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

Oliwia Karpińska
Mateusz Grzębkowski
Kamil Żołądek
Bartłomiej Woźniak

Warsaw University of Life Sciences
Faculty of Forestry
Department of Zoology and Wildlife Management

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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
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
Forest habitat on sample plot
Material and methods

1. Hole searching
2. Cavity-nest control (April - July)
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
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

- Arachnida: 48%
- Mammalia: 5%
- Insecta: 10%
- Aves: 34%
- Empty: 3%

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 $W = 171720$

$p < 0.001$ $N=1419$
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
Occupyancy in tree species

Kruskall-Wallis $H_{3,1445}=93.252 <0.001$
N=1419
Occupyancy 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
Conclusion

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


Thank you for the attention