

**Forestry and Game Management Research Institute, PRI, Jíloviště –
the Kunovice Research Station**



National Forest Tree Seed Bank in the Czech Republic

FORESTS' FUTURE 2021

on-line meeting

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Pavel Kotrla, Josef Cafourek,

Lena Bezděčková, Hana Bajajová, Kamila Surovcová



History in the Czech Republic:

- 1986 – The State Tree Seed Bank was established in the Tree Seed Centre Týniště n. Orlicí – the goal was the breeding of the forest trees.
- 1995 – The Regional Forest Trees population Bank was established in Tree Seed Centre Týniště n. Orlicí (state forests) - the goal was conservation of regional populations.
- 2014 – The National Forest Tree Seed Bank was established in the Forestry and Game Management Research Institute, the Kunovice Research Station – the aim is to preserve *ex situ* populations of forest trees of all forest owners in the Czech Republic.



The establish of the National Forest Tree Seed Bank is associated with the announcement „National Programme for the protection and reproduction of the forest tree species gene pool“ (for the period 2014 – 2018).

Within of this program in 2014 was established „National Forest Tree Seed Bank“(NFTSB).

At present „National Programme.....“ is still runnig in the period 2019 – 2028.



The National Bank of the forest tree seeds and explants comprises two independent facilities:

- **National Forest Tree Seed Bank (Kunovice)**
- **National Bank of Forest Tree Species Explants (Jíloviště)**

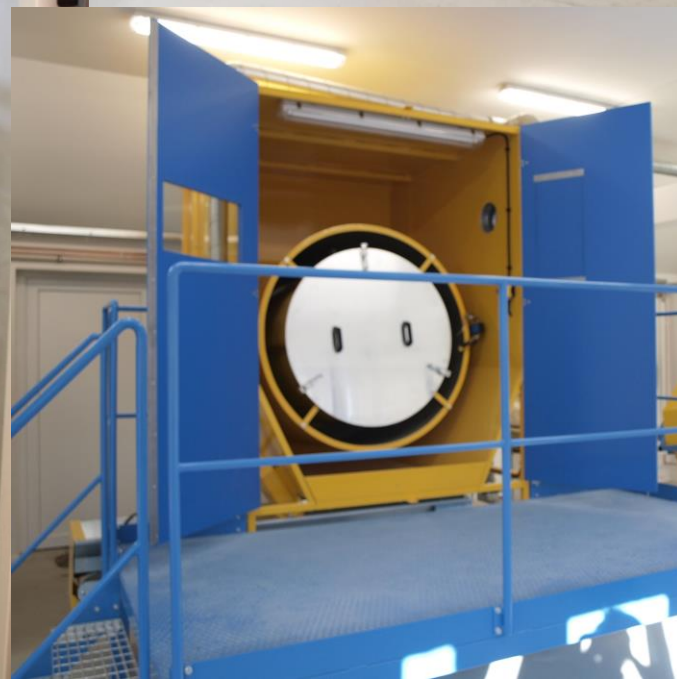
This contribution is related to the National Forest Tree Seed Bank.

**NFTSB is in
separate building,
which was built in
2014-2015.**





We bought a new equipment:





The National Forest Tree Seed Bank focuses on long – term storage of *ex situ* preserved samples of forest tree seed storable for over than 10 years (orthodox seeds).

The main species are:

- ***Picea abies***
- ***Pinus sylvestris***
- ***Larix decidua***
- ***Betula***
- ***Alnus***





The goals of the National Forest Tree Seed Bank are:

- **To collect seed samples of forest tree species populations from the Czech Republic, and to preserve present genetic diversity of these populations.**
- **Collections of cones done only from the highest quality forest stands (selectes source of FRM – forest stands A).**

Phenotypical class „A“ (categorie „selected“)

Economically highly valuable stands, autochthonous or allochthonous with wood production of high value or quality, with excellent morphological markers and immunity.





