THE EFFECT OF 1984/1985 SEVERE WINTER-TIME ON SOME FAUNISTIC ELEMENTS IN ROMANIA

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Animal populations are affected by various types of extreme weather. In Romania the winter of 1984/1985 was one of the harshes. The absolute minimum reached - 38° C on 14.01.1985 at Miercurea Ciuc station. The paper presents the impact of the freezing weather and abundant snow on 16 vertebrate species (10 mammal species, 6 bird species). This research highlights a death toll of nearly 12 000 individuals in all Romanian provinces.

Keywords: severe winter 1984/1985, animal deaths, mammals, birds, Romania.

INTRODUCTION

Some severe climatic phenomena do affect the dynamics of various animal populations (Poll, 1976; Blondel, 1995; Asenov, 2001; Dajoz, 2006). Regarding the situation for the Romanian wildlife, to be considered is a paper written by Racoviţă & Filipaşcu (1971) which refers especially to the very cold winter of 1830 and its dramatic consequences for the animal world (for mammals in the first place).

The author discusses this aspect on the basis of some original information, depicting the losses suffered by the wild fauna in the winter of 1984/1985. Among the Romanian 20th century winters, that of 1984/1985 was one of the harshes, with very low temperatures, snowstorms and fairly high snow-layers. Thus, that winter featured all climate severe phenomena (Bacinschi *et al*., 1986). Harsh winters are causing high death rates due to lack of food and hypothermia which leads to lung, heart, neurovascular and locomotor diseases (Ardelean & Barnea, 1972; Enache, 2016).

MATERIAL AND METHODS

For the illustration of weather conditions, thermic values of some representative meteorological stations were used, obtained from various bibliographical sources. The wild animals causalties produced 35 years ago were calculated on the basis of the identification and research of various informations, official statistical reports,

and assessments of the species of cynegetic interest. The figures selected were found in the central and local archives of forestry and hunting units, being further processed and presented in chronological order, for each species and county. Field research resulted in the identification of valuable informations obtained through interview investigation with specialized personnel. The material refers to 16 species, 10 of them mammalian : roe deer – *Capreolus capreolus* (Linnaeus, 1758), hare – *Lepus europaeus* (Pallas, 1778), fallow deer – *Dama dama* (Linnaeus, 1758), wild boar – *Sus scrofa* (Linnaeus, 1758), mouflon – *Ovis ammon* (Linnaeus, 1758), otter – *Lutra lutra* (Linnaeus, 1758), red deer – *Cervus elaphus* (Linnaeus, 1758), moose – *Alces alces* (Linnaeus, 1758), wolf – *Canis lupus* (Linnaeus, 1758) and rabbit – *Oryctolagus cuniculus* (Linnaeus, 1758) and 6 bird species: great bustard – *Otis tarda* (Linnaeus, 1758), partridge – *Perdix perdix* (Linnaeus, 1758), pheasant – *Phasianus colchicus* (Linnaeus, 1758), mallard – *Anas platyrhynchos* (Linnaeus, 1758), whooper swan – *Cygnus cygnus* (Linnaeus, 1758) and wood pigeon – *Columba palumbus* (Linnaeus, 1758). Some of these mammals are now listed in the Red Book of Vertebrates of Romania (Murariu, 2005).

RESULTS

CHARACTERISTICS OF THE WINTER CLIMATE

The 1984/1985 winter was "*among the coldest 20th – century ones ever registered in Romania*" (Bogdan & Niculescu, 1999, p. 35). The very low temperatures were the result of cold waves brought by the advection of polar or arctic air masses (Bogdan & Marinică, 2007). From the last decade of December 1984 to mid-March 1985, records speak of a particularly cold weather, with a January peak below -8/-11^{o}C and even under -12^{o}C, with -9^{o}C and -5^{o}C deviation from the mean. The absolute minimum fell below -30^{o}C at 10% of the weather-stations in Romania, with variations between, -20^{o}C and -30^{o}C at 43% them (Bogdan, 1999). The cold air advection began on January 12, 1985, and the high-altitude air circulation was of the "*reverse polar*"-type (Marinică, 2006). On January 13, 1985 the ridge of the Scandinavian Anticyclone moved southwards over Romania, facilitating a Mediterranean Cyclone developing over Sardinia and Corsica. January 13 and 14, 1985 witnessed the expansion of the mass of cold air on the soil all over the country, associated with a thermal response to the nocturnal radiation enhanced by a consistent snow layer (30–40 cm) over much of the Romanian territory (Dima, 2011). January and February 1985 experienced 1–3 waves of polar/arctic air, which lasted between 3 and 25 days.

