

THE WOODPECKER GUILD COMPOSITION IN THE FORESTS OF CENTRAL LITHUANIA

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Brazaitis G., Pėtelis K. 2010. The woodpecker guild composition in the forests of central Lithuania. *Acta Biol. Univ. Daugavp.*, 10(2): 183 - 188.

Most of woodpecker species are and endangered in Europe and Lithuania. The estimation of rare woodpecker species population size has been changed during the last decade significantly: from 4 times (the Medium spotted woodpecker) to 100 times (the White backed woodpecker). The aim of this study is to analyze the species composition and density of woodpecker guilds in the forest of central Lithuania. The census were provided in central part of Lithuania, mainly in mixed deciduous-spruce forests. Totally, census was fulfilled in 35 study plots. The average density of the Great spotted woodpecker was highest (14.66 pair / 100 ha). Other woodpecker species was much rarer: the Black woodpecker (1.80 pair / 100 ha), the Medium spotted woodpecker (1.34 pair / 100 ha), the White-backed woodpecker (1.20 pair / 100 ha) and the Lesser spotted woodpecker (1.17 pair / 100 ha) was more than one pair in 100 ha. Mostly rare woodpeckers were the Three-toed woodpecker (0.46 pair / 100 ha), the Grey woodpecker (0.37 pair / 100 ha) and the Green woodpecker (0.06 pair / 100 ha). The analysis showed that abundance of rare woodpecker species is significantly higher in Natura 2000 sites selected for the Three-toed woodpecker protection, but not for the White-backed woodpecker and the Medium spotted woodpecker. The protected areas (Natura 2000 territory selected for any bird species) significantly favour the populations of the White-backed woodpecker and significant on the Medium spotted woodpecker. The abundance of the White-backed woodpeckers were significantly higher in optimum habitats. The density of woodpeckers are varying from country to country but in general is similar and could be explained by methodological and regional (south-north) reasons.

Key words: *Woodpecker, density, population, Lithuania*

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INTRODUCTION

Woodpeckers (*Picidae*) are medium sized birds (8-50 cm), systematically characterized 214 species in the World. Woodpeckers colonized all continents except Australia and Antarctica (Short 1982; Winkler et al. 1995). Main ecological features of woodpeckers are hollow nesting and

forest related birds. Woodpeckers as a rule has narrow ecological niches and many species could co-exist together (Short 1978).

Woodpeckers immediately respond to quantitative and qualitative changes of forest habitats (Angelstam and Mikusinski 1994). Resident bird species such as woodpeckers are

one of mostly sensitive group of wildlife (Weselowski and Tomialojc 1986; Angelstam 1990, 1992). Sensitivity means that species are dependent on habitats that existence is against forestry interests: search food on deadwood, for breeding use old deciduous forests (Angelstam and Mikusinski 1994). The size of woodpeckers is larger most of other resident species and they require larger individual and breeding territories than other (tits, treecreepers). Most of woodpecker species became rare in the regions where forestry is too much intensive (Rassi and Vaisanen 1987; Angelstam et al. 2004).

Most of woodpecker species are and endangered in Europe and Lithuania. Only the Great spotted woodpecker *Dendrocopos major* is common and abundant. The estimated population in Lithuania is 40000-60000 pairs (Birdlife international, 2000, Kurlavičius 2003). Other species is much rarer. The population decrease from the Lesser Spotted Woodpecker *Dendrocopos minor* (7000-10000 pairs), to the Black woodpecker *Dryocopus martius* (3000-6000 pairs); the Medium spotted woodpecker *Dendrocopos medius* (2000-2500 pairs); the White-backed woodpecker *Dendrocopos leucotos* (900-1200 pairs). The rarest woodpecker species are the Grey woodpecker *Picus canus* (500-700 pairs); the Green woodpecker *Picus viridis* (300-500 pairs); the Three-toed woodpecker *Picoides tridactylus* (150-200 pairs) (Birdlife international, 2000, Kurlavičius 2003). The estimation of rare woodpecker species population size has been changed during the last decade significantly: from 4 times (the Medium spotted woodpecker - Birdlife international, 2000) to 100 times (the White backed woodpecker - Žalakevičius et al. 1995). The aim of this study is to analyze the species composition and density of woodpecker guilds in the forest of central Lithuania. Such analysis is very valuable and essential source for population evaluation of species population not only on national and on International levels.

Study area, materials and methods

The census of woodpeckers were provided from 15th March till 30th April (10th May), with regards on the activity of woodpecker. The census of woodpeckers were started after the snow melted and temperature persisted above a zero. The census lasted up to 4-5 hrs after the sunrise. The census was not provided during bad, windy or rainy weather.

The census unit was 1 km² study plot. The borders of study plot were combined with compartment lines. The census of woodpeckers was made in 4 points, equally dispersed in the each study plot (the distance among points was 500 m). The census in each point lasts 12 minutes totally with interruptions after 6 and 9 minutes by woodpecker drumming playback (each lasts 2 min.). The birds were registered also moving from the point to point. One study plot was inventoried during 2-2.3 hrs. During one morning were investigated two squares.

