Report on Livestock Breeding

in Bulgaria in the target SPAs of 'Vultures back to LIFE' project

LIFE14NAT/BG/649

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Fund for Wild Flora and Fauna

Technical Report under Action A4

BRIGHT FUTURE FOR THE BLACK VULTURE

Vultures back to LIFE LIFE14NT/BG/649

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Introduction

The reduction of the food resources for vultures is one of the main reasons for their decline. Significant decrease of wild ungulates number as a result of habitat degradation and direct anthropogenic pressure and abandonment of traditional farming and livestock breeding practices posed severe problems for the carnivores and scavengers on the highest level of the trophic pyramid in the ecosystems.

This study is part of Action A4 "Analysis on the status of live-stock breeding in the target areas" of the project "Bright future for the black vulture" LIFE14 NAT/BG/649, which is funded by the LIFE financial instrument of EU. The partners: Green Balkans-Stara Zagora, FWFF, VCF, EURNATUR and Junta de Extremadura are aiming to restore the breeding population of the locally extinct in Bulgaria Eurasian Black Vulture. Some of the main actions in the Project are focused on improving the food base through restoration of the extensive livestock breeding practices and wild ungulates in the target zones – Sinite kamani- Grebenets SPA (here after Sinite kamani), Kotlenska Planina (here after Kotel mountain), Vrachanski Balkan SPA (here after VB) and Kresna SPA, where releases of Eurasian Black Vultures is foreseen. The study deals with the overall number and type of livestock and wild ungulates – potential food source for vultures. Historical and present condition and distribution are presented, analysed and commented. The information gathered and analysed here will be the base for development of site by site Action plan for improving the condition of food source for vultures and grassland habitats in a nature conservation perspective bringing also benefits to local people and community.

Action A4 provides for gathering up-to-date information from the local veterinary services on the number and type of grazing animals using pastures in the target areas. This information will be supplemented with queries disseminated among the local farmers, as it is considered that at least 30 % of domestic animals in Bulgaria (mostly small farm animals, such as goats and sheep) are not marked and thus listed in the veterinary studbooks.

Within the proposed action, a minimum of 10 farmers, one municipal authority and the relevant veterinary service will be contacted per target area. In addition to that, the team will contact the regional divisions of the State Agency for Food Safety in Haskovo, Stara Zagora and Varna.

A parallel query on the quantity of available pastures, including deserted arable land, turned into grasslands and their current status in terms of maintenance, will be carried out in the regional forest and agriculture services. The collected information will be overlapped with land cover dataset and orthophotos in GIS environment in order to produce a realistic picture on the contemporary pastures and their extent of degradation. The output layer will present the real open habitats, which state potential foraging area for Black Vulture.

The information collected within the two studies will be processed to assess the extent of contemporary use of grasslands and pastures and the potential for increasing the numbers of grazing animals. The parameters for maintaining pastures in favourable conservation status, inbuilt in the Common Agricultural Policies of EU will serve as a baseline for these analysis.

The query disseminated among the farmers will also collect information on the problems livestock breeding faces (such as realization of production, access to EU-funding, etc.), particular needs, as well as ideas for supporting its development.

This action also provides for analysis on the international legislation and identification of successful local regulations, which have stimulated the development of livestock breeding, especially in countries, similar to Bulgaria (post-communist countries).

The whole set of information will then be processed and compared against the experience and solutions, applied for similar problems in other CEE countries.

The outcomes of the study will be published within a manual, containing a set of recommendations for developing livestock breeding and encouraging "vulture-friendly" pasture management. The manual will present particular examples and solutions for the identified problems and challenges. These recommendations will be offered for transposition into the municipal regulatory documents, concerning leasing and use of pastures and other arable land.

The manual will be presented at an informational meeting with representatives of national and regional authorities in charge of animal husbandry in Bulgaria and will then be disseminated among the local services on agriculture, forestry and veterinary medicine.

The action will be completed with an experience exchange. A group of 7 Bulgarian farmers from the target areas, together with the project coordinator and project staff will visit Podlasie in Northeastern Poland, where EURONATUR has supported local farmers. The Bulgarian livestock breeders will get introduced to the local farming unions, learn more on successful utilization of EU-funding, the advantages of cooperative dairy farms, possibilities for joint search of market, as well as the local regulations in operation.

