Report identifies a number of knowledge gaps, without claiming to be complete.

- **Develop a Flemish research agenda for biodiversity.** An understanding of ecological processes and how they interact with the socio-economic context is necessary in order to develop measurement networks and indicators and design effective, efficient and socially just management strategies. An ambitious Flemish knowledge agenda will help improve the organisation of biodiversity research and thus address the knowledge needs of managers and policymakers. As well as purely ecological issues, the social, economic and institutional aspects of biodiversity policy must also be addressed.
- **Provide integrated biodiversity measurement networks and promote *citizen science*.** Many of our measurement networks have a limited thematic, taxonomic or spatial scope. For example, we have hardly any indicators concerning agricultural areas and urban and built-up areas, or genetic and functional diversity. By improving the integration of existing measurement networks, including less well-covered themes and ecosystems and harmonising methodologies, we can monitor biodiversity in Flanders more comprehensively and efficiently. Citizen science supplements professional data collection and can increase support for biodiversity.
- **Extend the set of indicators for biodiversity policy.** Current monitoring lacks indicators on the effects of climate change and drought on biodiversity, on the functioning of terrestrial ecosystems and on the impact of our consumption and production on biodiversity. There are few indicators relating to the social, economic and institutional aspects of biodiversity. To complete the scientific input that guides biodiversity policy, new indicators are needed that cover the entire socio-ecological system.
- **Evaluate policy and management.** A state and trend analysis is useful for determining how much ground needs to be covered to achieve policy goals and to uncover underlying causes of observed trends. Policy evaluation is needed to determine the extent to which policy mechanisms have contributed to the state or trend of biodiversity and whether policy instruments are effective. Policy evaluation needs to be a fully fledged part of the policy cycle, so that successes and areas for improvement are clearly identified, with an emphasis on learning lessons.

Publication details

Editorial team: Anik Schneiders, Katrijn Alaerts, Helen Michels, Maarten Stevens, Peter Van Gossum, Wouter Van Reeth, Inne Vught

33 p.
D/2021/3241/050
ISBN:9789040304286
doi.org/10.21436/inbom.33571965
Mededelingen van het Instituut voor Natuur- en Bosonderzoek 2021 (1)

Citation wording: Schneiders A., Alaerts K., Michels H., Stevens M., Van Gossum P., Van Reeth W., Vught I. (2021). Nature Report Flanders 2020: Facts and figures for a new biodiversity policy. Mededelingen van het Instituut voor Natuur- en Bosonderzoek 2021 (1). Brussel

Distribution: Research Institute for Nature and Forest (INBO)
Concept & copywriting: Pantarein Publishing
Lay-out: The Oval Office
Translation: Lu's Paragraph
Infographics and figures: Pantarein Publishing
Photos: Vildaphoto - iStock: p. 19 - Kevin Scheers: p. 17.

Responsible publisher: Maurice Hoffmann, Research Institute for Nature and Forest (INBO), Herman Teirlinckgebouw, Havenlaan 88 bus 73, 1000 Brussel

This publication is the English translation of the executive summary of the Natuurrapport 2020: feiten en cijfers voor een nieuw biodiversiteitsbeleid. The rest of that publication is only available in Dutch.

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