Good practices in forest management which are beneficial for keystone function of the Black Woodpecker in forest ecosystems

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Introduction

- Saving biodiversity
- Secondary-cavity nesters – need for natural holes
- Managed forest – holes not numerous
- Woodpeckers are keystone species especially in managed forests
- The Black Woodpecker – the most important for the biggest secondary-cavity nesters

Research aim:

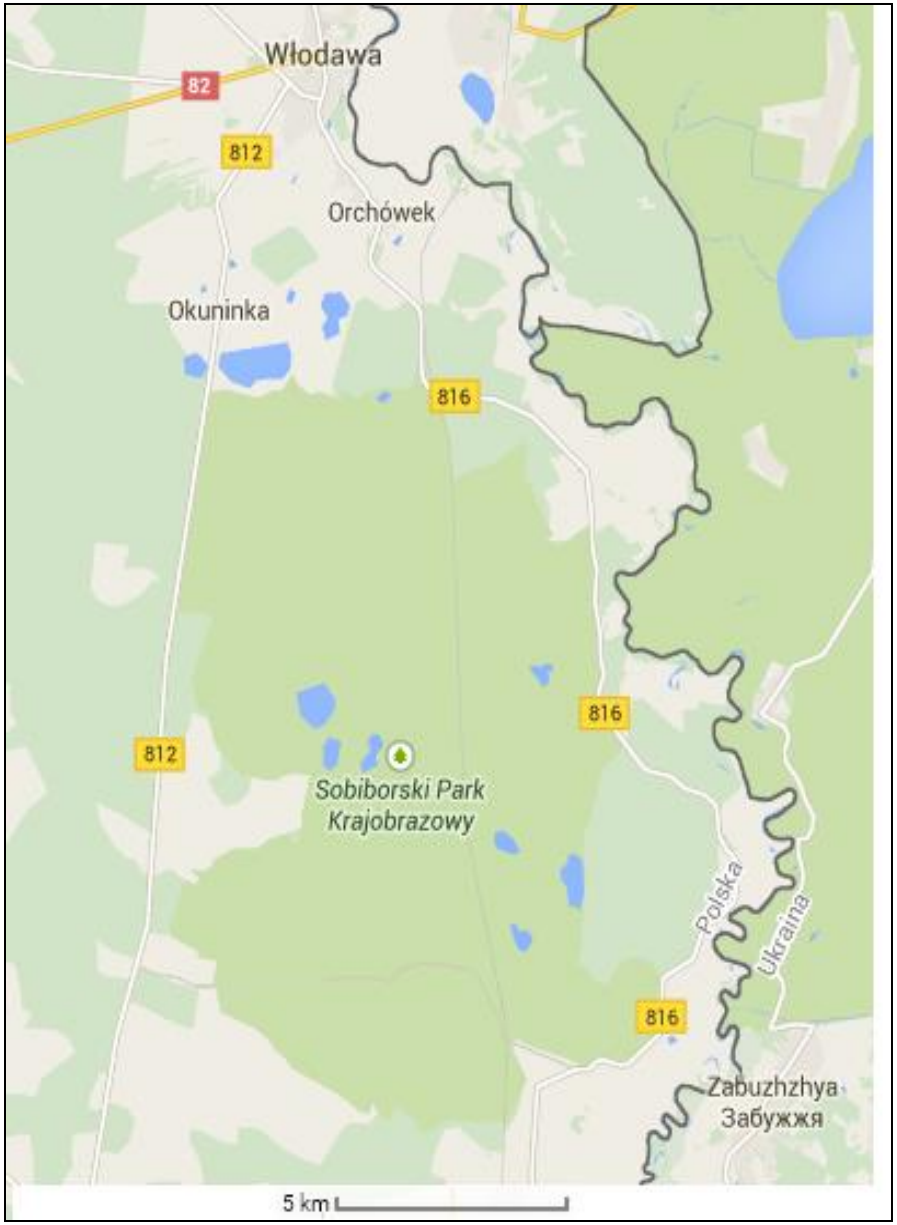
- Evaluate the Black Woodpecker's influence as a keystone species for secondary cavity-living animals in different types of forest

- Determine beneficial practices in forest management for a keystone species role of the Black Woodpecker

