Ministry of Climate and Environment
Republic of Poland

State Forests
Poland

IBL
INSTYTUT BADAWCZY LEŚNICTWA

Forest and climate change - experiences of Poland

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National Forest Dialogue
22-23 April 2024

Forest, biodiversity and climate change

the main challenge of today => the key solutions of tomorrow

An answer for the need of dialogue with society

National Forest Dialogue

- Strengthening social participation in forest governance and management
- Strengthening protection of the most valuable forest ecosystems (biodiversity, climate and social functions), including exclusion of 20% of forest from utilization, creating new national parks and nature reserves
- Strenghtening protective functions of forests (including coastal forests and forests in urban area)
- Development of the new solutions, acceptable for all
- Planned modification of Act on Forests
- Discussion is still ongoing

Social forests in 9 urban areas

Project announced at the press conference at 25 April 2024 by Minister of Environment Paulina Hennig-Kloska and Undersecretary of State Mikołaj Dorożała

*„Work on the establishing of social forests in 9 agglomeration will be carried out in teams composed of representatives of the relevant forest districts, the regional and general directorate of the State Forests, the regional directorate of environmental protection, the **„society and nature" side,** the wood industry, local forest services, the Bureau for Forest Management and Geodesy and Forest Research Institute, as well as the **local governments**. Systemic solutions regulating the principles of dialogue will reduce the risk of conflicts at the stage of forest management." Paulina Hennig-Kloska, Minister of Climate and Enviroment of Poland*

9 agglomerations: Warsaw, Łódź, Poznań, Wrocław, Katowice, Kraków, Three-City (Gdańsk, Gdynia, Sopot), Szczecin, Bydgoszcz/Toruń

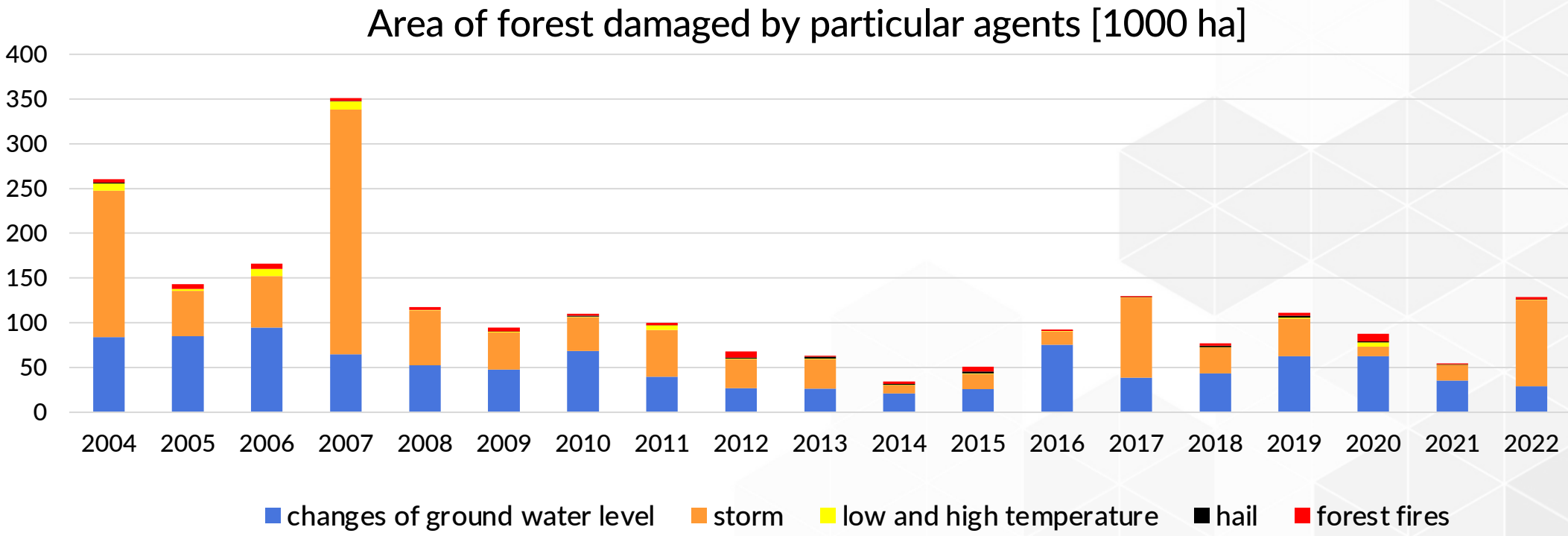
Adaptation – trees and forest in urban areas

„One of the activities that will allow you to determine the scale of needs related to the implementation appropriate activities mitigating the effects of climate change may be the use of nature and climate indicators by cities. This will allow both to identify the extent to which cities are involved in nature-climate activities and will help in planning and designing new projects for environmental protection, including adaptation to climate change. Use modern nature and climate indicators is today the basis for design by the administration local public policies in the field of sustainable urban development."

