CONCLUSION

Whether in terms of air quality, water and soil quality or the status of fauna, flora and natural habitats, policies at the international and regional levels have led to significant improvements. In all cases, however, efforts must be continued, whether to combat increasing or difficult to attenuate pressures, to meet more stringent quality requirements in the light of evolving knowledge of the health and environmental impacts of certain pressure factors, or to take into account certain inertia phenomena that delay the effects of the corrective measures put in place.

Towards more ambitious air quality improvement targets

Improving air quality is an important health and environmental issue. Air quality degradation can affect not only human health but also the functioning of certain ecosystems at local, regional or international levels. Since the 1990s, air emissions of various pollutants (GHGs[1], SO_x[2], NO_x[3], NH_3[4], VOCs[5], PM[6], TMs[7], ODSs[8]) have declined significantly in Wallonia, leading to an overall improvement in air quality, even if pollution peaks are still sporadically observed. This reduction enables Wallonia to comply with the objectives set by European legislation and various international protocols. While structural factors have certainly contributed to this trend (improved performance of boilers, engines, industrial processes and waste treatment, the widespread use of catalytic converters, the use of cleaner fuels and the development of renewable energies and cogeneration, etc.), the economic situation (financial and economic crisis, lower energy consumption, companies closures, etc.) has also contributed. For example, the adoption in 2016 of a sectoral charter aimed at reducing emissions of dust and fine particulate matter from quarries in Wallonia illustrates the sector's commitment to this issue. However, the structural efforts will need to be continued if Wallonia is to meet the more ambitious objectives that will be set for the future, whether these are the objectives laid down in the context of a more proactive Walloon policy ("climate" Decree of 20/02/2014, Air Climate Energy Plan 2016-2022 (*Plan air climat énergie 2016-2022*) and the Energy Climate Plan 2030 (*Plan énergie climat 2030*), in development) or those imposed by European legislation (policy framework for climate and energy in the period from 2020 to 2030 (COM (2014) 15), Directive (EU) 2016/2284) and the revision of certain international protocols and conventions (Gothenburg Protocol, Paris Agreement). Efforts will have to be maintained to meet the new targets to reduce (i) GHG emissions by 30% by 2020 or 80-95% by 2050 compared to 1990 laid down under the "climate" Decree of 20/02/2014, (ii) the following five pollutants: NO_x, SO_2[9], NH_3, VOCs and $PM_{2.5}$ by 2020 and 2030 compared to 2005, laid down in Directive (EU) 2016/2284. This implies a revision of the Air Climate Energy Plan 2016-2022 and a strengthening of the measures it contains.

AIR 1 Emissions of greenhouse gases	Anthropogenic GHG emissions play a major role in climate change. In Wallonia, they fell by 36.6% between 1990 and 2014, despite the increase in emissions from road transport.	
	⊕	**Slightly unfavourable status** —Reference: Political agreement on intra-Belgian Burden Sharing of 04/12/2015 (Decision No 406/2009/EC) — In Wallonia, emissions from non-ETS sectors[10] in 2013 and 2014 were below the targets defined by the linear path of a 14.7% reduction in 2020 compared to 2005. These results are mainly due to contextual factors. It should be noted that in 2014, Wallonia emitted 35,506 kt CO_2 eq of GHGs (-36.6% compared to 1990 emissions). The objective for Belgium under the Doha Amendment to the Kyoto Protocol is to reduce emissions by 20% by 2020 compared to the base year (1990).
		Trend towards improvement Between 1990 and 2014, GHG emissions decreased by 36.6%.
AIR 2 Emissions of acidifying pollutants	SO_x, NO_x and NH_3 contribute to acid deposition. The European reduction targets and the measures implemented in Wallonia have made it possible to reduce their emissions.	
	⊕	**Slightly unfavourable status** — Reference: Directive 2001/81/EC — In 2014, Wallonia emitted 3,231 t Aeq of acidifying substances. Adjustments made at national level and granted by Europe for NO_x from 2010 to 2014 in the transport and agricultural sectors enabled Belgium to comply with overall emission ceilings. This compliance with the ceilings is linked in particular to contextual factors.
		Trend towards improvement Between 1990 and 2014, air emissions of acidifying pollutants decreased by 61%.

[1] Greenhouse gases | [2] Sulphur oxides | [3] Nitrogen oxides | [4] Ammonia | [5] Volatile organic compounds | [6] Airborne particulate matter | [7] Trace metals | [8] Ozone-depleting substances | [9] Sulphur dioxide | [10] Emissions Trading Scheme

AIR 3 Emissions of tropospheric ozone precursors	NO_x and VOCs are involved in complex reactions which form tropospheric O_3[10], a pollutant harmful to health and the environment. The European reduction targets and the measures implemented in Wallonia have made it possible to reduce their emissions.	
	⊕	**Slightly unfavourable status** —— Reference: Directive 2001/81/EC ——In 2014, Wallonia emitted 138 kt VOC eq of tropospheric O_3 precursors. Adjustments made at national level and granted by Europe for NO_x from 2010 to 2014 in the transport and agricultural sectors, and for VOCs in 2010 in the agricultural sector, enabled Belgium to comply with overall emission ceilings. This compliance with the ceilings is linked in particular to contextual factors.
		Trend towards improvement Between 1990 and 2014, atmospheric emissions of tropospheric O_3 precursors decreased by 54%.
AIR 4 Emissions of fine particulate matter	Airborne particulate matter has adverse health effects. The measures implemented in Wallonia have made it possible to reduce their emissions.	
	⊕	**Assessment of status not achievable** —— No reference
		Trend towards improvement Between 2000 and 2014, total suspended particles (TSP), PM_{10} and $PM_{2.5}$ emissions decreased by 53%, 49% and 49% respectively. These reductions are linked to contextual factors and the measures taken in the context of environmental permits to reduce particulate matter.
AIR 5 Emissions of micropollutants	TMs, dioxins, furans and PAHs[11] are micropollutants which are toxic to health and the environment. Measures taken at international level and implemented in Wallonia *via* environmental permits have made it possible to reduce their emissions.	
	⊕	**Assessment of status not achievable** —— No reference
		Trend towards improvement Between 1990 and 2014, emissions of TMs, dioxins, furans and PAHs decreased by 80%, 92% and 91% respectively. These reductions are linked to contextual factors and the strengthening of environmental permits in terms of limiting emissions.
AIR 6 Destruction of the ozone layer	Emissions of ODSs are responsible for the destruction of the O_3 layer, which plays an essential role in protecting against UV radiation. Since 1995, they have declined in Wallonia, mainly as a result of the application of international and European regulations.	
	⊕	**Favourable status** —— Reference: Montreal Protocol —— In 2014, Walloon emissions of ODSs were 50.2 t CFC-11 eq, following the limitation and subsequent ban on the production and use of ODSs.
		Trend towards improvement Between 1995 and 2014, Walloon emissions of ODSs were reduced by 90%.
AIR 7 Ozone in ambient air (vegetation and forest)	The oxidising properties of O_3 interfere with plant growth. Appearing in hot and sunny weather, the peaks of O_3 are formed from precursor gases of O_3 (NO_x, VOCs) whose emissions are decreasing thanks to the measures of the Air-Climate Plan (2008-2012) and the Programme for the Progressive Reduction of Emissions of SO_2, NO_x, VOCs and NH_3 (Walloon Government Decree of 25/03/2004).	
	⊕	**Favourable status** —— Reference: Directive 2008/50/EC ——In 2014, all O_3 monitoring stations met the European target value for O_3 exceedance (AOT40 vegetation). However, the long-term objective (unspecified deadline) was met for only 2 out of 15 stations.
		Trend towards improvement Since 2006, a year which was rich in O_3, the O_3 exceedance has been decreasing. Between 2011 and 2014, the AOT40 vegetation and AOT40 forest were at their lowest levels since 2000. This improvement may mask pollution peaks in some years depending on climatic conditions.