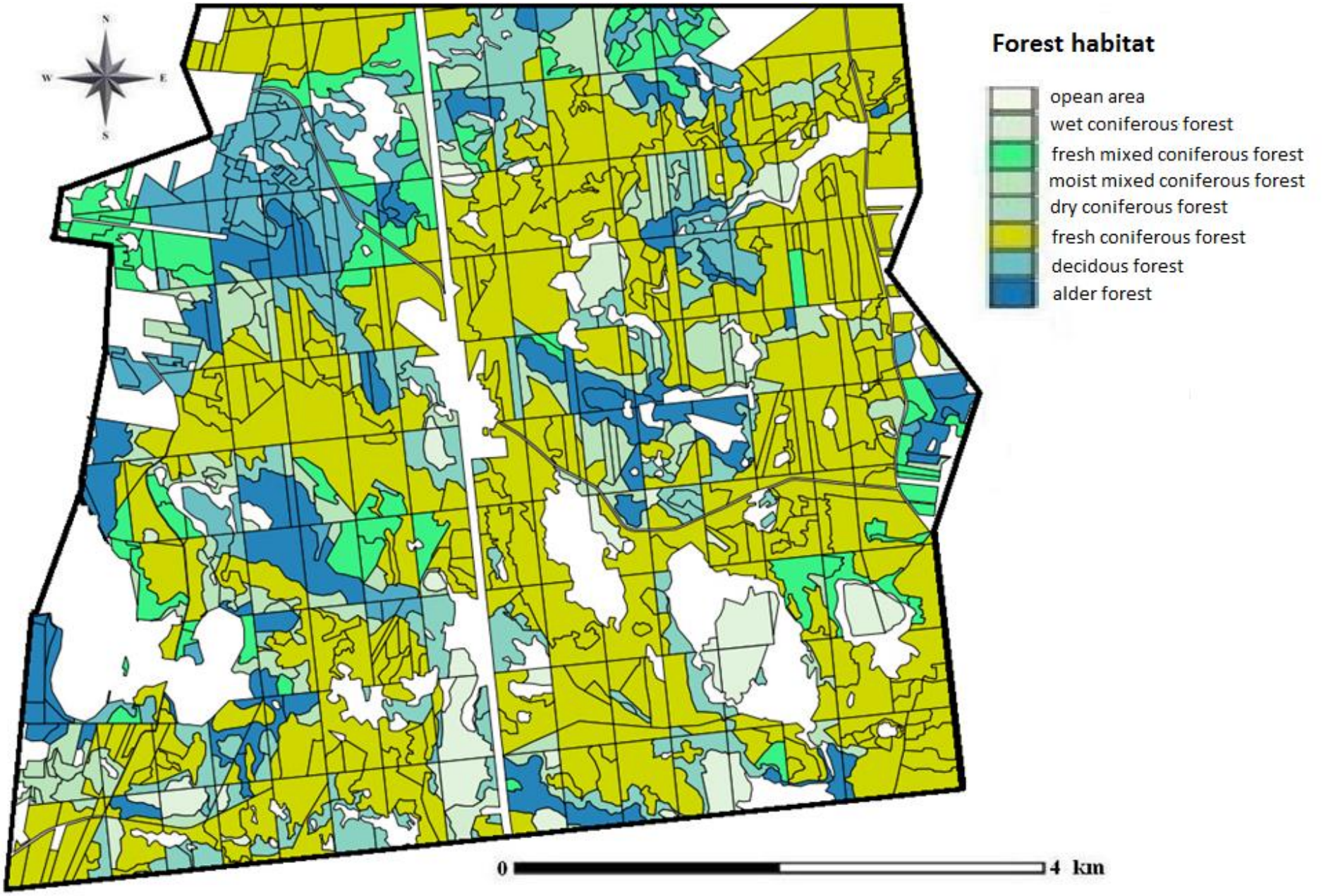
Fot. A. Kasprzak

Research area:

- Lubelskie region**;**
- Eastern part of Sobibór Forest**;**
- Sample plot: **3636,9 ha;**
- Forest area - **91,5%;**
- Managed forest and reserves
- 12.2012- 07.2015



