ORNIS SVECICA 8:11–16, 1998 https://doi.org/10.34080/os.v8.22955

Nest site selection of the White-backed Woodpecker *Dendrocopos leucotos* in the eastern part of Latvia

INDRIĶIS KRAMS

Abstract

The White-backed Woodpecker Dendrocopos leucotos shows decreasing population trends in most areas in Europe. The main reason for this is increasing activity of man in changing the species' habitat. My study on the distribution and breeding biology of the White-backed Woodpecker in the eastern part of Latvia provides some evidence that these local woodpeckers live in stable populations. In view of this, it is important to begin more serious studies on the Latvian White-backed Woodpeckers to develop successful protection pogrammes which could be useful also for the whole of northern Europe.

Indriķis Krams, Department of Sciences, Daugavpils Pedagogical University, LV-5407 Daugavpils, Latvia.

Received 28 August 1997, Accepted 6 March 1998, Editor: S. Svensson

Introduction

The survival perspective for the White-backed Woodpecker Dendrocopos leucotos appears to be acute. The species has declined drastically over much of Europe (Ahlén et al. 1978, Aulén 1988, Aulén & Carlson 1990). The main decline seems to have occurred within the last 30–50 years. It was revealed that the principal reason for the decline is that suitable breeding habitats are deteriorating in different ways or have disappeared completely. The greatest changes to the habitats have occurred and are occurring due to the intensive forest management. However, it is not forestry alone which has effect on the environments where the White-backed Woodpecker occurs. The habitat structure can also be completely or partly destroyed due to other human activities such as tidying-up the forests or felling of trees for domestic fuel. Present information on population dynamics of the White-backed Woodpecker confirms a region-wide decline of the species in Sweden and Finland, showing that population fragmentation and habitat degradation have been the forces increasing the species' susceptibility to extinction.

In contrast, the present situation for the White-backed Woodpecker appears to be the opposite in Latvia. A great part of Latvian forests has become nearly natural, mostly due to extensive forestry methods used during the last fifty years or lack of thinning. The total coverage of deciduous forests, suitable for the White-backed Woodpecker, has reached about one third of the Latvian forest area. At the same time, the White-backed Woodpecker seems to be more common today compared with its former status (Strazds 1983, Priednieks et al. 1989, Bergmanis & Strazds 1993). The estimated number of White-backed Woodpeckers was nearly 2000 pairs in 1993, probably the highest number ever during the 20th century (Bergmanis & Strazds 1993). The objectives of this paper are to give a general view of the breeding ecology of the White-backed Woodpecker in the eastern part of Latvia, and to analyse the spatial distribution of its territories.

Material and methods

The field data were collected both when visiting localities previously found by other ornithologists, and when visiting suitable areas where the species could occur, finding breeding territories by chance. During 1992–1996, 31 nests of the White-backed Woodpecker were found as shown in Figure 1.

When describing the nests, I followed the field record system used by Aulén (1988), including nest tree location, tree species, condition of tree (living, dead or dying), nest hole position (in stem below or

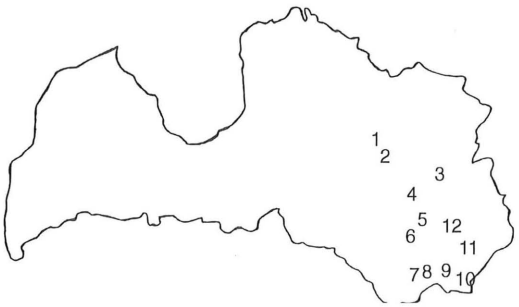

Figure 1. Distribution of the White-backed Woodpecker territories found in 1992–1996. 1 – Pededze forest (4 nests) and Aiviekste river (5 nests), 2 – Klajātnes bog (4 nests), 3 – Rēzekne (1 territorial male), 4 – Malta (1 territorial individual), 5 – Rušons lake (4 territorial males), 6 – Viški lake (1 teritorial male), 7 – Krauja (1 nest), 8 – Naujiene (2 nests), 9 – Krāslava (5 nests), 10 – Indrica (2 nests), 11 – Robežnieki (3 nests), 12 – Ezernieki (5 nests).

Fördelning av påträffade revir av vitryggig hackspett 1992–1996 på olika lokaler.

within canopy), diameter of the tree at breast height and at nest hole height, height of tree and height to nest hole.

