

*Department of Forest Ecology,  
The Silva Tarouca Research Institute for Landscape and Ornamental Gardening*



# Methods and results of the inventory and whole area research comparison of the National Nature Reserve Ranšpurk

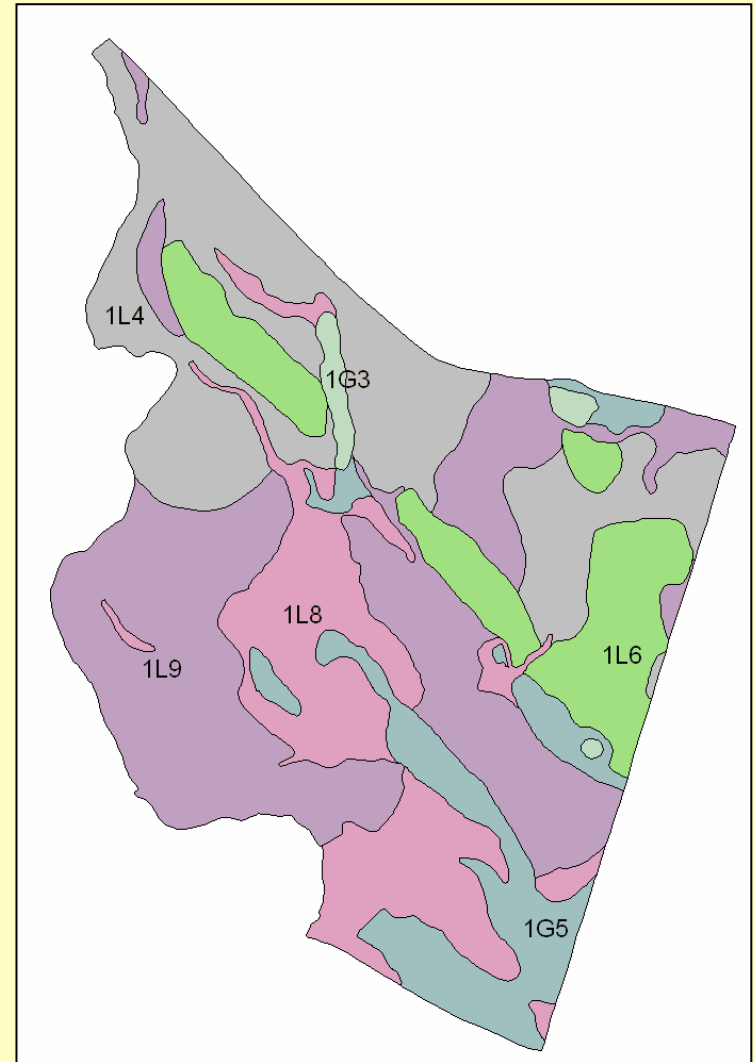


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## NNR Ranšpurk – natural conditions

- NNR Ranšpurk is situated 6.5 km to the south of the **confluence** of Morava and Dyje rivers on the border junction of Austria, Czech Republic and Slovakia.
- Total area is **22.25 ha**.
- The altitude ranges between **150-153 m** above sea level.
- Geological basement are recent Holocene sandy and clayey sediments on fluvial gravels.
- Soils can be most often classified as Gleyi-Eutric Fluvisols or Eutric Fluvisols.
- Mean temperature amounts to 9 °C, mean precipitation amounts to 517 mm.
- According to the Braun-Blanquet approach, plant communities can be most often classified in the “drier wing” *Fraxino pannonicae-Ulmetum* association.

