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**Action Plan for the Conservation of
Black Grouse *Tetrao tetrix* in Latvia**

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Summary

Decline in numbers of the Black Grouse across Europe has been noted since the end of the 19th century with a steep decrease after 1970 when size and range contraction significantly affected populations, including those of Northern Europe. Latvia is no exception; the available data show a long-term negative trend for the Black Grouse here as well. Their numbers fell most rapidly, about three-fold, between 1970 and 1985. The national population currently seems to be stable though its conservation status should be regarded with serious caution. The species distribution is uneven with some signs of fragmentation, it lies close to the SW margin of the continuous boreal range, numbers and population densities are relatively low. No special studies have been carried out on the Black Grouse in Latvia, therefore most likely factors behind the population decrease have been generally deduced to be habitat degradation (mainly drainage, extraction and overgrowing of open bogs), increased predator pressure and spring hunting at leks. In order to improve the conservation status of the Black Grouse populations and their habitats in Latvia, a number of actions are proposed: ban spring hunting and replace this activity by limited autumn hunting (during September and October), improve the system of surveys and monitoring, elaborate on the procedure of establishing hunting bag limits, and provide habitat management and predator control measures. The unpublished archive data on yearly grouse numbers and hunting bag from State Forest Service reports should be processed and analysed to improve knowledge on population dynamics and their limiting factors in Latvia. A popular booklet on status, exploitation and conservation of the Black Grouse should be printed and distributed for public awareness and educational purposes.

Introduction

The Species Action Plan for the Black Grouse is being developed in the time period when Latvia is accessing the EU and adapting the national nature protection legislation to the EU requirements. The EU Bird Directive determines that hunting of migrating birds is forbidden during spring migration when returning to breeding sites, as well as breeding period. For Latvia, the requirements concern three bird species that have been hunted in spring up to now: Capercaillie, Black Grouse and Woodcock.

The Species Action Plan for the Capercaillie was developed already in 1999 (Strazds 1999). The Plan discusses possibility of limited spring hunting under a strong control also in future. In the case of the Capercaillie, it means accepting decision not popular for nature conservation, but important and justifiable for species conservation (Sutherland 2000). One of the main objectives of this document is to develop grounded and clearly defined attitude towards the spring hunting of the Black Grouse, too.

Despite long historical and traditional management (hunting) of the Black Grouse in Latvia, the species is not studied (!). Thus, the theoretical background of the Plan is based on available publications regarding species studies elsewhere in Europe.

The aim of the Plan is to assess the status of the Black Grouse population; perspectives of population exploitation and conservation based on advanced knowledge about the species ecology. Hopefully, the results of the Plan will promote response and initiative for improvement of species conservation in Latvia hereafter. Clearly, that may be ensured just by practical action in controlling and management of the Black Grouse population.

1. Species characteristics

1.1. Distribution and numbers

The Black Grouse (Fig. 1) is distributed in a wide territory of forest and forest-steppe zone from the British Islands and the Alps in the West, to Russian Ussuriya in the East. In Europe, the largest part of the distribution range of the Black Grouse occupies the boreal forest zone: the Nordic States (Fennoscandia and the Baltic's), Belarus and Russia, to the North from 55°N.



FIGURE 1. Lekking male Black Grouse (© Aivars Petriņš).

Separate isolated and highly fragmented populations have remained in the British Islands, Belgium, the Netherlands, Germany, the Czech Republic, Slovakia and Poland. A comparatively large and stable population inhabits the Alps (Figure 2). At present, Fennoscandia and Russia represent the most numerous European populations of the Black Grouse (Tucker & Heath 1994; Hagemeyer & Blair 1997).



FIGURE 2. Distribution of the Black Grouse in Europe (after Snow & Perrins 1998).

Reduction in the numbers of the Black Grouse in Western and Central European states has been noted already since the end of the 19th century. During the 20th century, the species distribution range decreased and receded towards north – east, along with fragmentation and extinction of habitats (afforestation of heathers, drainage and peat extraction in bogs, etc.). Continuously, many small and isolated populations became extinct. Decrease in Black Grouse numbers was particularly remarkable since the 1970s occurring in nearly all European States. In Denmark, the species disappeared few years ago, but in the Netherlands and Belgium it is close to extinction (see Tucker & Heath 1994; Hagemeyer & Blair 1997; Snow & Perrins 1998, Storch 2000).

Negative trends in the distribution and numbers of the Black Grouse have been observed in Northern Europe, too. In the south of Sweden, the Black Grouse disappeared already in the 18th century along to extinction of traditionally managed heathers. Some generally stable populations of high hunting importance remained until the beginning of the 20th century. Further, a long-term reduction of the population has been observed, despite cyclic fluctuations of the population in the north of the country and constant numbers after 1980s (Svensson *et al.* 1999b; Cramp 1980). In Finland, the number of the Black Grouse has remarkably gone down since 1940's, especially in the south (by 80%), and reflects an overall decrease trend in a longer period. Some data proves the growth in the number in the middle of 1970s – the end of 1980's, but the causes and relationship with cycles are not clear (Svensson *et al.* 1999b; Snow & Perrins 1998). In Estonia, decrease of the population has been observed already in the second part of the 19th century, but the highest rate - in the 1960s and 1970's. E.g., the number of Black Grouse males decreased threefold in 1970-1980, from 30,000 to 11,000. Lately, the population is comparatively stable (Viht 1994; Snow & Perrins 1998).

In Latvia, the Black Grouse occurs in nearly all the area with uneven distribution (Figure 3-5). Despite the different periods of the three mappings and different spatial resolution of the data, the maps have several common features. According to both distribution and number, the north - west of Kurzeme, Sēlija and Vidzeme are most densely populated regions. Nearly no Black Grouse may be observed in the Zemgale plain outside continuous forest stands, and surroundings of Rīga. Insufficiently mapped distribution and/or low breeding density appears in Liepāja district and south part of Latgale. At present, it is too early to compare the maps of both Breeding Bird Atlases (Figure 3 and 4) to determine changes in the last 20 years. The reasons are: uneven and still ongoing inventory of territories¹; high proportion of the obtained data are not yet processed; and the maps of both Atlases are not directly compatible, due to different projection and square network resolution. That must be taken into account comparing square statistical data in both Atlases. Numbers of squares with Black Grouse recorded are not comparable due to the different scale of grid (100 km² and 25 km² squares).