[10] Ozone | [11] Polycyclic aromatic hydrocarbons

CONCLUSION

AIR 8 Ozone in ambient air (health)	The oxidising properties of O_3 can affect the respiratory system. Appearing in hot and sunny weather, the peaks of O_3 are formed from precursor gases of O_3 (NO_x, VOCs) whose emissions are decreasing thanks to the measures of the Air-Climate Plan (2008-2012) and the Programme for the Progressive Reduction of Emissions of SO_2, NO_x, VOCs and NH_3 (Walloon Government Decree of 25/03/2004).	
	●	**Favourable status** —— Reference: Directive 2008/50/EC —— In 2014, the standard was met for all measuring stations (max. 25 days above the target value on average over 3 years). The information and alert thresholds have never been exceeded.
		Overall stable trend Although the annual average concentration tended to decrease over the period 2000-2014, pollution peaks are still observed in some years depending on climatic conditions.
AIR 9 Acidifying pollutants in ambient air	Today, SO_2 and NO_2 are no longer pollutants of concern to human health, except for local exposure from certain industrial activities (SO_2) or urban areas (NO_2).	
	⊕	**Favourable status** —— Reference: Directive 2008/50/EC ——In 2014, concentrations of acidifying pollutants (SO_2 and NO_2) in ambient air were below the limit values for all measuring stations.
		Trend towards improvement Since the early 1990s, annual mean concentrations of SO_2 have dropped sharply to below 4 µg/m³ in 2014 for almost all measuring stations. Annual mean concentrations of NO_2 decreased between 2001 and 2014 from 19% to 57% depending on the measuring station in question, with the exception of the Mons station.
AIR 10 Particulate matter in ambient air	PM in ambient air has an impact on the respiratory and cardiovascular systems. Although the annual mean concentrations of PM_{10} and $PM_{2.5}$ tend to decrease, pollution peaks are observed in some years.	
	⊕	**Slightly unfavourable status** —— Reference: Directive 2008/50/EC ——In 2014, the annual mean concentrations of PM_{10} and $PM_{2.5}$ were below the European standards for all stations. All PM_{10} monitoring stations recorded exceedances of the daily limit value (50 µg/m³) defined for PM_{10} only. For 1 out of 22 stations, the number of exceedance days was greater than 35, the maximum number allowed.
		Trend towards improvement Between 2005 and 2014, the annual mean concentrations of PM_{10} decreased from 23 to 66% depending on the location of the station. The number of days on which the daily limit value was exceeded also decreased. $PM_{2.5}$ decreased from 15 to 37% between 2008 and 2014.
AIR 11 Micropollutants in ambient air	Annual mean concentrations of TMs and organic micropollutants in ambient air are sometimes of concern locally, near emitting industries (TMs, PAHs) or in areas of high road traffic density (benzene, PAHs).	
	⊕	**Favourable status** —— Reference: (i) Directive 2004/107/EC, (ii) Directive 2008/50/EC ——In 2014, for all monitoring stations, the European target value was met for Ni[12], As[13], benzo(a)pyrene and the European limit value was met for Pb[14] and benzene. For Cd[15], the European target value was met in 16 out of 17 stations. These results are partly related to the economic climate.
		Trend towards improvement Annual mean concentrations decreased between 2007 and 2014 for TMs and between 2004 and 2014 for benzo(a)pyrene (PAH). For benzene, annual mean concentrations increased slightly between 2002 and 2014.
AIR Focus 1 Recent evolution of the regional climate	The assessment of climate trends for the period 1954-2015 indicates an average temperature increase (T°) of more than 1°C compared to the period 1961-1990, which is most noticeable in spring and summer. There is no clear trend for rainfall levels.	
AIR Focus 2 Future evolution of the regional climate	Regional simulations leading up to 2100 compared to 1976-2005 indicate an increase in T° of about 2°C for the scenario with a moderate increase in GHGs and about 3.5°C for the scenario with a large increase in GHGs. The simulations indicate an increase in rainfall levels of 7-8%.	

[12] Nickel | [13] Arsenic | [14] Lead | [15] Cadmium

Very gradual improvement of water quality

Assessments for the period 2010-2015 indicate that 55% of surface water bodies do not have good status/ecological potential. For the period 2009-2013, 39% of Walloon groundwater bodies generally did not have good status within the meaning of the Water Framework Directive 2000/60/EC. However, the first River Basin Management Plans (RBMPs) had the objective of limiting these proportions to 49% (surface water) and 30% (groundwater) by the end of 2015. The second RBMPs aim to reduce these proportions to 42% (surface water) and 33% (groundwater) by 2021. The situation is particularly difficult to improve in the Scheldt river basin district and in some of the sub-basins of the Meuse, which are characterised by high population densities and major agricultural and industrial activities.

