Black Grouse habitats in Poland

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During the years 1993–94, habitat characteristics of 298 areas occupied by the Black Grouse and 108 areas abandoned by this species between 1982 and 1994 were described. Changes in the number of Black Grouse in specified types of habitats were analysed using data from hunters’ reports. At the beginning of the 1990s Black Grouse occurred mostly in wet-forest habitats. These habitats undergo alterations due to draining and land development for woodland or agricultural purposes. The number of birds living in this kind of habitat decreased between 1982 and 1994 by 70%. Black Grouse often occupied peat bog habitats. These habitats have also been subsequently drained, but environmental changes were slower. The decline of the Black Grouse in this period was smaller (54%) and the bird density proved to be the highest. In the dry-forest habitat the Black Grouse occurred rarely. Habitat changes in these areas consisted mostly in diminishing of the forest stand range of the youngest classes of age. The decline in the occurrence of the Black Grouse was very high (71%). In mountain habitats, most of the refuges were situated in the upper subalpine forests or above the forest level. On the borderland of lower subalpine forests and grasslands the presence of the Black Grouse was especially noticed, because most of the grasslands were developed for agricultural purposes. Locally an increase in the number of Black Grouse in the mountains was observed as well as appearances of Black Grouse in new places, therefore, between 1982 and 1994, the decline was the lowest (41%).

Keywords: Black Grouse, Tetrao tetrix, habitats, population trends, Poland

INTRODUCTION

In Poland, Black Grouse live mainly in forested areas with a large part of open and semi-open areas – heathlands, bogs, firebreaks, military training grounds, young forest plantations, as well as extensively used meadows and fields, with thicket of birch, alder or willows (Sumiński 1963, Fruziński 1970). The species is attached to tree and scrub vegetation typical of the boreal zone of the continental climate (Matuszewski & Morow 1994). This stems, among other things, from the species’ alimentary preferences. The character of the vegetation cover also plays a significant role.

The availability of preferred habitat type in various regions of the species’ range varies, and is subject to changes in time, the cause being, among other things, succession of vegetation, and also the broadly imposed human activities. The environmental transformations result in changes of some parameters of the Black Grouse population, including the numbers and spatial distribution (Klaus et al. 1990, Angelstam et al. 2000, Kamieniarz 2000).

This work presents the living environments of Black Grouse in Poland at the end of the 20th century and the species’ situation in various types of habitats.
MATERIAL AND METHODS
The research was conducted in the years 1993–94 in all regions of Black Grouse occurrence in Poland, selected on the basis of hunters' reports analysis (Fig. 1). Fieldwork covered most hunting areas and national parks inhabited by the Black Grouse, as well as areas in which the species was abundant in the 1980s, but retreated from them later. Information about the current (or past) areas of occurrence of the Black Grouse were supplied by people interested in the species: hunters, foresters and ornithologists. The area of occurrence was defined as the lek (one lek site or many such sites found in direct neighbourhood), along with surrounding areas where the birds nest and stay on a regular basis. In order to determine 1993–94 and 108 locations abandoned by the species between the years 1982 and 1994. All of them were classified into four habitat types. The first three types include areas of occurrence on lowland or upland:

1. Dry-forest habitat – forests dominated by pine (locally with a significant portion of birch), distinguished by poor vegetation cover and undergrowth. Among them or proximate to them there were large areas of meadows, firebreaks or waste lands, as well as small open and semi-open sites such as bogs, clear-cuts, forest plantations and agricultural land.

2. Wet-forest habitat – forests with a high tree species diversity, the most important being: pine, spruce, birch and alder, with rich herbaceous plant cover and undergrowth, growing partially in areas with a high ground water level. Among them or proximate to them were open and semi-open spaces (as above).

Fig. 1. Regions of Black Grouse occurrence in Poland during 1982–94.
3. Peat bog habitat – extensive areas of waterlogged meadows as well as moors and other types of waste land, interspersed with shrubs or trees such as willow, alder and birch, and also compact bog/fen complexes or raised peat-bogs.

Mountain habitats formed a separate category – areas of the upper forest limit, upper subalpine forest interspersed with young forest plantations and peat bogs, as well as the border of lower subalpine forest and grasslands.

The change in Black Grouse numbers in areas with a domination of various habitat types in the period of 1982–94 were analysed on the basis of hunters' reports. When presenting the trends on figures the data of 1982 were set as 100%.

It was impossible to determine the real density of the Black Grouse in various habitat types, because the amount of area used by the population during the year was not known. In order to estimate the differences between habitat types, the overall density in hunting districts inhabited by the species for the year 1994 therefore had to be calculated. The results of our own personal observations were used, as well as the observations of hunters and foresters conducted during the lekking season.