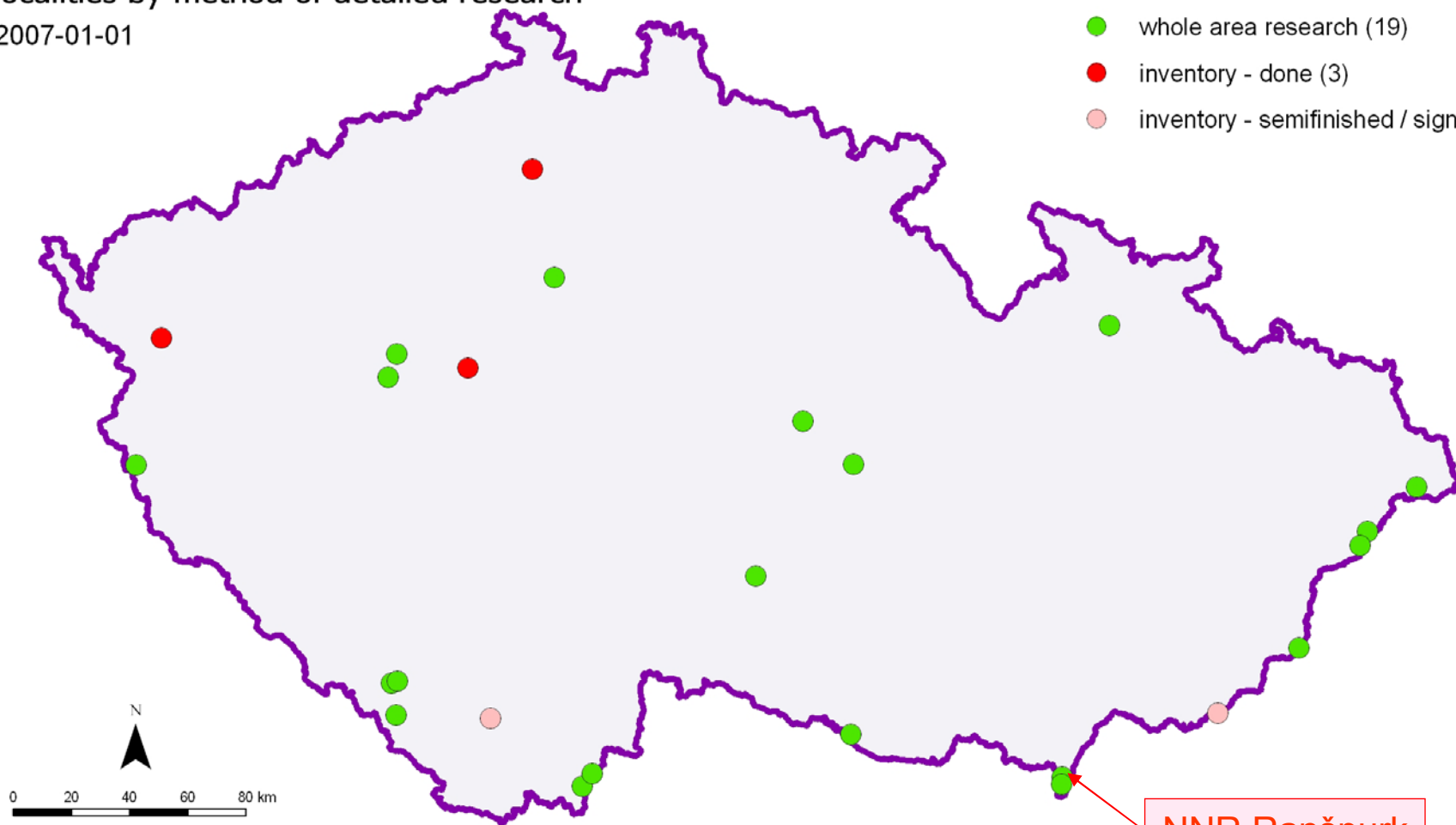


# NNR Ranšpurk among the Field-Map researched localities

Czech Republic  
localities by method of detailed research  
2007-01-01

**method:**

- whole area research (19)
- inventory - done (3)
- inventory - semifinished / signed (2)

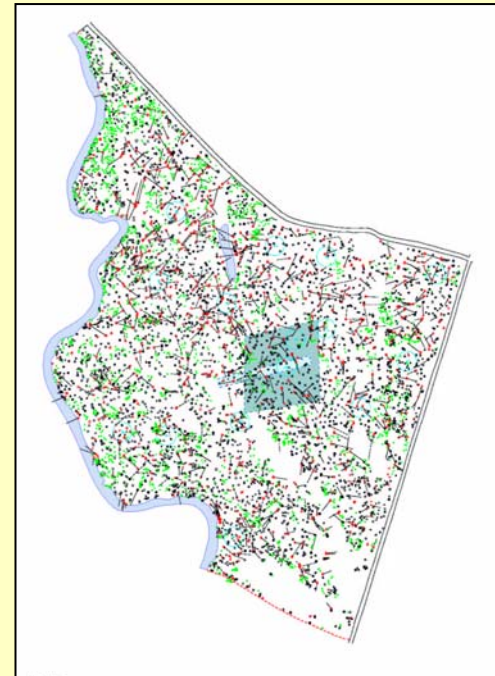
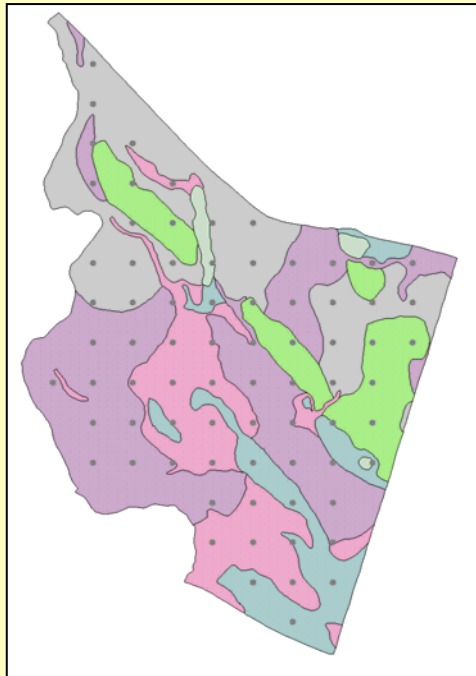