¹ More on the Atlas <http://www.lob.lv/lv/atlants/index.php>

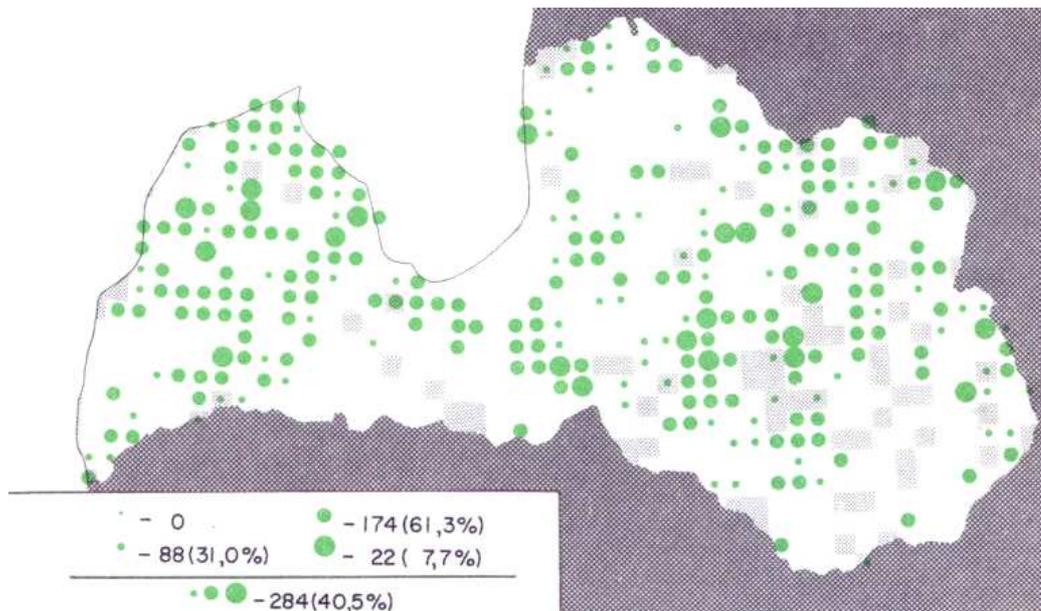


FIGURE 3. Distribution of the Black Grouse in Latvia in 1980-1984, according to the data of the first Breeding Bird Atlas (Priednieks, Strazds *et al.* 1989; 10x10 km square network).

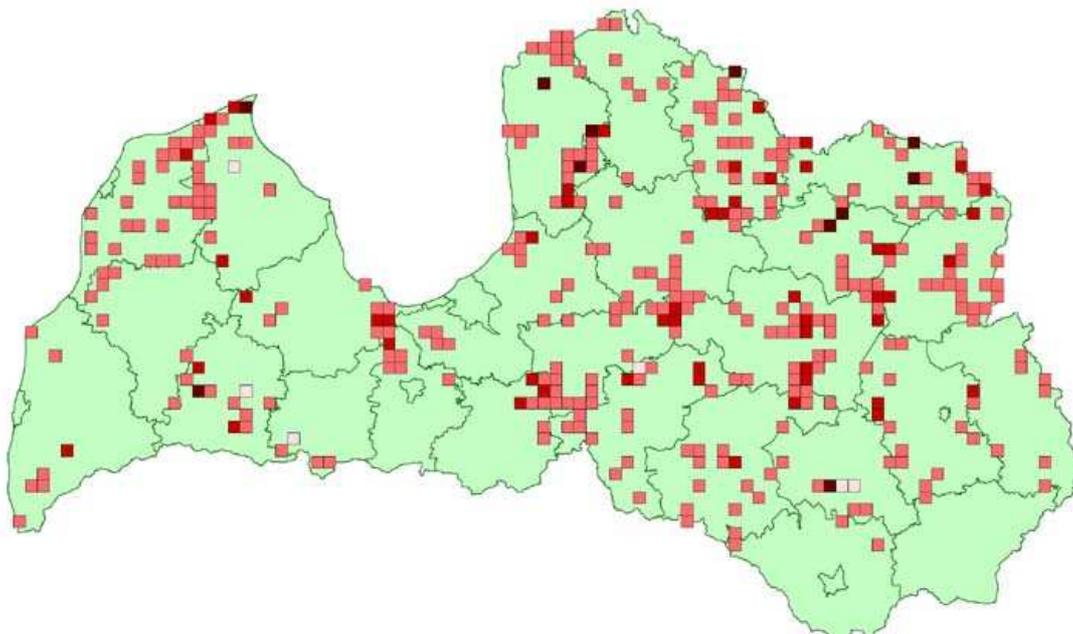


FIGURE 4. Distribution of the Black Grouse in Latvia in 2000-2003 according to preliminary data of the second Breeding Bird Atlas (5x5 km square network; situation on 28/10/2003. © Latvian Ornithological Society). Distribution in 4 red colourings reflects credibility level of breeding in every corresponding square (from the light to the dark colouring): presence of the species - 6, possible breeding - 297, probable breeding - 51, confirmed breeding - 11; the total square number for the Black Grouse - 365.