Minimum temperatures (at Weather-Stations) were in the range of -15^{o}C to nearly -40^{o}C.

So, in *January 1985* the lowest value, -38,4°C, was registered on 14.01 in Miercurea Ciuc. Noteworthy, the Miercurea Ciuc value is by only 0.1°C higher than the absolute minimum temperature registred at Bod in Braşov County (-38.5°C on January 25, 1942), actually the negative therma. In the same region of Eastern Carpathians were recorded: -35,5°C on 13.01 in Întorsura Buzăului and -34,9°C in the same day, 13.01, at Sf. Gheorghe (Bogdan & Niculescu, 1999).

The absolute minimum temperature, registered on January, 13, 1985, at some weather stations in Oltenia Region, have not been exceeded there to this day: -30.0°C at Apa Neagră (Gorj County), -29.9°C at Bălceşti (Vâlcea County), -29.6°C at Târgu Jiu, -29.2°C at Vânju Mare and -26.0°C in Calafat (Marinică, 2006). In Western Carpathians, in Huedin, on 13.01.1985 air temperature was -26,3°C (Gaceu, 2012) and in Southern Moldavia, in Tg. Bujor -25,5°C.

For the day of 14.01., Huştiu (2017) presented some other values: -32,2°C in Dej, -30,5°C in Negreşti-Vaslui, -30,4°C in Blaj, -30,2°C in Rădăuţi, -29,0°C in Adjud, -26,1°C in Lugoj, -25,5°C in Iaşi, -24,2°C in Brăila. In the same day, 14.01, in Răuseni (Botoşani County) were -30,0°C (Mihăilă, 2006). On 16.01 in Dobrogea in Hârşova -20,5°C were recorded (Torică, 2008).

In *February, 1985* temperatures reached: -35,5°C at weather station on Omu Peak in Bucegi Mountains on 20.02, -30,5°C in Tg. Mureş on 20.02, -26,4°C on 14.02 in Urziceni, -23,9°C also in 14.02 in Bucureşti-Băneasa, -23,5°C in Timişoara on 19.02 (Sandu, 2008). In Western Carpathians, in Gurahonţ (Arad County), also on 20.02, air temperature was -24,8°C (Gaceu, 2012).

On *March 1, 1985* values of -20.0°C in Urziceni and -15,0°C in Hârşova were recorded (Torică, 2008).

In the same time increased wind speeds were observed (for instance during the snow storm from 11–13.02.1985), causing more winter deaths in wildlife. It follows that the regions most affected by massive cooling were situated in the east, south-east and south of Romania, directly exposed to the influence of the Continental air. Noteworthy, in the latter half of the 20th century, in which the greatest number of frosty days, ever experienced in this country, occurred in the years 1963 and 1985, it was the Crivăţ, a cold and dry winter wind, blowing from north-east to south-west, that brought with it severe frost, snow-storm, and glazed frost. The south-east of Romania is the region most exposed to this wind, because it is here that the cold Arctic or East-European dorsals are strongly interacting with the warm Mediterranean air.

In some regions, the winter of 1984–1985 lasted from November through to April, the snow-layer staying on in some areas up to 170 days. At Apa Neagră Weather-Station, a 1–1.8 m-high snow-cover was in place until February 25, 1985, an 85 cm-layer (on average) being registered in Argeş County, over 80–100 cm in Suceava County, and 70–80 cm in the Romanian Plain, where it lasted for some three months.

THE WINTER IMPACT ON CERTAIN FAUNA SPECIES

That excessively cold winter (very low temperatures, cold and high winds, thick snowheaps made by the wind) led to a significant mortality rate among many mammalian or bird species (less physically fit individuals to cope with a heavy winter). Dead specimens used to be found in the woods, fields, irrigation canals, at feeding sites, etc.

An unusual event was the few warmer days that came after the first big snow-fall and snow storm registered at the beginning of 1985. The snow melt away easily, and the hard frosts that followed generated a strong crust overlain by a new snow layer (this lead to the suffocation of many hares and partridges), a situation that resulted in joint and nerves disorders and prevented many animal species high-mortality rates. In addition, intense poaching with dogs and cudgels was a common practice, wolves also being on the ground.