NNR Ranšpurk

# NNR Ranšpurk - research by IFER and VÚKOZ

rules	IFER	VÚKOZ
goal	perfect detection and evaluation of timber stand	each tree living trajectory observing
method	statistical inventory	whole area research

features	IFER	VÚKOZ
time	2003	2006
technology	Field-Map	Field-Map
covering the area	16,63%	100%
inventory plots	74	-
core areas	no	transect (100 x 10 m)



## Comparison of methods – differences

technology	IFER	VÚKOZ
electronic calliper	yes	no
GPS	yes	no
staff (min. #)	2	3
measured tree marking	nail	chalk
data processing	FM Inventory Analyst	SW PraleStat

measuring	IFER	VÚKOZ
DBH threshold	70 mm	100 mm
height of tree	immediately	afterward
natural regeneration mapping	immediately	afterward (into new tree map)
reference points network	regular	irregular
TREE_ID checking	no	yes
deadwood	all lying wood (incl. branches)	lying stems with DBH => 100 mm

## Results comparison – the number of trees (DBH ≥ 120 mm)

### LIVE TREES

species	Number of trees	
	IFER 2003	VUKOZ 2006
<i>Quercus robur</i>	83	94
<i>Carpinus betulus</i>	1824	2286
<i>Acer campestre</i>	2420	1786
<i>Fraxinus angustifolia</i>	853	1019
<i>Ulmus sp.</i>	345	244
<i>Tilia cordata</i>	433	386
Others	479	303
<b>Total</b>	<b>6437</b>	<b>6118</b>