The location of nest trees was divided into three main habitat types: (1) large tract of forest (>5 ha), (2) small wood (<5 ha), and (3) shore line forest.

The forest type was divided into: (1) mixed forest (20–70% deciduous trees of any kind), (2) northern deciduous forest (mainly aspen Populus tremula, birch Betula spp., sallow Salix caprea and alder Alnus spp.), (3) oak-dominated forest (>60% oak Quercus robur or other broad-leaved deciduous trees), and (4) coniferous forest (>80% coniferous trees).

In order to find out if the White-backed Woodpecker population in eastern Latvia is fragmented, I used both the localities with confirmed breeding and the territories where breeding of the species was considered only probable.

Results

Territorial activity

White-backed Woodpeckers can be heard drumming at any time of the year. This most characteristic form of territorial behaviour was recorded even when they were feeding nestlings. Usually the morning drumming reached a maximum from 4.00 to 8.00 hours, but the woodpeckers were also active in the evening from 20.00 to 22.00 hours. In the majority of cases (> 60 %), I found the breeding territories using the easily distinguishable drums of the birds. The woodpeckers in isolated territories as a rule got silent earlier in the season than the birds having neighbouring pairs. The territorial activity of the latter group often continued until the middle of June, and the difference between the groups was significant (Mann-Whitney U-test, $n_1 = 11$, $n_2 = 16$, $U = 32$, $p < 0.05$). The breeding territories of the isolated pairs, therefore, were frequently found by pecking sounds and alarm calls of the adult birds. In 10 % of the cases the woodpeckers' presence was revealed by their flights close to the water surface during the nestling period. Keeping a strict rule not to disturb the breeding birds, I avoided nest search until the nestlings had hatched. As a result, almost all nests were found by food-calls of half-grown nestlings, well audible outside the nest-hole.

Nest tree location

Shore-line forest was the predominant habitat of White-backed Woodpeckers since 13 nests were found in that habitat along the Aiviekste and Daugava rivers, and 8 nests in the shore-line forests enclosing lakes at Krāslava, Robežnieki and Ezernieki (Figure 1). I found 5 nests in the fragmented forest clumps at Indrica, Krāslava and between Naujiene and Krauja. The remaining 5 nests were found in large forest tracts in the Pededze area and the Ezernieki lakes site. The Pededze forest is the only area where I was able to record five drumming White-backed Woodpeckers simultaneously and such a density of territorial birds cannot be expected in any other suitable area. Most of the nests (n = 28) were found within 100 m distance from lakes and watercourses (8 nests < 10 m, 10 nests 10–50 m, 10 nests 50–100 m, and 3 nests >100 m).

Deciduous forest was the habitat used most frequently by the breeding White-backed Woodpeckers (21 nests in northern deciduous, 7 in oak, 2 in mixed, and 1 in coniferous forest). Most often the deciduous forest nests were found in forests dominated by alders (15 nests) and less often in forests dominated by birch (6 nests).

Choice of nest tree species

On average, there were about 10 tree species in the White-backed Woodpecker habitats. However, alders, birch and aspen were preferred. Ten nests (32%) were found in black alder Alnus glutinosa, 8 (26%) in birch, 6 (19%) in aspen, and 5 (16%) in grey

alder Alnus incana. Only once was the breeding hole made in a lime tree Tilia cordata or in a common willow Salix alba (3% each).

Condition of nest trees

More than half of the trees used for nesting were dead (16 of 31), including all birches (8) and grey alders (5), and 3 of the black alders. In contrast, all aspens (6), the willow (1), the lime tree (1) and 2 of the 10 black alders were living trees. Five of the black alders were decaying trees.

Almost all of the dead trees were stumps (n=15), either broken by wind or destroyed by polypori . The grey alders used by the woodpeckers were all decaying stumps.

Heights and diameters of nest trees

The height of the nest tree varied between a minimum of 3.0 m (grey alder) and a maximum of 22.0 m (birch). The height of the nest trees was as follows: 1 at 3 m (3%), 4 at 6–10 m (13%), 8 at 11–15 m (26%), 13 at 16–20 m (42%), and 5 at 21–22 m (16%). On average, aspen was the tallest nest tree (14.5 ± 2.3 m, mean and SD) followed by willow (12 m), birch (11.5 ± 3.1 m), lime-tree (7.8 m), grey alder (7.6 ± 1.4 m) and black alder (6.5 ± 0.9 m).