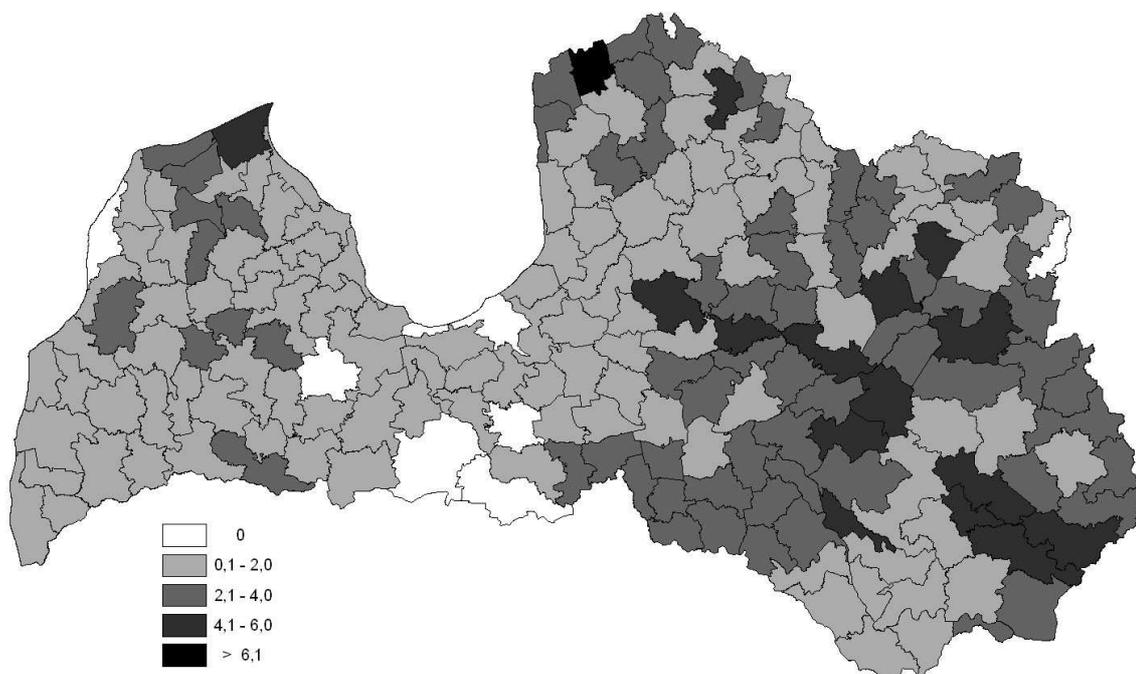


FIGURE 5. Density of Black Grouse males per 1,000 ha at the state Forestry level in 2003 (State Forest Service data).

In publications of the 19th century on the Baltic Region and the bird fauna of the present Latvian territory, the Black Grouse has been mentioned as a common species of mixed forest, young stands of deciduous trees, overgrowing clearings, bogs and meadows (Тауриньш 1983). Although the Black Grouse was common also in the first part of the 20th century, several authors already noted a decrease in numbers (Transehe, Sināts 1936; Vilks 1936; Kalniņš 1943) that was confirmed by the published data on game inventory of the Forest Department (Figure 6).

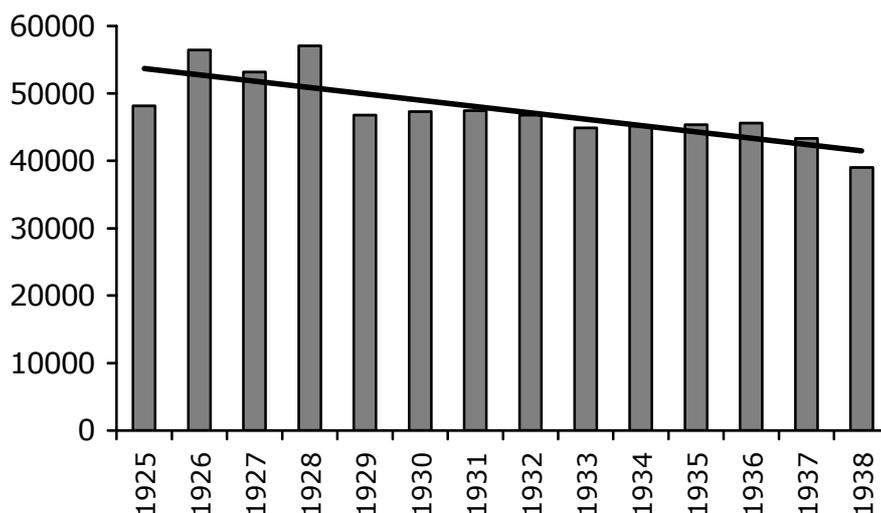


FIGURE 6. Dynamics of the Black Grouse population in Latvia, 1925-1938 (according to Kalniņš 1943)

In 1925-1938, the number of the counted Black Grouse individuals was stable or slightly decreasing, fluctuating from 39,000 to 57,025 (47,598 in average; Figure 6, Kalniņš 1943). During the Post-War period, fluctuations have been observed that are not yet possible to explain. At first, a sharp decrease by approximately 40% down to 30,000, and less individuals in 1949-1958 (24,076-33,233, 28,812 in average; Figure 7, mostly unpublished data of SFS reports). That was twice followed by a sharp increase in numbers and relative stability in 1959-1970 (40,647-46,468, 44,503 in average, n=8 years; Figure 7, mostly unpublished data of SFS reports). Finally, a rapid decrease started close to 1970 that resulted in a threefold decrease until 1985 (Figure 7; see also Тауриньш 1966; Тауриньш 1983) when the number of the counted Black Grouses reached the lowest registered level or 14,199 individuals. At the beginning of the 1990s in Latvia, the number of breeding Black Grouse pairs has been estimated as 5,000 – 10,000 (Strazds *et al.* 1994).

Data of SFS reports show a slight increase in the number during the last 10-15 years (Figure 7). Credibility estimation of the increase is not possible without detailed analyses of the reports. Obviously, they have to be critically assessed (see Chapter 1.3 Current investigation and monitoring of the species in Latvia). There is lack of independent data proving the mentioned increase. The only known serious observations in Teiči Nature Reserve state that the Black Grouse numbers have not decreased during the last 10-20 years, and even may have been growing in the surroundings since the beginning of the 1990s (A. Avotiņš, personal comment). This may not be directly attributed to the whole state area because the data are not representative, due to the status of the reserve's Black Grouse population as the biggest, best-protected and the most stable in the country.