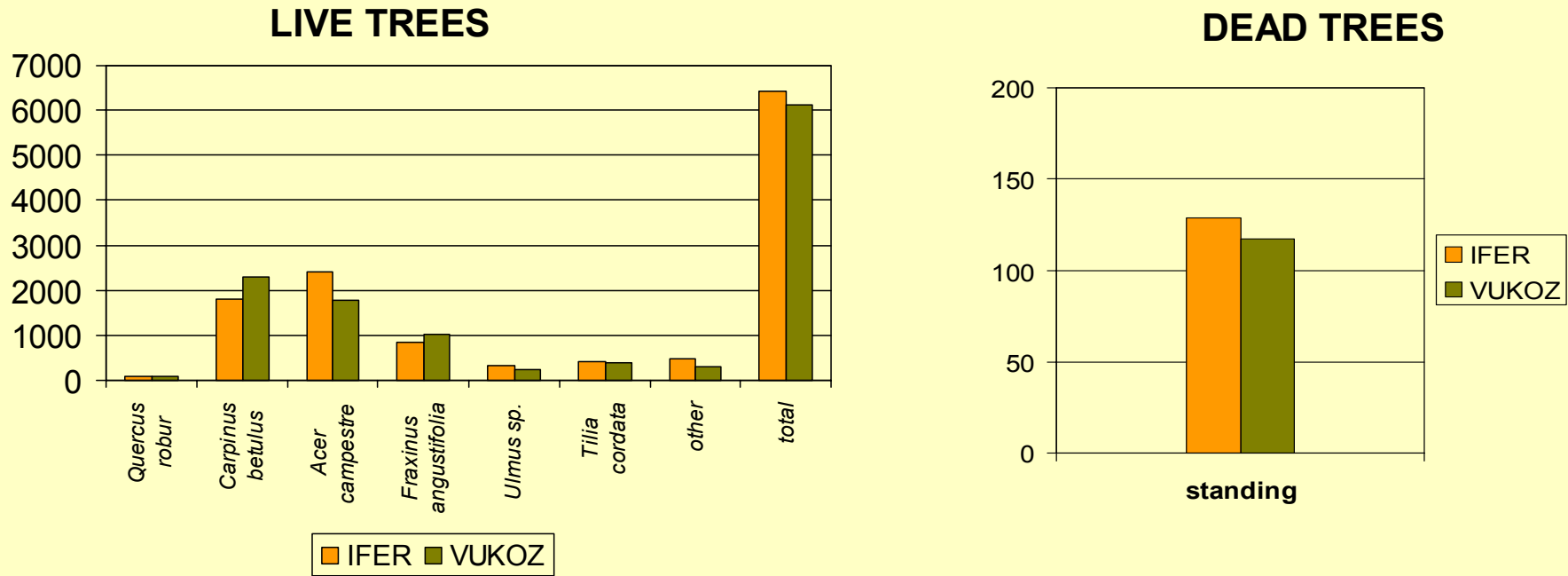
### DEAD TREES

deadwood form	Number of trees	
	IFER 2003	VUKOZ 2006
standing	129	117
lying	-	1066

### HECTARE INDICES

TREES	Number of trees	
	IFER 2003	VUKOZ 2006
LIVE	298	283
DEAD	-	49

## Results comparison – the number of trees



- All values from measuring in 2006 ranges to confidence interval of measuring 2003.
- Total difference of living trees approximates to 5%.
- Total difference of dead standing trees approximates to 9% - relatively high accuracy on the narrow set of individuals.

## Results comparison – the timber volume

### LIVE TREES

species	timber volume [m <sup>3</sup> ]	
	IFER 2003	VUKOZ 2006
<i>Quercus robur</i>	1 067	1326
<i>Carpinus betulus</i>	2000	2197
<i>Acer campestre</i>	1987	2002
<i>Fraxinus angustifolia</i>	3771	4048
<i>Ulmus sp.</i>	436	473
<i>Tilia cordata</i>	426	512
others	271	266
total	9957	10824

### DEAD TREES

deadwood form	timber volume [m <sup>3</sup> ]	
	IFER 2003	VUKOZ 2006
standing	404	431
lying	2489	2388
total	<b>2893</b>	<b>2819</b>

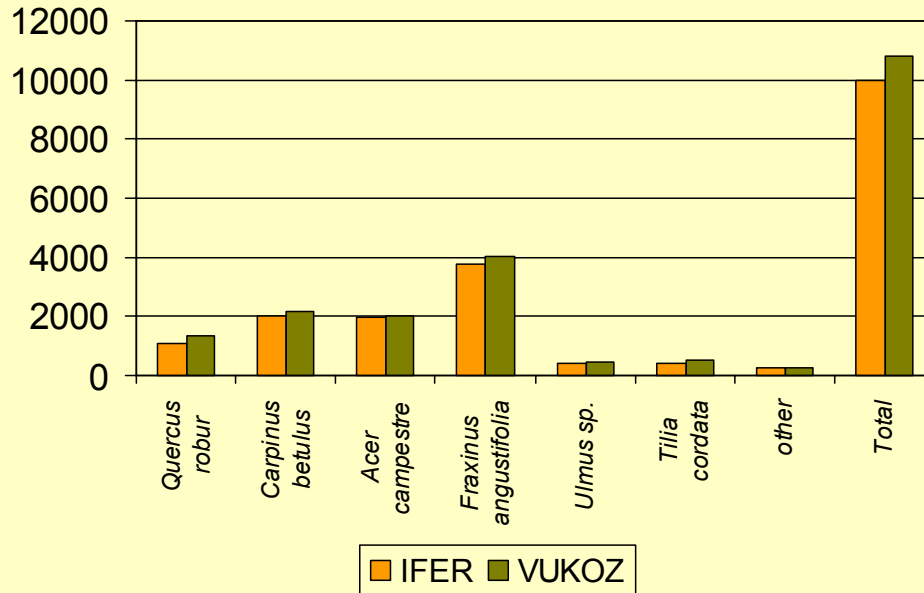
### HECTARE INDICES

TREES	timber volume [m <sup>3</sup> ]	
	IFER 2003	VUKOZ 2006
LIVE	461	501
DEAD	134	131
TOTAL	595	632