www.maps.google.pl



Forest habitat on sample plot

Fot. M. Grzębkowski


Fot. O. Karpińska


Fot. O. Karpińska


Fot. O. Karpińska

Material and methods

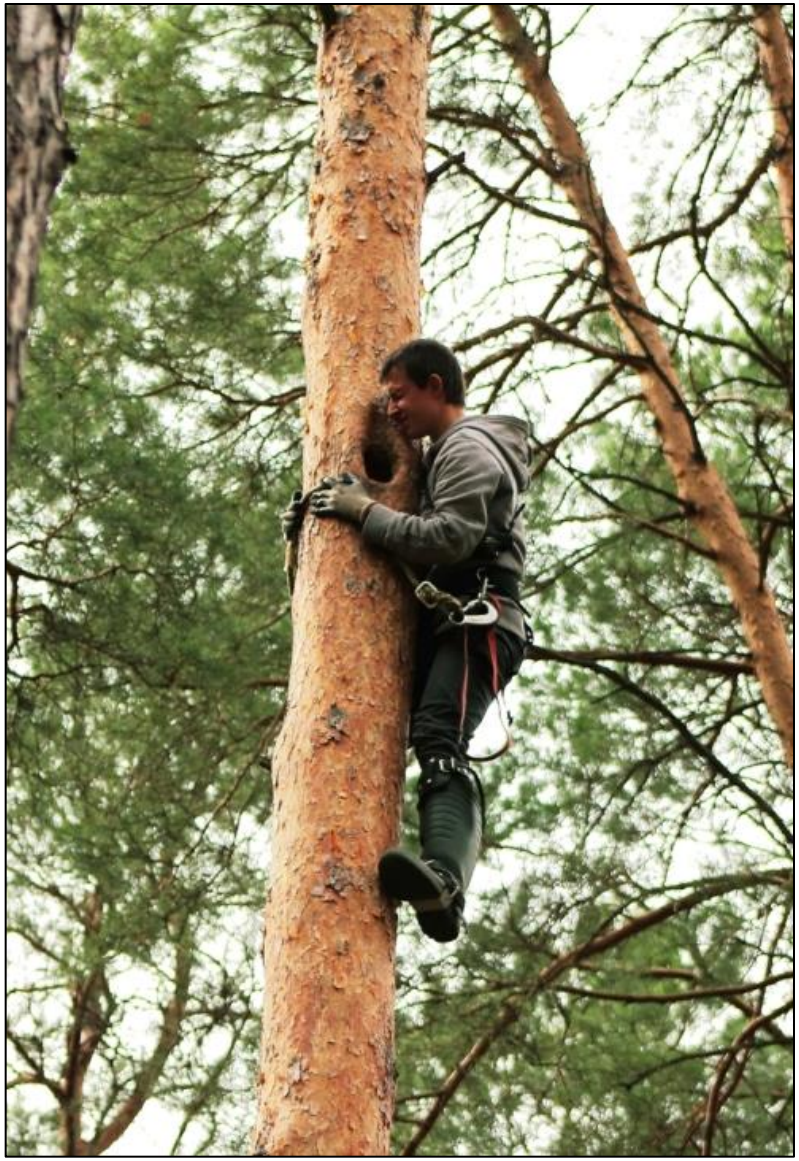
1. Hole searching

Fot. L. Smith

Fot. O. Karpińska

2. Cavity-nest control (April - July)

Fot. P. Wasserman



Fot. K. Żołądek

Fot. K. Żołądek

3. Habitat, tree & hole parameters

- DBH
- circumference
- cavity height
- hole parameters
- tree height

- tree vitality
- hole location
- understory
- tree stand age
- tree species
- forest habitat type

Fot. O. Karpińska

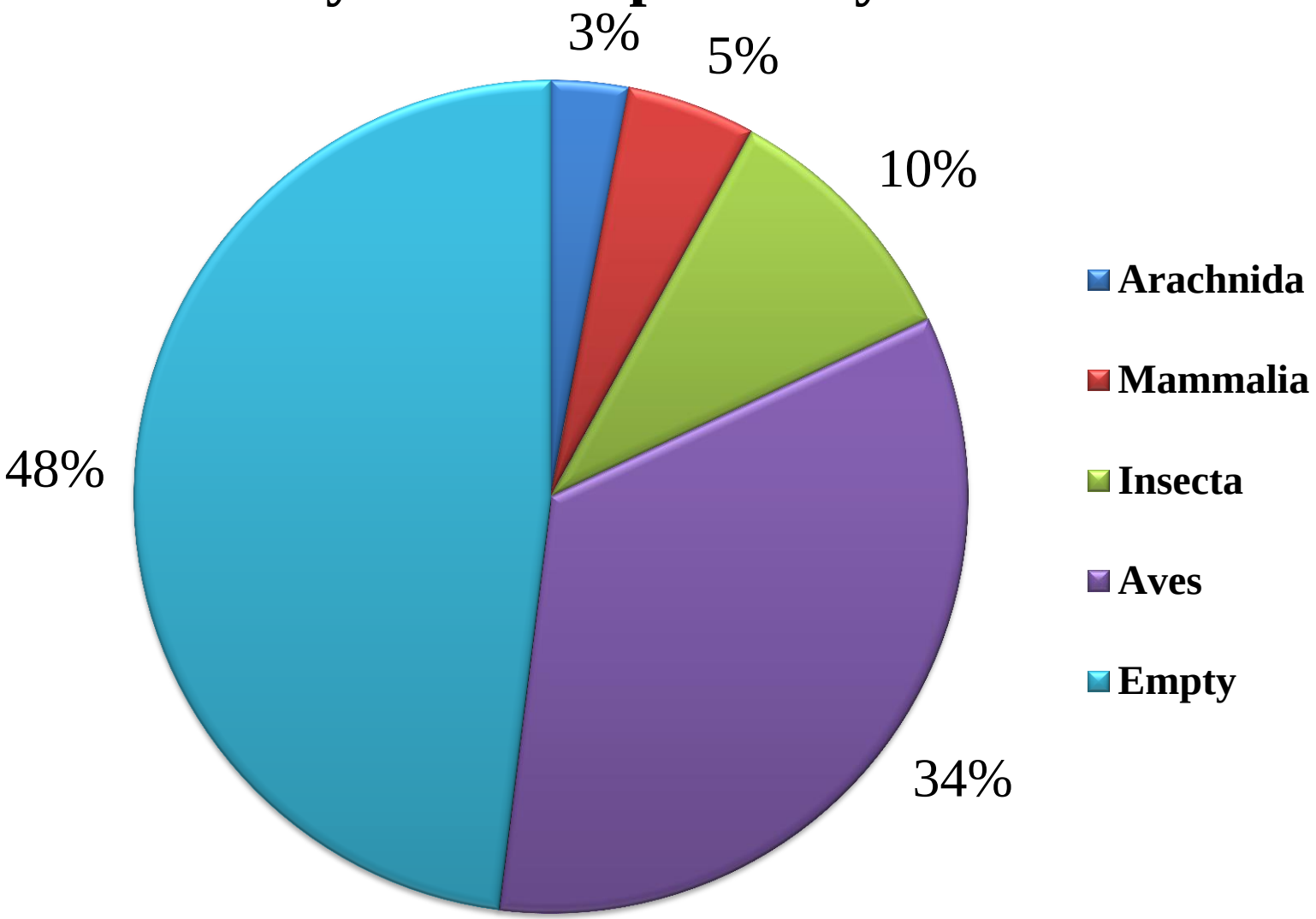
4. Analyses

- Microsoft Excel
- ArcGIS
- The R: Project for Statistical Computing
  - ✓ Wilcoxon
  - ✓ Kruskall-Wallis

