

Monitoring of Quantitative and Qualitative Changes in Combustible Material in the Białowieża Forest

Authors : Damian Czubak

Abstract : The Białowieża Forest is a very valuable natural area, included in the World Natural Heritage at UNESCO, where, due to infestation by the bark beetle (*Ips typographus*), norway spruce (*Picea abies*) have deteriorated. This catastrophic scenario led to an increase in fire danger. This was due to the occurrence of large amounts of dead wood and grass cover, as light penetrated to the bottom of the stands. These factors in a dry state are materials that favour the possibility of fire and the rapid spread of fire. One of the objectives of the study was to monitor the quantitative and qualitative changes of combustible material on the permanent decay plots of spruce stands from 2012-2022. In addition, the size of the area with highly flammable vegetation was monitored and a classification of the stands of the Białowieża Forest by flammability classes was made. The key factor that determines the potential fire hazard of a forest is combustible material. Primarily its type, quantity, moisture content, size and spatial structure. Based on the inventory data on the areas of forest districts in the Białowieża Forest, the average fire load and its changes over the years were calculated. The analysis was carried out taking into account the changes in the health status of the stands and sanitary operations. The quantitative and qualitative assessment of fallen timber and fire load of ground cover used the results of the 2019 and 2021 inventories. Approximately 9,000 circular plots were used for the study. An assessment was made of the amount of potential fuel, understood as ground cover vegetation and dead wood debris. In addition, monitoring of areas with vegetation that poses a high fire risk was conducted using data from 2019 and 2021. All sub-areas were inventoried where vegetation posing a specific fire hazard represented at least 10% of the area with species characteristic of that cover. In addition to the size of the area with fire-prone vegetation, a very important element is the size of the fire load on the indicated plots. On representative plots, the biomass of the land cover was measured on an area of 10 m² and then the amount of biomass of each component was determined. The resulting element of variability of ground covers in stands was their flammability classification. The classification developed made it possible to track changes in the flammability classes of stands over the period covered by the measurements.

Keywords : classification, combustible material, flammable vegetation, Norway spruce

Conference Title : ICFFM 2023 : International Conference on Forest Fire Management

Conference Location : Amsterdam, Netherlands

Conference Dates : December 04-05, 2023