

PRELIMINARY DATA ON THE SPECIES OF BIRDS FROM THE LEAOTA MOUNTAINS INCLUDED IN THE ANNEX I TO DIRECTIVE 2009/147/EC

MESTECĂNEANU Adrian, POP Oliviu, MESTECĂNEANU Florin

Abstract. The current paper is the first published study on the avifauna from the Leaota Mountains, an area located in the north-east side of Argeș County (Romania). A part of the results of the researches performed here in 2016 referring to the species from the Annex I of the Birds Directive are showed. The obtained data were compared to similar data obtained in Europe and Romania, particularly following the distribution according to the type of habitat occupied, the age of the forest, in the case of the forestry species, and the sea level altitude at which the species were observed. It has been found that the most of them preferred the 91V0 habitat, mature forests and the altitude range of 1,000-1,499 m, resulting in the need for urgent protection of the natural forest ecosystems. Several considerations have been made about hydrographic zoning, too, highlighting the basins of the main rivers or streams where significant concentrations of protected species have been found, and also in terms of their density and population. Some information about the migration of diurnal rapacious birds through the area was provided as well.

Keywords: Birds Directive, habitats, Argeș, Romania.

Rezumat. Date preliminare asupra speciilor de păsări din Munții Leaota incluse în Anexa I a Directivei 2009/147/CE. Lucrarea de față se constituie în primul studiu publicat asupra faunei de păsări din Munții Leaota, zonă localizată în nord-estul județului Argeș (România). Sunt arătate o parte a rezultatelor cercetărilor efectuate aici în anul 2016 cu privire la speciile din Anexa I a Directivei Păsări. Datele prezentate au fost comparate cu altele similare obținute în Europa și în România, punându-se accent pe distribuția speciilor în funcție de tipul de habitat ocupat, vârsta pădurii, în cazul speciilor forestiere, și altitudinea față de nivelul mării a locului în care acestea au fost observate. S-a constatat că cele mai multe dintre ele au preferat habitatul 91V0, pădurile mature și intervalul de altitudine cuprins între 1000 și 1499 m, de unde rezultă necesitatea ocrotirii urgente a ecosistemelor forestiere naturale. S-au mai făcut unele considerații referitoare la zonarea hidrografică, evidențiindu-se bazinele principalelor râuri și pâraie unde au fost găsite concentrații însemnate de specii protejate, precum și la densitatea și populația acestora. De asemenea, au fost date unele informații privitoare la migrația unor păsări răpitoare diurne prin zonă.

Cuvinte cheie: Directiva Păsări, habitate, Argeș, România.

INTRODUCTION

Works about the avifauna of the Leaota Mountains have not been published so far, because the attention of ornithologists was attracted by the more spectacular mountains Bucegi and Piatra Craiului from the neighbourhood. An avifaunistic image from the area could have been made by analogy with avifauna of these neighbourhood mountains or extracting information from generalist or atlas type works (BĂCESCU, 1961; BRÂNZAN et al. 2013; CIOCHIA, 1992; GEORGESCU & GEORGESCU, 1996; MUNTEANU, 1998, 2005, 2012; MUNTEANU et al., 1994; MUNTEANU et al. 2002; PETROVICI, 2015; RADU, 1967; VASILIU & ȘOVA, 1968).

MATERIAL AND METHODS

As mentioned above, **the place of research** was the Leaota Mountains. They are located in the Eastern part of the Southern Carpathians, in the group of Bucegi – Leaota – Piatra Craiului, between the Bucegi Mountains (towards East) and Piatra Craiului and Iezer-Păpușa (towards West), (Fig. 1). The area of these mountains is cca. 240 km² over fractions of the Argeș, Dâmbovița and Brașov Counties. Bângăleasa, Brateiul and Ialomița Valleys toward East, an alignment of hills of Dâmbovița Subcarpathians toward South, the Dâmbovița Valley toward West and the Rucăr-Bran Corridor toward North are the limits. Leaota (2,133 m) is the highest peak (<https://www.hartaturistului.com/munte/>), but, generally, the ridges are below 2,000 m.

The relief is strongly fragmented, formed by long, rounded ridges, without shapes of glacial erosion, that link the other peaks: Cumpărata (1,996 m), Pietrele Albe (1,888 m), Cioara (1,853 m), Sfântul Ilie (1,794 m), Albescu (1,793 m), Secăriile (1,766 m), Românescu (1,714 m), Făgetelul (1,618 m), Ghimbav (1,406 m), Priseaca (1,358 m), etc. (BARCO & NEDELICU, 1974).

The crystalline schists from Leaota series are largely extended and the brown-acid and podzolic soils are well

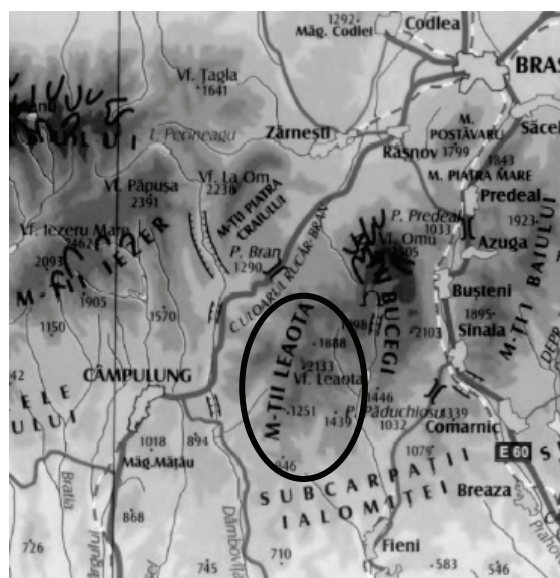


Figure 1. The map of the group of mountains Piatra Craiului – Leaota – Bucegi, with their surroundings (modified, by <http://elearning.masterprof.ro/>).

represented here (MĂCIU et al., 1982).

The streams radiate from the Bucșa – Sântilia – Marginea Domnească central crest. Bângăleasa, Moieciul Cald and Moieciul Rece flow toward North, to the Olt River. From West and South-West, the Dâmbovița River takes Valea Caselor, Valea Bădenilor (Bădeanca), Valea lui Coman and Valea Chiliilor and, from East and South-East, Ialomița River intercepts Brătei, Rătei, Răciu and Ialomicioara (http://www.carpati.org/ghid_montan/).

The climate of the area is temperate continental with mountain features. The average annual temperature is 6-0°C, between 800 and the highest peaks, with the average temperature of January between -6 and -11°C and the one of July between 16 and 6°C. The average of precipitations is between 800 and 1,200 mm, on the highest peaks.

As for the flora, 884 taxons have been inventoried so far; among them, 84 species belong to the Red List of the vascular plants from Romania (1 endangered species, 7 vulnerable species, 70 rare species): *Aquilegia nigricans* Baumg., *Arnica montana* L., *Campanula carpatica* Jacq., *Centaurea pinnatifida* Schur., *Dianthus henteri* Heuff. Ex Griseb. & Schenk., *Erysimum witmannii* Zawadsk., *Gypsophila petraea* (Baumg.) Reichenb., *Hepatica transsilvanica* Fuss., *Heracleum palmatum* Baumg., *Hesperis nivea* Baumg., *Leontopodium alpinum* Cass., *Ligularia glauca* (L.) O. Hoffm., *Peltaria alliacea* Jacq., *Phyteuma tetramerum* Schur., *Salvia transsilvanica* Schur., *Taxus baccata* L., *Trollius europaeus* L., *Viola dacica* Borbás, *Spiranthes spiralis* (L.) Chevall., etc. There are three level of vegetation: mountain, subalpine and alpine. The forestry vegetation is composed by: *Fagus sylvatica* L., *Acer platanoides* L., *A. pseudoplatanus* L., *Fraxinus excelsior* L., *Abies alba* Mill., *Picea abies* (L.) H. Karst., etc. *Rhododendron myrtifolium* Schott & Kotschy, *Vaccinium myrtillus* L., *Pinus mugo* Turra, and *Juniperus communis* subsp. *nana* (Willdenow) Syme appear in the subalpine level. The alpine level is characterised by: *Carex curvula* All., *Juncus trifidus* L., *Potentilla aurea* subsp. *Chrysocraspeda* (Lehm.) Nyman, *Festuca airoides* (Koeler) Mutel, *Loiseleuria procumbens* (L.) Desv., etc.