Biological indicators do not show any marked improvement in the ecological quality of water, despite efforts to reduce point source discharges of pollutants from industries and urban agglomerations. Diffuse inputs remain difficult to control even if a reduction in nitrogen and phosphorus flows to water bodies is observed, thanks to various factors, in particular the reduction of fertiliser inputs. With regard to nitrogen, the Sustainable Management Programme for Nitrogen in Agriculture (*Programme de gestion durable de l'azote en agriculture - PGDA*) (Walloon Government Decree of 13/06/2014) plays an important role in reducing pressures.

The various components of the water cycle are subject to more or less pronounced contamination by micropollutants (pesticides, trace metals, PAHs[16], medicine residues, etc.). From a legislative standpoint, new tools have been put in place at European level to monitor this phenomenon more closely. As such, in the case of surface water, Wallonia will need to monitor 12 new priority substances by the end of 2018 (Directive 2013/39/EU) and monitor substances on the first *watch list* drawn up by the Commission in 2015. At regional level, the Walloon Pesticide Reduction Programme 2018-2022 (*Programme wallon de réduction des pesticides 2018-2022*), which is currently being developed, should propose new measures to protect the aquatic environment from pesticides. As regards public drinking water, a new approach based on health risk management is now being promoted through Water Safety Plans. These plans will allow producers who wish to adapt water quality controls according to a risk assessment adapted to each water distribution zone. Concerning emerging pollutants, Wallonia is currently finalising a study to assess the presence of medicine residues in the various components of the water cycle (IMHOTEP project[17]). Initial results for drinking water indicate a low level of contamination. Various research projects to assess the presence of emerging pollutants and/or their effects on aquatic ecosystems are currently underway in Wallonia (BIODIEN[18], SEMTEP and DIADeM[19] projects).

The evolution of water quality is highly dependent on:

- in the short term, meteorological factors (runoff after fertiliser spreading, rising and falling groundwater levels, dilution and concentration of pollutants according to the flow rate of water courses, etc.);
- in the long-term, exchange dynamics with soils (for groundwater and surface water) and suspended matter (SM) and sediments (for surface water) that act both as an accumulation well and as a secondary source of various pollutants.

Improving the quality of ground and surface water therefore also means preserving soil quality. The quality of surface water also depends on the reduction of SM inputs (e.g., the fight against soil and bank erosion), the improvement of their quality (e.g., waste water treatment and the fight against diffuse pollution) and the management of sediments in certain sectors to prevent them from contaminating larger areas after becoming suspended again. The SM content of Walloon rivers fell slightly over the period 2006-2015. However, although around 2/3 of the sediments extracted from navigable waterways are polluted, the presence of recent unpolluted, or only slightly polluted, deposits on older beds in some locations suggests that the quality is improving.

Finally, it should be noted that improvements in water quality take time, particularly due to long ground-to-groundwater transfer times or slow restoration of aquatic ecosystems.

[16] Polycyclic aromatic hydrocarbons | [17] Inventory of trace hormonal and organic substances in patrimonial and drinking water | [18] http://www.cra.wallonie.be/fr/les-projets/biodien | [19] http://www.univ-reims.fr/minisite_152/

CONCLUSION

WATER 1 Status of water bodies	The 2015 target of achieving good status of surface and groundwater bodies required by the Water Framework Directive 2000/60/EC, and included in the first RBMPs, has not been achieved. This target has been postponed to 2021 or 2027.	
	?	**Unfavourable status** —— Reference: Water Framework Directive 2000/60/EC (water bodies in a good status or with good potential) —— Assessments carried out over the period 2010 - 2015 show that 41% of surface water bodies are in good or high ecological status and 55% are not in good ecological status. Assessments carried out over the period 2009 - 2013 show that 61% of groundwater bodies are in good chemical status and 39% of groundwater bodies are not.
		Assessment of trend not achievable The ecological and chemical status of surface water bodies are assessed separately, whereas their status was previously assessed overall. In addition, methodological changes in the assessment of chemical status do not allow the trend to be assessed. The chemical status of groundwater bodies was stable between 2005 - 2008 and 2009 - 2013.
WATER 2 Flows of major water courses	Variations in the flows of water courses, which themselves are linked to rainfall, affect the ecological and chemical status of water courses (e.g., pollutant concentrations and low oxygenation of water during low-water periods).	
	?	**Assessment of status not achievable** —— No reference
		Assessment of trend not-relevant A single assessment for all water courses is not relevant.
WATER 3 Biological status of surface water bodies	The assessment of the biological status of surface water bodies (SWB) is based on four indicator groups (diatoms, macrophytes, macroinvertebrates and fish). Nearly half of the SWBs are considered to be in good or high biological status. The poorer quality SWBs are located mainly north of the Sambre-et-Meuse line.	
	?	**Unfavourable status** —— Reference: Water Framework Directive 2000/60/EC (water bodies in a good biological status) —— In 2015, 47% of the SWBs assessed had good or high overall biological quality.
		Assessment of trend not achievable Between 2011 and 2015, the proportion of SWBs in the various status classes remained stable overall. However, the time series is not long enough to assess the trend.
WATER 4 Pollutant loads discharged into water courses	Domestic and industrial pollutant loads discharged into water courses are decreasing, while diffuse inputs (water runoff) are more difficult to control.	
	+	**Assessment of status not achievable** —— No reference ——There is no reference value in the strict sense for flows of C[20], N[21] and P[22] to water bodies or for industrial pollutant loads discharged into surface water. The intensity of these flows nevertheless affects the water status (eutrophication, pollution by NH_4^+ [23] and NO_3^- [24]), which is considered slightly unfavourable.
		Trend towards improvement Between 1993 and 2015, pollutant loads of C, N and P from runoff to land, urban waste water discharges, industrial discharges and cattle inputs decreased.
WATER 5 Eutrophication of water courses	Water courses affected by eutrophication due to excessive nitrogen inputs may not achieve the good ecological status required by the Water Framework Directive. The problem is more acute north of the Sambre-et-Meuse line.	
	+	**Slightly unfavourable status** —— Reference: Water Code - standards of the Walloon Government Decree of 13/09/2012 (90th percentile of annual concentrations) —— Over the period 2013 - 2015, the proportion of all monitoring sites where orthophosphate concentrations indicated bad to poor water quality was 16.3%.
		Trend towards improvement Between 1996 and 2015, the percentage of monitoring sites with bad to poor quality water decreased by an average of about 1% per year, despite interannual variations.

