

PART C

NATIONAL REPORTS OF PARTICIPATING COUNTRIES IN ICP FORESTS

8 NATIONAL REPORTS OF ICP FORESTS PARTICIPATING COUNTRIES

All participating countries in ICP Forests were invited to submit summary reports on their ICP Forests activities instead of reports only on their national crown condition survey. Many countries have taken this opportunity to highlight recent developments and major achievements from their many national ICP Forests activities.

All written reports have been slightly edited primarily for consistency and are presented below. The responsibility for the national reports remains with the National Focal Centres and not with the ICP Forests Programme Co-ordinating Centre. For contact information of the National Focal Centres, please refer to the annex.

Belgium

Belgium Flanders

National Focal Centre

Peter Roskams, Research Institute for Nature and Forest (INBO)

Main activities/developments

The Level I survey in Flanders is designed by means of a 4 x 4 km grid. In 2017, crown condition assessments were performed on 852 broadleaves and 686 conifers in 71 plots. The more important coniferous species are *Pinus sylvestris* (n = 505) and *Pinus nigra* subsp. *laricio* (n = 171). The main broadleaved species are *Quercus robur* (n = 362), *Fagus sylvatica* (n = 116), *Quercus rubra* (n = 91) and *Populus* sp. (n = 48). A subset with 'other broadleaves' consists of 13 species with a total of 235 trees, e.g. *Alnus glutinosa*, *Fraxinus excelsior*, *Betula pendula*... There are almost no 'other conifers' (n=10).

Long-term intensive forest monitoring (Level II) was continued in 5 plots. Data analysis revealed a.o. the impact of decreasing atmospheric deposition on soil solution chemistry in Flemish forests. Further steps were taken by the University of Antwerp in cooperation with INBO to upgrade the Level II plot in Brasschaat, which is equipped with a measuring tower for gaseous components, in order to meet the criteria of an ICOS Class-I-site.

Major results/highlights

In Level I, the mean defoliation was 24.1%, 21.1% of the trees were in defoliation classes 2-4, and 17.6% showed moderate defoliation. In 2.3% of the trees more than 60% of the crown was defoliated. The mortality rate was 1.2%. 9.0% of the trees in the survey were considered as healthy and 69.9% were in a warning stage (defoliation class 1).

The share of trees with more than 25% defoliation was higher than the mean in *Pinus nigra* (35.1%), *Quercus robur* (24.8%) and the subset with 'other broadleaves' (31.0%). *Fagus sylvatica* had the lowest defoliation score with 10.4% of the trees classified as being damaged. Crown condition was also better than the mean in *Quercus rubra*, *Pinus sylvestris* and *Populus* sp. The share of damaged trees for these species amounted to 17.6%, 13.1% and 12.4%. Mortality was high in the subset with broadleaves. Dieback of *Quercus robur* was noticed in several plots, dieback of *Alnus glutinosa* in one plot. From 2012 on, dead oaks and alders were reported every year.

Defoliators caused more than 10% defoliation on 14.6% of the *Quercus robur* trees, while 8.0% of *Q. robur* showed severe discolouration caused by *Microsphaera alphitoides* (>10% of the leaves). Discolouration by fungal infection was also noticed on *Pinus nigra*. *Dothistroma septosporum* caused brown discolouration in combination with needle loss. The cause of dead shoots, twigs or branches was often unknown. In one plot crown dieback on *Alnus glutinosa* was caused by *Phytophthora alni*. In several plots infection by *Hymenoscyphus fraxineus* resulted in dead shoots, twigs and branches on *Fraxinus excelsior*.

A slight increase in defoliation and the share of damaged trees was observed. Mean defoliation decreased significantly only for *Fagus sylvatica* (- 7.4 percentage points). Contrary to 2016 there was almost no seed production on beech. A significant increase in defoliation was registered in *Pinus sylvestris* (+ 1.0 percentage points), *Quercus robur* (+ 1.8 percentage points), *Quercus rubra* (+ 2.2 percentage points) and 'other broadleaves' (+ 2.3 percentage points). *Pinus nigra* and *Populus* sp. showed non-significant changes in defoliation (+ 0.3 and + 0.4 percentage points).

