2016 CC DATA ACCOMPANYING REPORT

Description of the sample plots

The implementation of the intensive monitoring program in Bulgaria was organized in 3 stationary areas. Their localization was based on the existing information about the history of forest management, the forest-economic district structure of the country, sources and nature of pollutants as well as requirements for technical equipment of the areas. In the beginning of 2010, after consultation with crown condition expert team, sample plot 0002 (Staro Oryahovo) was replaced with SP 0004 in the same region.

The following stations were determined:

Vitinia (0001) - this area is situated in the western part of Middle Stara planina (the Balkan mountain), on the territory of Vitinia State forestry district. It is representative for the beech forests. The region is under the influence of local and regional pollution sources.

Vitinia (SP 0001)

Staro Oryahovo (0004) – It is situated in the eastern part of Stara planina, “Gorska baraka” area of the Staro Oryahovo State forestry station. The region is representative for oak forests. There are regional pollution sources. In the beginning of 2010 a new sample plot (0004) was installed by taking into consideration the location in relation to the station for automatic monitoring of the atmospheric pollutants and meteorological parameters, plot for collection of depositions in the open field, tree species and density. 50 new trees were selected and numbered for assessment of crown condition.

Staro Oryahovo (SP 0004)

Yundola (SP 0003)

Yundola (0003) – this area is situated in the western part of the Rodope mountains, in the “Starina” area, on the territory of the experimental training forest station of the University of Forestry /UF/. The stand of this sample plot is representative for coniferous forests and is far away from local pollution sources.

Rojen (0005) - this area is situated at 1750 m. a.s.l. in the southern part of the Rodope mountains in the close of The National Astronomical Observatory (NAO). The stand is representative for coniferous forests and is far away from local pollution sources. The level II crown condition survey in this sample plot started in 2016.

The monitoring activities were prepared in compliance with the ICP Forests Manual.

Comprehensive evaluation of the monitoring in 2016

The results of the observations carried out in 2016 at the Vitinya field station (beech ecosystem), Staro Oryahovo field station (Hungarian oak ecosystem) and Yundola field station (spruce ecosystem) provide the opportunity to characterize and seek the connection between the so called stress factors and the biological and chemical condition of the monitored stands.

Stress factors

In 2016 the precipitation and relative humidity at the Vitinya and Yundola field stations continued to decrease as the drought was more significant during the summer months. As for the Vitinya region, the possible adverse impact of drought was supplemented by the higher temperatures on average for the year as well as on certain days of the summer months.

High winds as well as heavy wet snow in the winter are an important abiotic stress factor for the beech stand at the monitoring site “Vitinya” and for the fir-spruce stand at the SP Yundola, causing a lot of damages to the trees as branch and crown breakage, followed by the mass development of secondary pests: a large number of wood-destroying fungi and xylophagous insects (bark beetles).

Biological condition

In 2016 the condition of the beech stand at Vitinya field station was slightly worsened in comparison with 2015, with predominating number of trees of first degree of defoliation. Two of the sample trees which were fallen by heavy wet snow were cut down and excluded of the further crown condition survey. The damages caused by *Ectoedemia liebwerdella* are most common, while damages by leaf- feeding and leaf-mining insects are less, although the damages, caused by *Orchestes fagi*, can often be seen. The understory is highly developed and obstructs the visibility and assessments of monitoring trees.

In 2016 the Hungarian oak stand at the Staro Oryahovo field station was in a good condition. The predominating number of trees had a first degree of defoliation. Slight damages, caused by leafroller moths, leaf-feeding and leaf-mining insects, lice and gall wasps, were determined. New frost damages were determined in single trees.

According to the evaluations of the defoliation degree, the mixed fir-spruce stand at the Yundola monitoring site was in a good condition in 2016 with predominating trees of 0 and 1st defoliation degree. Fellings have been carried out outside the fenced part of the sample plot and the trees, determined during the previous year survey as dead trees, were removed from sample plot.