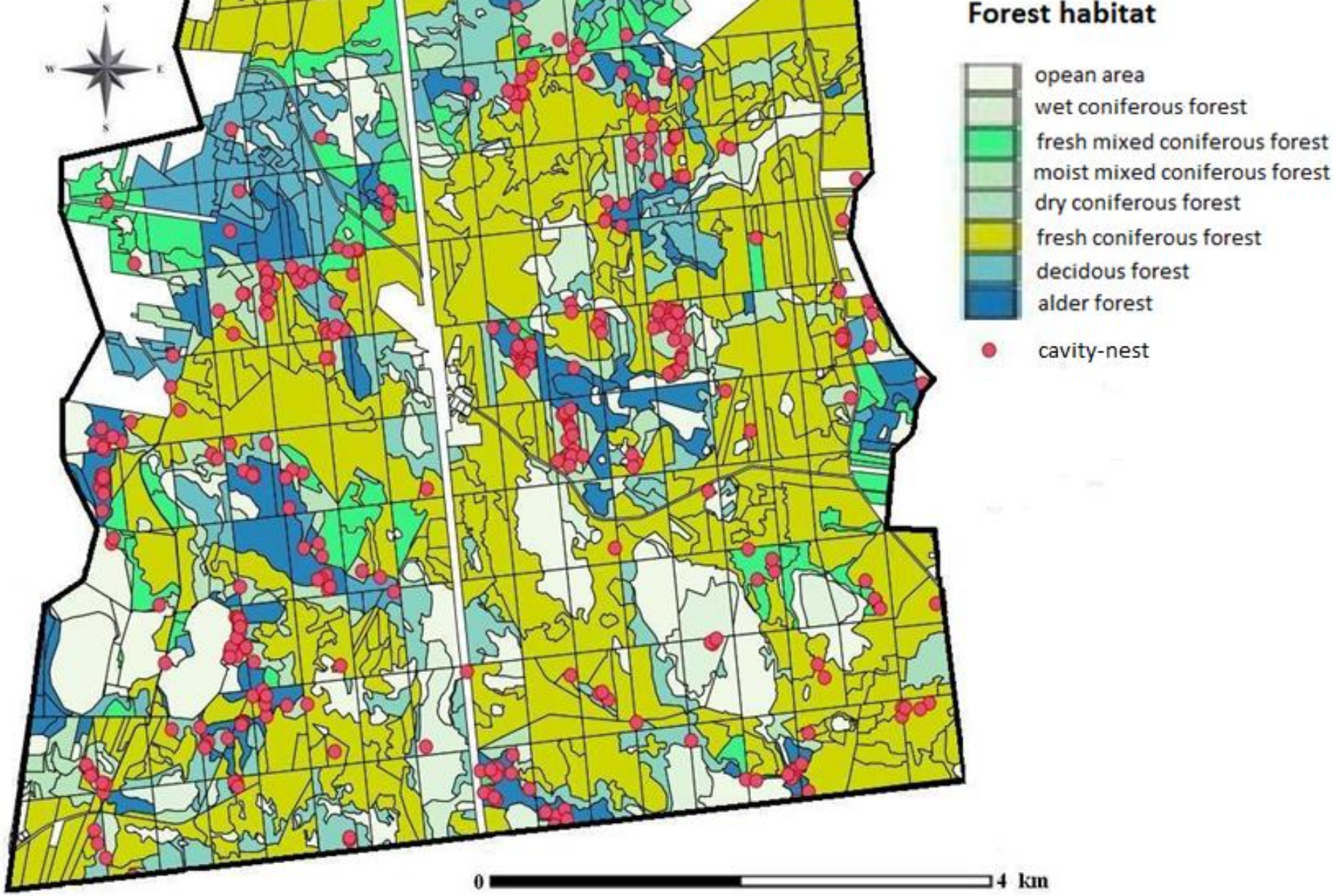
Results

- 375 cavity-nest
- 16 % inaccessible – 315 controlled
- 1419 cavity-nest controls
- 52 % were occupied
- 0,9 % were cut off