RESULTS AND DISCUSSION

In the years 1993–94, Black Grouse in Poland mostly occupied habitats classified as wet forest (Table 1). The areas of occurrence were mainly found in forests

<table>
<thead>
<tr>
<th>habitat types</th>
<th>area of occurrence</th>
<th>changes in the number of birds (%)</th>
<th>overall density (birds/km²)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>occupied</td>
<td>abandoned</td>
<td></td>
</tr>
<tr>
<td>wet-forests</td>
<td>124</td>
<td>35</td>
<td>-70</td>
</tr>
<tr>
<td>dry-forests</td>
<td>45</td>
<td>22</td>
<td>-71</td>
</tr>
<tr>
<td>peat bogs</td>
<td>93</td>
<td>17</td>
<td>-54</td>
</tr>
<tr>
<td>mountains</td>
<td>36</td>
<td>22</td>
<td>-41</td>
</tr>
</tbody>
</table>

Table 1. The situation of Black Grouse in Poland in specified types of habitats.
adjacent to large areas of meadow, bog and other wasteland. Less frequently, the Black Grouse could be found in forests interspersed with young forest plantations, wasteland or agricultural ground.

The discussed habitat type underwent environmental transformations, usually connected with drainage. The process was accompanied by the development of open and semi-open spaces between forests. The afforestation of such areas, frequently rich in blueberries and locally also cranberries in the past has at the beginning caused mainly an impoverishment of the feeding base. With passing years it also caused a reduction in area of potential lek sites and hatching grounds (Klejnotowski & Sikora 1995). This was probably a significant factor influencing the progressive decrease in Black Grouse numbers in wet-forest habitats (Fig. 2). As a result the species’ overall density in the habitat type was low (Table 1).

The decrease of the area of open sites and sites in early stages of forest succession was also evident in dry-forest habitats, the least inhabited by the Black Grouse in Poland at the end of the 20th century. Black Grouse could be encountered in such forests only when military training grounds, large firebreaks or numerous young forest plantations on grounds exempted from agricultural use were situated in their proximity. Young forest plantations frequently resulted from a nationwide action of post-agricultural ground afforestation conducted in the 1950s and 1960s. Periodically, especially during the 1970s, such young forests with a limited survivability, created convenient conditions for the Black Grouse in areas such as central Poland. (Markowski & Wojciechowski 1977). Between the 1980s and the 1990s, 30–40-year old woods with poor ground cover and undergrowth, lacking both cover and food sources, were preferred by Black Grouse. This may be the reason why the growth of young forest plantations on post-agricultural grounds was accompanied by a reduction in the number of Black Grouse, resulting in a low density or even a decline in the occurrence of those birds.

The environmental conditions in the vicinity of active military training grounds are different. Periodical “rejuvenation” of the forest stands was possible due to forest fires, and open spaces have been kept for military training needs. Military training ground borders have therefore been the last areas occupied by the Black Grouse in some regions of Poland, and even Europe (Klaus 1996).

A similar situation, though at a local scale, existed in mountain forests, although these open and semi-open sites were created due to insect gradation, atmospheric pollution and heavy wind and snowbreaks. Therefore, mountain habitats in Poland and other countries of Europe as well (Klaus 1992) are typical with a local increase in Black Grouse numbers, and even new locations of its occurrence. At the same time, a decrease in the number of Black Grouse refuges in several mountain areas is evident. In Poland this process was mainly observed in areas within the border between lower subalpine forests and meadows, where a radical impoverishment of the ecotone zone due to agricultural development, such as intensification of domestic animal grazing occurred.

Due to the local advantageous environmental situation in the mountain habitats, the decrease in Black Grouse numbers between the years 1982 and 1994 was the lowest in these areas, although large fluctuations were noticeable. The average overall density in the
middle of the 1990s was higher in mountain habitats than in the rest of previously discussed habitat types.

The highest densities were recorded in Black Grouse populations living in peat bog habitats. Their presence was primarily localised on extensive meadows with a high portion of shrubs, interspersed with bogs and other habitats without human utilisation, usually located in river valleys. There were less refuges in undrained bogs or raised peat bogs, due to their lowering numbers - many of them were ameliorated and transformed into meadows and grasslands, while peat bog exploitation was conducted on others.

Environmental transformations in consequence of draining were slower in peat bog habitats than in forest areas. Some local fragments of peat bog have remained unameliorated and undeveloped. During the time of the research these often represented the centre of particular areas of the Black Grouse occurrence. The birds preferred the non-developed peat bogs due to the abundance of favoured food sources and availability of resting grounds, while the ameliorated, regularly mowed meadows, frequently found in their proximity, became safe lek sites (Fruziński 1969). This arrangement most likely caused the refuges in peat bog habitats in Poland to be rarely abandoned by Black Grouse, and the decline in numbers was lower than in forest habitats.

The availability of preferred Black Grouse habitats in Poland was reduced, mainly due to human activities. It directly caused the decrease of occupied sites and numbers of this species. Only between 1982 and 1994 the area of Black Grouse occurrence decreased by 45%, and the numbers as much as by 73% (Kamieniarz 2000). A similar situation occurred in other countries of Central Europe. As a result, the Black Grouse has become isolated in some areas while in many others it became extinct. Mountain areas represent a specific exception, especially the Alps (Bergmann & Klaus 1994).

**LITERATURE**


Klaus S. 1996: Birkhuhn - Verbreitung in