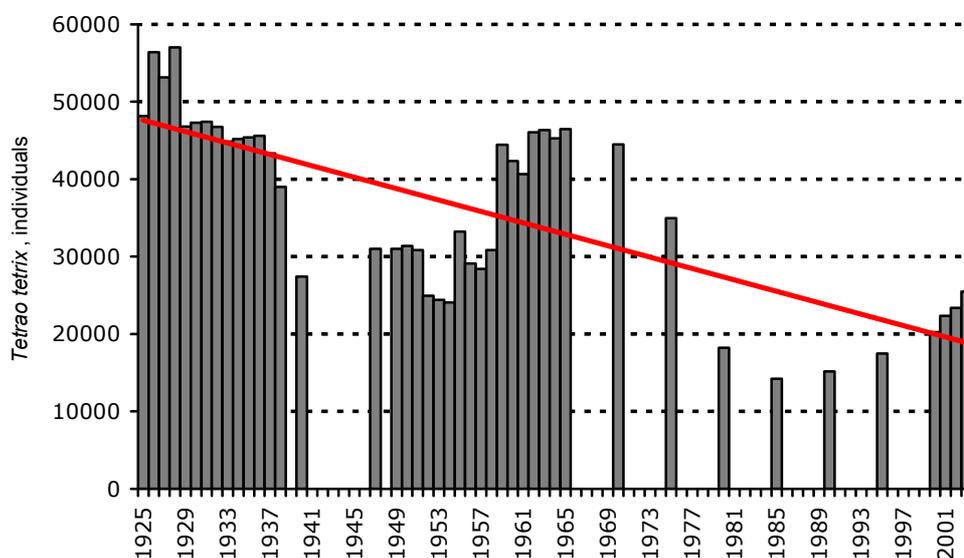


FIGURE 7. Dynamics of the Black Grouse population in Latvia since 1925. Compiled according to published data of the Forest Department (Kalniņš 1943) and available unpublished data of SFS reports.

Along to large fluctuations in the number, the second part of the 20th century has obviously brought also qualitative changes of the Black Grouse population that are hardly documented. The only exception mentioned in different sources is rare or extinct large leks with 10-30 males (Vilks 1936), 30-40 males (Тауриньш 1983) or even 40-50 males (Michelsons 1958) in the first part of the 20th century. Authors of later publications confirm the trend, e.g., “most leks are small, with one or several males” (Priednieks, Strazds *et al.* 1989). This corresponds to the results of the poll “The bird of year 2003 – Black Grouse” organised by the Latvian Ornithological Society. In filled forms (n=165), the respondents most often mentioned leks with 4-7 males (46.1%; n=76; Figure 8). The sum of two smallest lek categories (1-3, 4-7) increases the proportion of small leks up to 72.1% (n=119). The total sum of registered leks with 10 and less males constitutes 89.1% (n=147). The poll respondents have reported only about 4 leks with more than 15 males, just 2.4% of all leks (Figure 8). Though lek size is arguable due to different quality of the basic data, overall and simple illustration of the trends has been reflected in Figure 9 according to written resources.

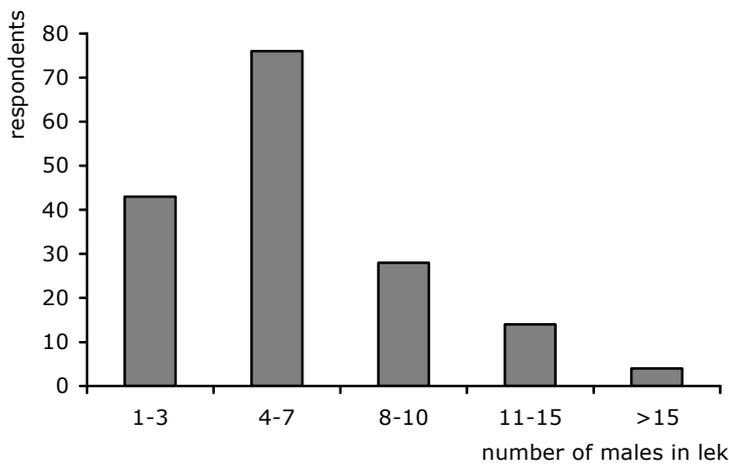


FIGURE 8. Number of males in a lek according to the poll “The bird of year 2003 – Black Grouse” results (LOS data; n=165).

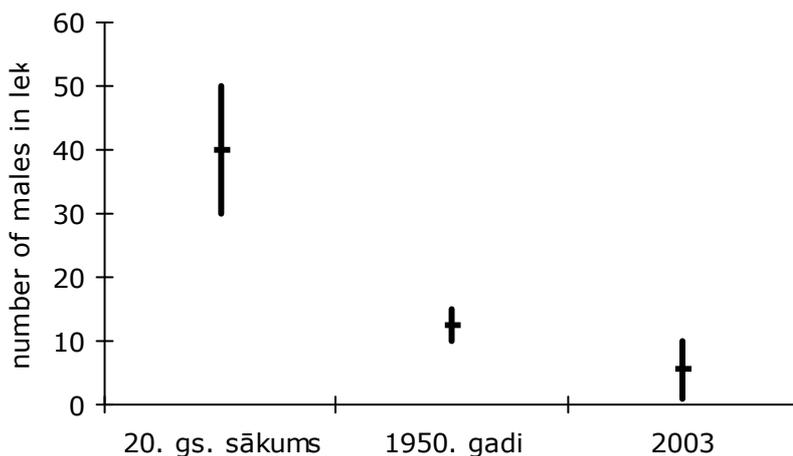


FIGURE 9. A generalised trend of lek size in Latvia (based on Michelsons 1958; Тауриньш 1983, and data of the poll “The bird of year 2003 – Black Grouse”).