The main habitats found in the area are: 91V0 - Dacian Beech forests (Symphyto-Fagion), (12,495.59 ha), 4060 - Alpine and Boreal heaths (11,577.79 ha), 9410 - Acidophilous *Picea* forests of the montane to alpine levels (Vaccinio-Piceetea), (8,343.89 ha), 6230 - Species-rich *Nardus* grassland, on siliceous substrates (1,389.14 ha), 6150 - Siliceous alpine and boreal grasslands (946.64 ha), 9110 - Luzulo-Fagetum beech forests (380.21 ha), 6520 - Mountain hay meadows (230.19 ha), 4070 - Bushes with *Pinus mugo* and *Rhododendron hirsutum* (Mugo-Rhododendretum hirsuti), (33.97 ha), and 91E0 - Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Pandion, Alnion incanae, Salicion albae), (4.70 ha). A mosaic of habitats appears on limestone (206.23 ha), so, the whole area sighted in the project was 25,417.48 ha (Fig. 2).

The invertebrate fauna is rich and is represented by numerous species that live in the vegetal floor. The vertebrates include: *Salamandra salamandra* (Linnaeus, 1758), *Bombina variegata* (Linnaeus, 1758), *Lacerta agilis* Linnaeus, 1758, *Anguis fragilis* Linnaeus, 1758, *Ursus arctos* Linnaeus, 1758, *Lynx lynx* (Linnaeus, 1758), *Canis lupus* Linnaeus, 1758, *Felis silvestris* Schreber, 1777, *Capreolus capreolus* (Linnaeus, 1758), *Cervus elaphus* Linnaeus, 1758, *Martes martes* (Linnaeus, 1758), *Sus scrofa* Linnaeus, 1758, etc. (cf. The Management Plan of Natura 2000 Site ROSCI0102 Leaota).

A part of the Leaota Mountains is included in ROSCI0102 Leaota (1,393 ha), Natura 2000 site administrated by the Foundation Conservation Carpathia, that contains alpine pastures and subalpine forests of spruces (<https://www.carpathia.org/ro/>, <http://natura2000.eea.europa.eu/>), (Fig. 3).

A multidisciplinary team studied the fauna and the flora, through the “Contract for the supply of research on biodiversity analysis”, beneficiary, SC Wildland SRL. From an ornithological point of view, the main purpose was to draw up a preliminary list of the species from the area of interest and to correlate the gathered data with the conservation status of the investigated habitats. In this paper we intended to present some data regarding the protected species from the area, other aspects of the project (the list of all species, indicator species, measures of conservation etc.) following to be discussed on another occasion.

The **period of observations** was May 15 – September 30, 2016. There were 28 days of field research: 6 in May, 7 in June, 6 in July, 6 in August and 3 in September. The majority of the observations were performed during the day, and no complex **methods of monitoring** for the groups of birds (elaborated in Romania by the Romanian Ornithological Society) were applied. In an optimal mode, the period of monitoring is: March 10 – April 20, for the woodpeckers, June 15 – August

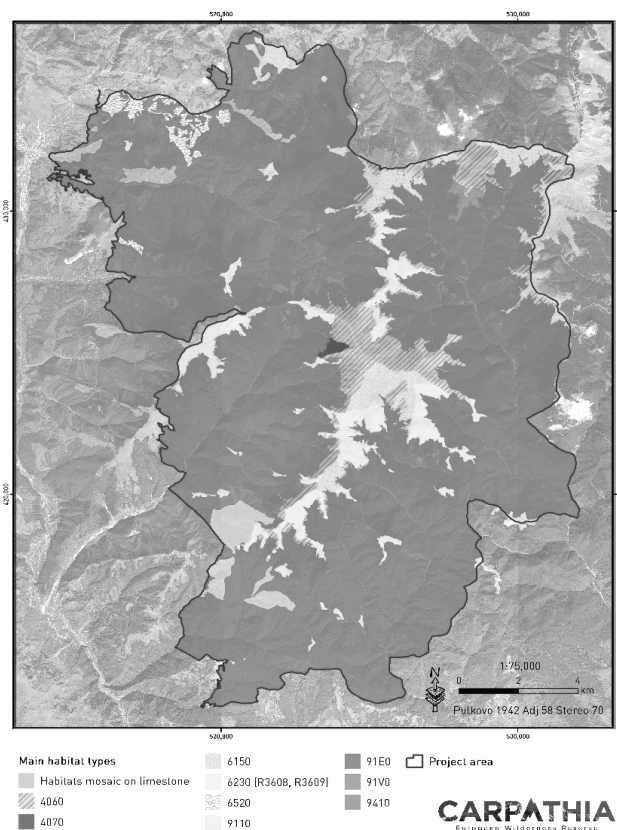


Figure 2. The main habitats types of Leaota area (original).

with glades and bushes along the Danube and the big rivers (below 600 m elevation), where population is 50-100 pairs (CIOCHIA, 1992; MUNTEANU et al., 2002).

In the area, it was observed only 1 individual, in passage (Table 1). In other parts (the Siret hydrographical basin), it was observed in exploitations of pure forests of *Fagus sylvatica* and on mountain meadows (RANG, 2002).

The species not breeds in the Leaota Mountains, and, probably, a few individuals cross the area every season of migration.

4. *Circus aeruginosus* (Linnaeus, 1758).

The marsh harrier breeds on shallow freshwater lakes or rivers with lining of fairly extensive reedbeds (SVENSSON et al., 2009, 2017). In Romania, it breeds mainly in the wetlands from the plain area with large reed beds, especially in the Danube Delta; the strength is estimated at 700-1,500 pairs (CIOCHIA, 1992; MUNTEANU et al., 2002).

All the 5 recorded individuals were observed over the habitats: 6150 - Siliceous alpine and boreal grasslands, 4060 - Alpine and Boreal heaths, and 6230 - Species-rich *Nardus* grassland, on siliceous substrates, when moved to the breeding grounds (1 individual, 20.00% of all) or to the winter quarters (4 individuals, 80.00% of all). They were spotted over the heights of 1,690-1,906 m (Table 1).

Even if the species does not breed in the researched area, probably a few tens of individuals overflow it every year, in migration.

5. *Falco peregrinus* Tunstall, 1771.

The peregrine falcon breeds on steep coastal cliffs or in mountains, also on cliffs in lowlands (SVENSSON et al., 2009, 2017). In Romania, breeds mainly in the Carpathians, in the grouse ornithological level, rarely in other places, even in towns (CIOCHIA, 1992), where the population is fewer than 20 pairs (MUNTEANU et al., 2002).

In the area of researches, the species was seen in (3 individuals, 18.75% of all) or over (13 individuals, 81.25% of all) the following habitats: mosaic of habitats on limestone – 5 individuals (31.25%), 4060 - Alpine and Boreal heaths – 4 individuals (25.00% of all), 6520 - Mountain hay meadows – 2 individuals (12.50% of all), 9410 – Acidophilous *Picea* forests of the montane to alpine levels (Vaccinio-Piceetea) – 2 individuals (12.50% of all), 6150 - Siliceous alpine and boreal grasslands – 1 individual (6.25% of all), 6230 - Species-rich *Nardus* grassland, on siliceous substrates – 1 individual (6.25% of all), and 91V0 - Dacian Beech forests (Symphyto-Fagion) – 1 individual (6.25% of all). In the Siret hydrographical basin, it was identified on the mountain meadows (RANG, 2002). A part of the registered individuals can be vagrant. The overflow elevations were situated between 822 and 1,937 m. When they were seen sat, this was 802, respectively 2,094 m (Table 1).