- 60% Polish citizens live in very diversted urban areas
- Nature and climate indicators of urban sustainable development (technical guide)

20 indicators, including indicator of area of forest and wood > 1 ha (per citizen)

Threats to forests

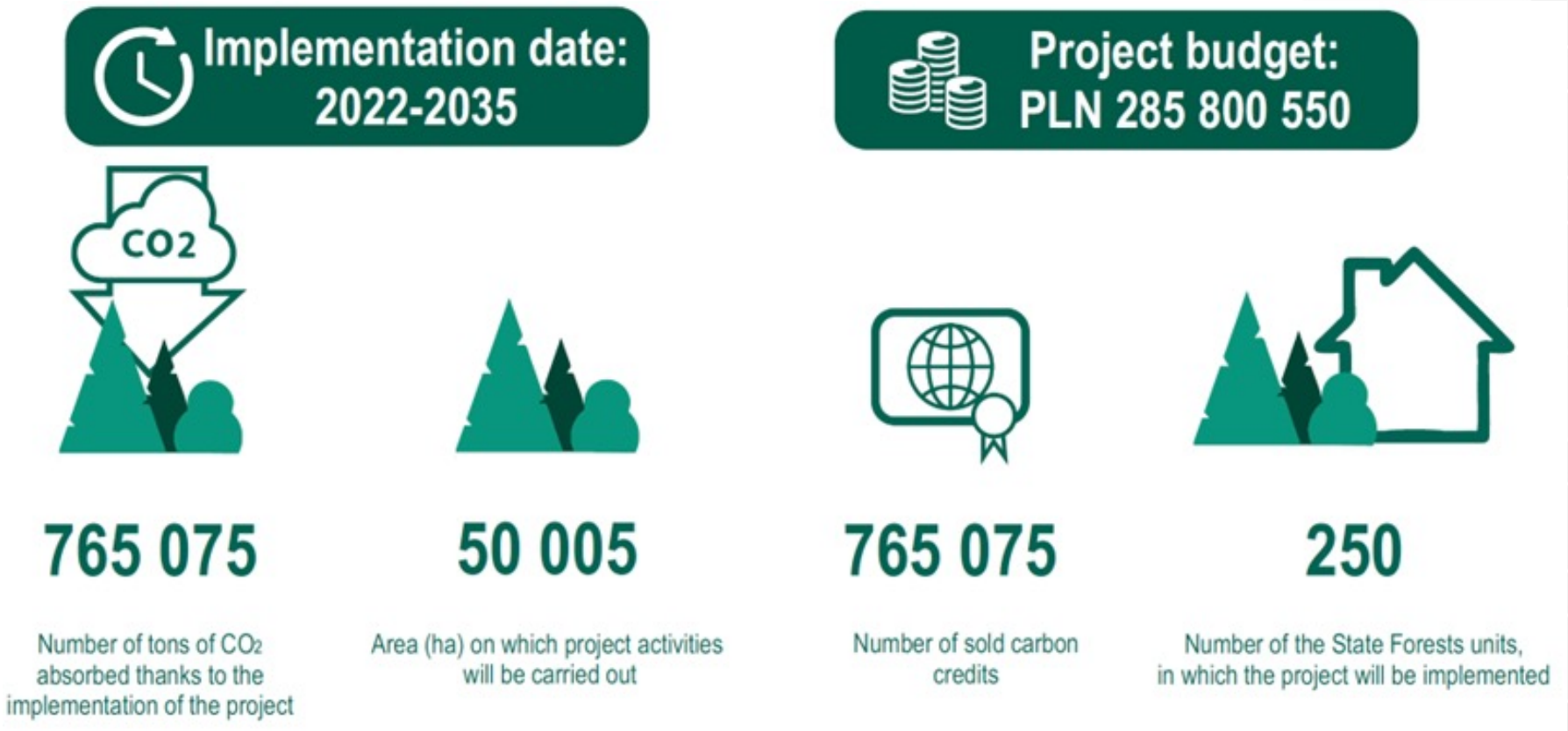


[data for the State Forests; area with factor „changes of ground water level" in particular years is cumulative]