Reasons why this is necessary

Extensively grazing livestock maintained on open pastures represents main food source for Black as well as all other vulture species. This in mind, livestock breeding has decreased ten times for the past 25 years of transition from communism to democracy. This has led to degradation of the grassland ecosystems and overall decrease of the food base for vultures. A great deal of Bulgarian animal husbandry is actually concentrated in the "vulture areas", targeted by the current proposal, what has allowed for the preservation of the vulture populations until present.

A positive trend in livestock breeding has been reported since the launching of the Operational Programmes for agriculture and rural development, funded by EU.

We consider that the current proposal could assist this trend, through a set of measures, developed to result in substantial and long-lasting increase of the food base for vultures in the target areas. The provided analysis and exchange of experience with countries which have encountered and solved similar challenges, are a prerequisite for the application of adequate practical measures for increasing livestock breeding, as provided in Actions C8, C9 and E4.

The most valuable experience in this regards can be presented by a post-communist country, which has underwent similar transition and has yet managed to develop successful solutions. The selection of Poland is also explained with the fact that EURONATUR has many years of experience, gained in result of active participation, support and promotion of animal husbandry practices.

Constraints and Assumptions

There are some risks related to obtaining the requested information from the local administrations. The lack of cooperation from relevant authorities (municipal services on agriculture and forestry, veterinarian services) can only delay the obtaining of that data, as there are legal ways for requesting the information (Public Access to Information Act).

There might be difficulties organizing the visit to Poland, considering the fact that the timing should be convenient for several people from all over the country and agreed with their animal husbandry schedule. This challenge can be overcome with timely planning, involving all parties.

Expected results

- Prepared analysis on the status of the pasture ecosystems in the target areas;
- Produced GIS dataset, illustrating the suitable foraging areas for Black Vulture and the ones, which could be turned into suitable ones (mostly overgrown areas, which do not presently represent suitable habitat)
- Elaborated manual with practical recommendations for measures to promote, support and develop livestock breeding;
- Organized meeting with local/regional/national authorities to present the findings and disseminate the manual;
- Exchange of experience and increase of the capacity of 7 leading livestock breeders from the target areas, through a study visit to **Podlasie in Northeastern Poland**.

Indicators of success

The progress and success of the action will be assessed through the following quantifiable indicators:

- Quantity and quality of collected data;
- Possibilities for practical application of the manual developed;
- Number of stakeholders reached when disseminating the manual;
- Number of livestock breeders involved in the study visit abroad, number of visited sites;

Methods used in the study

The data for livestock numbers and type is obtained mainly from the official Statistics Annuals of National Statistics Institute in Bulgaria (NSI). Some most recent data is received by the Veterinary Information System (VetIS). Absolute numbers are given directly by regions, while calculations (all livestock heads/km²) are made to establish density of livestock numbers per region's surface where official sources are again used.

In some cases all heads of grazing livestock is calculated as sheep equivalent. Here sheep and goat numbers are taken directly and the number of large livestock (bovine and equine) is multiplied by 6.6 as it is considered for livestock units (LU).

Pastures are considered the areas that are not arable land and free of forest. The Ministry of Agriculture and Forestry is issuing a permanent grasslands layer, which is considered here.

Finally for the target areas, the study area is within a circle of 30 km radius form a central point, which includes the vultures foraging territory. In some cases additional data from GPS/GPRS transmitters that are used to track the vultures movements are used to precisely establish their range.

Table 1. Absolute number (in .000) of livestock by type in Bulgaria for the particular year in the period 1892 -2017

Type of livestock	1892	1900	1905	1920	1939	1948	1957	1982	1987	1999	2007	2013	2017
Bovine	1426	1596	1696	1877	1495	1783	1528	1807	1678	671	602	575	540
Buffaloes	342	431	477	418	327	303	243	44	26	10	9	10	12
Equine	434	611	674	579	822	771	718	481	487	370	270	250	250
Ovine	6868	7015	8131	8923	9027	9265	7596	10726	9563	2774	1526	1369	1316
Caprine	1364	1405	1384	1332	550	719	714	490	441	1048	495	289	256
Porcine	462	368	465	1090	742	1077	1467	3844	4050	1721	889	586	593
Total	**10796**	**11426**	**12827**	**14219**	**12963**	**13918**	**12266**	**17392**	**16245**	**6594**	**3791**	**3079**	**2967**
Poultry	3427	4752	6408	7294	DD	11380	14117	40562	39735	15686	21796	13214	13007

Table 2. Density of livestock by type in Bulgaria in number of individuals per 1000 ha (10 km²) by particular year in the period 1892-2013.