Certainly, it breeds in the area of the Leaota Mountains (one confirmed place being the gorges known as Cheile Dâmboviței – Cheia Mare, down to the Ghimbav confluence). The overall estimated population is 1-2 breeding pairs, that means 1 pair/1-2 km² of habitats on limestone or 0.3-0.7 pairs/100 km² of mountain area. The highest breeding densities were reported from Great Britain (up to 8.5 pairs/100 km² inland), locally, 5 pairs/6.5 km², in Gibraltar (HAGEMEIJER & BLAIR, 1997); also, 8 pairs in one 10 km square or 1 pair/12.5 km² (FERGUSON-LEES et al., 2001). In Apuseni Mountains, 6-8 pairs were registered; no density was shown (KOVÁCS et al., 2008).

6. *Tetrao urogallus* Linnaeus, 1758.

The capercaillie lives in mature coniferous forests, preferring areas with old pines on rocky ground with abundance of berry-bearing shrubs and moss and with element of aspen and spruces, avoiding open ground (SVENSSON et al., 2009, 2017). In Romania, it breeds in the massive forests of resinous; above the treeline it is occurred only in the mating time (CIOCHIA, 1992). Resides in large coniferous forests, with tall trees and, often, with well developed underwoods, mainly *Vaccinium* sp. (MUNTEANU, 2000). It is frequent in Făgăraș and Bucegi (NEGRUȚIU, 1983). The population of Romania is ca. 10,000 individuals (MUNTEANU et al., 2002).

All 5 individuals were seen in the habitat 9410 - Acidophilous *Picea* forests of the montane to alpine levels (Vaccinio-Piceetea). In the Siret River basin, it was observed on mountain meadows, in old pure forests of *Picea abies* and their exploitations and in exploitations of forests of *Abies alba* and *Fagus sylvatica* (RANG, 2002). Our observations confirm its preference for mature forests of coniferous. The elevations where the birds were noted varied between 1,398 and 1,661 m (Table 1). In Rodnei Mountains, it was found between 1,200 and 1,600 m (BÉREȘ, 1977) and in the mountains of Bistrița, between 900 and 1,600 m (MUNTEANU, 2000). A nest was met at 1,430 m, in Călimani Mountains (CIOCHIA, 1992).

It is a probable breeding species in the area. The estimated population is at least 8-12 adult males or 0.10-0.14 males/km² of coniferous forest. Spring densities usually range between 1 and 2 displaying cocks/km² (HAGEMEIJER & BLAIR, 1997). In Romania, there were cited densities of 0.4 individuals/km² forest or 1 individual/km² (MUNTEANU, 2012). In Făgăraș and Bucegi, the density is over 1 male/km² of forest (NEGRUȚIU, 1983); in the upper basin of Bistrița - 0.4 individuals/km² (IONESCU et al., 1968).

7. *Bonasa bonasia* (Linnaeus, 1758).

The hazel grouse lives in mixed coniferous (rarely broad leaved), closed forests, preferring damp and densely undergrown areas with old spruces (SVENSSON et al., 2009, 2017). In Romania, it breeds in forests, mainly in the ones with *Corylus avellana* (CIOCHIA, 1992). In the mountains of Bistrița Moldovenească River, was observed chiefly in mixed forests with rich underbush, but, also in the coniferous or beech ones (MUNTEANU, 2000). However, rarely appears in the coniferous. The population is estimated at 9,000-12,000 pairs (MUNTEANU et al., 2002).

In the researched area, the 8 individuals was seen only in the habitat 91V0 - Dacian Beech forests (Symphyto-Fagion). In the Siret Valley, it was identified in young and old forests of *Picea abies* and *Fagus sylvatica*, in young and old forests of *Abies alba* and *F. sylvatica*, in old pure forests of *Pinus sylvestris*, in young and old pure forests of *F. sylvatica* and on mountain meadows (RANG, 2002). In our case, the presence of the species was associated with the occurrence of the underwood. The spots of observations ranged between 1,002 and 1,408 m (Table 1). In Romania, it was occurred between 300 m and the level of the coniferous forest (CIOCHIA, 1992) and in other mountains from the Eastern Carpathians, it was observed between 500 and 1,600 m (MUNTEANU, 2000).

Certainly, it breeds in the Leaota Mountains. The population is estimated at 15-30 pairs or 0.12-0.24 pairs/km² of forest from habitat 91V0. The peak densities have been ascertained in the Polish Carpathians: broad leaved forests - 2.5 birds/km², mixed forest - 5.6 birds/km², coniferous forest - 18 birds/km². In Russia and Belarus: 10-15 pairs/km² (HAGEMEIJER & BLAIR, 1997).

8. *Crex crex* (Linnaeus, 1758).

The corncrake breeds on damp meadows by marshy lowland lakes, but also on lush meadowlands and hay fields with access to wetter spot with taller vegetation (SVENSSON et al., 2009, 2017). In Romania, it breeds in all wetlands, as also in agricultural terrains near the waters (CIOCHIA, 1992), where nearly 20,000 pairs live (MUNTEANU et al., 2002).

Both observed individuals were registered in the habitat 6520 - Mountain hay meadows at 821, respectively 877 m a.s.l. (Table 1). In the Siret Valley, it was seen on mountain meadows (RANG, 2002). It is known to breed in the humid glens of the mountains fots (CIOCHIA, 1992) between 350 and 900 m elevation (MUNTEANU, 2000).

The species is probably breeding in the area, although it was not found in the perimeter of focal interest, but in the immediate vicinity, where probably there are 2-4 pairs or 0.4-0.8 calling males/km². In the Alps, the mean density was between 0.40 and 4.11 calling males/km² (PEDRINI et al., 2012). In Romania, it was 0-4.6 calling males/km², at 600-1,800 m (DEMETER & SZABÓ, 2005) or maximum 4 calling males/5 ha, in the north – eastern part of Romania (GACHE & TRELEA, 2004).

9. *Strix uralensis* Pallas, 1771.

The Ural owl lives in old boreal forests interspersed with bogs, often also open water, clearfellings and small fields (SVENSSON et al., 2009, 2017). In Romania, prefers to breed in large and old broadleaf forests from Carpathians (CIOCHIA, 1992) or in woods of *Fagus* sp. and *Picea* sp., with strength of 200-800 pairs (MUNTEANU et al., 2002).

The two registered individuals were seen in the habitat 91V0 - Dacian Beech forests (Symphyto-Fagion). *Fagus sylvatica* and *Picea abies* dominated the woody vegetation in both locations, which were situated at 826, respectively 1,310 m elevation (Table 1). In the Siret Valley, it was seen in old forests of *P. abies* and *F. sylvatica*, in old forests of *Abies alba* and *F. sylvatica*, in old pure forests of *Pinus sylvestris*, in old pure forests of *F. sylvatica*, in old forests dominated by *F. sylvatica*, and in other ecosystems that not appear in our area (RANG, 2002). In the mountains of Bistrița, it was met between 700 and 1,600 m (MUNTEANU, 2000).

It is a probable breeding species in the area. The strength is estimated at 6-12 pairs (0.04-0.09 pairs/km² of forest from habitat 91V0 or 0.02-0.05 pairs/km² of forest). The observed individuals were met on the tracks. No individuals responded to the nocturnal play-back, because of the unfavourable period of monitoring. Usually, the density is bellow 6-7 pairs/km² (HAGEMEIJER & BLAIR, 1997). In Romania, in old forest of *F. sylvatica*, at 830-1,100 m elevation, the density was 2 pairs/km² (BÉREȘ & CHERECHEȘ, 1997).

10. *Picus canus* Gmelin J. F., 1788.

The grey-headed woodpecker breeds in several quite different habitats, e. g. in swamp forests along river and lakeshores with plenty of insect-rich decayed deciduous trees; in open or park-like mature deciduous forest; in open woodlands in uplands (often to 600 m, at times higher) and with good coniferous element (SVENSSON et al., 2009, 2017). In Romania, it lives often in the broadleaf forests, mainly along the larger rivers. Also, it is met in the open deciduous and mixed woods and visits only the skirts of the coniferous forests (CIOCHIA, 1992). 20,000-50,000 pairs are the whole Romanian population (MUNTEANU et al., 2002).