Cavity-nest occupation by each Class

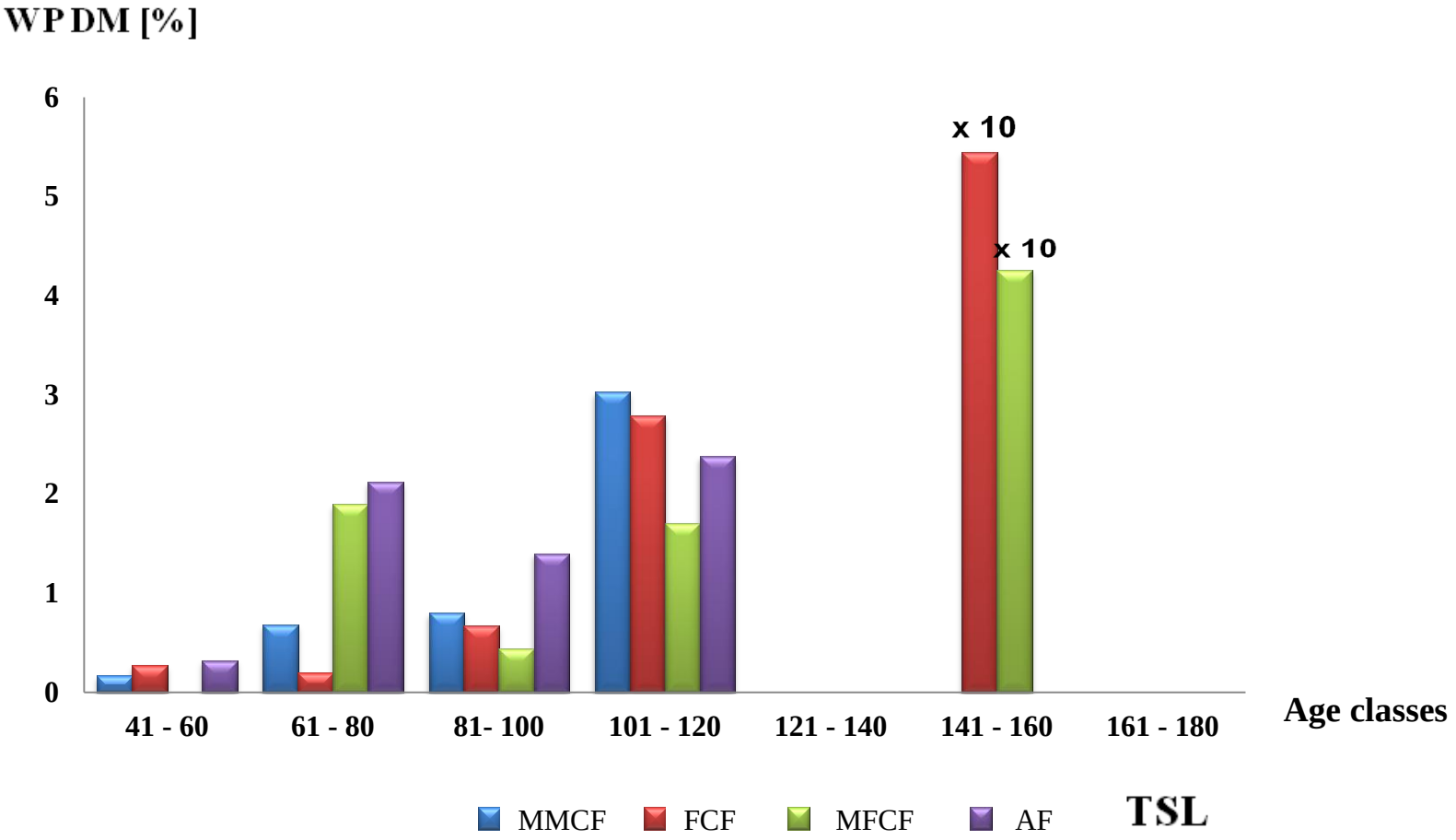


Occupied by 30 species



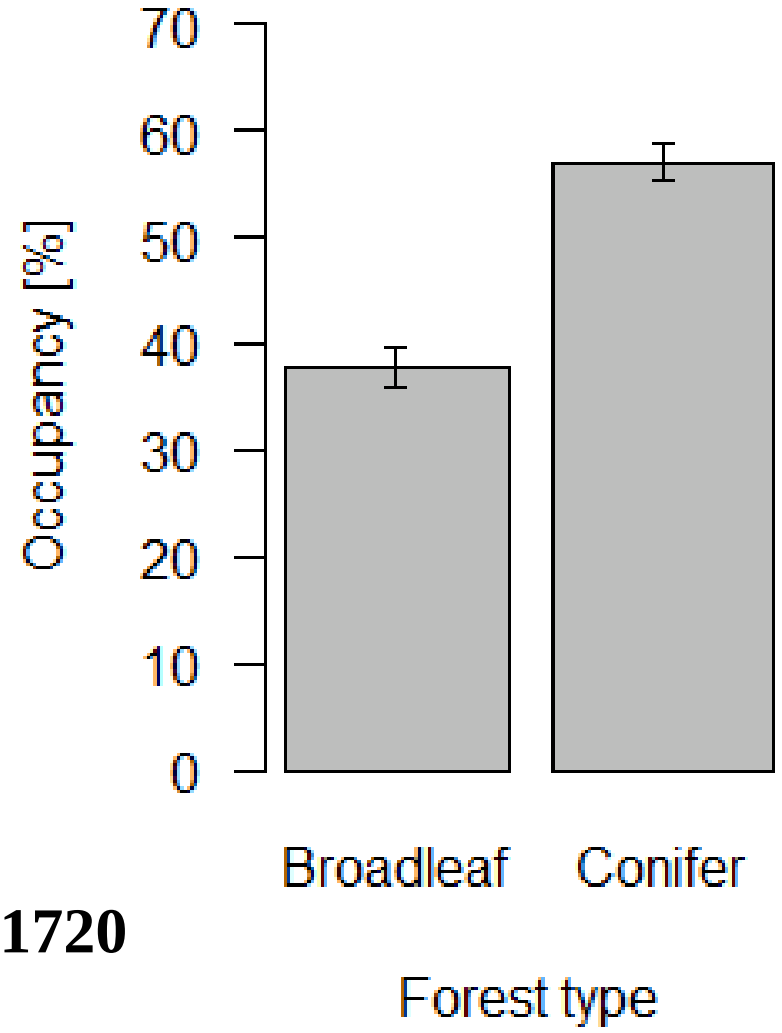
The Black Woodpecker's cavity-nest distribution on sample plot