[20] Carbon | [21] Nitrogen | [22] Phosphorus | [23] Ammonium | [24] Nitrate

WATER 6 Nitrogenous matter content in water courses	High levels of nitrogenous matter disturb aquatic ecosystems. The waters of the Scheldt basin are more affected in this respect. However, concentrations have been reduced thanks in particular to the measures included in the PGDA (Walloon Government Decree of 13/06/2014) and progress made in urban waste water treatment.	
	⊕	**Slightly unfavourable status** —— Reference: Water Code (*Code de l'eau*) - standards of the Walloon Government Decree of 13/09/2012 (90th percentile of annual concentrations) ——Over the period 2013-2015, the proportion of all monitoring sites where NH_4^+ concentrations indicated bad to poor water quality was 15.1%. The situation was not a concern as regards NO_3^-.
		Trend towards improvement Between 1998 and 2015, the percentage of common monitoring sites with bad to poor quality water (as regards the parameter NH_4^+) decreased by an average of about 1% per year, despite interannual variations. For NO_3^-, the situation was stable.
WATER 7 Organic pollutant content in water courses	The organic pollution of water courses assessed by BOD_5 and COD is higher in the Scheldt basin. However, it declined everywhere in Wallonia between 1996 and 2015.	
	⊕	**Favourable status** —— Reference: Water Code (*Code de l'eau*) - standards of the Walloon Government Decree of 13/09/2012 (90th percentile of annual concentrations) ——Over the period 2013-2015, the proportion of all monitoring sites where BOD_5 indicated bad to poor water quality was 2.7%.
		Trend towards improvement Between 1996 and 2015, the percentage of common monitoring sites with bad to poor quality water as regards BOD_5 decreased by an average of around 0.3% per year.
WATER 8 Micropollutants in surface water	Wallonia has a monitoring network of rivers within which the concentrations of about a hundred micropollutants are measured periodically.	
	?	**Slightly unfavourable status** ——Reference: Directive 2013/39/EU, annexes X*bis* and X*ter* of the regulatory part of the Water Code (*Code de l'eau*) —— The assessment is carried out taking into account the new environmental quality standards (EQS) for 7 priority substances and the monitoring of certain new priority substances. In 2015, 2.9% and 3.2% of the analytical results were above the EQS for annual average values and annual maximum values, respectively.
		Assessment of trend not-relevant Directive 2013/39/EU established new EQS for 7 priority substances and added 12 new priority substances to the existing 33. The presented evolution over time does not take these new substances into account. These results are likely to underestimate non-conformities and the trend assessment is therefore not relevant.
WATER 9 Hydromorphological quality of surface water bodies	Overall, rivers suffer from significant hydromorphological alteration which is detrimental to the development and maintenance of natural living communities.	
	?	**Unfavourable status** —— Reference: Water Framework Directive 2000/60/EC (water bodies in a good status or with good potential) ——Although hydromorphological parameters are *strictly speaking* only relevant for the definition of high ecological status, they contribute to the good ecological status required by Directive 2000/60/EC. In 2013, 40% of all water bodies had an overall hydromorphological quality index of bad to moderate, and 27% of natural water bodies had an overall hydromorphological quality index of moderate.
		Assessment of trend not achievable A comparison with previous data is not feasible due to methodological changes.
WATER 10 Quality of bathing water	Wallonia has 33 official bathing areas. In 2016, microbiological quality was in conformity for 25 of these areas.	
	⊕	**Slightly favourable status** —— Reference: Directive 2006/7/EC —— In 2016, the proportion of bathing areas with at least sufficient quality was 76%.
		Trend towards improvement Between 2010 and 2016, the number of bathing areas with at least sufficient water quality increased from 56% (20 out of 36 bathing areas) to 76% (25 out of 33); the number of bathing areas with excellent water quality increased from 28% (10 out of 36) to 52% (17 out of 33).

WATER 11 Suspended matter in surface water	SM levels in water courses are linked to inputs of particulate matter by water erosion of soils and banks, to which are added point source inputs. Preventive measures are included in the River Basin Management Plans and Flood Risk Management Plans to reduce SM inputs and improve the quality of water courses.	
	⊕	**Slightly unfavourable status** —— Reference: Walloon Government Decree of 13/09/2012 —— In 2015, 79% of the 210 monitoring sites sampled had good to high water quality in terms of SM contents.
		Trend towards improvement Between 2006 and 2015, the proportion of sites with good to high status increased. This evolution masks important one-off variations in time and space (rainy events).
WATER 12 Sediment in water courses and waterways	Sediment deposits no longer hamper navigation but the margin of safety remains low. Some sectors of waterways would benefit from remediation to avoid the shifting of polluted sediments, which would result in higher future management costs.	
	?	**Assessment of status not achievable** —— No reference
		Assessment of trend not relevant The various elements of this issue (deposit, sediment quality from the standpoint of sediment management, sediment quality from the standpoint of their impacts on aquatic ecosystems, contrasting situations and challenges of sediments in navigable and non-navigable waterways, etc.) make it impossible to assess a single trend.
WATER 13 Nitrate content in groundwater	Concentrations of NO_3^- in groundwater need to be monitored so that the drinking water standard is not exceeded. Special measures are taken in vulnerable zones, which cover 58% of the territory.	
	⊕	**Slightly unfavourable status** —— Reference: Directive 91/676/EEC —— Between 2012 and 2015, 8% of the monitoring sites spread across the Walloon territory had an average NO_3^- content higher than the drinking water standard (50 mg NO_3^-/l).
		Trend towards improvement Between 2004 and 2015, the percentage of sites not in conformity decreased from 9.5% to 8.2%. Moreover, a statistical study carried out (EPHESIA, 2014) revealed that three quarters of sites with NO_3^- concentrations above 50 mg/l in 2013 showed a favourable evolution.
WATER 14 Pesticides in groundwater	Between 2005 and 2014, pesticides were present in measurable concentrations in around ⅔ of groundwater quality monitoring sites.	
	●	**Slightly unfavourable status** —— Reference: SEQ-ESO (SPW - DGO3 - DEE & DEMNA, 2016) —— Over the period 2011-2014, 17.4% of monitoring sites had water for which the patrimonial quality[25] was rated as bad to moderate.
		Overall stable trend Between 2005 and 2014, the percentage of monitoring sites with bad to moderate patrimonial water quality in terms of pesticide concentrations remained relatively constant.
WATER 15 Compliance of public drinking water vis-à-vis pesticides	Water supplied by the public distribution system must meet drinking water standards, in particular as regards pesticide concentrations. Annual monitoring programmes show that a small proportion of non-compliances are linked to pesticides.	
	●	**Favourable status** —— Reference: Directive 98/83/EC —— In 2014, the compliance rate for public drinking water vis-à-vis pesticides was 99.97%.
		Overall stable trend Between 2005 and 2014, the compliance rate for public drinking water vis-à-vis pesticides fluctuated between 99.62% and 99.97%. Although an improvement in this rate was noticeable between 2011 and 2014, the time scale is not long enough to determine an improving trend.
WATER Focus 1 Emerging pollutants in drinkable water	The IMHOTEP research programme aims to measure the concentrations of 42 medicine residues in various components of the water cycle in Wallonia, in order to draw up an inventory of the problem. Contamination levels in drinkable water are low.	