The only individual was observed to the skirt in the habitat 91V0 - Dacian Beech forests (Symphyto-Fagion) with trees of diverse ages, at 1,105 m elevation (Table1). In the Siret Valley, it appeared in old pure forests of *Picea abies*, in young and old forests of *P. abies* and *Fagus sylvatica*, in young and old forests of *Abies alba* and *F. sylvatica*, in young and old pure forests of *F. sylvatica*, in young and old forests dominated by *F. sylvatica*, and in other ecosystems from the lower areas (RANG, 2002). Up to 900 m, it was observed in the mountains of Bistrița (MUNTEANU, 2000), and bellow 1,400 m elevation, in Călimani Mountains (KOHL, 1983).

It is a probable breeding species in the area. The estimated population is 2-4 breeding pairs or 0.01-0.03 pairs/km² of forest from habitat 91V0. Typical Central European densities are c. 0.1 pairs/km² or 0.25 pairs/km² (HAGEMEIJER & BLAIR, 1997). In Romania: 15 pairs/km² in mountain forest Fagetum-Mercurialitosum, at 850 m elevation (KORODI, 1957), 1 pair/km² in forest of *F. sylvatica*, the association Fagetum carpaticum, at 700-1,000 m elevation (MUNTEANU, 2012).

11. *Dendrocopos leucotos* (Bechstein, 1802).

The white-backed woodpecker breeds in wet mixed forest, often by lakes and rivers, with plenty of dead and dying deciduous trees (aspen, sallow, alder, birch); thus requires areas undisturbed by forestry operations (SVENSSON

et al., 2009, 2017). In Romania, lives in the large broadleaf and coniferous forests from Carpathians (CIOCHIA, 1992) and, also, in Dobruja. The all population ranges between 10,000 and 20,000 pairs (MUNTEANU et al., 2002).

Both registered individuals were seen in the habitat 91V0 - Dacian Beech forests (Symphyto-Fagion), at 1,044, respectively 1,078 m elevation (Table 1). In the mountains of Bistrița Moldovenească River, it was seen in the breeding season only in the interior of the forests, between 350 and 1,400 m sea level altitude (MUNTEANU, 2000).

In the area of interest, it is a probable breeding species. The estimated population is 8-15 breeding pairs (0.06-0.12 pairs/km² of forest from habitat 91V0 or 0.03-0.07 pairs/km² of deciduous, mixed and coniferous forests). The maximum density in optimal deciduous forests is 1.0 pairs/km² in Northern and Central Europe (HAGEMEIJER & BLAIR, 1997). In Romania, 3 pairs/km² in mountain forest of *Fagus sylvatica*, at 510-850 m elevation, 15 pairs/km² in mixed forests, at 480-600 m elevation, 2 pairs/km² in forest of *F. sylvatica*, in the association Fagetum carpaticum, at 700-1,000 m elevation, 17 pairs/km² in forest of *F. sylvatica*, the associations Symphyto-cordati – Fagetum, Fageto drymae – Fagetum, at 900-1,200 m elevation (MUNTEANU, 2012).

12. *Picooides tridactylus* (Linnaeus, 1758).

The three-toed woodpecker breeds in coniferous and mixed forest with some older spruce stands and (often dying) deciduous trees (SVENSSON et al., 2009, 2017). In Romania, it breeds in the coniferous forests, where the population is 2,000-5,000 pairs (CIOCHIA, 1992; MUNTEANU et al., 2002). Rarely, it appears in the mixed forest (MUNTEANU, 2000).

In the area of Leaota Mountains, it was recorded in one type of habitat: 9410 – Acidophilous *Picea* forests of the montane to alpine levels (Vaccinio-Piceetea), between 1,375 and 1,691 m elevation (Table 1). In the Siret Valley, it appeared in old forests of *Picea abies* and *Fagus sylvatica*, in old forests of *Abies alba* and *F. sylvatica*, and in old pure forests of *Pinus sylvestris* (RANG, 2002). It was found between 700 (near Brașov) and 1,550 m, in Călimani Mountains (KOHL, 1983). In the mountains of Bistrița, it was seen between 700-800 m and 1,600 m, in winter (MUNTEANU, 2000).

It is a probable breeding species in the area. The population is estimated at 5-10 breeding pairs or 0.05-0.11 pairs/km² in forest of *Picea abies*. In Europe, in favoured area, the density is 1 pair/42-200 ha (HAGEMEIJER & BLAIR, 1997). In Romania: 1.2 pairs/km² in forest of *P. abies*, the association Piceetum montanum austrocarpaticum, at 1,300-1,500 m elevation, 3 pairs/km², in forest of *P. abies*, the association Hieracio rotundati – Piceetum, at 1,350-1,650 m elevation (MUNTEANU, 2012).

13. *Dryocopus martius* (Linnaeus, 1758).

The black woodpecker nests in mature forest, often pine and mixed forest, but also beech (SVENSSON et al., 2009, 2017). In Romania, it breeds in diverse types of woods, preferring the coniferous ones (CIOCHIA, 1992). The population is estimated at 4,000-8,000 pairs (MUNTEANU et al., 2002).

Among the 17 observed individuals, 8 (47.05% of all) were seen in the habitat 91V0 - Dacian Beech forests (Symphyto-Fagion), 7 (41.17% of all) were seen in the habitat 9410 – Acidophilous *Picea* forests of the montane to alpine levels (Vaccinio-Piceetea), 1 was seen in the habitat 9110 - Luzulo-Fagetum beech forests (5.88% of all), and 1 (5.88% of all) was seen in the mosaic of habitats on limestone – M. In the hydrographical basin of the Siret River, it was registered in old pure forests of *Picea abies*, old forests of *Fagus sylvatica* and *P. abies*, old forests of *Abies alba* and *F. sylvatica*, old pure forests of *Pinus sylvestris*, old pure forests of *F. sylvatica*, and in old forests of *Fagus* sp. and other species of trees (RANG, 2002). In our case, 11 individuals (64.70% of all) were associated with the mature forest, 3 (17.64% of all) with the young or relatively young forests interspersed with mature or old trees, 2 (11.76% of all) with the forests composed by trees of diverse ages, and 1 (5.88% of all) with rare and mature trees in a rocky area. As mentioned above, 7 individuals (41.17% of all) were registered in the coniferous forest; 9 individuals (52.94% of all) were observed in the mixed forest and 1 (5.88% of all) in the broadleaf forest. The elevation of points of observation ranged between 872 and 1,598 m (1,670 m – the nest), (Table 1). In other parts of the country, it was observed up to 1,000-1,500 (1,600) m (KOHL, 1983), or between 400 and 1,600 m (MUNTEANU, 2000).

Certainly, it breeds in the area. The population was estimated at 20-30 breeding pairs (0.09-0.14 pairs/km² of forest). The density in Central Europe is 1 pair/300-1,000 ha (HAGEMEIJER & BLAIR, 1997). In Romania: 0.5 pairs/km² in forest of *Picea abies*, the association Piceetum montanum austrocarpaticum, at 1,300-1,500 m elevation, 2 pairs/km² in mixed forest (*F. sylvatica*, *P. abies*, *A. alba*), the association Piceeto-Fagetum carpaticum, at 1,200 m elevation (MUNTEANU, 2012), 2 pairs/km² in old forest of *F. sylvatica*, at 830-1,100 m elevation (BÉREȘ & CHERECHEȘ, 1997).

14. *Lullula arborea* (Linnaeus, 1758).

The woodlark breeds in open forests, preferring pine on sandy soil, but also in mixed or broadleaves forests with clearings and on heathland with scattered copses (SVENSSON et al., 2009, 2017). In Romania, breeds in the hilly areas and plateaus, and also in the large valleys of the Carpathians Rivers. It prefers the open lands, with tall trees (CIOCHIA, 1992), rarely from the mountain regions. The Romanian population is estimated at 20,000-40,000 pairs (MUNTEANU et al., 2002).