Mitigation – The „Carbon Forest" Project

Carbon sequestration

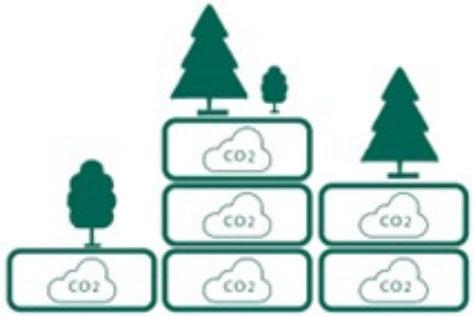
Mitigation – The „Carbon Forest" Project



Mitigation – The „Carbon Forest" Project

Planned effects

Obtaining international certification and the right to provide carbon credits



Deepening the knowledge of the ability to accumulate carbon dioxide carbon in the various reservoirs of forest ecosystems

Developed guidelines for surface selection and additional activities for the project

Calculating the carbon footprint of the State Forests as part of ESG/CSR activities

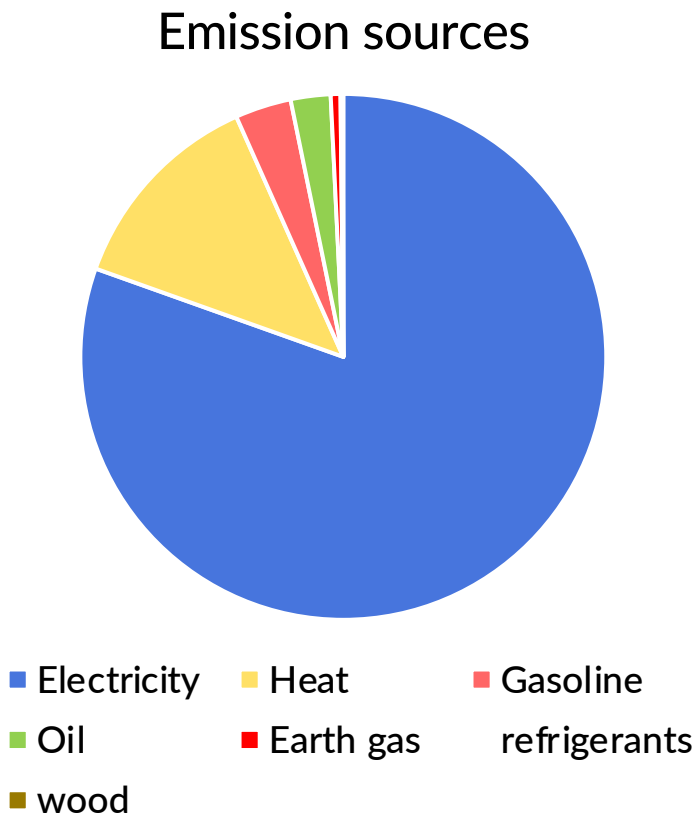
Carbon footprint calculation in the State Forests

