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# The Caucasian black grouse *Tetrao mlokosiewiczi* in Turkey: recent survey results and conservation recommendations

**Süreyya Isfendiyaroğlu, Geoff Welch & Murat Ataol**

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We conducted spring and autumn surveys of Caucasian black grouse *Tetrao mlokosiewiczi* throughout northeastern Turkey during 2004-2005. Birds were found at 45 locations, 29 of which were previously undocumented. The species appears to occur in four geographical units with differing degrees of connectivity and isolation, and is still under pressure from illegal hunting as well as habitat deterioration and fragmentation, principally as the result of road construction in mountain areas. A preliminary analysis of the degree of overlap between grouse populations and protected areas shows that the protected areas network should be reviewed. The data collected during the course of this survey are being used to develop a model for predicting the distribution of black grouse in northeastern Turkey and to prepare a National Species Action Plan. A detailed ecological study of the Caucasian black grouse is required to develop habitat management recommendations for the species.

*Key words: Caucasian black grouse, conservation, distribution, Turkey*

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The Caucasian black grouse *Tetrao mlokosiewiczi* is among the most poorly studied Tetraonidae species (Gokhelashvili et al. 2003) because of its limited range, small population size and high mountain habitat that is difficult to reach. The largest populations are found in Georgia and Russia, with small populations in Azerbaijan, Armenia, Iran and northeastern Turkey (Gokhelashvili et al. 2003). The species is largely sedentary, but undertakes altitudinal movements in response to weather conditions and in Georgia may move > 15 km to seek food (R. Gokhelashvili, pers. comm.). The distribution of the species is totally separate from that of the black grouse *T. tetrix*, a closely related species found throughout Eurasia (Klaus et al. 2003). The Caucasian black grouse is currently listed as Data Deficient (Hilton-Taylor 2000, Birdlife International 2004). For effective conservation of the species, it is essential to develop a better knowledge of its biology, ecology and distribution (Tucker & Heath 1994, Storch 2000, Klaus et al. 2003, Gokhelashvili et al. 2003).

In Turkey the Caucasian black grouse is patchily distributed throughout the coastal range of the eastern Black Sea Mountains, occurring from Salarut Yayla, the province of Trabzon, in the west to the Georgian border in the east (Başkaya 2003). This distribution is



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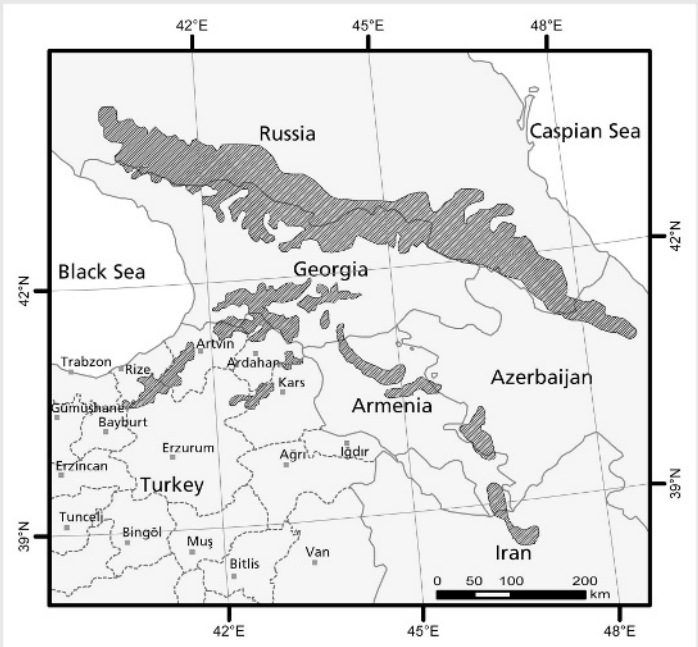


Figure 1. Global distribution of Caucasian black grouse (hatched areas) reproduced with permission of the Ornithological Society of the Middle East. City centres (■) and country borders (—) are shown.

closely correlated with the timberline habitats preferred by the species. Local populations are also reported in the Kargapazari, Mescit, Arsiyan and Kısır mountains (Ilicev & Flint 1989, Sultanov et al. 2003; Fig. 1).