We will expose next some examples from counties chosen from all Romanian provinces, to highlight the extension of these damages.

Moldavia

For the north-east of Romania we found reports concerning animal deaths for 8 species (6 mammal species and 2 bird species).

In **Bacău County**, at Iteşti-Gârleni, the fallow deer population decreased with 60%.

Botoşani County. A heavy snow-winter and very low temperatures, lasting for a long period of time, led to the freezing and pulmonary congestion-induced death of 73 roe deer. Most corpses were of old specimens, as well as of late-born and weak young. During this winter a few moose specimens, crossing the frozen river Prut, appeared near Oroftiana. In the same time, in search of food, the first red deer arrived in the woods near Dorohoi, coming from Pătrăuţi-Zamostea (Suceava County).

Galaţi County. The number of dead specimens in the first three months of 1985 was of 128 roe deer (mostly old specimens and part of the young), 49 hares, 28 partridges and 3 wild boars. The diary of Hanu Conachi Forest Range reported: "*the very harsh weather in the months January and February 1985 with a thick snow layer and temperatures often below -30^{o}C caused a great number of deaths to hare, roe deer and pheasant and the populations decreased considerably*". In Hanu Conachi Forest Range, 15% of the fallow deer population had died.

Iaşi County. Mortality during the first three months: one red deer (in Todirel-Bârnova region), one wild boar (in Şcheia area), 80 roe deer [1], 55 hares [2], 64 pheasants [3], 59 partridges [4] and 186 rabbits (in Corneşti area).

Other species were also diminished, in some Hunting Grounds, *e.g.* red deer by 18% at Poieni, rabbits by 56% at Bârnova, by 50% at Victoria, by 34% at Tomeşti. Rabbits appeared to be extremely affected by the snow that blocked their holes, and after a very short warming span (8–9 January, 1985), frost set in forming a thick crust, scores of these animals being chocked in their burrows.

In the woods near Hadâmbu it was observed a moose, which came across the frozen river Prut from the former Soviet Union in search of food.

Suceava County. The Hunting Association Transactions No. 88/April 6, 1985 read: "*The winter of 1984/1985 was one of the harshest, with frosts and over one m-high snowpacks, which prevented the game from moving about, so 10 males, 30 females and 17 calves (red deer) were frozen to death, as were 43 roe deer, 8 wild boars and 13 hares*". 50% (250 specimens) of the Pătrăuţi Forest fallow deer were found dead, gathered together from the cold (Fig. 1). That year, a few moose, seen near Cârlibaba area, had arrived from the Ukraine (Geacu, 2011).

Fig. 1. Concentration of *Dama dama* (some 30 specimens) in Pătrăuţi area.
View on February 15, 1985 (Photo; eng. Gh. Botoşan, Suceava Forestry Direction).

[1] 13 at Mogoşeşti, 11 at Horleşti, 11 at Gorban, 8 at Cornești, 6 at Poieni, 6 at Bârnova, 3 at Gheorghiţoaia, 3 at Şcheia, 2 at Moţca and by 1 at: Miroslăveşti, Hălăuceşti, Stolniceni, Stroieşti, Hodora, Cepleniţa, Coarnele Caprei, Chişcăreni, Şipote, Valea Lupului, Tomeşti, Răducăneni, Brăieşti, Bălţaţi, Erbiceni, Popeşti and Ţibana.

[2] At Şipote (4), and between 1 and 3 specimens at: Coarnele Caprei, Şcheia, Chişcăreni, Bivolari, Sineşti, Popeşti, Balş-Boureni, Gropniţa, Golăeşti, Tomeşti, Prisecani, Răducăneni, Pocreaca, Brăieşti, Bălţaţi, Erbiceni, Boroseşti, Moţca, Miroslăveşti, Stolniceni, Hodora, Frumuşica, Trifeşti, Probota, Victoria, Valea Lupului, Leţcani, Ţibana and Dagâţa.