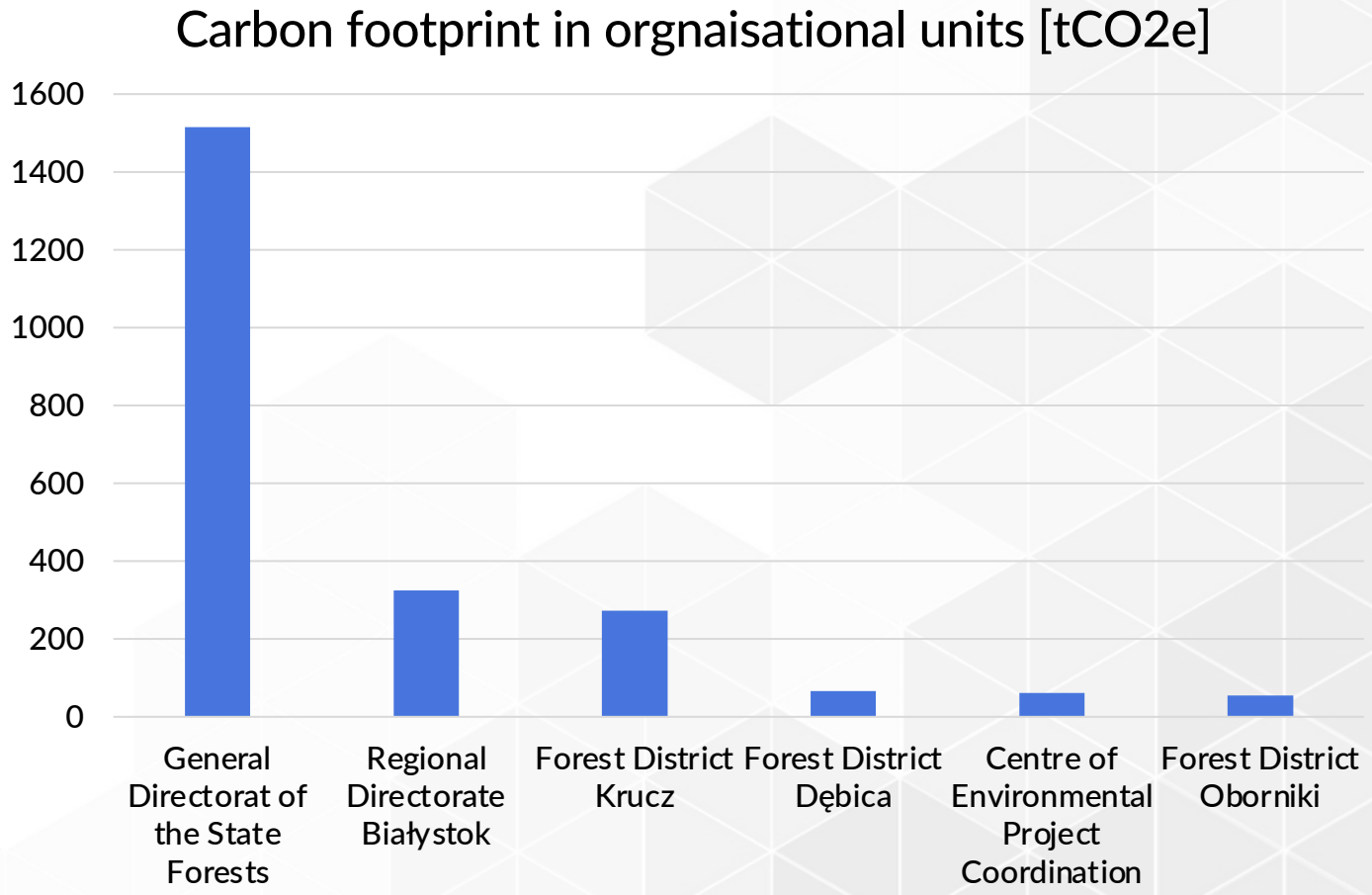
"If you can't measure it you can't improve it." - Peter Drucker

Main benefits:

1. Decreasing of environmental impact
2. Lowering the costs
3. Increasing stability of the company
4. Fulfilling regulatory requirements
5. Increasing competitive advantage
6. Improvent of the company's image

Carbon footprint – pilot resuts





Incerasing adaptative potential of forests through resistance selection

Aim:

Analysis of the adaptability of economically and ecologically important tree species to changing climatic conditions

(droughts periods and rising temperatures)

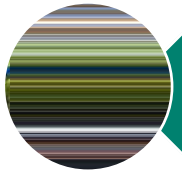
in order to increase the adaptative potential of forests through tree breeding of forest tree species.

In cooperation with General Directorate of the State Forestss
Timeframes: 2020-2024
Project manager: dr hab. inż. Marzena Niemczyk, prof. IBL M.Niemczyk@ibles.waw.pl

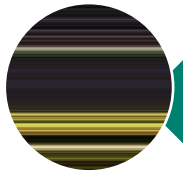
Incerasing adaptative potential of forests through resistance selection

Scope:

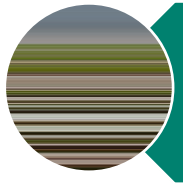
As part of the project, the responses of the most important economically forest-forming tree species in Poland (Scots pine, Norway spruce, pedunculate oak, common beech, silver fir) to factors related to climate change were examined, addressing 3 key issues:



Differentiation of responses to drought and high temperature stress of basic forest-forming tree species



Species distribution modeling for varius climate change scenarios



Simulation of various types of selection (in progeny trails) to optimally use the forest genetic resources

