Polish Academy of Sciences
Forest Sciences
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Position paper
of the Forest Sciences and Wood Technology Committee
of the Polish Academy of Sciences
on the EU 2030 Biodiversity Strategy "Restoring nature to our life"

In 2020, the European Commission approved the EU document: 2030 Biodiversity Strategy "Restoring nature to our life", which formulates assumptions concerning the protection of biodiversity and counteracting climate change. In the strategy, it was assumed that 30% of the land area of EU countries would be covered by legal protection, while 10% of the area will be excluded entirely from management practices.

As representatives of forest science, we fully support the need to protect terrestrial ecosystems, especially forest ecosystems and their biodiversity, and underline the need for urgent action to reduce factors causing the degradation of forest ecosystems and negatively affect their biodiversity as climatic conditions.

However, the way it is planned to protect biodiversity and prevent changes in living conditions on the Earth, particularly climate change, does not consider the current state of knowledge, the interests of local societies and global processes cause our doubts.

Our position is that when making such far-reaching decisions, the scientific knowledge on protecting forest ecosystems, which ensure rational usage of forest ecosystem services, should be taken into account. We believe that actions taken to protect biodiversity require cooperation and consensus, both scientific and social.

We rely on scientific knowledge about the processes in forest ecosystems, which - under the strong influence of anthropogenic pressure and due to high fragmentation and unnatural origin - lost their natural character in most forest areas and self-regulation ability.

Historically, plants and animals have constantly changed their natural ranges. The retreat of glaciers and the re-colonization of land by woody

plants is one example of such changes related to climate change. Worldwide, climate change and anthropopressure affect ecosystems, such as changes in species composition of forests and natural disturbance regimes.

The observed changes can have a cascading impact on ecosystem services such as retention and protection of water resources, preservation of wildlife habitats, survival of species, biodiversity, wood production, and carbon retention through absorption or emission of CO_2.

The scope of potential changes varies depending on the current climatic conditions and forest types. In the case of many highly transformed and fragmented European forest ecosystems, we can observe substantial changes in site conditions related to the increase in temperature and atmospheric nitrogen deposition and increased variability in the temporal and spatial distribution of precipitation. The changes are happening too fast to adapt the forest to them without active action on forest managers while retaining its ecosystem functions.

Over the past decades, numerous research results have shown the implications of climate and environmental change for forest ecosystems (Logan et al., 2003; Lindner et al., 2010; Etzold et al., 2020). Climate change, in particular, can lead to changes in:

- forest site productivity,
- range of forest tree species,
- regimes of disturbances in forest ecosystems,
- the reproductive cycles and the potential insect outbreaks,
- the occurrence of invasive species and outbreaks of species damaging trees and forests.

These examples result from our knowledge, which is certainly not complete, but constant climate change can trigger many other consequences of changing site conditions, including those related to the growth rate of trees.

On the one hand, accelerated growth means that successive generations of trees reach specific parameters in a shorter time (Bettinger, 2011), e.g. stands will become denser faster than it was several decades ago, which should be considered when planning stand treatments (Bettinger, 2011). Changes in growth patterns can also affect the ability of forest ecosystems to mitigate the effects of climate change. Along with growth dynamics, we can also expect positive trends in carbon dioxide storage, but with one crucial condition, there are no large-scale disturbances.

On the other hand, the changes related to the accelerated height increment contradict the natural adaptation of trees to unfavourable growing conditions. Faster growth is associated with numerous threats, particularly with an increased vulnerability to damage caused by drought and the risk

of disturbances. Droughts cause higher mortality rates for larger, and thus also older, trees (Bennett et al., 2015; Stovall et al., 2019).

Our particular concern is caused by the growing dynamics of the decline of European forests, in particular, those in Central and Eastern Europe, which is mainly due to increasing occurrence of periods of severe drought, lowering of the groundwater level, the severity of hurricane winds and the constantly increasing atmospheric deposition of nitrogen compounds.

As a result of drought and changes in forest ecosystems related to the change of climatic conditions, mass outbreaks of insects occur more often, and fungal pathogens intensify. Forest areas under the influence of anthropopressure, intensely transformed ecosystems and forests created due to afforestation of post-agricultural land, which in Poland account for nearly 30% of forest area, are particularly exposed to these factors. The dieback usually affects primarily the oldest stands, especially conifers, which should be successively replaced with new generations of trees that can adapt to new, changed growth conditions.