[25] Quality classes SEQ-ESO patrimonial status. The patrimonial status expresses the degree of water degradation relative to a quasi-natural state, without reference to any use.

Soils affected by human activity, pending more integrated policies

Throughout Europe, soils are subject to a certain number of pressures and threats (decrease in the organic matter content of agricultural soils, erosion, point source and diffuse pollution, compaction, sealing, loss of biodiversity, etc.) which they can only withstand within certain limits, given their non-renewable nature which is related to the time required for their formation or restoration. In Wallonia, around 22% of the cultivated area is affected by organic matter deficiencies leading to risks of soil structure degradation (organic carbon content < 1.15%), with negative consequences for soil erosion resistance, fertility and purification capacity. This situation can contribute to significant soil losses through water erosion, especially in loamy and sandy-loamy areas where anti-erosive farming practices and remedial solutions need to be continued and bolstered, while ensuring an improvement in the organic status of soils. Pollution from point sources, mainly linked to Wallonia's industrial past, has in recent years been the subject of strengthened management measures using legislative and financial tools (see part 7). With regard to diffuse pollution, nitrogen flows from agricultural soils to groundwater and surface water have decreased by more than 30% in 20 years thanks to a decrease in soil inputs and measures from the Programme for the Sustainable Management Programme for Nitrogen in Agriculture (*Programme pour la gestion durable de l'azote en agriculture - PGDA*) (Walloon Government Decree of 13/06/2014). However, nitrate levels in soils are still too high in 7% of the territory where agricultural pressures are high. Phosphorus flows from agricultural soils to surface waters do not yet appear to be following the sharp drop in inputs observed over the last 20 years. As regards compaction, risks can be assessed and greatly reduced if preventive measures are followed. As regards soil sealing, Wallonia has a high rate of soil sealing (7.2% in 2007) compared to other European countries, which is at least partly explained by a high population density. The establishment of binding targets seems to be essential in the fight against the phenomenon.

Faced with all these problems and given the non-renewable nature of soils, soil protection policies incorporating the principles of prevention, precaution and sustainable management are essential to ensure that soils can continue to perform various fundamental functions, in particular environmental functions (regulation and filtration of water flows, regulation and sequestration of carbon, habitat and biodiversity reservoir, seat of biogeochemical nutrient cycles, etc.) and economic functions (biomass production, a source of raw materials, support for human activities, etc.). However, unlike the other components of the environment (air, water), there is currently no comprehensive plan for the conservation or improvement of soil conditions at European or regional level. In Wallonia, soil protection is ensured by specific actions implemented in a wide variety of regulatory contexts that directly or indirectly target soil[26]. The diversity of these tools is linked to the key role that soils play in the environment and the many functions they perform, as well as the degradations they undergo and the human activities in question, whether impacting or impacted. This underlines the importance and difficulty of integrating and coordinating these instruments in order to ensure that all aspects of soil protection are taken into account in a coherent manner.

[26] E.g.: Decree of 05/12/2008 on soil management, Walloon Government Decree of 12/01/1995 on the use of sewage sludge on or in soils, PGDA (Walloon Government Decree of 13/06/2014), the cross-compliance of agricultural aids, agri-environmental programmes, the Walloon Pesticide Reduction Programme 2013-2017, the Water Code, the River Basin Management Plans, Decree of 15/07/2008 on the Forestry Code, Flood Risk Management Plan, Territorial Development Code, Air Climate Energy Plan 2016-2022, Walloon Waste-Resources Plan, Decree of 11/03/1999 on environmental permits, etc.