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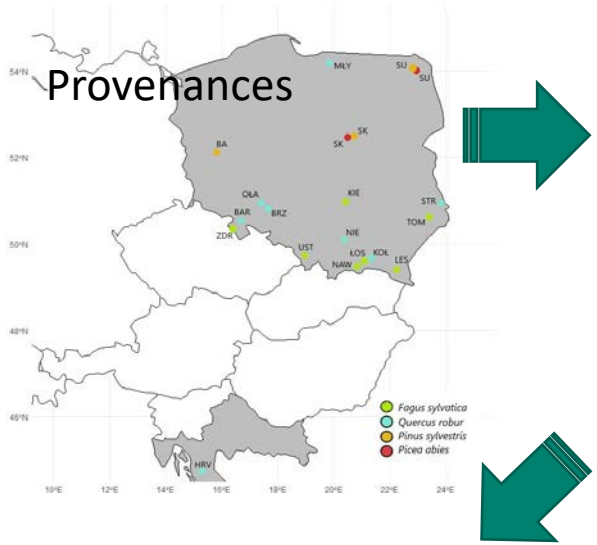
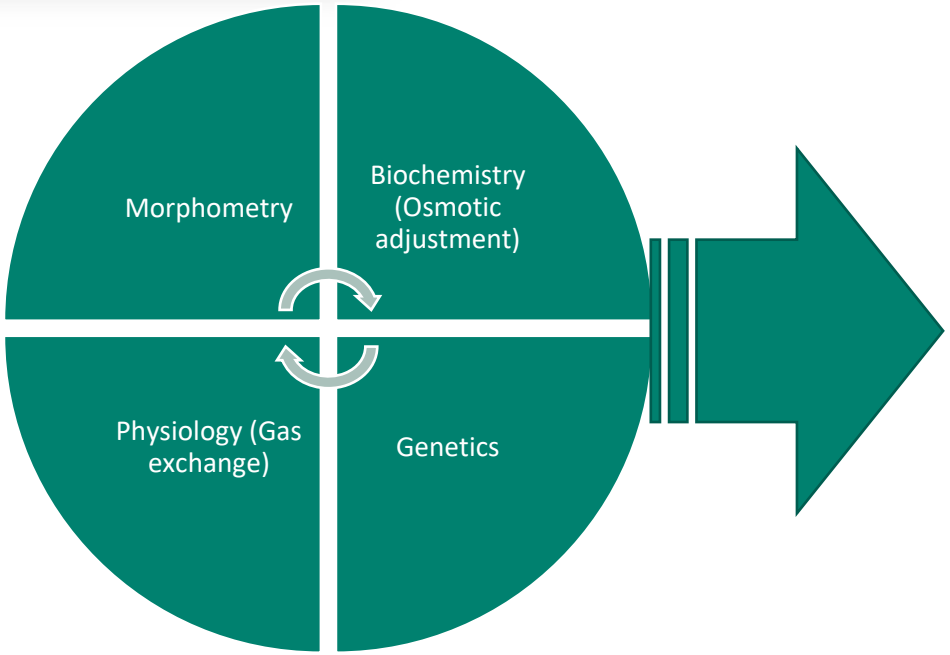
Incerasing adaptative potential of forests through resistance selection



Differentiation of responses to drought and high temperature stress of basic forest-forming tree species, taking into account their provenance variability based on physiological, biochemical, morphological and genetic responses in an experiment under controlled conditions with manipulated water availability.

Four species x 7 provenances→ drought experiment in controlled environment→responses of trees to stress and recovery after stress → responses measured on four levels:



Insights into inter- and intraspecific variability in tree responses to and recovery from drought stress to assist forest management decisions regarding species and provenance selection.

PRELIMINARY RESULTS:

1. **Pedunculate oak (Quercus robur**) –, high phtotosyntetic capablility, effective water management, effective stress (drought) response, fast recovery (physiological; morphological adjustment; high genetic variability) => **the biggest adaptative potential, predicted good conditions for further development in future climate**.

2. **Commonn beech (*Fagus silvatica*)** – high drough reaction capability, high phenotypic plasticity, growth strongly depend on both soil and climatic conditions => **less adaptative potential but still valuable in future climate.**

3. **Scots pine (*Pinus sylvestris*)** – high growth in diverse environmental conditions, high potential for improvement is tree improvement programmes, high heritability of quantitative traits, high stability of across environments => but **possible risk that local populations may not achieve optimal growth in the future. Scots pine has the ability to inhabit the poorest habitats, which makes it difficult to replace it with other tree species with higher site requirements.**

4. **Norway spruce (*Picea abies*)** – low stability, low heritability in progeny tests => **risk of insufficient growth conditions in the future climate, active measures and supported migration of forest reproductive material might be needed.**

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Thank you for attention

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