Among the 4 registered individuals, 3 individuals (75.00%) were observed in the habitat 6520 - Mountain hay meadows and 1 individual (25.00%) was seen in habitat 6230 - Species-rich *Nardus* grassland, on siliceous substrates. All individuals were seen near the forest, 2 (50.00% of them) close to the coniferous one and 2 (50.00% of them) close to the mixed one. The elevation, where the individuals were noted, varied between 1,103 and 1,406 m (Table 1). In the

Oriental Carpathians, it was met frequently between 550 and 1,500 m (KALABÉR, 1982). Up to 1,400-1,500 m elevation in the mountains of Bistrița (MUNTEANU, 2000).

Probably, it breeds in the researched area. The population was estimated at 10-20 breeding pairs or 0.06-1.23 pairs/km² of meadows (the habitats 6520 and 6230). In Eastern Europe, the density is 400-700 pairs/50 km square (HAGEMEIJER & BLAIR, 1997). In Romania, 10 pairs/km² were calculated in old forest of *Fagus sylvatica*, at 830-1,100 m elevation (BÉREȘ & CHERECHEȘ, 1997).

15. *Lanius collurio* Linnaeus, 1758.

The red-backed shrike breeds in open cultivated country, often on heaths and pastures with hawthorn, sloe and dog-rose, also in juniper stands (SVENSSON et al., 2009, 2017). In Romania, breeds in the lands where there are bodies of forest with glades and bushes and, also, on valleys with arbustive and arborescent vegetation; met up to the subalpine areas (CIOCHIA, 1992). The maximum abundance is in the hilly and plain areas. The population numbers 400,000-800,000 pairs (MUNTEANU et al., 2002).

All the 6 individuals recorded were seen in the habitat 6520 - Mountain hay meadows. In the Siret hydrographical basin, it was observed in exploitations of forests of *Picea abies* and *Fagus sylvatica*, in exploitations of forests of *Abies alba* and *F. sylvatica*, in exploitations of pure forests of *F. sylvatica*, in exploitations of forests dominated by *F. sylvatica*, on mountain meadows and in other few types of woods from the lower areas (RANG, 2002). They preferred the meadows from the vicinity of the forest (5 individuals, 83.33% of all); 1 individual (16.66% of all) was observed in an area with scattered trees and bushes. The minimum elevation where the species was observed is 702 m, while the maximum one is 1,084 m (Table 1). In Ciucaș Mountains, it was observed bellow 1,200 m (CIOCHIA, 1992) and in Călimani Mountains, up to 1,000-1,300 (1,750) m (KOHL, 1983). In the hydrographical basin of Bistrița Moldovenească, it was recorded until 1,200 m (MUNTEANU, 2000).

It is a confirmed breeder in the area, where the population was estimated at 10-20 breeding pairs or 2.1-4.3 pairs/km². The density exceeds 5,000 pairs/50 km square, in Eastern Europe (HAGEMEIJER & BLAIR, 1997). In Romania, 33 pairs/km² were met in some orchards from the mountain area, at 460-500 m elevation (MUNTEANU, 2012).

16. *Ficedula albicollis* (Temminck, 1815).

The collared flycatcher breeds in deciduous woods, in gardens and parks (SVENSSON et al., 2009, 2017). In Romania, it prefers to breed in the rich underwood forests and at the skirts of the large forests with hollow trees (CIOCHIA, 1992), from the mountain and high hilly areas, and recently from the lower ones, where the population is between 50,000 and 100,000 pairs (MUNTEANU et al., 2002). In the mountains from Oriental Carpathians, lives in deciduous forests, sporadically in the mixed one and, also, at the skirt of the coniferous plantations (MUNTEANU, 2000).

There were observed only 5 individuals, because some of the tracks were covered on the banks of streams, making difficult the hearing of the distant birds; also, the weather was rainy in some days of research, determining the birds to stop the singing. 3 individuals (60.00% of all) were observed in the habitat 91V0 - Dacian Beech forests (Symphyto-Fagion) and 2 individuals (40.00% of all) were observed in the habitat 9110 - Luzulo-Fagetum beech forests. In the Siret Valley, it appeared in old forests of *Abies alba* and *Fagus sylvatica*, old pure forests of *F. sylvatica*, young and old forests dominated by *F. sylvatica*, and in other ecosystems from the lower areas (RANG, 2002). In our situation, they were seen exclusively in well grown mixed forests. The elevation where the species was present fluctuated between 931 and 1,219 m (Table 1). In Gurghiu Mountains, it was met bellow 800 m (KALABÉR, 1982) and in the mountains of Bistrița, between 350 and 1,350 m (MUNTEANU, 2000).

It is a probable breeder in the area. The population was roughly estimated at 150-300 breeding pairs (1.16-2.33 pairs/km² of broadleaf and mixed forests), but it can be much higher, considering other studies: 52 pairs/km² in the forest of *Fagus* sp. (MUNTEANU, 2000), 17 pairs/km² in the mountain forest Fagetum-Oxolidosum, at 1,250 m elevation, 32 pairs/km² in the mountain forest Fagetum-Mercurialitosum, at 850 m elevation (KORODI, 1957), 52 pairs/km² in the mountain forest of *F. sylvatica*, at 510-850 m, 20 pairs/km² in the mixed forest, at 480-600 m, 22 pairs/km² in the mixed forest (*F. sylvatica*, *P. abies*, *A. alba*), the association Piceeto-Fagetum carpaticum, at 1,200 m, 72 pairs/km² in the forest of *F. sylvatica*, the association Fagetum carpaticum, at 700-1,000 m (MUNTEANU, 2012), 8 pairs/km² in the old forest of *F. sylvatica*, at 830-1,100 m elevation etc. (BÉREȘ & CHERECHEȘ, 1997). In Polish Białowieza National Park, the breeding densities ranged between 0.3-0.6pairs/ha, whereas 0.01 pairs/ha is representative of coniferous forest (HAGEMEIJER & BLAIR, 1997).

17. *Ficedula parva* (Bechstein, 1792).

The red-breasted flycatcher breeds in forests in a variety of habitats, mostly in lush, dense patches with rich undergrowth and a brook or other water, preferring deciduous woods but not shunning mixed (SVENSSON et al., 2009, 2017). In Romania, it resides the deciduous forest extended in the mountain areas, mainly of *Quercus* sp. Also, in mixed woods, with a few conifers (CIOCHIA, 1992). The population from our country is 20,000-40,000 pairs (MUNTEANU et al., 2002).

From the same motives previously exposed, in the area of research only 6 individuals were registered, all in the habitat 91V0 - Dacian Beech forests (Symphyto-Fagion). In the Siret hydrographical basin, it was identified in old forests of *Abies alba* and *Fagus sylvatica*, old pure forests of *F. sylvatica*, and in other ecosystems that are not occurred in the Leaota Mountains (RANG, 2002). Here, 5 individuals (83.33% of them) appeared in the mixed forests and 1 (16.66%) in the broadleaf ones. The occurrence of the mature or old trees was common in all. The species was observed

between 892 and 1,239 m elevation (Table1). In Călimani Mountains, it was seen up to 890 m (KOHL, 1983) and in the forests of Bistrița Moldovenească River it ascended up to 1,300 m (MUNTEANU, 2000).

It is a probable breeder in the area. The population was roughly estimated at 30-60 breeding pairs (0.24-0.48 pairs/km² of forest from habitat 91V0 or 0.14-0.28 pairs/km² of forest). The true strength can be much bigger, if regard the density registered in other areas: 39 pairs/km² in the forest of *Fagus* sp., at 510-850 m elevation, 20 pairs/km² in the mixed forests, at 480-600 m, 6 pairs/km² in the forest of *F. sylvatica*, the association Fagetum carpaticum, at 700-1,000 m, 30 pairs/km² in the forest of *F. sylvatica*, the associations Symphytocordati – Fagetum, Fageto drymae – Fagetum, at 900-1,200 m elevation (MUNTEANU, 2000, MUNTEANU, 2012), 6 pairs/km² in the old forest of *F. sylvatica*, at 830-1,100 m (BÉREȘ & CHERECHEȘ, 1997). In Polish, the mean density was 1.2 pairs/10 ha, and it is supposed to be higher in primeval mountain beech-fir forest in Central Europe (HAGEMEIJER & BLAIR, 1997).