CONCLUSION

SOILS 1 Atmospheric deposits of dust and metallic trace elements	Atmospheric deposition of dust and trace metals is measured near the most emitting industries. However, these deposits are not representative of the overall level of contamination at the regional level.	
	⊕	**Slightly unfavourable status** —— Reference: TA Luft, 2002 ——In 2014, exceedances of guideline values were observed for 2 of the 7 pollutants monitored: Ni[27] in Ath, Charleroi and Farciennes (3 industrial groups) and Cd[28] in Ath and Engis (2 industrial groups).
		Trend towards improvement Between 2001 and 2014, dust and trace metals deposits near the most polluting infrastructures decreased by 33 to 76% depending on the type of deposition.
SOILS 2 Organic matter in agricultural soils	The presence of sufficient quantities of organic matter (OM) in soils, as estimated by soil organic carbon (SOC) contents, is essential for their functioning and the services they provide. Deficiencies in OM are observed in soils under crops.	
	⊖	**Unfavourable status** ——Reference: Van-Camp *et al.* (2004). Concentrations of OM < 2% (≈ SOC content < 1.15%) make aggregates unstable. The threshold is 1.5% of SOC according to Le Villio *et al.* (2001). —— Over the period 2004-2014, 22% of the area under crops contained SOC contents < 1.15%; 73% contained SOC contents < 1.5%.
		Trend towards deterioration Between the periods 1949-1972 and 2004-2014, SOC contents under crops decreased by an average of 20% across all agricultural regions.
SOILS 3 Water erosion of soils	In 2015, soil losses due to water erosion were estimated at 2.5 t/ha on average across the Walloon territory. Field crop regions were the most affected. Erosion control measures have been implemented.	
	?	**Unfavourable status** ——Reference: unsustainable erosion threshold set at 5 t/(ha.year) (Panagos *et al.*, 2015) —— In 2015, the share of agricultural land with soil losses > 5 t/(ha.year) was estimated at 35%.
		Assessment of trend not achievable The share of agricultural area with soil losses in excess of 5 t/(ha.year) decreased by 21% over the period 2006-2015 according to the regression curve, which is questionable given the high annual variability. However, on the ground, no improvement is confirmed at this stage.
SOILS 4 Nitrogen and phosphorus fluxes from agricultural soils	Nitrogen (N) from soils that is in excess of the needs of plants is transferred to groundwater. The nitrate concentration of waters percolating under the root zone exceeds the drinking water standard in 7% of the territory. Phosphorus (P) is carried away by runoff and erosion to surface waters, where it is a major eutrophying factor.	
	?	**Assessment of status not achievable** —— No reference —— Although there is no strict reference value for N and P fluxes from soils to water bodies, the intensity of these fluxes affects the water status (eutrophication, ammoniacal N and nitrate), which is considered slightly unfavourable.
		Assessment of trend not achievable N fluxes decreased by more than 30% between 1991-1995 and 2011-2015. However, P fluxes do not show a net downward trend.
SOILS Focus 1 Soil sealing	According to a recent study by the ULB (ULB - IGEAT - ANAGÉO, 2015), the soil sealing rate in Wallonia was 7.2% in 2007. However, this level varied significantly from one Walloon municipality to the next (from 3.7% to 26.4%).	
SOILS Focus 2 Compaction of agricultural and forestry soils	The deterioration of soil structure by compaction is mainly related to the passage of heavy machinery on fine-textured, poorly structured and wet soils. The most sensitive areas are generally the loamy, barely stony loamy soils of the central part of the Ardenne and the northern part of the north-eastern Ardenne. Preventive measures make it possible to reduce this phenomenon.	
SOILS Focus 3 Biological soil quality	Current research is aimed at developing a set of biological soil indicators adapted to the Walloon context. These indicators capture soil biological activity, provide an integrated measure of the ecological conditions of soils, and provide early warning of potential environmental disturbances.	

[27] Nickel | [28] Cadmium

CONCLUSION

Status of fauna, flora and natural habitats: progress is being made but efforts are still needed

Over the period 2007-2012, the conservation status of natural habitats of Community interest was considered unfavourable for 88% of the number of habitats concerned in the Continental biogeographical region (CBR) and 96% in the Atlantic biogeographical region (ABR). As regards species, conservation status was considered unfavourable for 63% of the number of species concerned in CBR and 71% in ABR. Moreover, according to the red lists drawn up for different groups of species, 31% of the animal and plant species studied are threatened with extinction at the Walloon level, and almost 9% have already disappeared from the regional territory according to assessments carried out over the period 2005-2010. For fish, reptiles, day butterflies and dragonflies, more than half of the species are in an unfavourable situation. The European objective of halting the loss of biodiversity by 2010 has therefore not been achieved in Wallonia. As regards avifauna, common bird populations are generally decreasing over the long term, and species from agricultural environments have shown the most marked decrease. A new indicator shows the increasing impact of climate change on bird populations. Other pressures on habitats and species include agricultural intensification, fragmentation and artificialisation of habitats, the incidence of pollution such as eutrophication, and the presence of invasive alien species.

However, progress has been made: according to a new indicator established for bats, populations of the species monitored show an overall increasing trend between 1995 and 2016. Although the total numbers remain far removed from those observed in the 1950s, these increases are encouraging. Another important advance: areas of forest and semi-natural vegetation affected by critical load exceedances of acidifying pollutants remain close to 0. As regards eutrophying nitrogen, the situation for forests has also improved markedly. However, other semi-natural ecosystems (especially oligotrophic environments) remain mostly affected by exceedances of critical loads of eutrophying nitrogen.

As regards the forest environment, forestry practices are gradually adapting but progress still needs to be made: the quantity of deadwood in 2015 was still too low within the meaning of the Decree of 15/07/2008 on the Forestry Code (*Code forestier*). The quantity of coarse wood and the specific diversity of stands are also low. The continued increase in wild ungulate populations over the past several decades has posed both environmental and economic problems in forestry and agriculture. However, a recent downward trend has been observed. Nonetheless, this development should be considered with caution due to the uncertainties associated with counting methods and partial data. In order to ensure a balance between forests and ungulates, stability of the measures implemented should be ensured.

Progress therefore remains to be made towards meeting the targets set out in the Biodiversity Strategy to 2020, which aims to protect and improve the state of biodiversity and reduce the strongest pressures. The establishment of the Natura 2000 network is now complete in Wallonia and conservation objectives have been set by the Walloon Government. The network must now be managed by implementing management plans and conservation and restoration measures for all Natura 2000 sites. The aim of the new nature integrated projet developed at the Belgian level is to define and implement a strategy to achieve the objectives set by the European directives. This will enable restoration and management programmes to be drawn up and monitoring tools to be developed. With regards to invasive alien species, a new European regulation (Regulation (EU) No 1143/2014) aims to provide a coordinated response by all Member States to the problem of biological invasions. The implementation of these regulations should lead to an improvement in the state of fauna, flora and habitats.

FFH 1 Conservation status of habitats of Community interest	For the period 2007-2012, the conservation status of habitats of Community interest was generally unfavourable due to a combination of factors. The implementation of a framework of priority actions (through the Belgian nature integrated projet) should enable the continuous and progressive improvement of conservation statuses with a view to achieving a favourable status.	
	?	**Unfavourable status** — Reference: (i) Directive 92/43/EEC, (ii) Biodiversity strategy to 2020 - target to halt the deterioration of the status of all species and habitats covered by EU legislation pertaining to nature, and to significantly and measurably improve their status by 2020. — For the period 2007-2012, 36 habitat types (out of 41 or 88%) in CBR and 26 (out of 27 or 96%) in ABR were in an unfavourable status.
		Assessment of trend not achievable For the period 2007-2012, in CBR, 43% of the number of unfavourable habitat types showed an improving trend; for 24%, the trend was unknown. In ABR, 46% of the number of unfavourable habitat types showed an unknown trend and 27% showed a deteriorating trend. Owing to the disparity of these results and the large number of habitats with unknown trends, it is difficult to establish an overall trend for Wallonia.