Density of livestock by type in Bulgaria in number of individuals per 1000 ha (10 km²) by particular year in the period 1892-2013.													
Livestock type/year	1892	1900	1905	1920	1939	1948	1957	1982	1987	1999	2007	2013	**Spain 2011***
Bovine	148	166	176	182	140	160	140	162	151	61	54	52	117
Buffaloes	36	45	50	41	30	30	20	0,4	0,2	0,1	0,1	0,1	DD
Equine	45	63	70	56	80	70	60	43	44	33	24	23	DD
Ovine	712	728	844	865	880	830	680	966	862	250	137	123	
Caprine	131	145	144	129	50	60	60	44	40	94	45	26	394
Porcine	47	38	49	106	70	100	130	346	365	155	80	53	508
Total	**1120**	**1185**	**1331**	**1378**	**1260**	**1250**	**1110**	**1567**	**1464**	**594**	**342**	**277**	**1020**
Poultry	356	493	665	707	DD	1025	1272	3654	3579	1413	1964	1191	2752

** In the last column is given data for Spain, where in such density of livestock (in general for the country), the number of vultures is as follows: griffon vulture >25 000 pairs; cinereous vulture >1700 pairs; Egyptian vulture >1500 pairs; bearded vulture >90 pairs.*

The number of livestock kept high levels during the Ottoman Empire period in Balkans and maintained the maximum level until the end of the Communist period in 1989 (see chart and table). Nowadays, the number of farmed animals is about 4.5 times smaller and is reduced to 277 animals on an area of 10 km² average for the country. Extensive pastoral livestock farming has been drastically reduced and somewhat compensated only by an increase in intensively kept pigs. In an intensive rearing, the number of animals is of no particular importance to vultures, as far as accessibility is not managed purposefully for their benefit.

Historical situation of livestock breeding in Bulgaria and project target SPAs

Table 3. Absolute number of livestock by type in Bulgaria in 1905.

District	Surface Km²	Horses	Mules	Donkeys	Cattle	Buffaloes	Sheep	Goats	Pigs	**Total**	poultry	Geese	Turkeys	Ducks	**Total**
*Burgas	11856	47713	1632	21844	143237	62365	1089374	192479	49895	**1608539**	460492	29669	28836	9041	**528038**
Varna	9031	78775	432	4154	179318	39656	815476	82777	31235	**1231823**	423828	43718	14889	14535	**469965**
Vidin	4405	30032	140	1349	67363	13536	345150	57068	34471	**549109**	305320	34722	2555	17674	**360271**
*Vratsa	6915	44649	239	3809	101930	62328	676619	110446	53256	**1053276**	511203	36726	5568	16108	**569605**
*Kyustendil	4727	30037	259	1899	86159	5322	392189	105553	49933	**671301**	241921	6213	1689	2830	**252653**
Plovdiv	10124	30939	6541	19174	156175	22199	645269	154610	30976	**1065883**	456052	18643	18233	10309	**503237**
Pleven	7661	46516	310	5302	136328	50878	739044	83052	35730	**1097155**	577011	32327	16327	18399	**644558**
Ruse	7591	63324	354	6574	168839	50523	558230	85523	21039	**954406**	547917	36130	11737	8734	**604518**

Sofia	9674	60355	270	4008	171211	33353	910615	212926	73359	**1466097**	478959	20117	4469	9111	**512656**
Stara Zagora	10613	30468	1013	42826	191336	46139	899807	142353	30464	**1384406**	645402	20432	25667	8820	**700321**
Tarnovo	7745	43021	408	7292	155366	50884	659634	68767	35880	**1021252**	700483	52515	44384	19102	**816484**
Shumen	5999	32442	349	5849	137998	39696	399640	88562	19095	**723631**	376492	23968	10892	7594	**418946**
Total	**96341**	**538271**	**11947**	**124080**	**1695533**	**476872**	**8130997**	**1384116**	**465000**	**12827149**	**5725080**	**355175**	**185740**	**142257**	**6408252**