Table 1. Some data regarding the distribution of the species from the Annex I of the Birds Directive, observed in the area of Leaota Mountains.

Species	No. individuals	Toponym	Date of observation	Latitude (N)	Longitude (E)	Habitats	Mentions	A.s.l.* (m)	Mean a.s.l.* (m)	n
<i>Aquila chrysaetos</i>	3	Dudele-Bucșa Mountains	July 10	45° 23.211'	25° 21.597'	4060, 6150, 9410	an immature bird coming and leaving from/towards the Grohotișul Mountain from Bucegi, being driven away by the adults	1,882	1,882 in flight	3
<i>Pernis apivorus</i>	1	Tâncava Mountain	May 15	45° 17.990'	25° 18.506'	6230	in migration, over the ridge, toward North	1,689	1,660.62 in migration	8
	1	Iuda Valley	May 29	45° 20.634'	25° 13.084'	91V0	in flight	1,034		
	2	Albescu Mountain	May 29	45° 21.094'	25° 13.673'	91V0	over a mixed forest from Valea Caselor	1,259		
	1	Albescu Mountain	June 5	45° 21.826'	25° 12.633'	91V0	over a mixed forest	1,054		
	1	Ghimbav Valley	June 5	45° 22.490'	25° 14.325'	91V0	in flight	1,008	1,129.72 in flight, in the nesting area	11
	2	Rucăr Hill (Vârful Crucii)	June 20	45° 23.411'	25° 11.587'	91V0	in flight	962		
	1	Dealul Sasului	June 26	45° 24.555'	25° 15.377'	91V0	in flight	1,013		
	1	Albescu Mountain	July 23	45° 21.449'	25° 13.195'	6520	in flight, near the stable, carrying a honeycomb in claws	1,248		
	2	Colții Ghimbavului	August 4	45° 23.057'	25° 13.748'	91V0	in flight	1,314	1,353.26 overall	19
	3	Țâbra Valley	August 25	45° 16.975'	25° 16.719'	91V0, 9410	in migration, towards South	1,342		
	1	Dudele Mountain	August 28	45° 23.218'	25° 21.999'	4060	in migration, over the ridge, toward South	1,825		
	3	Leaota Mountain	September 9	45° 19.534'	25° 19.256'	4060	in migration, flying towards South	1,915		
<i>Milvus migrans</i>	1	Valea Bădenilor	May 15	45° 19.923'	25° 16.010'	6230, 9410	in migration, ascending over the forest of <i>Picea abies</i> from the Valea Bădenilor and flying towards North, over Cioara-Râiosu Ridge	1,584	1,584 in migration	1
<i>Circus aeruginosus</i>	1	Râiosu Mountain	June 5	45° 20.404'	25° 17.152'	4060, 6150, 6230	in migration, over the ridge, toward North	1,690	1,803.20 in migration	5
	2	Sântilia Mountain	August 28	45° 22.876'	25° 19.487'	4060, 6150, 6230	in migration, over the ridge, toward South	1,827		
	1	Tătaru Mountain	August 28	45° 22.637'	25° 23.359'	4060, 6150, 6230	in migration, over the ridge, toward South	1,766		
	1	Leaota Mountain	September 9	45° 19.335'	25° 18.634'	4060, 6150, 6230	in migration, over the ridge, toward South	1,906		
<i>Falco peregrinus</i>	1	Valea Ghimbavului	June 5	45° 22.378'	25° 13.008'	91V0	in flight	1,015	1,390.23 in flight	13
	1	Rucăr Hill	June 20	45° 23.639'	25° 11.805'	6520	in flight	988		
	1	Dealul Sasului	June 26	45° 24.428'	25° 15.010'	6520	in flight, chasing 1 individual of <i>Apus melba</i>	1,159		
	1	Dudele Mountain	July 10	45° 22.999'	25° 21.624'	4060	in flight, following 1 individual of <i>Falco tinnunculus</i>	1,875		

	1	Tătaru Mountain	July 17	45° 23.217'	25° 24.123'	6150	in flight, coming from Grohotișu Mountain	1,886	1,232.66 standing	3
	2	Rucăr (Cheia Mare)	July 23	45° 23.193'	25° 11.439'	M	juveniles, on a rocky area with <i>Pinus</i> sp. and <i>Picea abies</i>	802		
	3	Cheile Ghimbavului	July 24	45° 23.352'	25° 11.831'	M	adult with 2 juveniles, in flight over a rocky area with mixed forest	822		
	1	Frumușelu Peak	August 25	45° 16.773'	25° 17.697'	6230	in flight, hunting	1,674		
	1	Țâbra Valley	August 25	45° 16.884'	25° 17.247'	9410	in flight	1,539		
	1	Dudele Mountain	August 28	45° 23.235'	25° 21.469'	4060	in flight, hunting	1,848		
		1	Leaota Mountain	September 9	45° 18.910'	25° 18.852'	4060	in flight	1,937	1,360.68 overall
1		Leaota Mountain	September 9	45° 19.435'	25° 18.883'	4060	1 juveniles, on a rock	2,094		
1		Vâja Mountain	September 9	45° 19.241'	25° 17.850'	9410	1 juveniles, in flight, hunting	1,686		
<i>Tetrao urogallus</i>	1	Frumușelu Mountain	May 21	45° 16.200'	25° 17.965'	9410	information from ranger, observed in a mature forest	1,415	1,555	5
	1	Marginea Domnească Mountain	May 23	45° 15.662'	25° 16.751'	9410	information from ranger, observed at the skirt, with rare and young trees, of a mature forest	1,398		
	1	Jigărea Mountain	July 10	45° 23.444'	25° 20.087'	9410	on the Northern versant, in a mature coniferous forest, near the outskirts	1,645		
	1	Sântilia Mountain	July 13	45° 23.404'	25° 17.909'	9410	observed in a mature forest	1,656		
	1	Sântilia Mountain	August 28	45° 23.756'	25° 18.731'	9410	in a relatively open mature forest, with moss, herbs and blueberries	1,661		
<i>Bonasa bonasia</i>	1	Jigărea Mountain	July 10	45° 23.905'	25° 19.751'	91V0	on the Northern versant, in a mixed forest with underbush	1,335	1,332.37	8
	5	Albescu Mountain	July 12	45° 21.361'	25° 13.659'	91V0	information from Monica Neblea, juveniles near a relatively recent clearance	1,408		
	1	Valea Ghimbavului	July 24	45° 22.149'	25° 13.330'	91V0	in a young mixed forest	1,002		
	1	Lespezi Mountain	August 21	45° 18.226'	25° 23.290'	91V0	in a mature forest of <i>Fagus sylvatica</i> and <i>Picea abies</i> with underwood	1,282		
<i>Crex crex</i>	1	Brebu (Gâlma Brebului)	June 27	45° 12.445'	25° 19.871'	6520	on the wet meadow with scattered trees, in an orchard	877	849	2
	1	Pucheni – Meișoare vicinity	July 2	45° 12.568'	25° 16.627'	6520	on the wet meadow with rows of young and mature trees (<i>Fagus sylvatica</i> , <i>Picea abies</i> , <i>Salix</i> sp., <i>Ulmus</i> sp., <i>Populus</i> sp., <i>Acer</i> sp., <i>Alnus glutinosa</i>)	821		
<i>Strix uralensis</i>	1	Tâncava Mountain	June 21	45° 18.248'	25° 15.824'	91V0	in an old mixed forest of <i>Fagus sylvatica</i> , <i>Picea abies</i> , and <i>Abies alba</i>	1,310	1,068	2
	1	Românescu Mountain	June 27	45° 14.113'	25° 18.879'	91V0	near the Marginea Domnească Monastery, at the confluence between Marginea Domească and Frumușelu streams, in a mixed forest with trees of diverse ages	826		
<i>Picus canis</i>	1	Albescu Mountain	June 5	45° 21.416'	25° 12.437'	91V0	at the outskirts of mixed forest	1,105	1,105	1
<i>Dendrocopos leucotos</i>	1	Valea Fiașului	May 23	45° 14.987'	25° 15.573'	91V0	in a relatively young forest of <i>Fagus sylvatica</i> with rare mature trees	1,044	1,061	2
	1	Albescu Mountain	June 5	45° 21.487'	25° 12.494'	91V0	at the outskirts of mixed forest with trees of diverse ages	1,078		
<i>Picoides tridactylus</i>	1	Marginea Domnească Mountain	May 23	45° 15.452'	25° 16.859'	9410	in a mature forest	1,375	1,533	2
	1	Sântilia Mountain	August 28	45° 23.666'	25° 18.709'	9410	in a sparsely mature forest with dead trees	1,691		
<i>Dryocopus martius</i>	1	Vâja Mountain	May 15	45° 18.930'	25° 16.477'	91V0	in a mixed forest, with <i>Fagus sylvatica</i> , <i>Picea abies</i> , and <i>Abies alba</i> of diverse ages	1,345	1,251.41	17
	1	Raciu Mountain	May 22	45° 17.327'	25° 20.885'	9410	observed in a mature forest	1,376		
	1	Marginea Domnească Mountain	May 23	45° 15.803'	25° 16.141'	9410	in a mature forest	1,319		