The census were provided in central part of Lithuania, mainly in mixed deciduous-spruce forests. Totally, census was fulfilled in 35 study plots.

The studied areas were divided into randomly selected and optimum habitats, representing visually best areas of the forest. Also we collected areas into protected Natura 2000 areas for certain woodpecker species, and unprotected areas. We compared selected habitats types using ANOVA.

RESULTS

The average density of the woodpecker species guild is presented in table 1. The Great spotted woodpecker was mostly abundant woodpecker. Other woodpecker species was much rarer. The average density of the Black woodpecker, the Medium spotted woodpecker, the White-backed woodpecker and the Lesser spotted woodpecker was more than one pair in 100 ha. Mostly rare woodpeckers were the Three-toed woodpecker,

the Grey woodpecker and the Green woodpecker. The densities of these species were 0.46 pair and less in 100 ha of the forest.

The analysis showed that abundance of rare woodpecker species is significantly higher in Natura 2000 sites selected for the Three-toed woodpecker protection ($F=5.85$; $p<0.02$), but not for the White-backed woodpecker ($F=3.32$; $p<0.08$) and the Medium spotted woodpecker ($F=1.18$; $p<0.28$) and moreover for the whole woodpecker community ($F=0.40$; $p<0.53$).

The protected areas (Natura 2000 territory selected for any bird species) not favour the populations of the Black woodpecker ($F=3.00$; $p<0.09$), the Green woodpecker ($F=0.32$; $p<0.57$), the Grey woodpecker ($F=0.51$; $p<0.48$), the Great spotted woodpecker ($F=1.17$; $p<0.68$), the Lesser spotted woodpecker ($F=1.34$; $p<0.25$), the Three-toed woodpecker ($F=0.60$; $p<0.44$) (table 2). The analyzed impact is near significant on the White-backed woodpecker ($F=3.33$; $p<0.08$) and significant on the Medium spotted woodpecker ($F=5.84$; $p<0.02$).

Table 1. The average densities of woodpecker species in Central Lithuania.

Species	Average density pair /1 km ²	± SE
Black woodpecker <i>Dryocopus martius</i>	1.80	0.21
Green woodpecker <i>Picus viridis</i>	0.06	0.04
Grey woodpecker <i>Picus canus</i>	0.37	0.09
Great spotted woodpecker <i>Dendrocopos major</i>	14.66	1.42
Medium spotted woodpecker <i>Dendrocopos medius</i>	1.34	0.24
Lesser spotted woodpecker <i>Dendrocopos minor</i>	1.17	0.21
White-backed woodpecker <i>Dendrocopos leucotos</i>	1.20	0.22
Three-toed woodpecker <i>Picoides tridactylus</i>	0.46	0.16

Table 2. Average densities of woodpecker populations in protected, not protected, randomly selected and optimum habitats in Central part of Lithuania (* - Protected and unprotected are selected from general list of Natura 2000 areas; ** - Protected and unprotected are selected for certain species Natura 2000).

Habitat	Black woodpecker*	Green woodpecker*	Grey woodpecker*	Great spotted woodpecker*	Medium spotted woodpecker**	Lesser spotted woodpecker*	White-backed woodpecker**	Three-toed woodpecker**
Protected Natura 2000	2.04 ±0,29	0.04 ±0,04	0.42 ±0,10	14.25 ±1.90	1.63 ±0,36	1.33 ±0,27	1.46 ±0,28	1.13 ±0,51
Unprotected	1.27 ±0,14	0.09 ±0,09	0.27 ±0,19	15.5 ±1.88	1.11 ±0,31	0.82 ±0,26	0.64 ±0,24	0.26 ±0,13
Random selected	1.76 ±0,29	0.06 ±0,06	0.29 ±0,11	12.2 ±1.88	0.88 ±0,24	0.82 ±0,25	0.70 ±0,20	0.29 ±0,24
Optimum habitats	1.83 ±0,31	0.06 ±0,06	0.44 ±0,14	16.9 ±2.00	1.78 ±0,38	1.50 ±0,32	1.67 ±0,34	0.61 ±0,22

Finally we compared the random and the optimum habitats for woodpeckers. The abundance of the White-backed woodpeckers were significantly higher in optimum habitats ($F=3.17$; $p<0.05$), but this was not observed on the Three-toed woodpecker ($F=1.34$; $p<0.28$), and the Medium spotted woodpecker ($F=1.40$; $p<0.26$). The total abundance of woodpeckers were also higher ($F=2.97$; $p<0.06$).

DISCUSSION

Great spotted woodpecker. The average density in central Lithuania was 14.7 pair/ 100 ha. In random selected areas density was lowest – 12.2 pair / 100 ha as well as in optimum habitats – 16.9 pair/100 ha. The detected density in neighbouring countries is similar and are 10.2 pair /100 ha in Latvia (Pridnieks et al., 1989) and 8-17 pair / 100 ha in Poland (Tomialojc et al. 1984; Tomialojc and Stawarczyk 2003). Only in the overmature park „Vingis“ in Vilnius were registered higher abundance - 26 pair / 100 ha (Riauba 1998). In young and not suitable habitats the density of great spotted woodpecker was 0.2-1.2 pair / 100 ha (Kurlavičius, 1995, Pridnieks et al., 1989).