* the district in which the current target sites belonged to or the nearest et the time. Note some places were outside the current State territory (e.g. Kresna Gorge and Eastern Rhodopes)

4.1. Ovine

Historically sheep are considered to be the most important domestic animals in Bulgaria, because they were bred for multiple reasons – meet, milk, leather and wool. All these products become recently less needed, especially the wool and leather, that were replaced by cotton first and later by the synthetic surrogates. The meat and milk are nowadays considered, a kind of exotic, once because of their specific flavour, but also due to high price compared to industrial meats – pork, poultry, but also beef. The sheep were historically also the most favourable food for vultures due to several reasons: 1. because of their largest number of head (in some periods around 12 million); 2. because were bred in extensive way, including transhumance and thus were always in the open ground – thus accessible for the scavenging birds, when die; 3. because their medium size and soft skin made it easy and preferred prey for carnivores, but also for all species of scavengers;

Historical overview of sheep numbers in Bulgaria.

year	1892	1900	1905	1920	1939	1948	1957	1982	1987	1999	2007	2013	2017
Sheep number of heads in .000	6,868	7,015	8,131	8,923	9,027	9,265	7,596	10,726	9,563	2,774	1,526	1,369	1,316

Note the three important periods – in mid 1950s when the Communist regime made the nationalization of the entire economic sector (e.g. agriculture) the number of sheep dropped down, but later was re-established, in a new economic situation – state property and planned economy and the number increased as well quality of farming – top standards at the time were massively introduced.

In early 1990s after the fall of the Communist regime, the national economic crisis and the transition from planned economy to marked oriented economy related with the privatization of (among others) the agricultural sector, let to catastrophic decline in sheep number. Lost traditions, changed generation's priorities and the deep demographic and economic crises, added to the low level but large scale crime in the rural areas let to cascade drop down of about 10 times the number of sheep in Bulgaria.

The decline in sheep number continues until recently, although after the joining of EU in 2007, the Bulgarian agriculture started to receive subsidies. The sheep, however, are still declining, because of less demand of sheep meet and milk and due to the low competitiveness of the sector based on local circumstances and characteristics. Large import from external producers, bad organisation of the local farms and some socio-economic and environmental factors make the livestock breeding and sheep rearing in particular more like an amateur initiative then a pure business. Nowadays, mainly people who earn their money otherwise are making short-term to mid-term attempts to establish sheep farms. Best problem in most cases is the fragmentation of the land, and lack of well consolidated and organised farms. In most cases the barn (very much needed in winters in Bulgaria) is at one place, while the pastures for which the same sheep owner may ask subsidies for grazing them are away or totally absent. The last problem is well articulated by the mass interest in hiring pastures in the National Parks, where the land is of a single owner – the State and it could be obtained from a single desk. Contrary, the land in lowlands and lower to mid mountains is much fragmented and owned by different owners – private, State, Municipal etc. In lowlands the land is mainly used as arable land, while in the mountains for hay mowing. Both require shorter periods of occupation, mechanized maintenance and lower risk. The sheep rearing requires hardly recovered costs for fodder and personnel. The last although in some places available, is usually non-reliable.

In 2014-2020 Rural development programme (RDP) sheep rearing is subsidized, and some extra national payments are also available as per capita and through the pastures calculated as 1 LU/ 6.6 ha or 1 sheep/ha. The payments are varying in different years, but in general the figures are as follows:

1. Sheep (ewe) National payment is 20 EUR per capita

2. Sheep (ewe) under selection EU payment – 50 EUR per capita

3. Sheep (ewes + rams) rare breed EU payment – 140 EUR per LU = 21 EUR per capita

4. Almost each year a *de minimis* payment is applied for sheep accounting for some 2-3 EUR per capita.

The schemes 1+4 and 2+3+4 can be combined.