Latvia is located close to the south - west border of the species' N European distribution range. Beyond the border, the Black Grouse distribution is highly fragmented in Poland. It is sporadic in intensively managed big agricultural fields of Central Europe (possibly already from the mid-Lithuania), mainly as separate small isolated island shape populations (Figure 2). The observed long-term reduction in the number of the Black Grouse and lek size in Latvia, as well as resident life style of the species raise the question: how the reduction of the population influences the distribution of the species in the state now, and will do in future? For evaluation, a simple spatial analysis with the help of GIS maps has been done on the bases of Black Grouse distribution data from the new Latvian Breeding Bird Atlas. All 365 5x5 km squares with species record in 2000-2003 (status in database on 28/10/2003; see Figure 4) have been transformed in centroids independently on the level of breeding credibility. Two size radial buffer zones have been constructed around the centroides. The following buffer radiuses were chosen based on literature data on the distance of Black Grouse dispersion:

- 1) minimum buffer with a 5.5 km radius (corresponds to the maximum dispersion figure of young Black Grouse males in Norway; Cramp 1980);
- 2) maximum buffer with a 20 km radius (corresponds to the maximum dispersion figure of young Black Grouse females in Norway; Cramp 1980).

The results of the preliminary assessment (Figure 10) raise the discussion that local scale (buffers of 5.5 km) populations of the Black Grouse are fairly well connected and often develop merging or very close micro-populations. Thus, dynamic processes of metapopulations may theoretically act in those micropopulations, as well as exchange of individuals that is important for demographic and genetic processes. Nevertheless, spatial gaps do exist among separate micropopulations or their groups. The smallest gaps may be either systematic error of the modelling methods (the real distribution range may not be correctly estimated by reduction of all distribution data to 5x5 km square centroids), or the result of incomplete basic data (not sufficient inventory) of the state territory. The modelling result directly correlates with the distance of the accepted buffer.

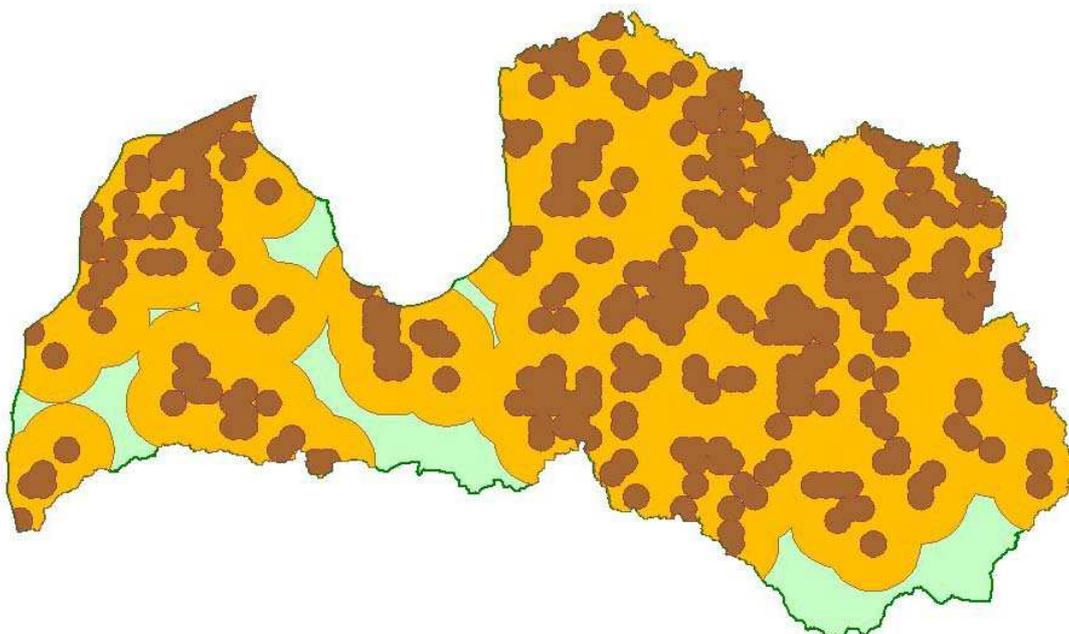


FIGURE 10. Local and regional fragmentation of the Black Grouse distribution (5.5 km and 20 km buffers around the square centroids of the Latvian Breeding Bird Atlas; n=365) in Latvia.

If possible Black Grouse dispersion up to 20 km distance from the birth place is assumed in Latvian conditions, even the map (Figure 10) obtained from the present possibly incomplete data set shows an apparent consolidation of the Latvian Black Grouse population at a regional scale. In southern Latgale and Kurzeme, small areas not covered by the buffer probably are an artefact caused by incomplete inventory for the Atlas. The empty area in Zemgale and the surroundings of Rīga may already be supposed as a plausible gap in the distribution range of the species. This is the first weakest link. If this breaks, isolation of the Kurzeme Black Grouse population may start and progress at a regional scale, as well as movement to the north – west, like in the example of the Capercaillie (e.g., Priednieks, Strazds *et al.* 1989; Strazds 1999).

It must be stressed that the above mentioned should be considered as initiative for further studies. We do not have detailed knowledge on real dispersion of the Black Grouse and metapopulation dynamics in Latvian conditions to make sure conclusions for future. Nevertheless, the location close to the continuous distribution range, decrease in numbers and density, and small leks makes the look at Figure 10 from a less optimistic viewpoint.

In any case, the spatial analyses of the Black Grouse distribution is recommended to repeat with more complete basic data and additional data layers, e.g., land cover and network of specially protected territories. Assessment of long-term maintenance perspectives of the Latvian Black Grouse population should be supplemented with more precise inventory data on size dynamics.

1.2. Threat status of the species

At the European scale, the Black Grouse is included in Category 3 of the Species of European Conservation Concern² as vulnerable species with a significantly decreasing population (Tucker & Heath 1994), and the IUCN Lower Risk (least concern) Category (Storch 2000). It is included in Category 3 of the Red Data Book of Latvia (Andrušaitis 2000).

1.3. Current investigations and monitoring of the species in Latvia

Biology, feeding, habitat and spatial requirements, behaviour and reproduction of the species are generally well studied (Storch 2000). Despite the hunting status, the Black Grouse population and hunting are monitored with different methods and intensity in most European states (e.g. Gilbert *et al.* 1998; Linden *et al.* 1996).

