BULGARIA

In 2017, observations on the degree of crown defoliation and discoloration, biotic and abiotic damages, and other stress factors were carried out on 5588 trees in 160 permanent sample plots. The assessment covered four coniferous tree species (*Pinus sylvestris* L., *Pinus nigra* Arn., *Picea abies* L. and *Abies alba* Mill.) as well as eight deciduous species (*Fagus sylvatica* L., *Quercus frainetto* Ten., *Quercus petraea* (Matt.) Liebl., *Quercus cerris, Quercus rubra* L., *Tilia platyphillos* Scop., *Carpinus betulus* L. and *Castanea sativa* Mill). The total number of the observed coniferous trees was 2422 (42%) and of the deciduous - 3166 (58%). In relation to degree of defoliation, the observed coniferous and deciduous trees retained their rate compared to the previous year - 72.3% of the monitored trees showed 'none' or 'slight' defoliation (≤ 25%). There was a decrease in the percentage of severely-defoliated and completely dead trees - 5.0% in 2017 compared to 6.5% in 2016. The trend for better condition of deciduous compared with coniferous tree species continued in 2017 - with defoliation, up to 25% were 80.1% of deciduous trees and 63.0% of coniferous.

With regard to coniferous species up to 60 years old, *Pinus nigra* trees were assessed in better condition - there were 0.4% dead trees, while in the *Pinus sylvestris* plots, the number of completely dead trees reached up to 7%. Regarding the monitored stands over 60 years old, the best condition was determined in the *Picea abies* plots where 91.5% of trees had 0 and 1 class of defoliation and only 0.5% were assessed to be in 3 and 4 class. Trees in *Abies alba* plots were also in good condition - 88.7% showed defoliation up to 25%, and 4.3% - in 3 and 4 class. The worst condition was observed in the *Pinus sylvestris* stands, where the frequency of severely-damaged and dead trees over 60-year old reached up to 13.8%. With regards to the determined biotic factors, the bark beetle (*Ips acuminatus*) caused serious damages to the coniferous tree stands in the monitored sample plots. The presence of the fungus *Heterobasidion annosum* was observed in both the *Pinus sylvestris* and *Pinus nigra* stands. The pathogens *Dothistroma pini*, *Sphaeropsis sapinea* and *Cyclaneusma minus*, which caused damage to needles and shoots, pose a threat to the monitored tree stands. The described biotic damages have not led to significant changes in the tree health status compared with the previous year.

In the group of monitored deciduous tree species up to 60 years old, trees in good health were determined in the plots of *Quercus rubra*, *Fagus sylvatica, Fagus orientalis* and *Quercus frainetto*, where 75-100% of trees showed defoliation of up to 25%. The worst condition was assessed at *Quercus cerris* with 10% dead trees. The best condition among the monitored deciduous tree species over 60 years old was observed in the *Fagus sylvatica*, *Quercus cerris, Quercus petraea*

and *Tilia platyphyllos* plots, where 78 - 100% of the trees exhibited no or slight defoliation. The highest percentage of severely-defoliated trees was determined in the *Carpinus betulus* stands – 6.3%. In some plots of *Fagus sylvatica*, the number of healthy and slightly-damaged trees was associated with the negative effects of different abiotic (wet snow, ice, wind) and biotic agents (*Nectria* spp., *Ascodichaena rugosa*, *Fomes fomentarius*, *Orchestes fagi*, *Mikiola fagi*, *Hartigiola annulipes* etc.) that caused damage to stems, branches and leaves. The negative anthropogenic impact was still visible in 2017. The risk of pathogen penetration and development of snowfall-damaged trees is still very high.

Concerning oak species, 83% of trees were determined as healthy or slightly-defoliated, mainly affected by leaf rollers and skeletonizers (Lepidoptera: Geometridae and Tortricidae). For stands up to 60 years old, *Quercus petraea* and *Quercus frainetto* trees showed recent damage caused by the pathogen *Ceratocystis roboris*. A trend of expanding the number of trees affected by both *Hypoxylon mediterraneum* and the gall maker *Dryomyia circinans* was found in Turkey oak stands.

In 2017, a new sample plot of sweet chestnut *(Castanea sativa)* trees was planted and added to the level I national grid. It was established that 82.5% of the trees were in a considerably worse condition due to chestnut blight caused by the aggressive pathogenic fungus *Cryphonectria parasitica* which forms diffuse cankers and lead to gradual tree death.