The nest holes were placed as follows: 11 nests (35%) at 3–5 m, 17 at 6–10 m (55%), and 3 at 11–15 m (10%). Thus, 20 (65 %) of the nest holes were placed more than 5 m above the ground.

The trees used by the woodpeckers were rather thin both at breast height and nest hole height (Table 1) indicating that the forests chosen by the breeding birds were rather young. Unfortunately, the exact age of the forests were not identified in all cases. However, I was able to estimate the stage of succession at most of the habitats. Only in 7 (23 %) cases (Pededze wet forest, Robežnieki, Krauja and Indrica), the nesting White-backed Woodpeckers used forests in a final stage of succession.

Breeding success and predators

There were 5–7 nestlings (5.6 ± 0.3, mean and SD) in seven observed broods of the White-backed Woodpecker. During more than 300 hours of field observations I never observed any predation impact from the beginning of the breeding season until the dispersion of the juveniles. Outside the breeding season, I observed two successful attacks of the Goshawk Accipiter gentilis on juvenile woodpeckers crossing open space of ca. 350 m above the river of Daugava.

Observations of territorial White-backed Woodpeckers

To find out whether or not the White-backed Woodpeckers of the Pededze area and the birds breeding in the south-eastern part of Latvia were isolated from each other, I used additional data on territorial birds collected in areas between these two main areas. There were seven territorial individuals along the northern shore of lake Rušons, on the southern shore of lake Viški in the vicinity of Rēzekne city and near Malta town (Figure 1).

Discussion

The principal reason supposed to be responsible for the decline of the White-backed Woodpecker in Sweden and Finland is that suitable breeding environments are deteriorating or disappearing completely (Aulén 1988, Tiainen 1990). The greatest changes of the forests have occurred and are occur-

Table 1. Proportion (%) of White-backed Woodpecker nests in trees of different diameter (m) at breast height (n = 31) and at nest hole height (n = 23).
Andel bon på olika höjd i träd med olika diameter (m) i brösthöjd (n=31) och vid bohålet (n=23).

Diameter of tree *Trädets diameter*	0.16–0.20	0.21–0.25	0.26–0.30	0.31–0.35	0.36–0.40	0.41–0.45
Breast height *Brösthöjd*	13	16	38	19	10	4
Hole height *Hålets höjd*	17	40	26	13	4	0

ring as a result of forest management. In Latvia, where forestry has been more extensive, the White-backed Woodpeckers use the same tree species as in Sweden and Poland in spite of supposedly different proportion of tree species in the forests of the two countries (Wesołowski & Tomiałojc 1986, Aulén 1988).

The Swedish experience shows that besides the forest management there are some other human activities which have effect on the environments where the White-backed Woodpecker occurs or may be considered to occur (Aulén 1988). Suitable areas can also be completely or partly destroyed due to conservation measures, labour market policies, and management plans in nature reserves which are directed to other protection interests, buildings and road-making. These activities can be severe threats if the most valuable trees for nesting and foraging, especially dead or decaying trees, are removed during forests thinning and felling.

This study shows that dead and decaying deciduous trees are essential as nest sites. The aspen is the only exception since all aspens used for nesting were living trees. This confirms the previous suggestion (Aulén 1988) that the birds prefer trees with soft wood for their nests.

Since alder forest is the predominant habitat of the White-backed Woodpecker in the east of Latvia, it could explain the use of alders by the nesting birds. The results obtained suggest that White-backed Woodpeckers mainly occur close to lakes and rivers and there are plenty of them in the eastern part of Latvia. Both alder species are often important components of forests and forest clumps around lakes with small admixture of other deciduous trees. The alder forests can reach a climax stage of succession faster than forests with other trees. There is a high biological diversity in the alder forests growing close to water, and this makes nesting of the woodpecker possible even in rather young alder forests. The number of suitable habitats of this type can be high in the eastern part of Latvia. Nevertheless, the broad-leaved forests composed of big trees are mentioned as particularly important for the White-backed Woodpecker (Aulén 1988, Hogstad 1978, Bergmanis & Strazds 1993). Such a forest is the Pededze wet forest which represents the most outstanding habitat of the White-backed Woodpecker in Latvia. Only in that forest the density of the birds reaches 1.45 individuals per km^2 (Bergmanis & Strazds 1993). This means that each woodpecker pair can exploit 2 km^2 area which is necessary for successful nesting (Tiainen 1990).