CONCLUSION

FFH 2 Health status of forests	Since the early 1980s, abnormal phenomena of defoliation of trees and discolouration of foliage have been observed in Walloon forests, as in most Central European forests.	
	⊖	**Unfavourable status** — Reference: (i) Decree of 15/07/2008 on the Forestry Code (Art. 1) - principle of maintaining the health and vitality of forests, (ii) Regulation (EC) No 1737/2006 - defoliation is considered abnormal if it exceeds 25% of leaf/needle loss (average to significant defoliation) — In 2015, 40% of deciduous trees and 17% of coniferous trees showed abnormal defoliation.
		Trend towards deterioration The percentage of abnormally defoliated trees showed an overall increase between 2000 and 2015 for both deciduous and coniferous trees. For deciduous trees, it increased from 12% to 40%; for coniferous trees, it increased from 12% to 34% between 2000 and 2014, before falling back to 17% in 2015.
FFH Focus 1 Phytosanitary and phenological data from the Walloon Observatory of Forest Health	According to data from the Walloon Observatory of Forest Health, the percentage of coniferous and deciduous trees with more than 25% defoliation showed a decrease between 2010 and 2015, which was particularly pronounced for deciduous trees. As regards the monitoring of phenology, the data collected do not yet allow a trend to be established, but provide indications of inter annual variations of phenological events.	
FFH 3 Indicators of biodiversity in forests	Various indicators of biodiversity in forests calculated for Walloon forests confirm their worrying status. However, current forestry practices increasingly take into account the objectives of maintaining and developing biodiversity.	
	⊕	**Unfavourable status** — Reference: Decree of 15/07/2008 on the Forestry Code (Art. 71) - objective of reserving 2 large deadwoods per hectare in public deciduous forest. In the absence of numerical targets for the other indicators, the assessment is based solely on the "deadwood" indicator. — In 2011 (central year of the period 2008-2015), the number of large deadwood per hectare in public deciduous forests was estimated at 0.60 per hectare.
		Trend towards improvement The volume of deadwood per hectare in Walloon forests increased between 2008 (7.8 m³/ha for 70% of the plots, 1st cycle of the Walloon Permanent Forest Resources Inventory (*Inventaire permanent des ressources forestières de Wallonie - IPRFW*)) and 2011 (10 m³/ha for 50% of the plots, 2nd cycle of IPRFW).
FFH 4 Exceedance of critical loads of acidifying and eutrophying pollutants	Acidifying compounds are no longer a problem for Walloon ecosystems, probably due to the drop in SO_x[29] and NO_x[30] emissions since 1990. However, deposits of eutrophying N[31] remain problematic for oligotrophic environments in particular. More ambitious emission reduction targets have been set from 2020 onwards.	
	⊕	**Assessment of status not achievable** — No reference — As regards acidifying N and S[32], the situation was no longer problematic, either for forests (less than 1% of the areas still affected by deposition exceeding the critical load in 2013) or for other semi-natural ecosystems (0%). As regards eutrophying N, 8% of forest areas and 93% of areas of other semi-natural ecosystems were still affected by exceedances.
		Trend towards improvement Between 1990 and 2013, the areas affected by atmospheric deposition of N and S exceeding the critical load decreased (in forests: -99.6% for acidifying S, -96% for acidifying N and -88% for eutrophying N; in semi-natural ecosystems: -100% for acidifying S and -7% for eutrophying N).
FFH Focus 2 Fragmentation of water courses	Obstacles to the free movement of fish have been recorded on Walloon water courses since 1997. In 2016, nearly 60% of these obstacles were considered significant to impassable, and 2% had been removed or managed. A programme to reintroduce Atlantic salmon into the Meuse basin was launched in the late 1980s. Returns of adult salmon to spawning grounds were observed in early 2000.	