	1	Piscul Frunții	May 23	45° 15.395'	25° 15.486'	9110	in a young broadleaf forest with rare old trees	1,207		
	1	Valea Bădenilor	May 24	45° 18.059'	25° 15.022'	91V0	in a relatively young mixed forest of <i>Fagus sylvatica</i> , <i>Picea abies</i> , and <i>Alnus incana</i>	894		
	1	Roșu Mountain	May 29	45° 20.611'	25° 12.898'	91V0	in a mature mixed forest	1,018		
	1	Valea Caselor	May 29	45° 20.923'	25° 14.008'	91V0	in a mature mixed forest of <i>Fagus sylvatica</i> , <i>Picea abies</i> , and <i>Alnus incana</i>	1,122		
	1	Albescu Mountain	June 5	45° 21.447'	25° 12.675'	91V0	in a mixed forest with trees of diverse ages	1,094		
	1	Tâncava Mountain	June 21	45° 17.870'	25° 15.813'	91V0	in a mature mixed forest	1,075		
	1	Mitarca Mountain	June 28	45° 20.178'	25° 19.723'	9410	a nest, in a mature forest	1,670		
	1	Colții Ghimbavului	August 4	45° 22.750'	25° 13.758'	M	in a rocky area, with debris and <i>Picea abies</i> , <i>Pinus</i> sp., and vegetation of dry meadow	905		
	1	Făgețelu Mare Mountain	August 13	45° 19.374'	25° 15.350'	9410	in a relatively young forest	1,497		
	1	Țâbra Valley	August 25	45° 17.008'	25° 16.522'	91V0	in a mature mixed forest	1,341		
	1	Țâbra Mountain	August 25	45° 16.972'	25° 17.314'	9410	near the treeline of a mature forest	1,598		
	1	Românescu Mountain	August 25	45° 16.363'	25° 17.498'	9410	in a mature forest	1,483		
	1	Vâja Mountain	September 9	45° 19.083'	25° 16.840'	9410	information from Monica Neblea, observed in a mature forest	1,458		
	1	Valea Chiiilor	September 25	45° 12.983'	25° 14.514'	91V0	in a mature mixed forest	872		
Lullula arborea	1	Marginea Domnească Mountain	May 23	45° 16.011'	25° 16.253'	6230	bellow the stable, near the forest of <i>Picea abies</i>	1,406	1,210.75	4
	1	Albescu Mountain	June 5	45° 21.678'	25° 12.468'	6520	near a mixed forest	1,103		
	1	Dealul Sasului	June 26	45° 24.662'	25° 14.940'	6520	at the outskirts of relatively young coniferous forest of <i>Picea abies</i> and <i>Pinus</i> sp.	1,206		
	1	Albescu Mountain	July 23	45° 21.620'	25° 12.683'	6520	at the outskirts of young mixed forest of <i>Picea abies</i> and <i>Fagus sylvatica</i>	1,128		
Lanius collurio	1	Albescu Mountain	June 5	45° 21.758'	25° 12.531'	6520	at the outskirts of mature mixed forest	1,084	918.16	6
	1	Rucăr Hill	June 20	45° 23.394'	25° 10.934'	6520	at the outskirts of mature forest of <i>Fagus sylvatica</i>	793		
	1	Dealul Sasului	June 26	45° 24.810'	25° 14.904'	6520	at the outskirts of relatively young forest of <i>Picea abies</i> and <i>Pinus</i> sp.	1,170		
	1	Pucheni – Meișoare vicinity	July 2	45° 12.761'	25° 16.580'	6520	on the meadow with rows of young and mature trees (<i>Fagus sylvatica</i> , <i>Picea abies</i> , <i>Salix</i> sp., <i>Ulmus</i> sp., <i>Populus</i> sp., <i>Acer</i> sp., <i>Alnus glutinosa</i>)	875		
	1	Rucăr Hill	July 23	45° 23.220'	25° 10.797'	6520	in a rocky area at the skirt of a forest with mature trees of <i>Pinus</i> sp. <i>Picea abies</i> , <i>Fagus sylvatica</i> and bushes	702		
	1	Valea Chiiilor	September 25	45° 13.091'	25° 14.677'	6520	nest, in a bush of <i>Crataegus</i> sp., at the skirt of the mixed forest	885		
Ficedula albicollis	1	Vâja Mountain	May 15	45° 18.823'	25° 16.263'	91V0	in a mixed forest, with <i>Fagus sylvatica</i> , <i>Picea abies</i> , and <i>Abies alba</i> of diverse ages	1,219	1,065.6	5
	1	Valea Fiașului	May 23	45° 14.806'	25° 15.952'	91V0	in a mature forest of <i>Fagus sylvatica</i> , with rare trees of <i>Alnus</i> sp., <i>Picea abies</i> , and <i>Abies alba</i>	931		
	1	Muchia Marginea Domnească	May 23	45° 14.896'	25° 16.094'	9110	in a mature forest of <i>Fagus sylvatica</i> , with rare trees of <i>Picea abies</i> , <i>Abies alba</i> , <i>Acer</i> sp., <i>Betula</i> sp., <i>Populus</i> sp.	968		
	1	Muchia Marginea Domnească	May 23	45° 14.981'	25° 16.155'	9110	in a mature forest of <i>Fagus sylvatica</i> , with rare trees of <i>Picea abies</i> , <i>Abies alba</i> , <i>Acer</i> sp., <i>Betula</i> sp., <i>Populus</i> sp.	1,020		
	1	Muchia Marginea Domnească	May 23	45° 15.163'	25° 16.543'	91V0	in a mature mixed forest with <i>Fagus sylvatica</i> , <i>Picea abies</i> , <i>Abies alba</i> , <i>Betula</i> sp.	1,190		
Ficedula parva	1	Vaca Valley	May 22	45° 15.797'	25° 20.528'	91V0	in a mature mixed forest with <i>Fagus sylvatica</i> , <i>Picea abies</i> and <i>Alnus incana</i>	977	1,038.33	6
	1	Rucăr Hill	June 20	45° 23.532'	25° 11.969'	91V0	in a forest of <i>Fagus sylvatica</i>	948		
	1	Tâncava Valley	June 21	45° 18.169'	25° 15.623'	91V0	in an old mixed forest of <i>Fagus sylvatica</i> , <i>Picea abies</i> , and <i>Abies alba</i>	1,197		

1	Raciu Mountain	June 29	45° 16.681'	25° 24.012'	91V0	in an old mixed forest of <i>Fagus sylvatica</i> , <i>Picea abies</i> , <i>Ulmus</i> sp., <i>Abies alba</i> , <i>Acer</i> sp.	977
1	Pucheni – Meișoare	July 2	45° 12.297'	25° 16.062'	91V0	in a relatively young forest, with rare mature trees of <i>Fagus sylvatica</i> and <i>Picea abies</i>	892
1	Lespezi Mountain	August 21	45° 18.226'	25° 23.201'	91V0	in a mature forest of <i>Fagus sylvatica</i> and <i>Picea abies</i> with underwood	1,239

Legend: * - sea level altitude of the species place of observation by Google Earth; n- number of individuals.