Age classes preference in forest habitat type



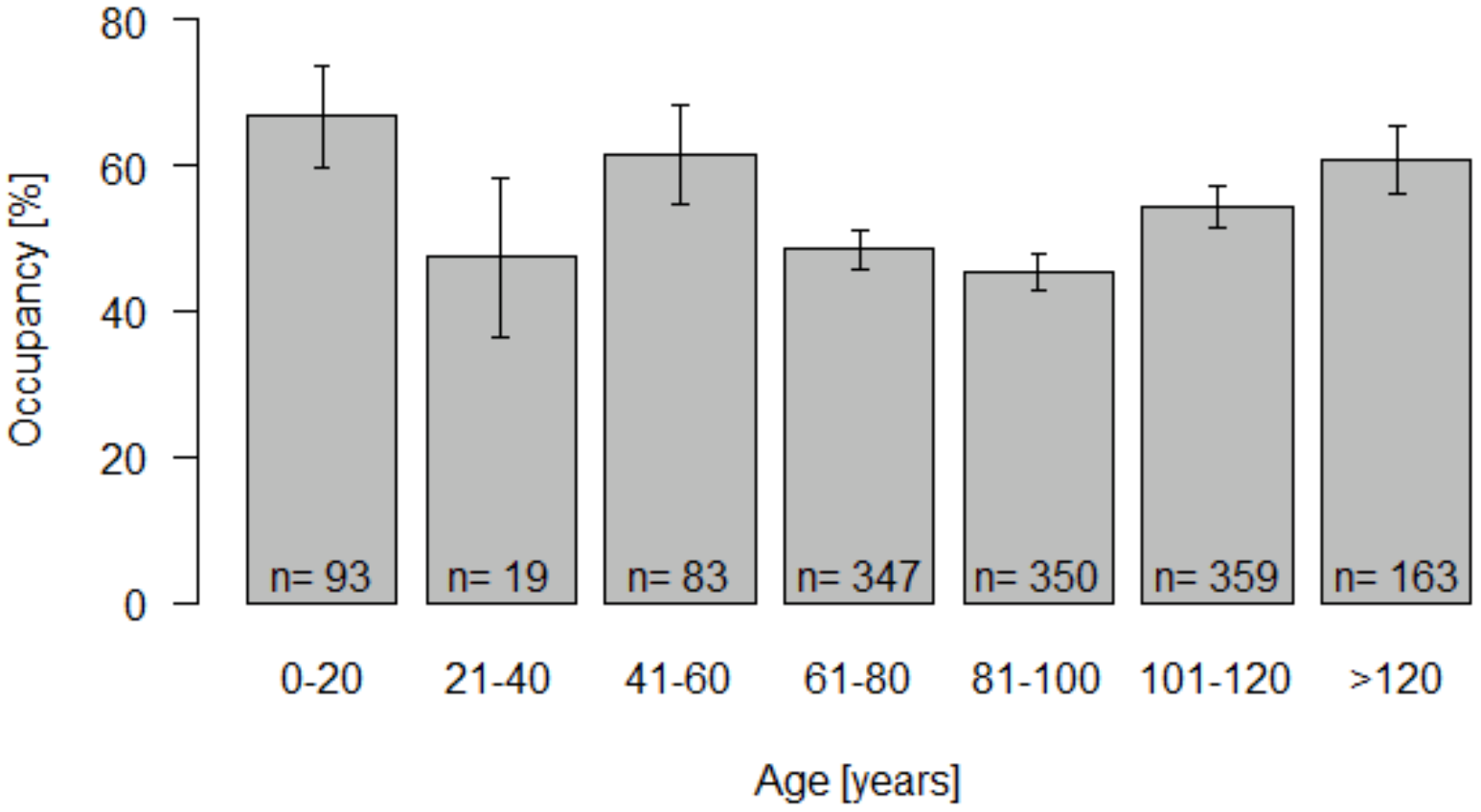
Ryc. 6. Habitat Preference Ratio for the Black Woodpecker on sample plot including age classes of forest habitat type (WP DM - habitat preference of the Black Woodpecker) (N = 243).