[3] At Valea Lupului (8), Golăeşti (7), and between 1 and 4 specimens at: Gropniţa, Bivolari, Chişcăreni, Victoria, Leţcani, Răducăneni, Bălţaţi şi Boroseşti, Miroslăveşti, Hodora, Balş, Coarnele Caprei, Şipote, Trifeşti, Probota, Prisecani, Pocreaca, Erbiceni, Tomeşti, Popeşti and Ţibana.

[4] Between one and 3 specimens at: Balş, Chişcăreni, Şipote, Golăeşti, Gropniţa, Bivolari, Prisecani, Răducăneni, Miroslăveşti, Stroeşti, Hodora, Cepleniţa, Frumuşica, Coarnele Caprei, Trifeşti, Probota, Victoria, Valea Lupului, Românești-Leţcani, Tomeşti, Popeşti, Şcheia, Dagâţa, Stolniceni, Bălţaţi, Erbiceni, Sineşti and Ţibana.

Vaslui County. 86 dead roe deer in Hunting Grounds: 30 on Fălciu, 20 on Buneşti, 7 on Merieni, 3 each on Bădeana and Bârlad, one-two each on: Negreşti, Cărpineni, Telejna, Zăpodeni, Sârbeşti, Pojorâni, Pogoneşti, Popeni, Bogdăniţa, Hurdugi, Gugeşti, Râşeşti, Voloseni and Costeşti areas. In Perieni area the decrease in roe deer population was 1/2 and in Băcani 1/3.

Pheasant effectives dropped by Hunting Grounds: 87% on Dumeşti, 77% on Gârceni, 66% on Bârlad, 64% on Costeşti, 60% on Bădeana, 57% on Soleşti, 50% on Oniceni and 34% on Mireni. Also, by 31% fewer hares were left in the Găgeşti region.

That winter led to the extinction of the fallow deer in Huşi area.

Muntenia

In this area the highest number of species afflicted by deaths (6 mammal species and 6 bird species) was recorded.

Argeş County. Abundant snowfall began on December 20, 1984, very low temperatures (-28^{o}C at Stolnici Weather-Station), that lasted for over 30 days, obliged many mammals to sleep in frosty weather on the snow crust, so they died. The study of some roebuck corpses made vet specialists conclude that death came from cold-induced lung oedema.

In the first months of 1985, the death-toll was 911 roe deer, 468 hares, 38 fallow deer, 280 pheasants and 3 wild boars. In Mozacu region alone, they registered 231 hares, 45 roe deer and 33 fallow deer; 38 roe deer were found near Ştefan cel Mare Commune. That harsh winter, the roebuck populations of Deaguri region was diminished by 71% males and 67% females, with 69% females and 61% males in Mozăceni area. In Mozacu area the mouflon population had a 35% decrease and in Furduieşti fallow deer population dropped with 14%.

Brăila County. Dead specimens: 500 wood pigeon, 386 roe deer, 110 mallard, 41 hares, 21 pheasants, 15 whooper swans and 3 wild boars. Roe deer had died from lung congestion, wild doves from the rain fallen (on the night of 8 to 9 January, 1985) which, freezing on their body, prevented them from flying, falling to the ground with broken legs.

În the first trimester of 1985, **Buzău County** numbered 80 roe deer, 24 hares, 16 wild boars and one mouflon dead. Only in the Harţagu valley woods, in north-western part of the county 35 red deer were found dead.

That same trimester, the death-toll in **Călăraşi County** was of 260 roe deer in numerous areas [5], many having fallen on the snow driven by a strong wind, others fell in irrigation canals and drowned there. The roe deer and pheasants populations of Vlăiculeşti area were halved. Only in the timeframe 26 February –

[5] 50 at Călăraşi, 26 at Negoieşti, 21 at Tămădău, 20 at Boianu, 19 at Podu Pitarului, 18 at Brăieşti, 15 at Plătăreşti, 15 at Săpunari, 12 at Nicolae Bălcescu, 12 at Plevna, 10 at Nana, 8 at Roseţi, 8 at Vasilaţi, 6 at Bogdana, 5 at Putineiu, 5 at Radu Negru, 5 at Borcea and 5 at Independenţa.

7 March 1985, the number of dead roe deer detected reached 83 at Boianu-Călăraşi, and was over 100 in Răsvani-Săruleşti-Dor Mărunt area. Close to Podu Pitarului Forest, they found 3 hares and 5 pheasants dead; two hares and 4 pheasants dead in Vasilaţi Commune. At the same time 164 roe deer and mouflons died in the area of Vărăşti Forest. In search of food in this harsh winter red deer showed up in Ciornuleasa Forest, coming from Bulgaria, across the frozen Danube.