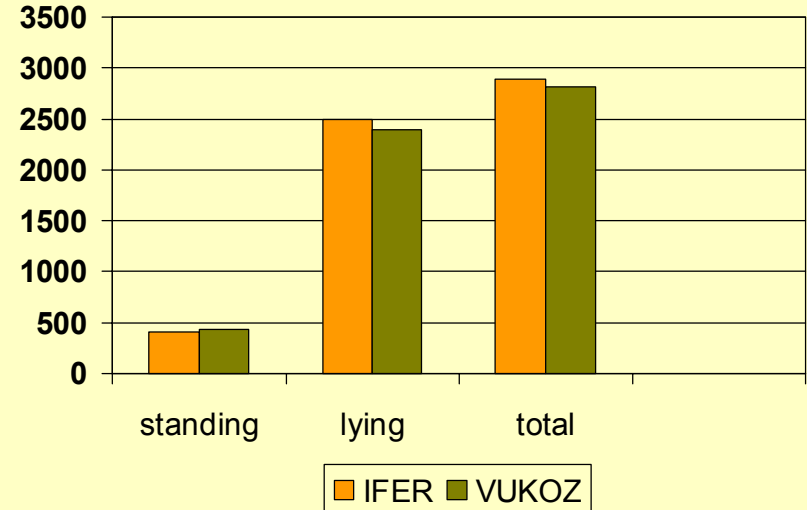


## Results comparison – the timber volume (DBH ≥ 120 mm)

### LIVE TREES



### DEAD TREES



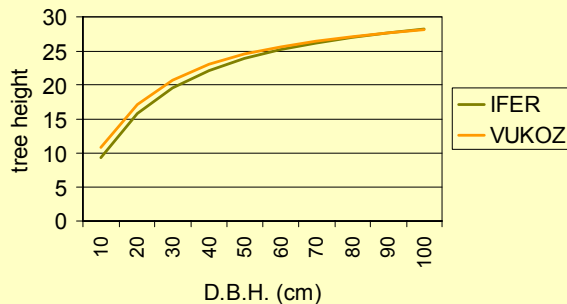
- All values from measuring in 2006 ranges to confidence interval of measuring in 2003.
- Total difference of living trees approximates to 8%; possibly 5% including average increase of individuals from period 1994-2006.
- Total difference of dead trees ranges surprisingly to 3%!!! – using different ways of deadwood measuring.
- Different ways of tree volume computing (height curve, volume tables) are necessary to take into calculation.

## Results comparison – the height structure

### *Carpinus betulus*

DBH [cm]	HEIGHT [m]	
	IFER 2003	VÚKOZ 2006
10	11,00	10,88
20	16,80	17,17
30	17,70	20,71
40	20,40	22,94
50	22,90	24,47
60	26,30	25,58
70	27,00	26,42
80	27,00	27,09
90	27,80	27,62
100	28,00	28,06

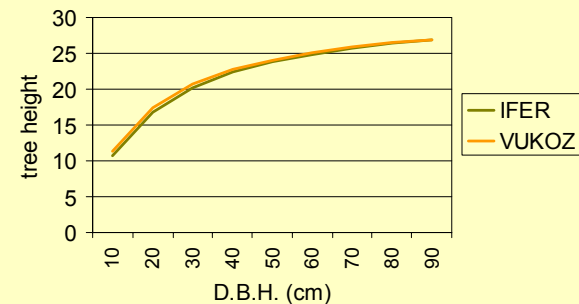
Naslund height curve - *Carpinus betulus*



### *Acer campestre*

DBH [cm]	HEIGHT [m]	
	IFER 2003	VÚKOZ 2006
10	10,00	11,28
20	16,10	17,34
30	21,60	20,65
40	22,90	22,69
50	23,60	24,08
60	24,70	25,08
70	25,60	25,84
80	26,20	26,43
90	26,90	26,90
100	-	-

Naslund height curve - *Acer campestre*



## Summary - conclusions

IFER

VÚKOZ

### Used research methods:

- statistical inventory
- whole area measurement

### Main features:

- optional (sufficient) accuracy
- high accuracy
- time economy
- high time requirements
- repeatability
- repeatability

### Results provide:

- characteristic of locality as a whole
- life journey description of real tree from its birth to its death
- precise description of actual state
- detection of internal ecosystem dynamics
- possibility of main trends monitoring
- possibility to analyse selected phenomenon ad hoc (spatial patterns, species competition etc.)

# Thank you for your attention!

This contribution has been resulted thanks to research intention

MSM 6293359101

Research into sources and indicators of biodiversity in cultural landscape in the context of its fragmentation dynamics

## **Methods and results of the inventory and whole area research comparison of the National Nature Reserve Ranšpurk**

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**IFER**

**Institute of Forest Environmental Research**