At the beginning of the project, we reviewed most of the published studies of the species in Turkey and surrounding areas. This review revealed scattered sites of occupation south of the eastern Black Sea Mountains, but large gaps in the geographic distribution within most of this mountain range, despite apparently continuous habitat (Atkinson et al. 1995, Magnin &Yarar 1997, Kirwan & Martins 2000, Storch 2000, Başkaya 2003, Klaus et al. 2003, Sultanov et al. 2003, Kirwan et al. 2003, Kılıç & Eken 2004). However, we could not determine if the reported gaps represented truly isolated populations or were a reflection of observer coverage. In order to answer this question, we initiated surveys to accurately map the distribution of the Caucasian black grouse in all of northeastern Turkey in 2004, but we concentrated on the eastern Black Sea Mountains. Our objectives were 1) to update a similar survey made by Başkaya (2003) during 1992-2002, 2) to assess the effectiveness of the current protected areas network for conserving the species, and 3) to obtain the baseline information required for developing future management recommendations.

## Material and methods

The initial objective of the project was to attempt to survey all areas in the species' distribution where there were gaps, but access to many of the sites south of the eastern Black Sea Mountains was prohibited by the Turkish military authorities on security grounds. These authorities refused permission to carry out surveys in the provinces of Ağrı, Iğdır and Bingöl. Therefore the study area covered the mountains in the following provinces: Gümüşhane, Trabzon, Rize, Artvin, Ardahan and Erzurum.

The surveys were carried out in spring (early April to the end of June) and autumn (September-October), the periods when the grouse are known to be most active (Klaus et al. 2003, Klaus & Storch 2003). Eight people participated in the surveys, with survey teams including at least two observers. A single team operating in the field conducted the surveys in 2004. In 2005, one team conducted most of the work, except during 9-17 June, when a second team carried out a simultaneous survey. In 2004, the survey periods covered 25 days in spring and 32 days in autumn. In 2005, the survey period was 54 days in spring. Surveys were carried out both at sites where grouse were known or reported to be present (22 sites) and at locations (43) containing apparently suitable habitat but without records of grouse.



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Spring surveys consisted of counts of displaying birds and were carried out when lekking activity is highest, i.e. principally during the first three hours after sunrise and during the last two hours before sunset (Klaus et al. 2003). The location of each vantage point and lek was recorded using a Global Positioning System handheld unit. Where it was impossible or impractical to visit actual lek sites due to the terrain, the relevant location and physical information such as altitude and slope aspect were later calculated from 1:25,000 topographic maps. Where possible, lek sites and habitat survey points were visited and additional evidence of the presence of birds was noted, e.g. feathers, droppings and snow burrows together with opportunistic sightings of birds. For each observation, we completed a standard habitat form in order to collect data for a future computer model for predicting the distribution of Caucasian black grouse.

At each survey site in spring, we chose suitable vantage points and scanned potential lek areas for Caucasian black grouse using 8 × 40 binoculars and a 77-mm telescope with 20-60× zoom. We determined the age and sex of grouse when feasible. In spring, surveys were restricted to counts from vantage points to avoid undue disturbance to breeding birds. The points providing the best viewing conditions were chosen. The duration of observations was 2-3 hours in the morning and 1-2 hours in the evening. The average survey period per site was one day, but it extended up to three days occasionally depending on weather conditions. Some sites were counted twice per visit, but only the maximum count is presented in the results.

The autumn surveys, again of areas known to support grouse and areas of potentially suitable habitat, consisted of a combination of counts from vantage points and walking through areas of suitable habitat. Due to the frequently foggy conditions encountered in the mountains, walking was found to be the most efficient way of finding grouse at this time of year. The width of the area that could be surveyed while walking varied from 200 m to 1,800 m, depending on the terrain. All birds seen or heard were recorded, with other signs of presence being noted on an opportunistic basis. Standard habitat data were also collected during the autumn surveys.