Except for the birds that were observed on the wings, which belong to 5 species (*Aquila chrysaetos*, *Pernis apivorus*, *Milvus migrans*, *Circus aeruginosus*, and *Falco peregrinus*), *Bonasa bonasia*, *Strix uralensis*, *Picus canus*, *Dendrocopos leucotos*, *Dryocopus martius*, *Ficedula albicollis* and *F. parva* were observed in the habitat 91V0 - Dacian Beech forests (Symphyto-Fagion), *Crex crex*, *Lullula arborea* and *Lanius collurio*, in the habitat 6520 - Mountain hay meadows, *Tetrao urogallus*, *Picoides tridactylus* and *Dryocopus martius*, in the habitat 9410 - Acidophilous *Picea* forests of the montane to alpine levels (Vaccinio-Piceetea), *Falco peregrinus* and *Dryocopus martius*, in the mosaic of habitats on limestone (M), *Dryocopus martius* and *Ficedula albicollis*, in the habitat 9110 - Luzulo-Fagetum beech forests, *Falco peregrinus*, in the habitat 4060 - Alpine and Boreal heaths, and *Lullula arborea*, in the habitat 6230 - Species-rich *Nardus* grassland, on siliceous substrates. As a result, among these 13 species, 9 (69.23%) were observed in forests and the rest in other habitats (Table 3).

As for the age of the woods where they were identified, *Tetrao urogallus*, *Bonasa bonasia*, *Picoides tridactylus*, *Dryocopus martius*, *Ficedula albicollis*, and *F. parva* were present in the mature forests, *Picus canus*, *Dendrocopos leucotos*, *Dryocopus martius*, *Strix uralensis*, and *Ficedula albicollis* in the forests of diverse ages, *Strix uralensis*, *Dryocopus martius*, and *Ficedula parva*, in the old forests, *Dryocopus martius* and *Ficedula parva* in the relatively young forests, and *Bonasa bonasia* in the young forests (Table 2).

As for the altitude from the sea level of the places of observations of the sitting birds we have: 500-999 m – *Falco peregrinus*, *Crex crex*, *Strix uralensis*, *Dryocopus martius*, *Lanius collurio*, *Ficedula albicollis*, and *F. parva*, 1,000-1,499 m – *Tetrao urogallus*, *Bonasa bonasia*, *Strix uralensis*, *Picus canus*, *Dendrocopos leucotos*, *Picoides tridactylus*, *Dryocopus martius*, *Lullula arborea*, *Lanius collurio*, *Ficedula albicollis* and *F. parva*, 1,500-1,999 m – *Tetrao urogallus*, *Picoides tridactylus*, and *Dryocopus martius*, and over 2,000 m – *Falco peregrinus* (Table 2).

The distribution of the species on the hydrographical basins of the main rivers and rivulets from the Leaota Mountains was non-uniform. For every basin, it takes in account the quality of the habitats, meaning the availability in food resources, shelters and/or breeding places, the time reserved for field research, which was not proportionally with their size, and the area of caching. At this moment of researches, we can say that Valea Bădenilor (with 8 species), from South-West, Brătei (with 7 species), from East, Valea lui Coman, from South, and Rudărița, from North (each with 6 species) were the best represented from this point of view.

Table 2. The repartition of the species from the Annex I of the Birds Directive, by the type of habitat and forest and the altitude from the sea level where they were seen.

Type of habitat	Number of species	%	Type of forest	Number of species	%	Elevation range(m)	Number of species	%
91V0	7	53.85	mature forests	6	66.67	1,000-1,499	11	84.62
6520	3	23.08	forests of diverse ages	5	55.56	500-999	7	53.85
9410	3	23.08	old forests	3	33.33	1,500-1,999	3	23.08
M	2	15.38	relatively young forests	2	22.22	2,000-2,499	1	7.69
9110	2	15.38	young forests	1	11.11			
4060	1	7.69						
6230	1	7.69						

CONCLUSIONS

In the area of study, during May 15 – September 30, 2016, 17 species included in the Annex I of the Birds Directive were identified. They are species first mentioned in the Leaota Mountains.

The data confirm the distribution of the species shown in the cited scientific literature on the types of habitat, age of forest and sea level altitude. Some little exceptions related to the highest elevation where they were observed appeared: *Tetrao urogallus* was observed up to 1,661 m, *Picoides trydactylus* up to 1,691 m, and *Dryocopus martius* up to 1,670 m.

The majority of the species were observed in the habitat 91V0 – Dacian Beech forests (Symphyto-Fagion), in the mature forests and between 1,000 and 1,499 m elevation, while the less ones were recorded in the habitats 4060 – Alpine and Boreal heaths and 6230 – Species-rich *Nardus* grassland, on siliceous substrates, and, also, in the young forests and at over 2,000 m sea level altitude. It is obvious that the forests with the highest anthropogenic impact were the less attractive for the protected species, from where, it results the urgent necessity of preservation of the natural forestry habitats.

Because of monitoring circumstances, the densities were under evaluated for some species; we consider that, in the adequate habitat, the estimated densities for *Aquila chrysaetos* – 0-1 pairs/254 km² and *Falco peregrinus* – 0.3-0.7

pairs/100 km² (both species with large territories), *Crex crex* – 0.4-0.8 calling males/km², *Dryocopus martius* – 0.09-0.14 pairs/km², *Lullula arborea* – 0.06-1.23 pairs/km² and *Lanius collurio* – 2.1-4.3 pairs/km² are closer to the real ones.

By the status of breeding, 10 species (58.82% of all, *Aquila chrysaetos*, *Tetrao urogallus*, *Crex crex*, *Strix uralensis*, *Picus canus*, *Dendrocopos leucotos*, *Picoides tridactylus*, *Lullula arborea*, *Ficedula albicollis* and *F. parva*) were probably breeding in the area, 5 species (29.41% of all, *Pernis apivorus*, *Falco peregrinus*, *Bonasa bonasia*, *Dryocopus martius* and *Lanius collurio*) were certainly breeding in the area, and 2 species (11.76% of all, *Milvus migrans* and *Circus aeruginosus*) were non-breeding.

A weak migration was noted over the ridges for some species (*Pernis apivorus*, *Milvus migrans* and *Circus aeruginosus*), the birds coming along the rivulets or on North-South crests, detached from the secondary ways of migration from the region that pass through the Rucăr-Bran Corridor and Prahova Valley.

Some areas (Valea Bădenilor, Brătei, Valea lui Coman, and Rudărița) can be considered hot spots regarding the richness of the species from the Annex I of the Birds Directive.

The work is a preliminary study of the birds from Leaota Mountains. It must continue to establish a more accurate situation of every protected species. Also, through future researches it is expected to grow the list of protected species.

We hope that the results shown here, mainly the ones that refer to the importance of some places and habitats for the species from the Annex I of the Birds Directive, will be used by all forestry bodies that administrate the studied area in their forest arrangements. They will have to exploit the woody resources so as to favour these protected birds. Large areas with integral protection shall be imposed.

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Mestecăneanu Adrian

The Argeș County Museum, Armand Călinescu, 44, 110047, Pitești, Argeș, Romania.
E-mail: mestecaneanua@yahoo.com

Pop Oliviu

Conservation Carpathia Foundation, Șoseaua Cristianului, 12A, 3, 500053, Brașov, România.
E-mail: oliviu.grigore.pop@gmail.com

Mestecăneanu Florin

Dărmănești, 117360, 283, Argeș, Romania.
E-mail: mestecaneanua@yahoo.com

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