Dâmboviţa County. The death-toll within the same interval was of 48 partridges, 30 roe deer, 30 pheasants, 13 hares, 3 wild boars and 3 whooper swans. The fallow deer effectives fell by 17% in the Comişani Hunting Grounds and by 18% in Bolovani Forest. In the southern extremity of the county alone (Croitori-Glogoveanu area), predators consumed, in various proportions, 15 roe deer, 2 wild boar, 20 hares and 350 pheasant (40 adult birds and 310 juveniles).

Giurgiu County. The great bustard population became extinct (Geacu, 2016). In Albele-Ogarca area in the central part of the County: 60 roe deer dead, 33 corpses being found between March 12–16, 1985. In the same time the red deer population in Malu Spart-Căscioarele Forest was nearly cut in half.

Ialomiţa County. Death-toll: 57 roe deer [6] and 2 wild boars (one in Căbăl area and one in Făcăeni region). Also other species had suffered during that harsh winter: population losses at Dridu – pheasants (48%); Jilavele – pheasants (95%); Bărcăneşti – pheasants (59%), Moviliţa – pheasants (86%), Alexeni – pheasants (49%), Armăşeşti – a six-time decrease in hares. Other 255 roe deer were found dead on a field between Axintele and Sineşti.

Ilfov County death-toll within the first three months: 12 roe deer in Cernica Forest; 8 roe deer, 6 mouflons, 4 hares and 2 pheasants in Malu Roşu Forest. That year saw the death of 216 fallow deer (the species being extinct in Râioasa Forest).

Prahova County. 159 roe deer, 83 partridges, 8 hares, 3 red deer, 2 pheasants and one wild boar dead. This winter provoked also the extinction of the small mouflon nucleus from Drăgăneşti-Gherghiţa.

Teleorman County. Frost had killed 325 roe deer (in Pielea, Cervenia, Zâmbreasca, Crângeni and Lăceni areas), also great bustard effectives fell by 36 per cent. The great bustard population registered a 60% decrease in the area situated east of Mârzăneşti village and 36% on the field situated south-west from Videle. That winter, near Gălăteni train station, bustards with frozen wings were caught with hooks by the poachers.

Dobrogea

In the south-eastern part, deaths afflicted 6 mammal species.

Constanţa County within the first three months of 1985: 11 dead roe deer; one red deer in Dumbrăveni area. The mouflon population of Adamclisi (south-

[6] Hunting Grounds: Slobozia – 11, Săveni – 9 , Gimbăşani – 8, Gheorghe Lazăr – 6, Bora – 4, Feteşti – 4, Andrăşeşti – 4, Bărcăneşti – 4, Amara – 3, Cegani – 2, Căbăl – 1 and Făcăeni – 1.

west of this County) fell by 35% (ca. 110 dead); in "Ion Corvin" Hunting Grounds losses included 29% roe deer. The small mouflon population from Negureni dropped with dozens of individuals, and in the whole county roe deer population registered a 8% decrease.

Tulcea County death-toll : 41% out of the wild boar population on Fântâna Mare Hunting Grounds and 60% in Ciucurova Forest Range ; roe deer population fell by 10% in that county. That winter caused the extinction of the fallow deer populations in two areas (Niculiţel and Letea) and their reduction in number in the woods situated north of Casimcea, and for the red deer living in Atmagea woods the cut in half of the population. In the same time, otter population diminished with 1/3.

Oltenia

In south-western parts deaths were registered in the populations of 8 species (4 mammals and 4 birds).

These are the deaths observed on the **Dolj County** territorry in I trimester of 1985: 566 roe deer [7], 191 partridges [8], 85 hares [9], 42 pheasants (Teslui – 20, Bârca – 15, Breasta – 4, Orodel – 2, Catane – 1) and 5 wild boars (Breasta – 4, Pietroasa – 1).

High death-rates among the fallow deer (especially calves in Bratovoeşti Forest), but also of frost-affected fairly vigorous specimens, reduced their effectives by 20% in Perişor Commune, 25% in Punghina Forest and by 27% in Fântânele Forest.