Occupancy in different forest type



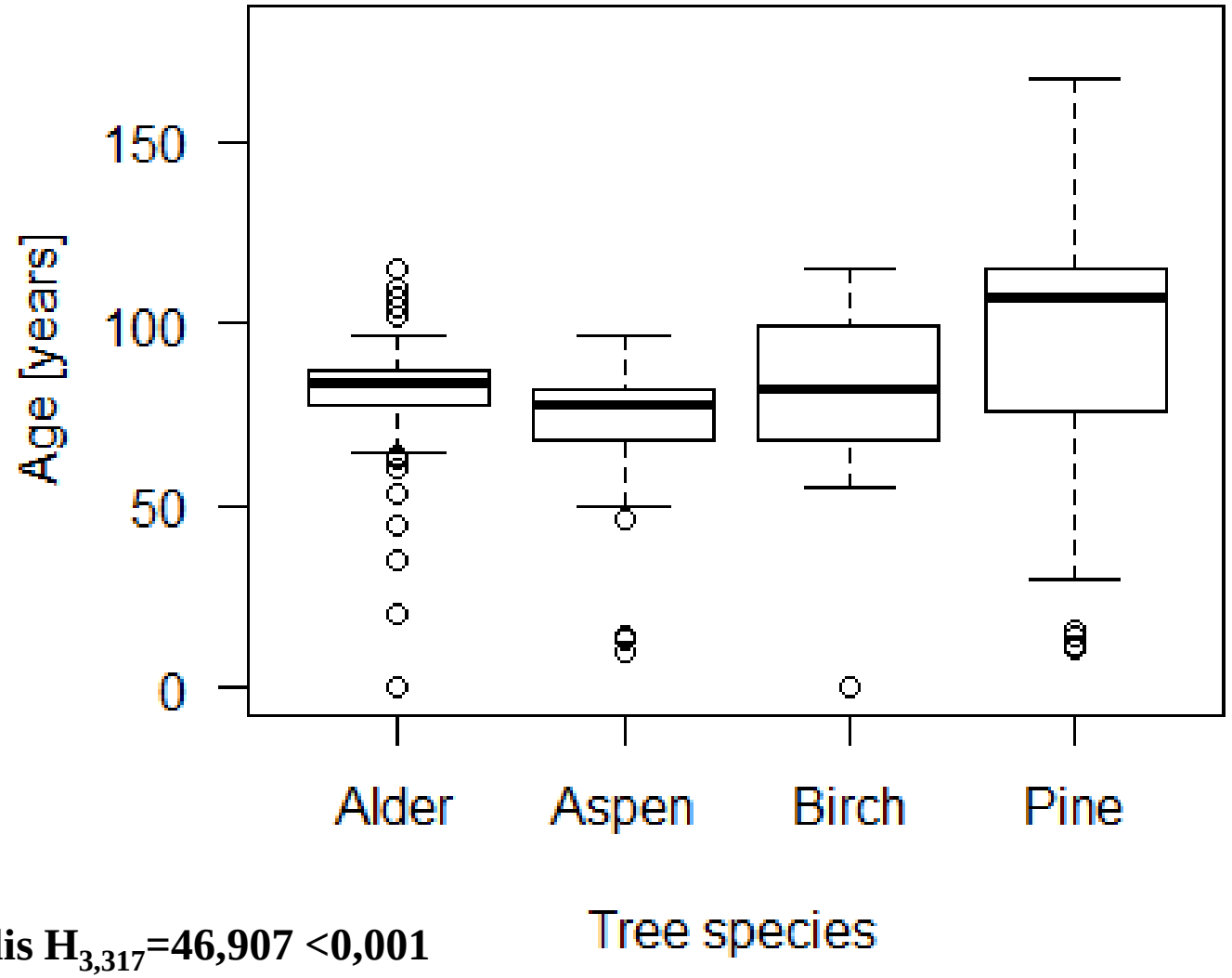
Wilcoxon W = 171720
<0,001 N=1419

Occupancy in different age classes



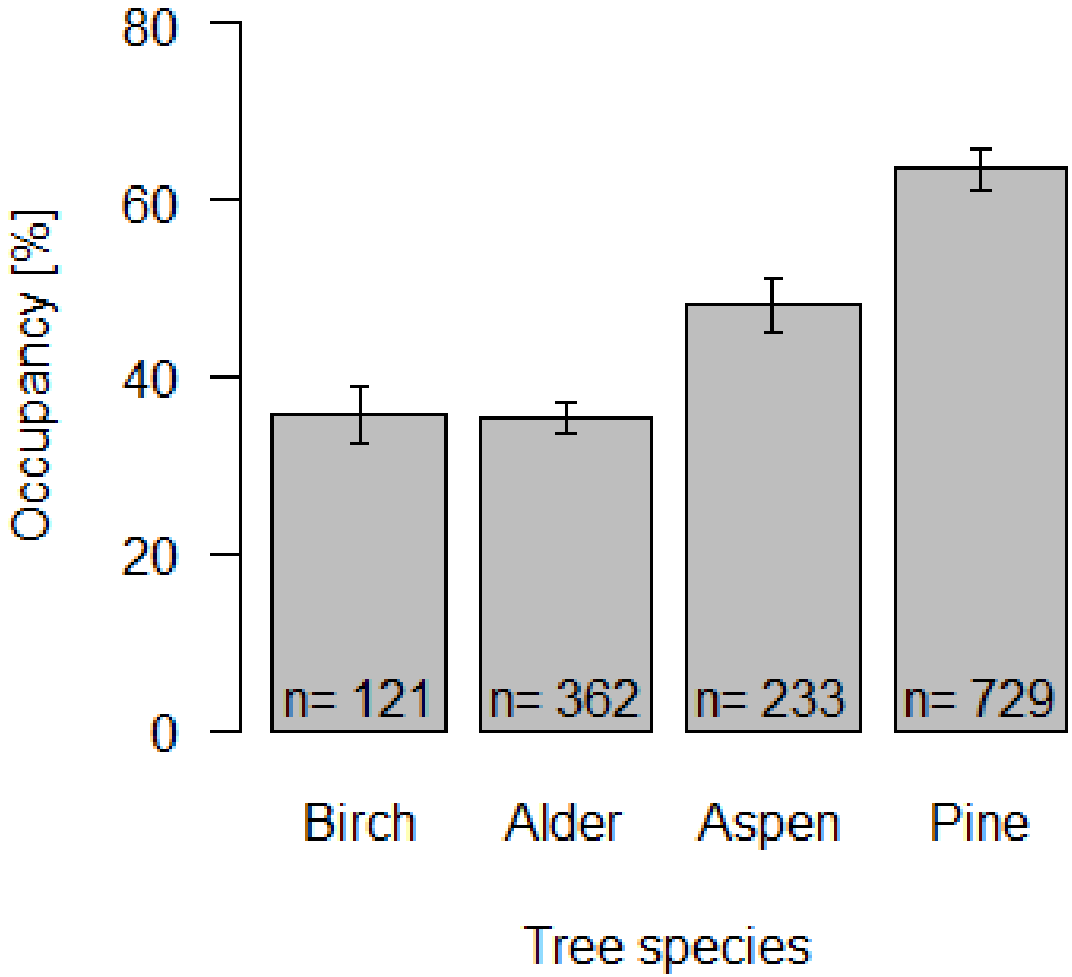
Kruskall-Wallis $H_{6,1414}$=24.582 <0,001
N=1419