All survey data were computerised for analysis and we compared the resulting geographic distribution of the black grouse to the existing protected areas network in northeastern Turkey using ArcGIS software, ArcMap 9.1.

## Results

In total, 331 Caucasian black grouse were recorded from 45 sites, 29 of which were not pre-

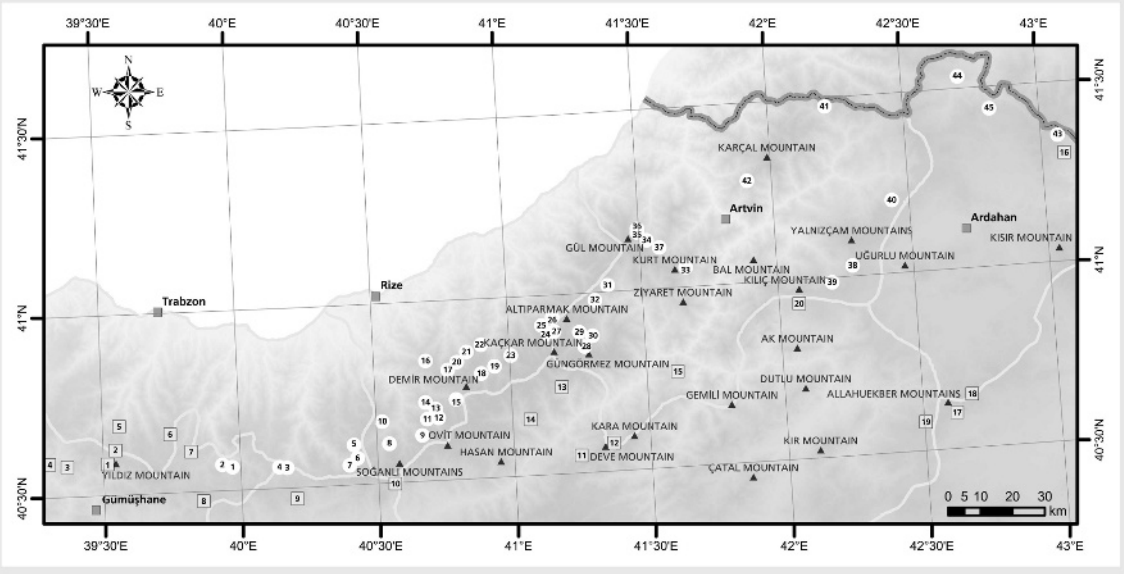


Figure 2. Caucasian black grouse survey sites with (○) and without (□) observations in northeastern Turkey during 2004-2005. City centres (■), mountains (▲), province borders (white line) and country borders (grey line) are shown. Numbers refer to the sites listed in Tables 1 and 2.



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Table 1. Survey sites, dates and number of Caucasian black grouse recorded in northeastern Turkey during 2004-2005. The asterisk (*) indicates that this site was not previously known to be occupied. For location of the sites see Figure 2.