Paradoxically, excluding the oldest stands from use leads instead to forest loss than protection. In this context, the planned strict protection of old forests is extremely threatening. The strict protection of forests based on the age parameter alone can lead to significant dispersion of protected areas and difficulties in the organization, planning and management of the forests. As a one-off action, strict protection of old trees may lead to their natural decline in a relatively short time, especially in the context of intensification of the impact of destructive abiotic factors (e.g. drought, hurricanes). Increased activity of cambio- and xylophagous insects will contribute to this process, transforming into large-scale infestations that would threaten forests in neighbouring areas. Consequently, this phenomenon can lead to a rapid reduction in the protection of old trees in a spatial dimension.

The increasing forest decline caused by anthropogenic and natural factors (Senf et al., 2020) has resulted in the destruction of approximately 20% of forests in Europe (Senf and Seidl, 2020). It is predicted that due to increasing dynamics of forest decline, the median age of EU forests could fall below 30 years by 2050, which would have profound implications not only for timber production but also for a range of ecosystem services, i.e. the regenerative capacity of forests, the protection of biodiversity and carbon dioxide binding (Senf et al., 2020). The immediate consequences of forest mortality are:

- increased soil erosion and decomposition rate reducing forest land productivity,
- additional CO_2 emissions,
- loss of nutrients in the soil,
- disturbed water budgets,
- loss of forest habitats,

- increased threat from pests and diseases in the remaining stands,
- changes in the regeneration structure favouring species typical for the first stages of succession,
- economic damage and losses to forestry enterprises (decrease in timber supply will result in the need to look for suppliers abroad, and consequently - capital outflow related to moving production abroad).

The strategy shows the right direction for increasing the protection of the land surface. However, in our opinion, the plan to provide 10% of land areas with a strict protection, understood as according to the currently used definition, not only in Poland but also in other countries, is not very realistic to implement and would have enormous ecological, economic and social consequences, which currently could not be fully assessed.

The strict protection of approximately 2.5 million hectares of Polish forests will result in a drastic reduction of timber harvesting that will have negative economic consequences, especially for the wood industry and related industries. Limitation of timber harvesting in EU countries, including Poland, where the sustainable principles of forest management are applied, will result in the need to import wood from countries that do not apply these rules, which in turn may result in faster deforestation in those areas, decrease in forest biodiversity and drastically increased CO_2 emissions.

Changes in the management of forest ecosystems should not be carried out in isolation from previous achievements and without considering the regional specificity and experience of forestry in protecting biodiversity. In Poland, the planned changes may contribute to the interruption of long-term trends consisting of the systematic growth of forest resources. Poland's forest cover has increased from 20.8% in 1945 to 29.6% today (according to GUS-Main Statistical Office data from December 2019). The size of the timber harvest is several dozen per cent smaller than stand growth, which contributed to an increase in the overall volume of wood on the forest area, from just over 1,000 million m^3 in 1967 to 2,645 million m^3 in 2019.

There is also concern about the growing criticism of multifunctional forestry, introduced because of the need to integrate nature conservation with sustainable forest management. Not fully understood, a wide range of activities in multifunctional forestry is contested in the last time, although the profound legitimacy of its use is confirmed in research results. The principles of forest management are a subject of continuous improvement based on the latest achievements in "forest science" and its already over 200 years old legacy.

The central part of the European Commission's efforts to improve the protection of biodiversity in EU countries deserves support, but the biodiversity strategy 2030 should consider the sustainable management of forests and their multifunctional role. Except for the necessity of nature

protection, it is necessary to consider the many social and economic aspects of forest functions.

The EU strategy should consider the specificity of forest ecosystems and forest management individual for EU countries, the type and effectiveness of the biodiversity protection methods used so far, and specific social-economic conditions. The implementation of the biodiversity protection strategy should take into account the latest scientific research results. We are concerned that the proposed solutions that are not based on research results in many aspects can have opposite effects than intended. In particular, our concern is the violation of durability and the multifunctional role of Polish and European forests.

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