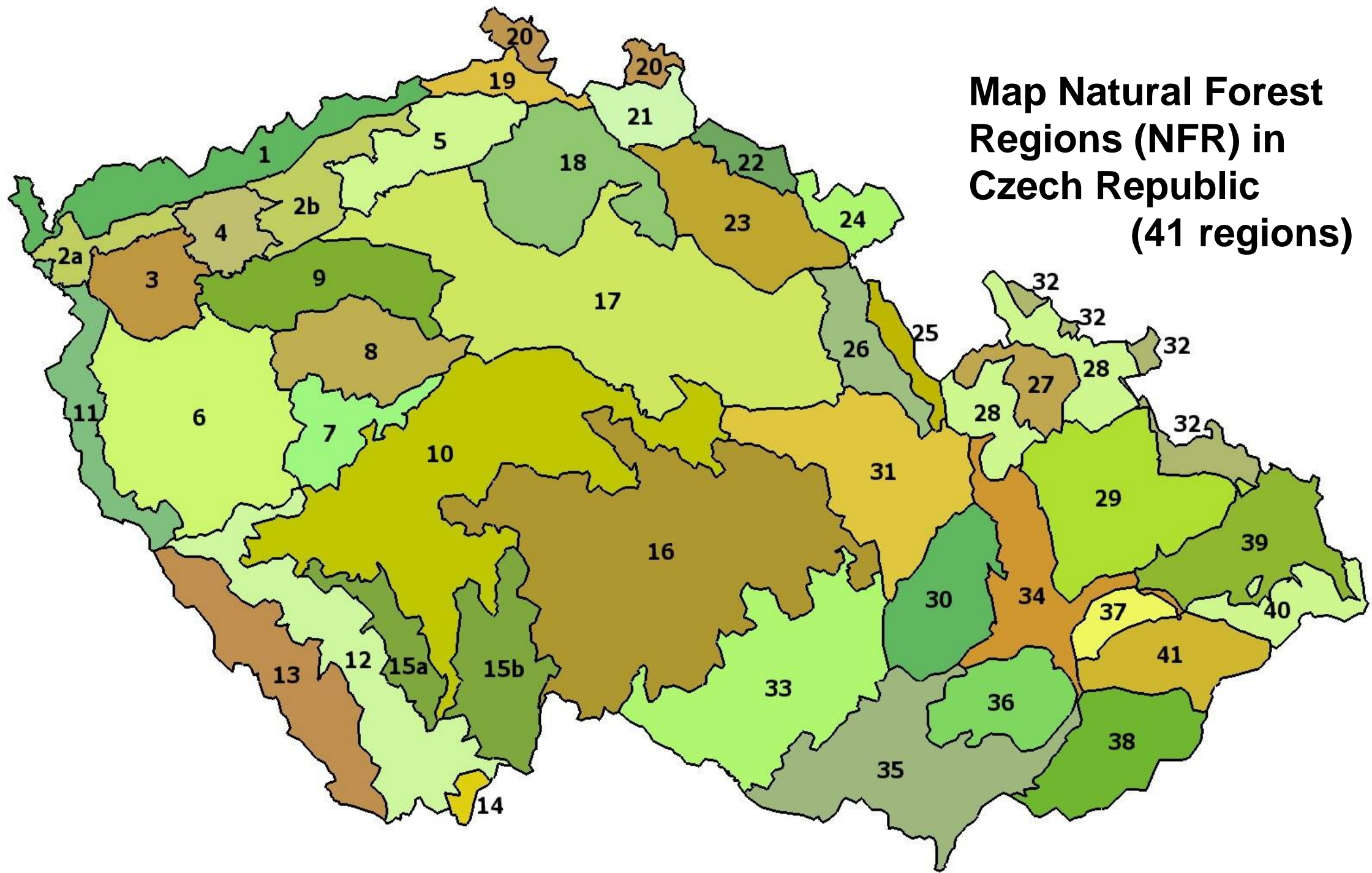
The collections of the seeds (cones) for the NFTSB:

- **Are organized by the staf of Forestry and Game Management Research Institute.**
- **Only with the agreement of forest owner**
- **Are done in accordance with legislation regulations (including EU)**
- **The collections are organized according to the general outlook of the collections (from 2017) - according to the representation of tree species according to natural forest regions.**
- **The main emphasis is put on correct identity of the collected materials.**





Map Natural Forest Regions (NFR) in Czech Republic (41 regions)





The collections of the seeds (cones) into the NFTSB:

- To maintain the genetic diversity of populations – cones are harvested from minimum 50 trees per stand. The collections are made by climbing into crowns with harmless technology.
- The size of seed samples (amount of collected cones) is done by the assumed future reforestation of 10 ha (main species) or 5 ha (other species).

Future use of seeds from the NFTSB:

- Woody Plants Populations Restoration – priority in situ condition.
- Only based on approved projects – not for commercial reforestation.

Stored samples in the NFTSB:

- Seed raw material (cones) treatment
- Check of seed quality – actual samples (first control)
- Storage in cool box (at -18°C)
- Presumed period of storage (30 years)
- Every three years repeated check of seed quality
- Seed quality data maintain in database ERMA (Forest management institut Brandýs nad Labem)



Seed Sample Structure Storage in Seed Bank:

- The basic sample (reproduction population for future basic seed volume).
- The samples for check of seed quality (packaget separately).
- The samples for international exchange and other purposes (packaget separately).