| No | Site name | Date | Counts | Province |
|---|---|---|---|---|
| 1 | Erikli Yayla * | 10 June 2005 | 1 male | Trabzon |
| 2 | Salarut Yayla | 11 June 2005 | 5 males | Trabzon |
| 3 | Kavlatan | 12 September 2004 | 8 males, 4 females, 6 females or juveniles | Trabzon |
| 3 | Kavlatan | 9 June 2005 | 9 males | Trabzon |
| 4 | Mahtalar Yayla | 13 September 2004 | 2 males | Trabzon |
| 5 | Yente | 7 June 2005 | 4 males | Trabzon |
| 5 | Yente | 16 September 2004 | 5 females or juveniles | Trabzon |
| 6 | Arpaözü Yayla | 17 September 2004 | 4 males, 13 female or juveniles. | Trabzon |
| 6 | Arpaözü Yayla | 7 June 2005 | 7 males, 1 female | Trabzon |
| 7 | Balıklı Lake* | 8 June 2005 | 5 males | Trabzon |
| 8 | Çiçekli Village* | 7 May 2005 | 2 males | Rize |
| 9 | Göl Yayla* | 6 May 2005 | 8 males | Rize |
| 10 | Vicinity of Tozköy * | 8 May 2005 | 3 males | Rize |
| 11 | Zorkal Yayla | 8 May 2004 | 7 males, 2 females | Rize |
| 12 | Büyük Yayla | 20 September 2004 | 5 males, 2 females | Rize |
| 12 | Büyük Yayla | 12 June 2005 | 5 males | Rize |
| 13 | Çamlık Yayla | 22 September 2004 | 2 males | Rize |
| 13 | Çamlık Yayla | 25 May 2005 | 1 male, 1 female | Rize |
| 14 | Puşula Yayla | 22 September 2004 | 4 females or juveniles | Rize |
| 15 | Başköy in Cimil* | 14 June 2005 | 6 males | Rize |
| 16 | Çağırankaya* | 28 May 2005 | 8 males | Rize |
| 17 | Incesu Village* | 14 May 2005 | 4 males | Rize |
| 17 | Incesu Village* | 15 June 2005 | 5 males | Rize |
| 18 | Başköy Yayla in Verçenik Mountains* | 19 May 2005 | 9 males, 1 female, 2 subadult males | Rize |
| 19 | Kale Yayla and surrounding slopes* | 20 May 2005 | 22 males | Rize |
| 20 | Mesasırt Yayla* | 27 September 2004 | 3 males | Rize |
| 21 | Zargistal Yayla* | 28 September 2004 | 3 males | Rize |
| 21 | Zargistal Yayla* | 24 September 2005 | 3 males | Rize |
| 22 | Kito Yayla | 24 September 2005 | 1 male | Rize |
| 23 | Elevit Yayla* | 21 May 2005 | 2 males | Rize |
| 24 | Yukarı Kavron Yayla | 13 May 2005 | 4 males | Rize |
| 25 | Aşagı Kavron Yayla | 22 May 2005 | 3 males | Rize |
| 26 | Büyük Tercan* | 23 May 2005 | 3 males, 1 female | Rize |
| 27 | Çeymakçur Yayla | 23 May 2005 | 8 males | Rize |
| 28 | Yusufeli Yaylalar | 20 October 2004 | 1 female | Artvin |
| 28 | Yusufeli Yaylalar | 29 May 2005 | 4 males | Artvin |
| 29 | Körahmet* | 26 April 2005 | 17 males | Artvin |
| 30 | Pul Sırtı* | 27 April 2005 | 3 males | Artvin |
| 31 | Özgüven Yayla* | 8 June 2005 | 8 males | Artvin |
| 32 | Altıparmak Yayla* | 7 June 2005 | 1 male | Artvin |
| 33 | Kurt Mountain | 11 June 2005 | 16 males | Artvin |
| 34 | Egri Su Yayla* | 15 October 2004 | 2 males | Artvin |
| 35 | Çamurlu Yayla* | 13 October 2004 | 14 males, 4 females | Artvin |
| 35 | Çamurlu Yayla* | 11 October 2005 | 20 males | Artvin |
| 36 | Çamurlu Kuzey yamaç* | 14 October 2004 | 2 males, 3 females or juveniles | Artvin |
| 37 | Hatila Valley* | 12 June 2004 | 2 males | Artvin |
| 38 | Bilbilan Yayla* | 20 June 2005 | 2 males | Artvin |
| 39 | Bulanık Yayla* | 20 June 2005 | 1 male | Artvin |
| 40 | Yavuzköy Village* | 19 June 2005 | 3 males | Artvin |
| 41 | Mısırlı Yayla* | 17 June 2005 | 4 males, 1 female | Artvin |
| 42 | Beşahıl Yayla* | 17 October 2004 | 1 female | Artvin |
| 43 | Baltalı Village* | 24 June 2005 | 5 males | Ardahan |
| 44 | Posof Environmentally Sensitive Area | 16 June 2005 | 2 males | Ardahan |
| 45 | Yeniköy Yayla* | 11 June 2004 | 8 males, 1 female | Ardahan |