Medium spotted woodpecker. The average density in central Lithuania was 1.34 pair/ 100 ha. In random selected areas density was lowest – 0.88 pair / 100 ha as well as in optimum habitats – 1.78 pair/100 ha. The average density in other studies was differ from 0.9 pair / 100 ha (Bergmanis and Strazds 1993) to 5-11 pair / 100 ha (Tomialojc et al. 1984). Moreover in optimum sites the average density in Poland could reach 24 pairs / 100 ha (Wesolowski and Tomialojc 1986). The average area of individual territory is 8.9 ha (Pasinelli 2000) but seems, could be much lower, depending on bird density.

Lesser spotted woodpecker. The average density in central Lithuania was 1.17 pair/ 100 ha. In random selected areas density was lowest – 0.82 pair / 100 ha as well as in optimum habitats – 1.50 pair/100 ha. The density of this species depends

on the habitat: the lowest density is found in pine forests - 0.1 pair / 100 ha (Stenberg and Hogstad 1992) and largest in broadleaved riparian forests - 2-4 pair /100 ha (Wesolowski and Tomialojc 1986; Pridnieks et al. 1989). The density in wet ash – black alder stands was 3-5 pair / 100 ha, oak – hornbeam – 1-3 pairs / 100 ha (Tomialojc et al. 1984).

White-backed woodpecker. The average density in central Lithuania was 1.20 pair/ 100 ha. In random selected areas density was lowest – 0.70 pair / 100 ha as well as in optimum habitats – 1.67 pair/100 ha. In neighbouring countries the average density of this species is from 0.6 pair / 100 ha in Latvia up to 1-2 pairs /100 ha in Poland (Tomialojc et al. 1984; Bergmanis and Strazds 1993). In the optimum habitats in Latvia the density of White backed woodpecker reach 1.5 pair / 100 ha (Bergmanis and Strazds 1993).

Three-toed woodpecker. The average density in central Lithuania was 1.80 pair/ 100 ha. In random selected areas density was lowest – 0.29 pair / 100 ha as well as in optimum habitats – 0.61 pair/ 100 ha. The highest density was registered in Natura 2000 areas selected for this species protection – 1.13 pair / 100 ha. In neighbouring countries the density of this species varies from 0.5 pair / 100 ha in semi-natural forest in Finland (Virkkala 1987) and 0.34 pair / 100 ha in Latvia (Bergmanis and Strazds 1993) as well as 2-3 pairs / 100 ha in ash-black alder stands and up to 1 pair / 100 ha in oak – hornbeam stands in Poland (Tomialojc et al. 1984).

Grey woodpecker. The average density in central Lithuania was 0.37 pair/ 100 ha. In random selected areas density was lowest – 0.29 pair / 100 ha as well as in optimum habitats – 0.44 pair / 100 ha. In neighbouring countries the density of this species varies from 0.14 pair / 100 ha in Latvia (Bergmanis and Strazds 1993) as well as <0.1 pair / 100 ha in Poland (Tomialojc et al. 1984; Tomialojc and Weselowski 1990). Only in the overmature city park „Vingis“ in Vilnius were registered higher abundance - 0.4 pair/100 ha (Riauba, 1998).

Black woodpecker. The average density in central Lithuania was 1.80 pair/ 100 ha. In unprotected areas density was lowest – 1.27 pair / 100 ha as well as in protected Natura 2000 habitats – 2.04 pair / 100 ha. In neighbouring countries the density of this species varies from 0.15 pair / 100 ha in central Sweden (Johnsson, 1993) and 0.3 pair / 100 ha in Latvia (Bergmanis and Strazds 1993) as well as <1 pair / 100 ha in Poland (Tomialojc et al. 1984). In Sweden the density increases southward direction (Johnsson, 1993).

ACKNOWLEDGMENT

We are grateful Per Angelstam and Jean-Michel Roberge for methodological contribution and collaboration as well as Kaunas, Marijampolė, Kaišiadorys, Dubrava, Prienai and Alytus State Forest Enterprises for information on forest structure.

CONCLUSIONS

1. The Great spotted woodpecker was mostly abundant woodpecker. The average density of the Black woodpecker, the Medium spotted woodpecker, the White-backed woodpecker and the Lesser spotted woodpecker was more than one pair in 100 ha. The average density of the Three-toed woodpecker, the Grey woodpecker and the Green woodpecker was 0.46 pair and less in 100 ha of the forest.
2. The abundance of the Black woodpecker and the Three-toed woodpecker were higher in protected Natura 2000 area as well as other were more abundant in optimum habitats.
3. The density of woodpeckers are varying from country to country but in general is similar and could be explained by methodological and regional (south-north) reasons.

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Received: 27.06.2007.

Accepted: 20.09.2009.