Although the density of the White-backed Woodpeckers along the shores of lakes and rivers in south-eastern Latvia is much lower than in the Pededze forest, the total number of breeding pairs may be much higher in these small shore-line forests than the total number of the birds in the few outstanding areas such as the Pededze forest. This situation may change to the worse in the nearest future because suitable forest clumps composed mainly of common alders can be cut and replanted with trees more suitable to the needs of forestry.

The current fragmentation of natural habitats inevitably leads to many species becoming split into disjunct local populations, forming a metapopulation of isolated subpopulations in small patches of suitable habitat. It is considered that population fragmentation besides habitat degradation is the major force increasing the White-backed Woodpecker's susceptibility to extinction in the taiga forests of Northern Europe (Aulén 1988, Tiainen 1990, Carlson & Aulén 1992). Although the 120 km distance between Pededze wet forest and the nests near Krāslava is about twice longer than the longest dispersal distance recorded by Aulén (1988), my results indicate that the White-backed Woodpecker is not yet split into isolated subpopulations in eastern Latvia. Therefore, Latvia may be an excellent place for future studies of the White-backed Woodpecker in order to protect the species more efficiently than has been done in other regions of Northern Europe. However, other methods than bird counts and population monitoring should be used, and further progress is not possible without an individually-based approach to the species' ecology.

Acknowledgements

I thank Gustaf Aulén and Ola Olsson for their valuable comments on the manuscript. I am very thankful to Ingemar Ahlén and Walther Thiede for providing much of the literature on the White-backed Woodpecker. Gabriel Ekman, Kristoffer Stighäll, Christer Stighäll, (Åke Tidigs, Roine Karlsson, and Gunnar Brusewitz encouraged me to start the field data collection. Also, I would like to express my thanks to Tatjana Krama for the field assistance. Ilgvars Ugars and Ivars Stivriņš helped with the manuscript preparation.

References

Ahlén, I., Andersson, A., Aulén, G. & Pettersson, B. 1978. White-backed Woodpecker Dendrocopos leucotos and

Middle-spotted Woodpecker Dendrocopos medius – the ecology of two endangered species in Sweden. *Anser Suppl.* 3: 5–11.

Aulén, G. 1988. *Ecology and distribution history of the White-backed Woodpecker, Dendrocopos leucotos, in Sweden.* Rapp. Inst. Viltekol. 14, Uppsala.

Aulén, G. & Carlson, A. 1990. Demography of a declining White-backed Woodpecker (Dendrocopus leucotos) population. Pp. 63–66 in *Conservation and Management of Woodpecker Populations* (Carlson, A. & Aulén, G., eds.). Swedish University of Agricultural Sciences, Dept. of Wildlife Ecol., Report 17, Uppsala, Sweden.

Bergmanis, M. & Strazds, M. 1993. Rare woodpecker species in Latvia. *Ring* 15: 255–266.

Carlson, A. & Aulén, G. 1992. Territorial dynamics in an isolated White-backed Woodpecker (Dendrocopos leucotos) population. *Conservation Biology* 6: 450–454.

Hogstad, O. 1978. Sexual dimorphism in relation to winter foraging and territorial behaviour of Picoides tridactylus and three Dendrocopos species. *Ibis* 120: 198–203.

Priednieks, J., Strazds, M., Strazds, A. & Petriņš, A. 1989. *Latvian Breeding Bird Atlas 1980–1984.* Zinātne, Rīga.

Strazds, A. 1983. The white-backed woodpecker. Pp. 132–133 in *Latvian Birds: Territorial Distribution and Number* (Vīksne, J., ed.). Rīga.

Tiainen, J. 1990. Distribution changes and present status of Dendrocopus leucotos in Finland. Pp. 21–28 in *Conservation and Management of Woodpecker Populations* (Carlson, A. & Aulén, G., eds.). Swedish University of Agricultural Sciences, Dept. of Wildlife Ecol., Report 17, Uppsala, Sweden.

Wesołowski, T. & Tomiałojc, L. 1986. The breeding ecology of woodpeckers in a temperate primaeval forest – preliminary data. *Acta Ornithol.* 22: 1–19.