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Table 2. Sites surveyed where no Caucasian black grouse were recorded in northeastern Turkey during 2004-2005. For location of the sites see Figure 2.

| No | Site name | Date | District | Province |
|---|---|---|---|---|
| 1 | Uğurtaşı | 17 April 2005 | Center | Gümüşhane |
| 2 | Deveboynu Yaylası | 5 September 2004 | Center | Gümüşhane |
| 3 | Ayliye tepesi | 19 April 2005 | Torul | Gümüşhane |
| 4 | Tokçam | 20 April 2005 | Torul | Gümüşhane |
| 5 | Goflagoz Yayla | 2 September 2004 | Center | Gümüşhane |
| 6 | Dumanlı Yayla | 3 September 2004 | Center | Gümüşhane |
| 7 | Ziyaret hill | 4 September 2004 | Center | Gümüşhane |
| 8 | Kahramankaya Hill | 6 June 2004 | Center | Gümüşhane |
| 9 | Çençül Yayla | 19 April 2005 | Aydıntepe | Bayburt |
| 10 | Yoncalı Village | 22 April 2005 | Center | Bayburt |
| 11 | Devedağı | 3 June 2005 | Ispir | Erzurum |
| 12 | Yamaç üstü village | 7 June 2005 | Yusufeli | Artvin |
| 13 | Sırakonaklar | 1 June 2005 | Yusufeli | Artvin |
| 14 | Yıldıztepe | 2 June 2005 | Ispir | Erzurum |
| 15 | Karadağ | 6 June 2005 | Yusufeli | Artvin |
| 16 | Sabaholdu village | 25 June 2005 | Çıldır | Ardahan |
| 17 | Dikmen Yayla | 24 May 2004 | Selim | Kars |
| 18 | Bozkuş Yayla | 25 May 2004 | Selim | Kars |
| 19 | Esence Yayla | 26 May 2004 | Şenkaya | Erzurum |
| 20 | Oğuzkent Yayla | 22 September 2005 | Oltu | Erzurum |

viously known to be occupied (Fig. 2). All these previously undocumented sites were in the provinces of Trabzon, Rize, Artvin and Ardahan (see Fig 2). A list of sites holding Caucasian black grouse and the counts are presented in Table 1. Sites surveyed, but holding no grouse, are given in Table 2. The locations of positive observation sites in relation to the existing 13 protected areas are shown in Figure 3. The names of the protected areas are listed in Table 3.

