

Birds from a primaeval temperate forest hardly use feeders in winter

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Received 21 October 1994, accepted 4 April 1995

The use of feeding tables by birds in winter is so common that one tends to take this phenomenon as something self-evident, more as something which can be used in one's study, than as something begging for a special explanation. When extra food is provided we simply expect that birds will use it. Here I describe two cases in which birds did not behave as anticipated — the birds wintering in primaeval stands of the Białowieża National Park, when provided with supplemental food, generally failed to use it. The results clearly indicate that the use of feeders should not be taken for granted. Perhaps this phenomenon is more widespread, but it remains undocumented, due to the reluctance of observers to publish negative results.

Observations were carried out in the Białowieża Forest, probably the least changed, containing the largest amount of pristine features, forest complex existing in the temperate Europe. The forest is located on the Polish–Belarussian border. Situated on the Polish side, Białowieża National Park covers a 47.5 km² block of the best preserved primaeval stands. This area has been strictly protected since 1921. The primaeval stands preserved in BNP are multi-storey, mixed-species and uneven-aged. They are composed of trees reaching unusual heights and contain a large amount of dead timber and uprooted trees. Diversified, fertile upland and swampy de-

ciduous stands cover roughly two-thirds of the BNP area. Coniferous stands cover about 20% of the area. Detailed descriptions and photographs of the forest are given in Tomiałojač and Wesołowski (1994).

Trial I was carried out in the winter of 1986/87. Feeders were designed so as to attract Nuthatches *Sitta europaea* and Marsh Tits *Parus palustris*, and to facilitate their catching. Cardboard containers (ca 10 × 15 × 3 cm) with open covers were fixed on top of 1.5 m high poles and filled with sunflower seeds. Twenty such feeding tables were erected within a 50 ha oak-hornbeam plot on 19 February, next to places where foraging Nuthatches were seen.

Observations carried out in the area on the following day did not show any sign of the utilisation of feeders by birds, though Nuthatches were seen in the vicinity of 13 feeders and Marsh Tits next to 14 feeders. Great Tits *Parus major* and Blue Tits *P. caeruleus* were observed in the vicinity of feeders as well. A repeated visit to the plot after 34 days (on 26–27 March) revealed that in seven of the feeders food supplies were still intact, two feeders were hardly used (only some seeds spilled around them), one feeder was torn apart, apparently by some larger animal, and only the remaining 10 (50%) showed signs of regular use — large fraction to all seeds were

removed. The heavily used feeders were concentrated in the western part of the plot. The weather during the intervening period was relatively cold, with mean daily temperatures averaging -5.4°C , falling below -10°C during a cold spell in the beginning of March, with a minimum of -19.4°C on March 3. The ground was continuously covered with a 20–32 cm deep layer of snow.

Trial II was carried out in the winter of 1991/92. These feeders were designed to attract White-backed Woodpeckers *Dendrocopos leucotos*. The method applied here had worked efficiently both in Finland (Virkkala et al. 1993) and in Sweden (S. Haavisto, pers. comm.). Pieces of suet (30 feeders) or lard (17 feeders) measuring approximately $12\text{--}15 \times 20$ cm (mass of ca 0.8 kg) were covered with chicken wire-mesh and fixed to trees bearing fresh signs of woodpeckers foraging, at a height of 1.2–1.6 m. A total of 47 feeders were distributed at distances of 0.5–1 km along main forest paths on 5–7 January. They were mostly placed in oak-hornbeam and swampy stands. All the feeders were within areas occupied during the antecedent spring by White-backed Woodpeckers (jointly 21 different pairs — Wesołowski 1995). The feeders were checked approximately at one week (12 January), 2.5 weeks (24 January) and four weeks (4 February) after their provision. The weather during that period remained relatively calm, average mean daily temperature amounted to -1.8°C , only on 19–22 January did mean daily temperatures dropped below -7°C , with a minimum of -12.2°C on 21 January. There was either no snow or a very thin (1 cm deep) snow cover.

At every control empty, damaged feeders were found. Traces found on trunks and on the ground (pieces of bark, moss) at several of these places suggested that some larger animal had climbed the trunk to remove food. Overall, within the observation period about one-third of the feeders were lost in this way. This resulted in a diminishing number of feeders available to birds in the consecutive controls.

After a week of exposure to supplemental food, only 4.8% (2 of 42) of feeders had any signs of being used by birds. This figure rose to 25% (9 of 36) after 2.5 weeks and remained at the same level — 28% (7 of 25) after four weeks.

Overall, any signs of birds' utilisation were detected at only 25.3% (12 of 47) of feeders and the majority of them had remained unexploited. Only three of the feeders were used intensively. In three cases, birds had started to exploit food, but quitted the feeder later on. The signs left at the utilised feeders suggested their exploitation by small birds, only in three cases did the size of traces indicate that they could have been made by woodpeckers.

Birds wintering in primaeval stands failed largely to profit by supplemental food. This remained in sharp contrast with the behaviour of birds wintering in the Białowieża village, with only about 700 m of open farmland separating it from BNP. These birds intensively used supplementary food. A single feeder with lard fixed at a hotel balcony on 5 January 1992 attracted birds almost immediately, and was used intensively throughout the whole period of our stay. It was regularly used by at least 17 individuals of six species (tits, nuthatches, woodpeckers). The actual number of birds using this feeder could be even higher, as birds were not ringed and the estimate is based on the number of birds simultaneously seen at the feeder. Within a week the birds removed half of the offered food.

The data described above were not collected for a project designed to test the reaction of birds to food provisioning, thus, the following discussion should be treated as an attempt to generate hypotheses which could be critically tested in the future. Several possible explanations could be put forward to account for the contrasting pattern found in this study.

1) The densities of birds wintering in BNP are so low that most feeders fell outside home ranges of birds. This is rather unlikely, as spring densities of the year-round residents (100–200 individuals/km², Tomiałojć & Wesołowski 1994) are rather high and the feeders were located where the foraging Nuthatches and tits were seen (Trial I), or fresh signs of woodpecker foraging were visible (Trial II).

2) Caching birds are not interested in exploiting novel food sources in mid-winter. This could be only for the cases of Nuthatch and Marsh Tit, though.

3) Birds in BNP are neophobic (sensu Greenberg

1990). Birds in BNP very probably do not have any experience of artificial feeders, whereas village dwellers are accustomed to the food provided at feeders.

4) Birds do not need extra food. Food resources in a primaeval forest may be rich enough to fulfil the requirements of resident birds. (Wesołowski in press). If this explanation is correct, it would have wide-ranging implications for our understanding of the mechanisms controlling bird numbers, and of the processes shaping bird communities (review in Wiens 1989). It would be of clear conservation importance, too, helping us to propose sound measures to counter adverse effects of modern forest management on birds and forests.

The proposed explanations are not exclusive, different factors acting in parallel could produce the observed pattern of low usage of feeders by the birds in BNP.

Acknowledgements. I heartily thank A. Dybich, K. Hałupka, T. Kliś, B. Orłowska, T. Stawarczyk and D. Szulc for their participation in the data collection. The financial assistance of the Polish Academy of Sciences (project CPBP 04.09) and WWF Sweden (grant to G.

Aulén and A. Carlson) made field work possible. Valuable comments of M. Mönkkönen and R. Virkkala on the manuscript are acknowledged as well.

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