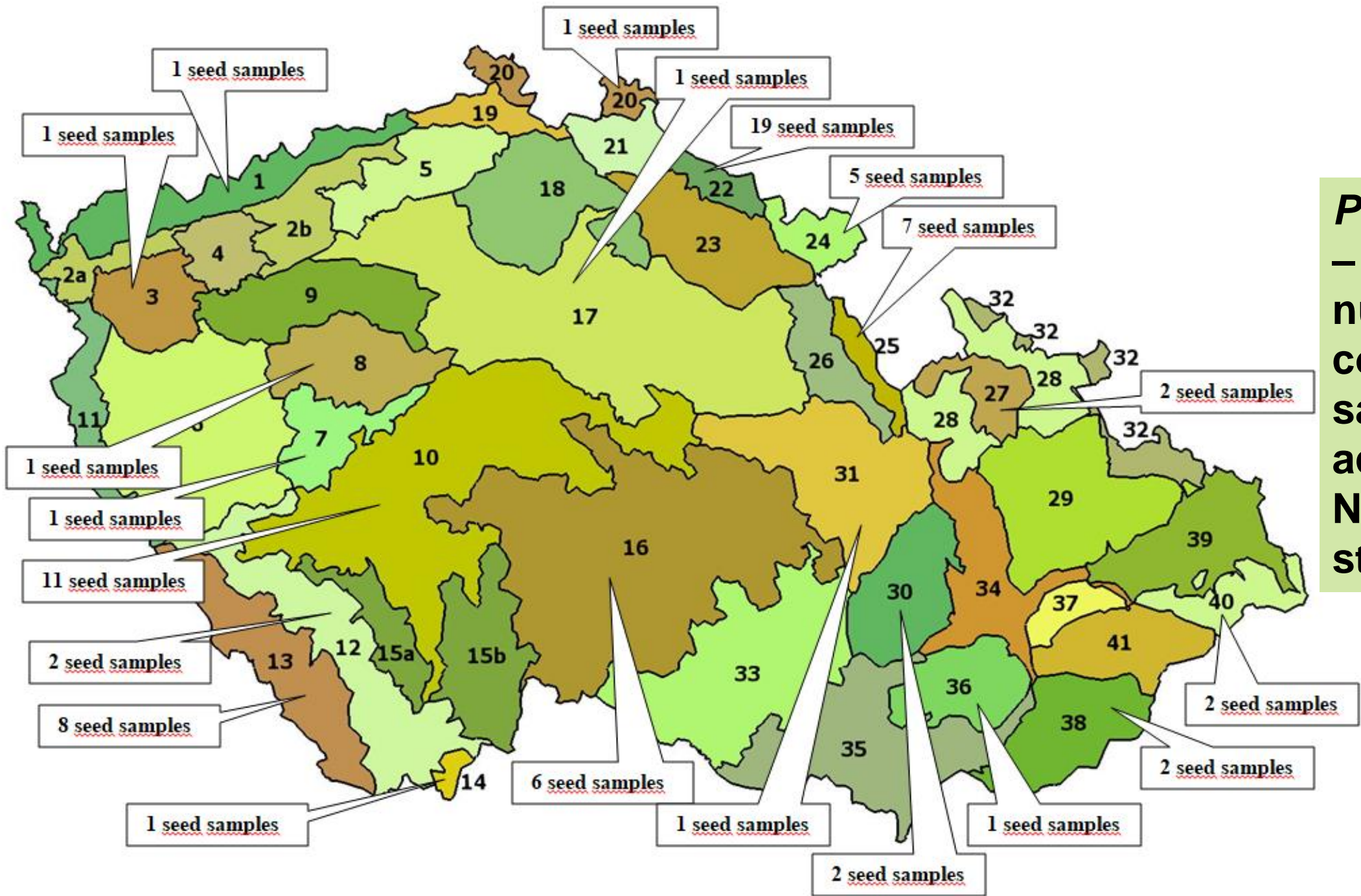




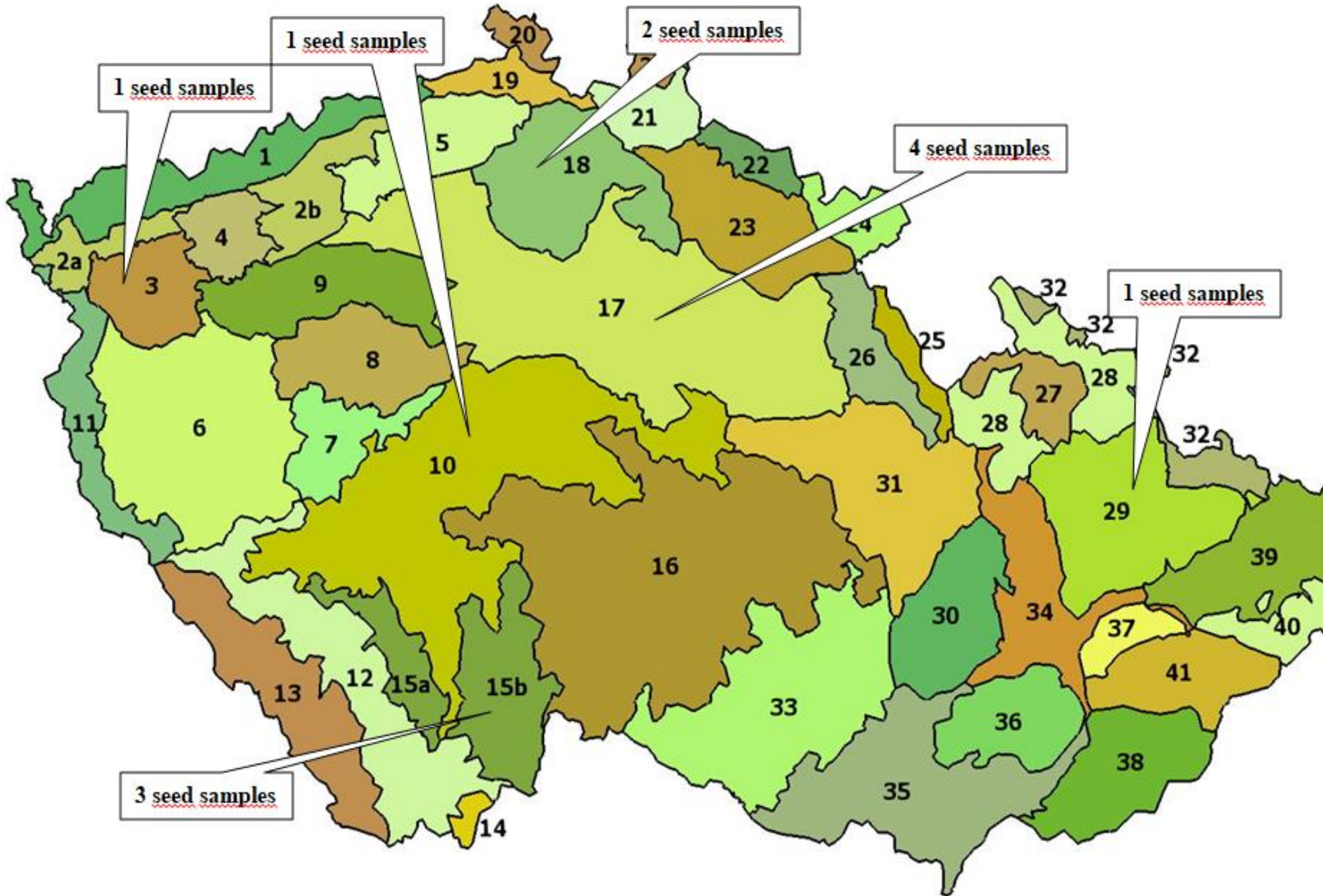
- Collections to the NFTSB were started in 2015.
- The amount of obtained samples and collected tree species is based on the harvest in a year and capacity of collection.
- In recent years, due to the weather fluctuatinos, was the quality of seeds unbalanced, not all samples obtained meet the quality criteria for storage in a seed bank.

Overview of collections in individual years.

| harvest season | quantity of seed samples | wood species |
|----------------|--------------------------|--------------|
| 2015 - 2016 | 55 | spruce |
| 2016 - 2017 | 10 | pine,larch |
| 2017 - 2018 | 6 | spruce |
| 2018 - 2019 | 10 | spruce,larch |
| 2019 - 2020 | 4 | pine |
| 2020 - 2021 | 24 | spruce, pine |



Picea abies
– total number of collected samples according to NFR (total 77 stands)



Pinus silvestris – total number of collected samples according to NFR (total 12 stands)



Conclusion:

- Preservation of genetic resources of forest trees *ex situ* is an "insurance" against the extinction of important forest tree populations.
- These measures are also becoming increasingly important in the context of climate change in Europe.
- In the case of *Picea abies*, we can prove in our case that we failed to catch populations in areas of incipient disaster (northern Moravia), but to the contrary, a number of populations from areas of ongoing disaster are already stored in the seed bank.



Thank You for Your Attention

**Forestry and Game Management Research Institute
Kunovice Research Station**

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