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Brief reports

The detectability of Black Woodpecker: implications for forest bird censuses

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Introduction

The Black Woodpecker (*Dryocopus martius*) is believed to be affected negatively by modern forestry in Fennoscandia. Long-term summer censuses of forest birds in Finland indicated a 75% decline in the Black Woodpecker population during 1945–1975 (Järvinen et al. 1977). This was interpreted as a result of loss of old forest, assumed to be critical habitat for the Black Woodpecker, and a general negative impact of modern forestry. These authors suggested "efficient elimination of old and/or sick tree individuals from the forests and the decreased average size of old forest areas" as the habitat change responsible for the decrease (Järvinen et al. 1977, p. 293).

During our telemetric study we found that the Black Woodpecker used young forest intensively for feeding. This was especially clear in May, June and July, ie. in the period of summer census of forest birds (own unpubl. data). We also observed that detection of the birds in young forest was more difficult than in old forest. This lead us to hypothesize that summer census results could be affected by forest age.

Method and study area

Detection rate of Black Woodpeckers was studied in May–July 1991 and 1992 in a south boreal forest of southeastern Norway — the Varaldskogen study area (60°10′N; 12°30′E). Nineteen radio-equipped birds were used for the test. During each trial the bird was first localized using triangulation from a distance to not disturb it. Then, an observer with a portable receiver and antenna approached from 50–100 m directly toward the bird and continued until the bird flew away, or for 200 m if the bird only moved to the side and remained in the area. We made 55 trials, but no more than once a day for each bird (3 exceptions). Results were classed into two categories — "detected" when the bird was seen or heard or " not detected" when the bird was neither seen nor heard. The forest was dominated by Norway spruce (*Picea abies*) and Scots pine (*Pinus silvestris*). Three categories of forest age were used: clearcut (1–10 years old), young forest (11–40 years old), and old forest (> 70 years old). The age class 40–70 years old comprised only 7% of the study area and did not appear in our sampling. Rolstad et al. (1988) provided a detailed description of the study area.

Results and Discussion

Detectability depended on forest age (Table 1). The detection rate in young forest was lower (23%, n = 26) than in old forest (76%, n = 21, χ^2 = 11.1, df = 1, P < 0.001). Birds were most visible on open clearcuts (100%, n = 8).

Both the intensive use of young forest by Black Woodpeckers during the spring-summer period (own unpubl. data) and the much lower detectability rates in young forest can influence the results of summer censuses. Therefore, the summer census method described by Järvinen and Väisänen (1976) may have yielded data that were biased if the proportion of young forest in the censused areas changed during the study period. This makes it difficult to determine long-term population trend of the Black Woodpecker without considering the changing age structure of forests being censused. The Black Woodpecker decline in Finland cannot be solely explained by the lower detectability in young forest, because the reported proportion of young forest 11–40 years old increased only from 14% in 1952 to 20% in 1973 and the woodpecker decline was about 75% (Järvinen et al. 1977). However, it is not possible to calculate the effect that differential detectability had on this decline because the forest structure along the census transects could have been different from the general forestry data in Finland. Additionally, proportions of other age classes were changing as well both in time and space. We do not have data on detectability in middle-age forest, which comprises a large proportion of modern stands. The possible effect of forest age-dependent detectability on the census results from Finland depends on the forest structure in the transects that contributed most to the recorded decline. Low sample size and the local scale of our study preclude generalizing conclusions. However, the aim of our contribution is to point out the problem and indicate the trend of the possible bias. A correction index can be developed using the method presented.

In general, we conclude that summer surveys of birds in quickly changing forest structure should be interpreted with caution due to possible habitat-dependent differences in detectability.

Table 1. Detection of black woodpecker in different age classes of boreal forest. The symbol "+" is used for category "detected", symbol "–" for "not detected".

Bird number	Old forest > 70 y. old	Young forest 11–40	Open clear-cut 1–10
45		– –	
66	+		
71	+ + –	– – –	+
113	+ –	– +	
130	+	– –	+
150	+	+	+
176		–	
182	+		
200		–	
236		+	
272	+ + –	+	+
276	+		
285	+		
293	+ + + –	– –	
323	+	–	
371		– –	
395		– – – – +	+ + + +
687	+	– +	
927	–		
Detected (+)	16	6	8
Not detected (–)	5	20	0

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