Despite long-term exploitation (hunting) traditions, the Black Grouse is not studied in Latvia. The only information sources about changes in the number are the 1925-1938 inventory data published by the Forest Department (Kalniņš 1943 *et al.*), and reports of the post-War period up to now stored by the State Forest Service.

Few reasons may suggest that information reported by forest servants is not plausible and qualitative without specific additional analyses. Nevertheless, the data set is valuable and must be deeply analysed, even if the new monitoring system will be based on a different methodology.

² The main part of the global population of the species is concentrated outside Europe, but it possesses unfavourable protection status in Europe.

Information about the Black Grouse hunting bag, from the post-War period up to now, is scarce (Figure 11). Like the inventory data, also long-term data (before 2000) on the hunting bag have not been compiled.

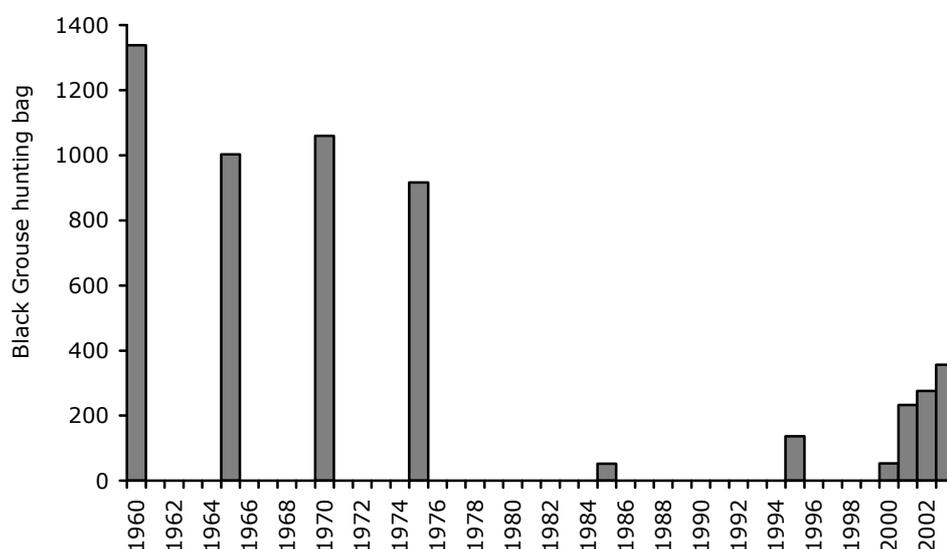


FIGURE 11. Available statistics on the annual hunting bag of the Black Grouse since the middle of the 20th century (unpublished data of the SFS).

2. Current protection of the species and its habitat

2.1. Legal protection

Protected species. It is included in the Cabinet of Ministers Regulations No 396 (14/11/2000) "On list of specially protected species and species with exploitation limits" and in Annexes I and II/2 of the species list of the European Council Bird Directive. The EU member states are obliged to carry out special conservation measures regarding the habitats of species and subspecies included in Annex I of the Directive. If specified, it means request to develop special protection areas for all species and subspecies included in Annex I. Hunting of the species included in Annex II/2 is authorised only to the EU member states with special permission.

The Black Grouse had been included in the protected animal list of the Latvian SSR, and in Category 3 of the Red Data Book of the Latvian SSR by the Council of Ministers Decisions No 241 and 596. In 1976-1980, hunting was forbidden in the whole territory of the Republic excepting few areas with a sufficient number of the birds (Council of Ministers Orders No 220-r, 06/04/1976 and No 203-r, 30/03/1979). According to Cabinet of Ministers of the Republic of Latvia Regulations No 251 ("Hunting Regulations"), the Black Grouse may be hunted from March 20 to May 10.

A fine of 50 LVL must be compensated for illegal hunting, and of 100 LVL for nest destruction (Cabinet of Ministers Regulations No 11 on 13/01/1998, Annex 1 and Annex 2.)

2.2. Current protection measures

Despite of well-grounded expert warnings on threatening the Black Grouse and specific suggestions to improve the status of the species in Latvia in different periods (e.g., Michelsons 1958; Тауриньш 1966; Aigare *et al.* 1985; Lipsbergs *et al.* 1990), no active action in species conservation and investigation has been carried out. The hunting prohibition in 1976-1980 is nearly not documented and does not relate to the whole state territory, therefore it is not a serious action.

Micro-reserves are not being developed in the lek sites of the Black Grouse. Thus, one of the most important factors for Black Grouse conservation is habitat conservation within specially protected territories of state importance. At present, it is hard to correctly estimate the proportion of the Black Grouse in the network of the specially protected territories of Latvia because of two reasons. At first, precise inventory data are lacking. Secondly, the network of specially protected territories is being revised and expanded by new areas during last three years to develop a network of potential protected nature territories of EU importance Natura 2000 (implemented by the Emerald project). Being a comparatively common and disperse species, the Black Grouse has not been advanced as the main criterion for evaluation of bog areas when planning tasks of expeditions of the project Emerald.

The Black Grouse population living in nature reserves and other specially protected territories are under passive and non-direct protection that guarantees only maintenance of a protected area as such. Neither action to improve the quality of species habitats has been carried out in the largest part of the territories, nor have predator populations been controlled. Also, the prohibition of Black Grouse hunting is only an exemption referring to nature reserves or reserve zones of another protected area categories.

Like for many another specific bog species that are dependent on open bog areas, the status of specially protected area does not guarantee quality and long-term maintenance of Black Grouse habitats. Nearly all bogs of Latvia have been affected by different scale drainage, and still are influenced by ditch networks (Bergmanis 2002; unpublished data of the Emerald project). Specially designed year 2001-2003 data analyses of the Emerald project shows that at least 2/3 (64%) of 67 potential Natura 2000 bog areas with Black Grouse population are significantly influenced by drainage: 13 areas (19%) are being extracted for peat, but 30 areas (45%) are strongly influenced by ditches. Up to now, Teiči Nature Reserve is the only specially protected nature territory with a goal-directed and well-documented improving of the quality of natural bog habitats. It is done installing simple dams and raising the water level (Bergmanis 2002).