Gorj County, 168 dead roe deer on the territories of 28 settlements [10], most of them in Scoarţa (13), Bărbăteşti (12), Licurici (10), Târgu Logreşti (8) and Slăvuţa (8) regions, a 32% decrease in the fallow deer population of Tismana area.

Mehedinţi County: 50 roe deer, 45 pheasants, 9 partridges and 4 wild boars were dead. In Cerveniţa area fallow deer population was cut in half. Also many cervidae were found dead in Vânju Mare Forest Range.

Olt County dead specimens: 405 roe deer, 30 hares, 13 mallard, 10 pheasants, 3 whooper swans and 2 wild boars. A report of the Slatina-based Hunting Association (April 5, 1985) shows that the massive snowfalls between December

[7] Pietroaia – 68, Căciulat – 45, Melineşti – 40, Veleşti – 40, Cernăteşti – 32, Orodel – 29, Gebleşti – 28, Pleniţa – 24, Valea Stanciului – 23, Radomir – 22, Verbiţa – 21, Breasta – 20, Cioroiaşi – 16, Mihăiţa – 15, Teslui – 14, Băileşti – 13, Covei – 13, Bârca – 13, Galicea – 12, Bucovăţ – 12, Rudari - 10, Bechet – 10, Coşoveni – 10, Gabru – 9, Segarcea – 8, Măceşu – 4, Catane – 3, Goicea – 3, Gura Văii – 3, Moţăţei – 2 and Cerăt – 2.

[8] Melineşti – 40, Pietroaia – 35, Radomir – 21, Teslui – 20, Veleşti – 20, Rudari – 16, Orodel – 10, Breasta – 10, Zănoaga – 10, Pleniţa – 6 and Moţăţei – 3.

[9] Căciulat – 23, Orodel – 15, Covei – 6, Gabru – 5, Gebleşti – 5, Pietroaia – 4, Bârca – 4, Verbiţa – 3, Băileşti – 3 and Catane – 2.

[10] Scoarţa, Bărbăteşti, Licurici, Tg. Logreşti, Slăvuţa, Boboşti, Tehomir, Trestioara, Mihuţa, Săcelu, Bumbeşti, Brodiceni, Leleşti, Curtişoara, Ceauru, Dăneşti, Turceni, Valea Curea, Valea cu Apă, Peşteana, Romanţu, Ioneşti, Turburea, Bibeşti, Albeni, Dăculeşti, Stoina and Stejari.

22, 1984 and March 14, 1985 led to the death of roe deer from pulmonary congestion, kidney obstruction, destroyed breathing pathways and chilblains. In early 1985, two empty wells in Reşca Forest were filled with roe deer corpses. The Caracal Forest Range reported a 20% decrease in fallow deer females and young (Geacu, 2012). In Seaca area, in the northern part of the county, many roe deer but also fallow deer were found dead (stuck in the snow). In the same time many cervidae were found dead in Drăgăneşti Olt Forest Range. Also the number of great bustards was halved (Geacu, 2016).

High mortality rates among the roe deer and the fallow deer occured in Drăgăşani area (Vâlcea County). Forest workers would report the presence of roe deer at the fires they used to make to warm themselves (Geacu, 2012).

Transylvania and Banat

For these two provinces wildlife death tolls were reported for 7 species (5 mammal species and 2 bird species).

In **Alba County** the fallow deer population from Pianu registered a 10% decrease.

In **Arad County**, wolves, inable to find prey in mountain areas, migrate in the plain zone attacking fallow deer in Chişineu-Criş area.

In **Caraş-Severin County**, in Oraviţa area, the fallow deer population decreased with 38%.

Cluj County death-toll: 73 pheasants, 59 hares, 48 roe deer, 2 partridges and one wild boar.

Harghita County: the corpses of 24 roe deer, 18 hares, 6 pheasants, 2 wild boars, 2 partridges and one red deer were found. In some situations, red deer were stuck in frozen snow, without the possibility to get to food (Fig. 2).

Fig. 2. *Cervus elaphus* specimen stuck in the frozen snow in Şicasău Forest, Zetea Forest Range, Harghita County. View on February 20, 1985 (Photo: Eng. I. Micu, Miercurea Ciuc Forestry Direction).

In **Hunedoara County**, the fallow deer population from Silvaş-Haţeg decreased with 36%.