Sammanfattning

Vitryggiga hackspettens Dendrocopos leucotos *boplatsval i östra Lettland*

Vitryggiga hackspetten är hotad över stora delar av Europa. Nedgången tycks huvudsakligen ha skett under de senaste 30–50 åren. Huvudorsaken tycks vara att lämpliga häckningsbiotoper har försämrats eller försvunnit fullständigt. Orsaken till detta är främst det moderna skogsbruket, men även andra mänskliga aktiviteter såsom rensning in skogarna och vedhuggning för hemmabruk. Detta har lett till små isolerade bestånd av hackspetten, vilka nu hotas av utrotning.

I motsats till detta tycks situationen vara gynnsammare i Lettland. Där har en stor del av skogarna utvecklats till nära nog naturskog under de senaste femtio åren på grund av att föga gallring skett. Nästan en tredjedel av den lettiska skogsarealen är i dag lövskog som passar viryggiga hackspetten. Arten har sannolikt till och med ökat i antal och beståndet uppgår nu till nästan 2000 par, förmodligen det högsta antalet under hela nittonhundratalet.

Materialet till denna undersökning har insamlats under åren 1992–1996, då 31 bon påträffats på de lokaler som visas i Figur 1. Varje bo och boplats har beskrivits med avseende på olika faktorer.

Strandskogar var den dominerande biotopen (13 bon längs floderna Aiviekste och Daugava och 8 bon runt sjöarna Krāslava, Robežnieki och Ezernieki). Fem bon låg i skogsdungar vid Indrica, Krāslava och mellan Naujiene och Krauja. Övriga fem bon fanns i större skogar vid sjöområdena vid Pededze och Ezernieki. Tjugoåtta av de trettioen bona påträffades inom 100 m från en sjö eller ett vattendrag. Lövskog var den föredragna biotopen (21 bon i vanlig lövskog och 7 bon i ekdominerad sådan, 2 bon i blandskog och endast ett bo i barrskog). De flesta lövskogsbona (15) fanns i skog som dominerades av al, mindre ofta i björkdominerad skog (6 bon). Som boträd dominerade klibbal (10 bon), varefter kom björk (8), asp (6), gråal (5), samt ett i vardera lind och sälg. Mer än hälften av boträden var döda, därav alla gråalar och björkar. I motsats till detta var alla sex asparna levande. Nästan alla döda boträd var brutna högstubbar. Boträdens höjd varierade mellan 3 och 22 m (1 träd 3 m, 4 träd 6–10 m, 8 träd 11–15 m, 13 träd 16–20 m och 5 träd 21–22 m). Av bona låg 11 inom 0–5 m höjd, 17 inom 6–10 m och 3 inom 11–15 m. Boträden hade ganska liten diameter (Tabell 1), vilket indikerar att de utvalda skogarna var tämligen unga. Någon exakt åldersbestämning av skogarna gjordes dock ej.

Produktionen av ungar låg på mellan 5 och 7, i medeltal 5,6 i sju registrerade kullar. Under mer än 300 observationstimmar observerades inte en enda predation på hackspettarna under själva häckningstiden. Däremot noterades två framgångsrika attacker av duvhök utanför häckningstid. De inträffade när hackspettar passerade en 350 m öppen sträcka över floden Daugava.

Studien visar att döda och döende träd är nödvändiga som boplatser. Det enda undantaget är asp, vars mjuka ved tillåter hackspettarna att bygga bo även i friska träd. Det stora beroendet av al beror åtminstone delvis på att al är ett dominernade skogsträd i hackspettbiotoperna. Detta förklarar också närheten till vatten eftersom alen finns främst där. Men alen är viktig ur en annan synpunkt, nämligen på grund av att den är det skogsträd som snabbast bildar en mogen skog i sent successionsstadium. Men gammal ekdominerad lövskog synes ändå vara den allra bästa biotopen. Bara i sådan har riktigt höga tätheter registrerats, upp till 1,45 individer per kvadratkilo-

meter, t.ex. i Pededze sumpskog. För beståndet i sin helhet är det ändå de aldominerade strandskogarna som är viktigast, trots lägre tätheter, eftersom de finns över så mycket större arealer. Tyvärr kan detta förhållande snabbt ändras inom den närmsta framtiden eftersom dessa alskogar riskerar att huggas ner och ersättas av träd som passar skogsbruket bättre.

Mina inventeringar visar dock att det östlettiska beståndet av vitryggig hackspett ännu inte är fragmenterat i sådan grad att det är hotat. Därmed är Lettland ett utmärkt område för framtida studier av arten. Resultaten från fördjupade studier där kan bidra till bättre vård av arten i andra delar av norra Europa.