Additional plots were selected to monitor the crown condition of *Fraxinus excelsior* and the impact of *Hymenoscyphus fraxineus* in Flanders. 252 ash trees in 29 plots have been assessed yearly since 2014. A serious deterioration of the health status was noticed. Mean defoliation increased from 28.8% in 2014 to 43.0% in 2017, while the share of damaged trees

almost doubled (from 32.1% to 59.1%). 6.7% of the sample trees died and every year new dead trees were noticed.

Since the 1980's the acidifying and eutrophying depositions in Flanders decreased considerably. Analysis of the data collected in 5 ICP Forests Level II plots revealed the impact of the decreasing depositions on soil solution chemistry. It was shown that the abiotic nitrogen status started to improve and acidification slowed down during the past two decades. However, N depositions are still far above the critical loads for ectomycorrhiza and epiphytic lichens. The generally observed tendency of increased dissolved organic carbon (DOC) and nitrogen (DON) mobility is likely a direct result of lowered ionic strength and partly rise in pH. Abiotic recovery is delayed by a simultaneous decrease in the deposition of base cations (Ca²⁺, K⁺ and Mg²⁺) and sulphate desorption. Biotic recovery is lagging behind on the changes in soil solution chemistry, as indicated by the stable but unbalanced tree mineral nutrition. Acidification and eutrophication will likely continue to produce after-effects for many decades.

National publications/reports published with regard to ICP Forests data and/or plots

Sioen G, Verschelde P, Roskams P (2017) Bosvitaliteitsinventaris 2016. Resultaten uit het bosvitaliteitsmeetnet (Level I). Rapporten van het Instituut voor Natuur- en Bosonderzoek 2017 (15). Instituut voor Natuur- en Bosonderzoek, Brussel (in Dutch). https://pureportal.inbo.be/portal/files/12937745/Sioen_etal_2017_Bosvitaliteitsinventaris2016.pdf

Verstraeten A, Neiryck J, Genouw G, Cools N, Roskams P, Hens M (2017) Corrigendum to "Impact of declining atmospheric deposition on forest soil solution chemistry in Flanders, Belgium." [Atmos Environ 62C (2012) 50–63]. Atmos Environ 170: 334–335. doi: 10.1016/j.atmosenv.2017.10.030

Verstraeten, A., Neiryck J., Cools N., Roskams P., Louette G., De Neve S. and Sleutel S., 2017. Multiple nitrogen saturation indicators yield contradicting conclusions on improving nitrogen status of temperate forests. Ecological Indicators 82:451-462. doi: 10.1016/j.ecolind.2017.07.034

Verstraeten A, Neiryck J, Cools N, Roskams P, Louette G, De Neve S, Sleutel S (2017) Response of temperate forest N status to long-term recovery from acidification and decreasing atmospheric N deposition. IUFRO 125th Anniversary Congress 2017, 18–22 September 2017, Freiburg, Germany

Verstraeten, A. Pollen distribution causes the spring peak in throughfall dissolved organic carbon (DOC) in beech (*Fagus sylvatica* L.) / common oak (*Quercus robur* L.) forests. 33rd ICP Forests Task Force meeting, 18–19 May 2017, Bucharest, Romania

Outlook

The Level I crown condition assessments will be continued as well as the additional survey on the condition of *Fraxinus excelsior*. The Level II program will be continued.

Peter Roskams, Geert Sioen, Arne Verstraeten (INBO)

Belgium Wallonia

National Focal Centre

Elodie Bay, SPW – Public Service of Wallonia

Main activities/developments

In 2017, the data were collected in 8 plots for Level II/III and in 45 plots for Level I.

Major results/highlights

The vegetation period has started with rude frost in April. The climate during the rest of the vegetation period was dry. These conditions did not affect oaks which continue to show an average defoliation decrease of 2% per year since 2013. On the opposite, top of the beeches continue to degrade (2% more defoliation per year since 2013). Douglas-firs are still affected by Swiss rust which causes needle loss.

National publications/reports published with regard to ICP Forests data and/or plots

See our annual reporting on forest health (in French) which includes ICP Forest data on <http://owsf.environnement.wallonie.be> Data are also included in the Walloon Regional Environmental Report (in French) on <http://etat.environnement.wallonie.be>

Bulgaria

National Focal Centre

Genoveva Popova, Executive Environment Agency (ExEA)

Main activities/developments

The National Programme for Forest Ecosystems Monitoring is operationalized as part of the National System for Environmental Monitoring and implemented on two levels, namely, the large-scale monitoring (Level I) and the intensive