Mureş County registered the death of 169 roe deer, 167 pheasants, 38 hares, 6 red deer and 5 wild boars.

Satu Mare County death-toll: 300 partridges and 186 pheasants.

In **Timiş County** 47 fallow deer died at Şarlota, and at Margina-Coşava the whole population perished. Other 9 dead red deer were found at Nadăş, Alioş, Pişchia, Brestovăţ and 6 dead roe deer at Brestovăţ.

CONCLUSIONS

The winter of 1984/1985 in Romania was marked by massive cooling spells, excessively low temperatures, heavy snowfalls, a thick snow layer and snow storms, which listed it among the severest 20th-century ones.

It is an obvious example of the adverse effect of weather conditions on wildlife (especially ungulate), which resulted in populational decrease mainly in plain and plateau areas in southern and eastern counties, through weather-induced mortality, more killings, or as an easy pray fallen to other beasts. The populations that survived had a modest body, physiologically weakened by lack of food (Bogdan, 2004; Negruţiu & Popescu, 2006). Frosts used to act as a factor of animal population numerical control, the first "*victims*" being the ill, the weakened, or poorly developed specimens, the old, or the young. Freezing, or snowstorm intervals, prevent the animals from moving about in search for food.

Severe frosts caused neuralgia, respiratory affections, stopped oxygen supply to the peripheral circulation, paralyses, neuritis (inflamation of some nerves), chilblains and finally death. The Crivăţ, a cold and dry Continental wind, affected not only the body's thermal balance, but it also produced fast dehydration, drying up the mucous membranes and the skin (Condurăţeanu & Cusursuz, 1984). Having the animals long exposed to wind and cold led to muscular rigidity, disturbed the heart-rate down to heart failure and death (Teodoreanu, 2002; Dojană, 2008).

According to the findings of forestry, hunting and vet health control bodies, other causes of death were oedema and lung congestions, as well as kydney failure.

Thus, thounsands of specimens from different animal species were found dead throughout the country. In the counties of Călăraşi and Ialomiţa, many roe deer corpses, lying on the snow-covered fields, had been eaten fully or partially by stray dogs, crows, magpies, or had been collected by poachers. In some cases it was the wolves which devoured the corpses of various species (*e.g.* fallow deer in the Chişineu-Criş area – Arad County, or Huşi area – Vaslui County).

In search of food in that harsh winter, in some areas new species occurred, for instance red deer in the south of the Călăraşi county (coming from Bulgaria, crossing the frozen Danube) or in Dorohoi area and moose in Suceava, Botoşani

and Iaşi counties, comming from the former Soviet Union. For the same reason, in many areas the wolves penetrate in plain regions and attacked herbivorous species (for instance fallow deer at Chişineu-Criş).

At the same time the harsh weather caused the extinction of some species in certain areas – fallow deer in Huşi, Râioasa, Niculiţel, Letea, Margina – or even in some counties (mouflon in Prahova and great bustard in Giurgiu).

On the whole, based on the data collected by us, the magnitude of casualties, only for the 14 species analyzed in this paper, was of nearly 12.000 specimens in a ratio of 3/4 mammals and 1/4 birds (Table 1). The information was available only for 8 mammal species and 6 bird species, all of them valuable for hunting activities. Different other species were afflicted by populational decrease, but lacking economical value these were not recorded.

Table 1

Deaths registered in Romania for some animal species

Mammals	**Number of individuals**	**Birds**	**Number of individuals**
Capreolus capreolus	6015	*Phasianus colchicus*	1367
Dama dama	1147	*Perdix perdix*	763
Lepus europaeus	945	*Columba palumbus*	500
Oryctolagus cuniculus	246	*Anas platyrhynchos*	123
Cervus elaphus	229	*Otis tarda*	35
Ovis ammon	117	*Cygnus cygnus*	21
Sus scrofa	106	-	-
Lutra lutra	40	-	-
Total	**8845**	**-**	**2809**

Over half of the deaths afflicted the *Capreolus capreolus* L. populations. On regional scale, the greatest loss was in Muntenia province (56%, maximum in Argeş County), followed by Oltenia (18%, maximum in Dolj County), Moldavia (12%, maximum in Iaşi County), Transilvania-Banat (11%, maximum in Satu Mare County) and lesser in Dobrogea (3%, maximum in Tulcea County).

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