[29] Sulphur oxides | [30] Nitrogen oxides | [31] Nitrogen | [32] Sulphur

CONCLUSION

FFH 5 Red lists of species	According to the assessments carried out between 2005 and 2010, nearly one third of the animal and plant species studied were threatened with extinction in Wallonia. More than half of species of fish, reptiles, day butterflies and dragonflies were in an unfavourable situation. The implementation of the Belgian nature integrated projet should contribute to the achievement of European biodiversity objectives.	
	?	**Unfavourable status** — Reference: (i) EU Biodiversity strategy to 2010 (COM (2006) 216), (ii) Biodiversity strategy to 2020 - target to halt the deterioration of the status of all species and habitats covered by EU legislation pertaining to nature, and to significantly and measurably improve their status by 2020. — According to the assessments carried out between 2005 and 2010, 31% of the animal and plant species studied (all groups combined) were threatened with extinction in Wallonia and almost 9% were already extinct.
		Assessment of trend not achievable Historical data are not usable.
FFH 6 Conservation status of species of Community interest	For the period 2007 - 2012, the conservation status of species of Community interest was generally unfavourable due to a combination of factors. The implementation of a framework of priority actions (through the Belgian nature integrated projet) should enable the continuous and progressive improvement of conservation statuses with a view to achieving a favourable status.	
	?	**Unfavourable status** — Reference: (i) Directive 92/43/EEC, (ii) Biodiversity strategy to 2020 - target to halt the deterioration of the status of all species and habitats covered by EU legislation pertaining to nature, and to significantly and measurably improve their status by 2020. — For the period 2007 - 2012, 42 species (out of 67 or 63%) in CBR and 34 species (out of 48 or 71%) in ABR were in an unfavourable status.
		Assessment of trend not achievable For the period 2007 - 2012, in the CBR, 40% of the species with unfavourable status showed a deteriorating trend; for 26%, the trend was unknown. In the ABR, 44% of the species with unfavourable status showed a deteriorating trend, and for 24%, the trend was unknown. Owing to the disparity of these results and the large number of species with unknown trends, it is difficult to establish an overall trend for Wallonia.
FFH 7 Evolution of honey bee populations	Since the late 1990s, honey bee populations have been declining in Belgium. Although fluctuating from one year to the next, their mortality rate in Wallonia clearly exceeds the acceptable mortality threshold. There are many factors behind this decline.	
	?	**Slightly unfavourable status** — Reference: Winter mortality threshold < 10% (Morgenthaler, 1968; EPILOBEE, 2016) — In 2013 - 2014, the winter mortality rate of honey bee colonies in Wallonia was 18.2% and 9.8% respectively, according to data from the Belgian beekeeping monitoring and the EPILOBEE study.
		Assessment of trend not achievable In 2004 - 2005 and over the period 2008 - 2014, the mortality rate for honey bees ranged from 17.0% to 34.6% according to data from the Belgian beekeeping monitoring. However, the trend cannot be evaluated because the time series is incomplete.
FFH 8 Population trends of common birds	The populations of common birds monitored in Wallonia are generally in long-term decline. Agricultural avifauna shows the largest decline.	
	−	**Unfavourable status** — Reference: (i) EU Biodiversity strategy to 2010 (COM (2006) 216), (ii) Biodiversity strategy to 2020 - target to halt the deterioration of the status of all species and habitats covered by EU legislation pertaining to nature, and to significantly and measurably improve their status by 2020. — Over the period 1990 - 2015, common bird populations were in decline for 41 of the 75 species monitored (55%).
		Trend towards deterioration The populations of common birds are generally in long-term decline: -25% between 1990 and 2015.
FFH Focus 3 Impact of climate change on birds	New indicators calculated for Wallonia have shown an impact of climate change on avifauna: the Community Temperature Index has increased slightly (+0.027°C per decade between 1990 and 2014) and has been correlated with a return northwards by communities of species. The indicator of climate impact on bird populations shows an increase since 2001, followed by a possible stabilisation which started in 2009.	

FFH 9 Population trends of bats	Populations of wintering bats having been monitored in a standardized way were mainly increasing between 1995 and 2016. However, the total numbers observed in 2016 remained low and far removed from those observed in the 1950s.	
	⊕	**Unfavourable status** —— Reference: (i) EU Biodiversity strategy to 2010 (COM (2006) 216), (ii) Biodiversity strategy to 2020 - target to halt the deterioration of the status of all species and habitats covered by EU legislation pertaining to nature, and to significantly and measurably improve their status by 2020. —— Over the period 1995-2016, bat populations increased for 12 of the 13 taxa monitored (92%). In 2016, the populations of bats in Wallonia were much lower than those observed in the 1950s. For the period 2007-2012, the status was unfavourable for 44% (8 out of 18) of chiroptera species in CBR and 56% (9 out of 16) in ABR; → FFH 6.
		Trend towards improvement The populations of the bats being monitored almost tripled between 1995 and 2016.
FFH Focus 4 Status of non-flying mammalian populations	Given the multiplicity of species and their behaviour, as well as their low detectability, mammals are a special group to be monitored. Some species are the subject of specific inventories in Wallonia, or the collection of presence indices. This is the case for badgers, pine martens and Western polecats. According to a standardised monitoring, following a decrease in 2009, no significant change in the badger population was observed between 2010 and 2016.	
FFH 10 Population trends of wild ungulates	Wild ungulate populations have shown a significant increase since 1980. The recent trend reversal observed is encouraging but should be viewed with caution due to uncertainties in census methods and partial data from 2013 to 2016.	
	⊕	**Unfavourable status** —— Reference: Strategy for the reduction of populations og big game in Wallonia - objectives for reducing wild boar populations by one third between 2012 and 2015 and reaching a population of 10,000 red deer in 2015. In the absence of a numerical target for roe deer, the condition assessment only takes into account red deer and wild boar species. —— Between 2012 and 2015, the number of wild boar in spring and before births decreased from 25,647 to 17,994, a reduction of 30%. Red deer numbers in spring and before births were estimated at 8,000 in 2015. However, despite these results, since the data are partial from 2013 to 2016 and this results in an underestimate, their status is considered unfavourable.
		Trend towards improvement In 2016, wild boar, red deer and roe deer numbers in the spring before births were estimated to be respectively 2.5 times, 1.4 times and 1.2 times higher than in 1980. This upward trend may be reversing: population declines of 6%/year between 2012 and 2016 for wild boar, 6%/year between 2010 and 2016 for red deer and 3%/year between 2005 and 2016 for roe deer.
FFH 11 Damage caused by wild ungulates	Populations of wild ungulates have increased significantly in recent decades. They cause damage to forests, agricultural parcels and biodiversity, which can be locally significant. Variability in the measures implemented over time has been observed. This is not optimal for managing the problem.	
	⊖	**Assessment of status not achievable** —— No reference —— Damage was observed between 2008 and 2015 in 21% of forest stands, 53% of plantations and 41% of areas undergoing natural regeneration.
		Trend towards deterioration Over the period 1994-2008, damage was observed on 17% of forest stands, 30% of plantations and 30% of areas undergoing natural regeneration. The situation has deteriorated.
FFH 12 Invasive alien species	European regulation (EU) No 1143/2014 establishes a list of 37 invasive alien species (IAS) of Union concern for which each Member State must lay down management objectives and priority actions. This has already been achieved in Wallonia. An assessment of the implementation of the actions must be carried out by 2019.	
	?	**Unfavourable status** —— Reference: (i) Regulation (EU) No 1143/2014, (ii) Biodiversity Strategy to 2020 - target to stem or eradicate the main invasive alien species by 2020. —— Of the 37 species listed in Regulation (EU) No 1143/2014, 14 were already naturalised in Wallonia as of 31/12/2015 (or nearly 38%). Moreover, according to the still non-exhaustive list of IAS in Wallonia, 375 species of ornamental plants and 21 species of vertebrates of alien origin are naturalised.
		Assessment of trend not achievable The assessment expected in 2019 will make it possible to establish a trend as regards the development in Wallonia of the IASs listed in the Regulation. It should be noted that as of 31/12/2015, of the 23 species not yet naturalised in Wallonia, 7 were occasionally sighted.