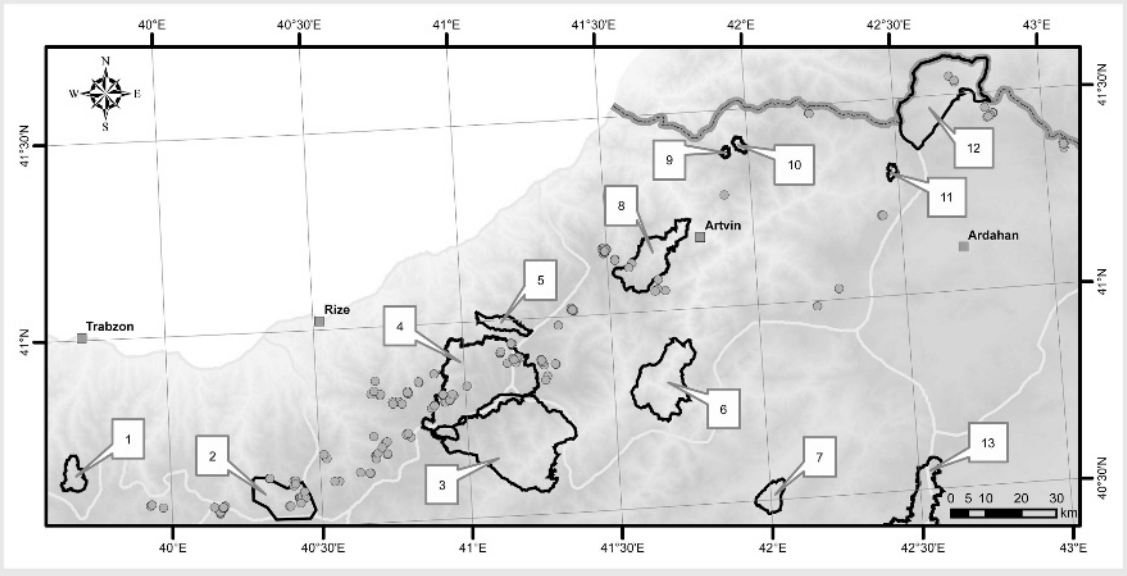


Figure 3. Sites with observations of Caucasian black grouse and protected areas in northeastern Turkey. Observation points (●), city centres (■), protected areas (bold line), province borders (white line) and country borders (grey line) are shown. Numbers refer to the protected areas listed in Table 3.



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Table 3. Protected areas in northeastern Turkey. For location of the protected sites see Figure 3.

| |
|---|
| National parks (Milli Parklar) |
| 1 Altındere Vadisi, Trabzon |
| 4 Kaçker Daglari, Rize |
| 8 Hatilla Vadisi, Artvin |
| 11 Karagöl-Sahara, Artvin |
| 13 Allahuekber Daglari, Erzurum, Kars |
| Nature protection areas (Tabiatı Koruma Alanları) |
| 10 Camili-Efeler Ormanı, Artvin |
| 9 Camili-Görgit, Artvin |
| Nature park (Tabiatı Parkı) |
| 2 Uzungöl, Trabzon (contained within borders of site below) |
| Important environment protection area (ÖÇKA) |
| 2 Uzungöl, Trabzon |
| Wildlife reserves (Yaban Hayatı Koruma ve Geliştirme Sahaları) |
| 12 Posof Yaban Hayatı Geliştirme Sahası, Ardahan |
| 6 Yusufeli Çoruh Vadisi Yaban Hayatı Geliştirme Sahası, Artvin |
| 5 Çamlıhemşin-Kaçker Yaban Hayatı Geliştirme Sahası, Rize |
| 7 Oltu Yaban Hayatı Geliştirme Sahası, Erzurum |
| 3 Ispir Verçenik Daglari Yaban Hayatı Geliştirme Sahası, Erzurum |

## Discussion

### Survey methodology

Due to the nature of the terrain in which the species occurs, vantage point counting is considered to be the most efficient survey technique for Caucasian black grouse, especially for lekking birds in spring (Atkinson et al. 1995). However, as access to high mountain areas is frequently limited by the availability of roads and tracks, our survey locations were seldom truly random. For this reason, the production of a computer-generated model of grouse distribution, together with a total population estimate, is a priority for future work using the project's data.

### Distribution

In this survey, we located the Caucasian black grouse in the following four geographical units of northeastern Turkey (see Fig. 2). The first unit, the eastern Karadeniz Mountain range (sites 1-37), is inhabited by an almost continuous population except for two small patches separated at the western end of the distribution. The westernmost sites (1-4) are 15 km from the nearest occupied point, which is site 7 (see Fig. 2). We consider that these populations are more vulnerable to declines than the populations in the rest of the first geographical unit. Further to the east (sites 5-37), the distribution of Caucasian black grouse is continuous in the suitable habitats. Therefore, we think that the gaps that had been highlighted in this geographical unit at the beginning of our study were due to lack of observer coverage in this part of the range.

The second geographical unit, Karçal Mountain, is located at the eastern end of the eastern Karadeniz Mountains, close to the Georgian border (sites 41-42).