2.3. Relation of this SAP with other species and habitat protection plans

The Black Grouse is the 2nd species of the three Grouse species of limited hunting with a developing species action plan. Few years ago, the Species Action Plan for the Capercaillie has been developed (Strazds 1999). Importance of action plans for both species is determined by two reasons. At first, it is necessary to reassess the hunting policy in the state regarding spring hunting before accession to the European Union. Secondly, it is increasing threat level to the species and necessity for conservation measures in the country.

In Western and Central European states, the decrease in the number and distribution of the Black Grouse in the 20th century and especially after 1970 was the most dramatic. As a result, the conservation status of the Black Grouse population is unfavourable. Projects are carried out to protect the species based on action plans. The basic document is the Grouse Status Survey and Conservation Action Plan that, among other species, describes the status of Black Grouse populations and conservation measures at the Pan-European level (Storch 2000). According to knowledge on the status of the Black Grouse in the developed European states, the basic conclusions about species threatening factors are as follows (first are most significant): degradation of habitats, small populations, pressure of predators, human disturbance, hunting, and collision with different obstacles.

2.4. Risk assessment of the current conservation and implementation of the Species Action Plan

Prohibition of spring hunting and permission of autumn hunting itself cannot guarantee stability and increase in the numbers of the Black Grouse. Obviously, spring hunting has a qualitatively different negative impact on Black Grouse populations compared to autumn hunting. Nevertheless, any hunting in the low-density population of Latvia will mean additional mortality along with the high pressure of predators. Interest of hunters (so far, only as hunting) is the only justification for autumn hunting of the Black Grouse with the hope that it will reduce predator pressure on the Black Grouse population. At present, there is no confidence about a real active hunter's action. It is recommended to prolong autumn hunting for five more years to stimulate interest of hunters. They have to actively reduce the number of predators within lek areas during this period. If monitoring shows no improvement of the species status during the five years (inefficient or insufficient elimination of predators), hunting will have to be totally prohibited. In this case, hunting pressure will be the only threatening factor that would be really preventable.

Insufficient or wrong planned and realised conservation and management actions may possess the risk that species limiting factors continue to act or even progress intensifying negative pressure on the size, demography and distribution of the population. As the result, the number of the Black Grouse will decrease, but the population will continue to rarefy and shrink. The foreseen autumn hunting together with necessity to precisely follow the status of the population, better understand limiting factors and more efficiently use conservation measures are reasons for the need of improved and precise annual Black Grouse survey. The counting has to be combined with precisely planned and implemented experimental management action.

3. The aim and objectives of the Species Action Plan

Aim: To achieve a favourable conservation status for the Black Grouse *Tetrao tetrix* and its habitats in Latvia. The indicators of the status have to be considered as follows:

- 1) stability of population size or increase in a longer time period;
- 2) stability of the distribution range of the species or increase at a local or regional level;
- 3) maintenance or increase in optimal area, number and quality of the species habitats.

Objectives:

1. Improving the status of the investigation and conservation of the species.
2. Initiating measures for habitat management and diminishing impacts of limiting factors.

3. Ensuring adequate inventory of changes in population size and hunting bag.
4. Carrying out additional investigation on regulatory mechanisms of the Black Grouse population. The conclusions have to base improved species conservation planning in future.

4. Action for species and habitat conservation

4.1. Legislation and nature conservation policy

Changes in regulations of the Republic of Latvia have to be introduced fully prohibiting spring hunting of the Black Grouse and shifting limited hunting to autumn period within five years. During this period, the Black Grouse could be hunted without limitations regarding sex from September 1 to October 31.

4.2. Species protection measures

Autumn hunting (Sep 1 – Oct 31) of the Black Grouse may be permitted in 2004-2008 in the whole territory of the state except:

- 1) strict nature reserves;
- 2) reserve or strict protection regime zones of another category specially protected nature territories;
- 3) areas³ with a low population density⁴ or negative trend of number dynamics.

Autumn hunting may be permitted only outside the centres of lek areas – in the peripheries of lek areas, or feeding sites surrounding lek areas. To facilitate interpretation and compliance with standards, it is advised to introduce daily hunting limitations, after 12 AM in the light time of a day.

Obligatory precondition for future hunting is an improved species monitoring system with a precise annual species count (inventory) in spring (see 4.4.1). Based on the count, autumn hunting limits will be calculated, as well as monitoring of hunting bag will be carried out. Hunting planning requires linking the limit to the specific inventory area. Inventory, monitoring and limit system must be improved and adopted by species experts in co-operation with the State Forest Service.

Hunting must be linked to predator control and habitat maintenance measures in hunting management areas. Hunter's organisations or individual hunters should be granted with odds or easements, if carried out specific management action. Possible procedure of implementation has to be set-up by the SFS in co-operation with hunter's organisations and species experts.

³ Desirable distribution at least at the state forestry level.

⁴ Threshold level (figure) of the population density still must be defined.

4.3. Actions for protection of the species habitat

Habitat conservation and management are the priority actions. At first, the status of species conservation has to be improved in already existing Specially Protected Nature Territories, developing nature protection plans and individual regulations of conservation and management (or revising the existing). Impact of drainage systems and intensified overgrowing of bogs must be reduced in bog territories. Teiči Nature Reserve is an example of success (Bergmanis *et al.* 2002). Depending on the conditions of a territory, management of lek areas (e.g., cutting of bushes, hay making in abandoned grasslands) and reduction of predator numbers may be foreseen.

At present, it is not possible to have a complete and comprehensive assessment about the areas and needed action to improve Black Grouse habitats at the state level. At first, improvement of the new network of protected territories Natura 2000 and development of the data base is still ongoing, and available estimation of the population size are not yet resumed. Secondly, management methodology applied in different habitats, its impact on another natural values, etc. must be evaluated deeper. Therefore, we have done only preliminary analyses of the draft Natura 2000 database and developed a rough assessment only about bog areas. The result of the analyses is two lists of the existing or developing Specially Protected Nature Territories. These areas are populated by the Black Grouse and require most efficient and cheapest in long-term habitat management – improvement or reestablishment of hydrological regime by installing dams on drainage ditches according to the methodology by Bergmanis *et al.* (2002).