Occupancy in different age classes in each tree species



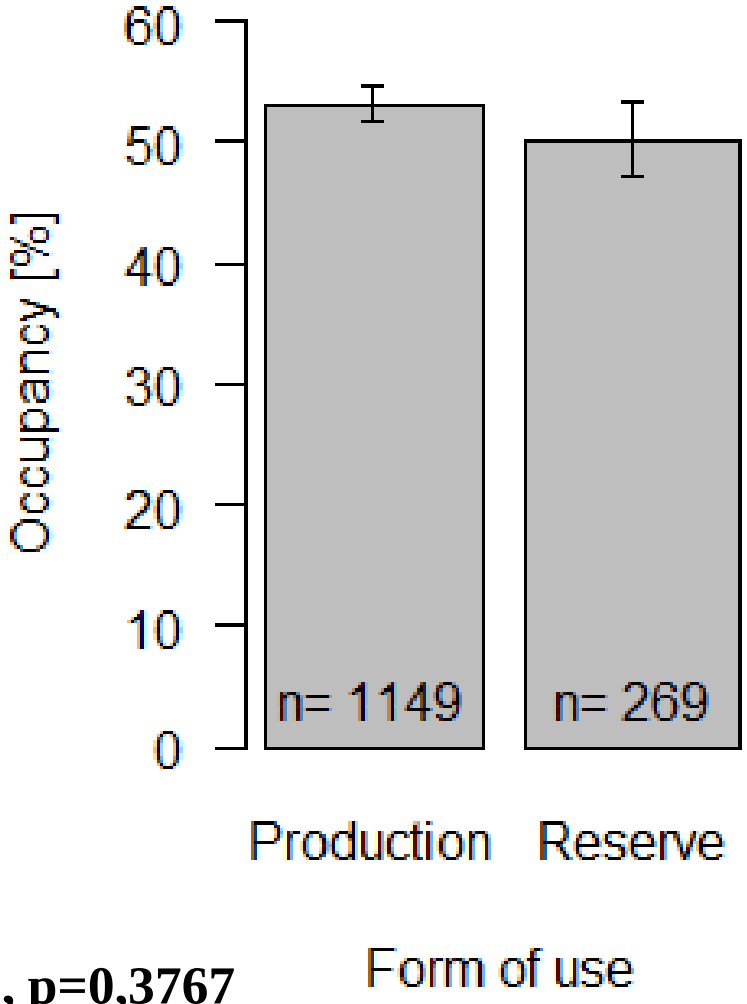
Kruskall-Wallis $H_{3,317}$=46,907 <0,001
N=1419

Occupancy in tree species



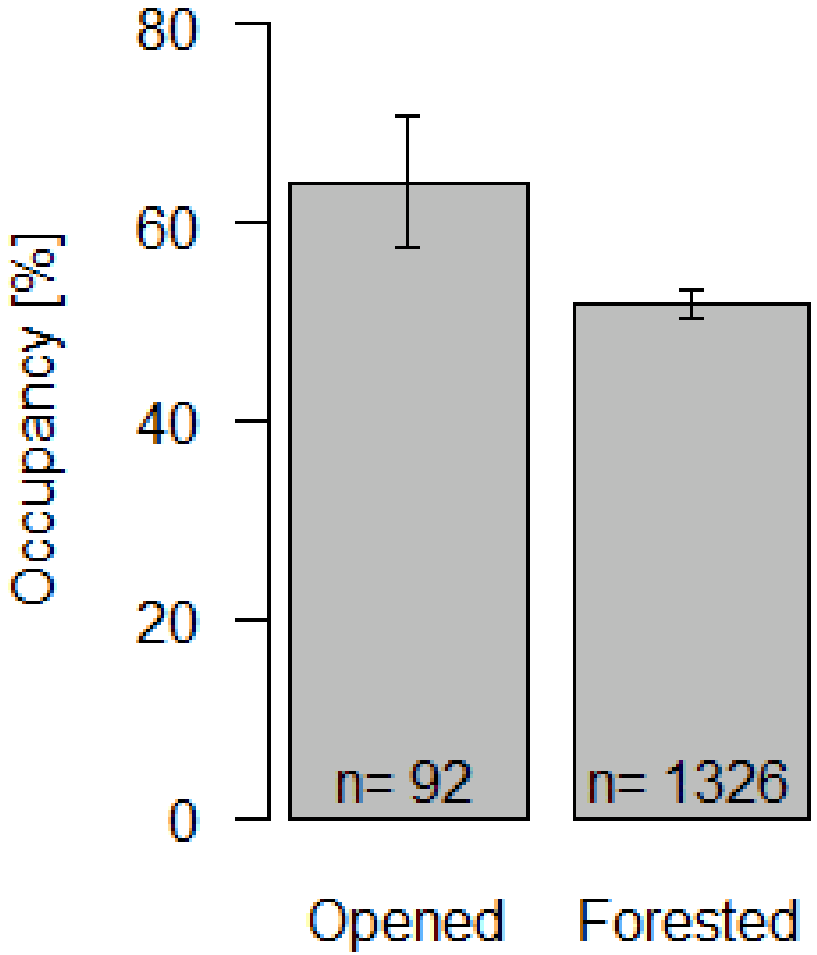
Kruskall-Wallis H3,1445=93,252 <0,001
N=1419

Occupancy in reserves & managed forest



Wilcoxon W = 159160, p=0,3767
N=1419

Occupancy in residual trees



Wilcoxon W = 53481 <0,05
N=1419

Conclusions

- The Black Woodpecker – keystone species
- The most important role in suboptimal habitat
- Contributes to increasing species diversity in managed forest

Fot. M. Grzębkowski

Conclusion

- Preserve diverse tree stand structures
- Retain residual trees, old-growth patches
- Retain fast-growing with optimal soft wood tree species groups like Aspen

Fot. A. Ahlfors

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Thank you for the attention