The third geographical unit, Yalnızçam Mountain, is south of the eastern Karadeniz Mountain range. The grouse sites (38-40) are patchily distributed because the rhododendron *Rhododendron* sp. scrubland and birch *Betula* sp. vegetation communities favoured by the grouse (Klaus et al. 2003) occur mostly at the eastern and western edges of this mountain range.

It is currently unclear whether the birds in the second and third units are isolated populations because the birds' movements and metapopulation dynamics are unknown (Gokhelashvili 2003). The Çoruh River geographically isolates both sites from the main eastern Karadeniz Mountain range. The birds in the Karçal Mountains may be linked to populations in Georgia.

The fourth geographical unit (sites 43-45) is located in adjacent valleys in the Posof and Çıldır districts of Ardahan. They are the easternmost grouse locations in Turkey. Wide areas of alpine meadows surround the mountains along the Georgian side of the border. Therefore, the birds are almost certainly linked to populations in Georgia and isolated from populations further west in Turkey. Clarifying the precise relationships between birds in the four units should be considered a priority because the degree of isolation of populations has direct implications for their long-term conservation and future management.

### Principal threats

In many mountain areas there is widespread and uncontrolled road construction, as well as conversion to summer holiday houses of the traditional yaylas (seasonal settlements traditionally used by livestock owners to feed their cattle and sheep on rich grasslands during the summer). These new holiday homes may lead to increased disturbance of the Caucasian black grouse and other mountain species (Başkaya 2003). During the two years (2004-2005) of our project the following new roads were constructed in the study area: Zorkar Yayla (site 11), Zargistal Yayla (site 21) and Piçankara Yayla (between sites 32 and 31). Additionally, the minor road to Bilbilan Yayla (site 38) was upgraded to a major highway. Whilst these roads are primarily for the benefit of local people, they increase access in general, which may increase the risk of illegal hunting and disturbance of the grouse.



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Around Posof, the grouse population at Yeniköy Yaylası (site 45) is potentially at risk from construction of the new Shahdeniz natural gas pipeline, which will bisect the main area of grouse habitat and is likely to lead to increased access.

In most areas, hunting of grouse appears to be largely opportunistic though there is some evidence of hunters coming from large cities such as Istanbul, Ankara and Izmir to seek trophy specimens. An exception to this general situation is in the vicinity of Ardanuç at sites 38 and 39, where hunting pressure is very high. It is thought that hunting has led to the extinction of grouse populations around Karadağ and Devedağı in the Mescit Mountains, where birds were known to have occurred in the past (Sultanov et al. 2003, Klaus et al. 2003), but could not be found during this project.

The other sites where illegal hunting was encountered were Kavlatan (site 3), Balıklı Lake (site 7), Tozköy (site 10), Büyük Yayla (site 12), Çamlık Yayla (site 13), Kito Yayla (site 22) and Beşahıl Yayla (site 42).

**Conservation recommendations and future work**

The distribution of the Caucasian black grouse determined from our project shows that the existing protected areas in northeastern Turkey provide protection to only a small proportion of the Caucasian black grouse population. We estimate that only about 34% of the total Turkish population is included in the existing protected areas (see Fig. 3). Therefore, to provide increased protection of the species, we suggest that the boundaries of the Kaçkar Dağları and Hatilla Vadisi National Parks and Posof Wildlife Reserve be extended and a new protected area established at Sivrikaya. With these border revisions and new designations approximately 70% of the grouse population would be included.

However, site designation is only the first stage of effective conservation and must be accompanied by the enforcement of legislation and, where appropriate, the introduction of practical habitat management. To assist this process, the National Species Action Plan proposes increased equipment and training for the staff of protected areas to increase their effectiveness 'on the ground'. A demonstration site of a management plan is in preparation for the Posof Wildlife Reserve, and we hope that this will provide a template that can be adopted at other grouse sites in Turkey and, potentially, other parts of the species' range.

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