Regarding development of protection plans and individual management regulations for Specially Protected Nature Territories, it is necessary to limit settling education trails and planning of tourism activities in bog areas, especially with persistent populations of the Black Grouse.

4.4. Studies and monitoring

4.4.1. Recommendations for the further control of the Black Grouse population

The existing inventory (in fact, reporting) of the Black Grouse population size theoretically foresaw absolute counting of the population size. It is difficult to estimate errors and plausibility without a detailed investigation of the data and different by-factors (see Chapter 1.3 Current investigation and monitoring of the species in Latvia). Necessity to change the absolute counting system in Latvia has been determined not only by methodological gaps, but also by practical means. A time and financial resource consuming (theoretically, with adequate performance) inventory of such a large geographic scale is not feasible. The quality of the result does not justify the action⁵. If the aim is obtaining possibly exact data on development of Black Grouse numbers in Latvia, another approach must be implemented according to the following principles:

- 1) the implementation is realistic and does not require large financing;
- 2) planning that allows obtaining statistically plausible and practically exploitable results.

⁵ The reform of the SFS after 1999-2000 reduced the number of employed foresters about two times. Individual survey areas have grown proportionally. It means changes in inventory methodology, as well as increased work volume for inventors. All above mentioned have negative impact on inventory quality.

To keep the requirements, absolute inventory possibly has to be declined. Instead, a network of sampling plots (sites, transects, or squares) in whole Latvia have to be set-up with the help of stratified random choice where annual inventories are carried out according to a unified methodology, in determined period and daily time independently on hunting. Those principles of inventory planning are important and well known (Bibby *et al.* 1992), and are common to inventory methodologies of hunted birds in different European states. We suppose that counting during spring leks of the Black Grouse is most suitable in Latvian conditions. Nevertheless, principles and detailed methodology have to be agreed with the SFS.

As regards species distribution and its dynamics, it is possible to obtain qualitative data from forest servants and hunters in a simple, cheap and efficient way registering presence of the Black Grouse in a fixed square network. The investigated area and the aim of the work determine distribution and resolution. In Latvian conditions, the network of 5x5 km squares in the LKS-92 coordinate system is the most suitable and rational. It has been used in the geographic information systems of state institutions, as well as during the preparation of the Latvian Breeding Bird Atlas. Possibility to obtain annual species distribution is a must to the cheap and simple mapping methodology. It will significantly supplement the inventory data in sampling plots. Unification of both methodologies will provide with opportunity to follow the changes in Black Grouse numbers in distribution in the state.

Some more aspects are related to the implementation of a new monitoring system. At first, it has to be discussed in relation to another species monitoring, at least concerning the Grouse. Secondly, the Black Grouse monitoring may be related to experimental management of habitats and regulatory measures for predators to determine and control the limiting factors of the population. Randomly chosen network of sampling plots has a high potential to include investigation on management efficiency. Thirdly, managerial and institutional issues are to be clarified additionally identifying executors of the working stage.

4.4.2 Compilation and detailed analyses of SFS report data on the changes in the number of Grouse and influencing factors in Latvia have to be done. Adequately assessing data and excluding identified most serious mistakes and deviations more complete utilisation of the data would be possible for the Black Grouse and possibly for another Grouse species on ecology and protection in Latvia.

4.4.3 GIS modelling of fragmentation of species distribution and population sustainability have to be developed utilising distribution data on habitat distribution (including bogs) and the borders of existing Specially Protected Nature Territories. It is necessary for evaluation of additionally necessary areas and their distribution to maintain an even distribution of the Black Grouse.

4.5. Information and education

Popular and well illustrated booklets about the status of the Black Grouse population, management and protection in Latvia must be edited and distributed, similarly to the edition of “Management of Capercaillie leks and surrounding forest” (Strazds 2000). The main conclusions and proposals of the Species Action Plan concerning practical management of the Black Grouse habitats are to be included in the booklet. Also, changes in the numbers of the Black Grouse in Europe and Latvia, as well as the main causes and limiting factors for lek have to be shortly included. The importance of undisturbed lek and potential influence of different types of hunting on the species population pays a special attention. Nature tourism disturbance and potentially negative impact on the local Black Grouse populations of specially protected territories should be mentioned in such edition. The possible target audience is forest servants (SFS, State JSC “Latvijas valsts meži”), nature conservation experts, and hunters.

4.6. Action table

Action	Executor	Necessary implementation time (months)	Estimated expenses, LVL	Possible financial source
Changing hunting regulations to limit autumn hunting of the Black Grouse from September 1 to October 31.	Ministry of Agriculture	Nov-Dec 2003		
Development of a system for species inventory, monitoring and hunting limiting.	LOS in co-operation with SFS	2 months (till June 2004)	900,-	SFS
Practical introduction and improvement of the inventory methodology.	LOS in co-operation with SFS	2 months (till June 2004)	1,200,-	SFS
Development of procedure to promote predator control and action to maintain habitats in hunting areas.	LATMA in co-operation with hunter's organisations and LOS	2 months (till Aug 2004)		Game found, SSC “LSF”
Compilation and detailed analyses of non-processed SFS report data on the hunted and counted Grouse, a deeper assessment of changes in species numbers and influencing factors in Latvia.	LOS in co-operation with SFS	3 months (till Oct 2004)	1,500,-	LEPF
Analyses of protection status of the species using GIS, assessment of importance of the network of Specially Protected Nature Territories and habitat management for the Black Grouse also outside bogs.	LOS	2 months (till Dec 2004)	500,-	LEPF, NPB
Preparation and distribution of an illustrated popular booklet (in printed and electronic form) on the status, management and protection of the Black Grouse in Latvia.	LOS in co-operation with SFS	2 months (till Mar 2005)	1,000,-	SSC “LSF”, NPB

The Species Action Plan for the Black Grouse in Latvia should be revised during next five years, but no later than in 2008.

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