4.2. Caprine

Abundant, but less important then sheep in the early XX century, in 1930s the goats were prohibited as domestic animals due to "damage they were causing to the forests". In this period the aforestation of the country was started and continued throughout the Communist period, where the process of aforestation was advanced based on the fully State ownership of land and enterprise, providing a base for a common planning and strategic implementation of different economic aspects. That is why the number of goats was for very long period kept around half million. This is the only type of livestock that increased in number after the end of the Communist regime, when almost doubled, but again was restored and even further declined after the EU accession of Bulgaria in 2007.

year	1892	1900	1905	1920	1939	1948	1957	1982	1987	1999	2007	2013	2017
Caprine number of heads in .000	1,364	1,405	1,384	1,332	550	719	714	490	441	1,048	495	289	256

1. Goat - National payment is 20 EUR per capita

2. Goat under selection EU payment – 50 EUR per capita

3. Goat rare breed EU payment – 140 EUR per LU = 21 EUR per capita

4. Almost each year a *de minimis* payment is applied for goats accounting for some 2-3 EUR per capita.

The schemes 1+4 and 2+3+4 can be combined.

4.3. Bovine

Cattle and buffaloes were very important before the 1950s, not that much for food production, but mainly for live power for transportation. During the Communist regime dairy cows formed the biggest portion of the sector, while nowadays we face increase of the cattle breeding for meat, which in Bulgarian circumstances is mainly managed as free ranging in low- to high-mountain pastures.

year	1892	1900	1905	1920	1939	1948	1957	1982	1987	1999	2007	2013	2017
Bovine	1,426	1,596	1,696	1,877	1,495	1,783	1,528	1,807	1,678	671	602	575	540

number of heads in .000													
Buffaloes number of heads in .000	342	431	477	418	327	303	243	44	26	10	9	10	12

1. Cow - National payment is 72 EUR per capita

2. Cow under selection EU payment – 125 EUR per capita (165 EUR for buffaloes)

3. Cow rare breed EU payment – 200 EUR per LU = 200 EUR per capita (also for buffaloes)

4. Almost each year a *de minimis* payment is applied for cows accounting for some 3-6 EUR per capita.

The schemes 1+4 and 2+3+4 can be combined.

4.4. Equine

Horses, donkeys and mules were very important historically as live power for transportation. Throughout the Communist regime the number of donkeys was still great as means of transport in villages. Nowadays, the donkeys are getting progressively rare, while horses are still in use in mountains for timber extraction. Some free ranging horses are reared for mountain pastures grazing and for keeping the rare breeds.

year	1892	1900	1905	1920	1939	1948	1957	1982	1987	1999	2007	2013	2017
Equine number of heads in .000	434	611	674	579	822	771	718	481	487	370	270	250	250

1. Horse rare breed EU payment – 200 EUR per LU = 200 EUR per capita.

4.5. Porcine

Intensification of pork production made during the Communist period raised the number to more than 4 million pigs, and the number dropped down sharply in the 1990s. The decline continued further even after the EU accession, this time because new regulations and standards were to be applied, which closed some industrial farms. However, in most recent years an increase in industrial pork production is again observed.

year	1892	1900	1905	1920	1939	1948	1957	1982	1987	1999	2007	2013	2017
Porcine number of heads in .000	462	368	465	1,090	742	1,077	1,467	3,844	4,050	1,721	889	586	593

4.6. Poultry

Intensification of poultry made during the Communist period raised the number to more than 40 million chickens, and the number dropped down in the 1990s. After the EU accession once again the number declined as some new regulations and standards were to be applied, which closed some industrial farms.

year	1892	1900	1905	1920	1939	1948	1957	1982	1987	1999	2007	2013	2017
Poultry number of heads in .000	3,427	4,752	6,408	7,294	DD	11,380	14,117	40,562	39,735	15,686	21,796	13,214	13,007

Subsidies for agriculture

Despite the shown above for the livestock per capita, the following other schemes are available and useful for livestock breeders:

i. Single area payment scheme – among others also available for pastures and meadows – about 95-110 EUR per hectare;

ii. Green payment - among others also available for pastures and meadows – about 90-100 EUR per hectare;

iii. Natural handicap payments to farmers in mountain areas – 70-130 EUR per hectare;

iv. Natura 2000 payments and payments linked to Directive 2000/60/EC – 5-12 EUR per hectare;

Project target sites - general description and livestock breeding situation:

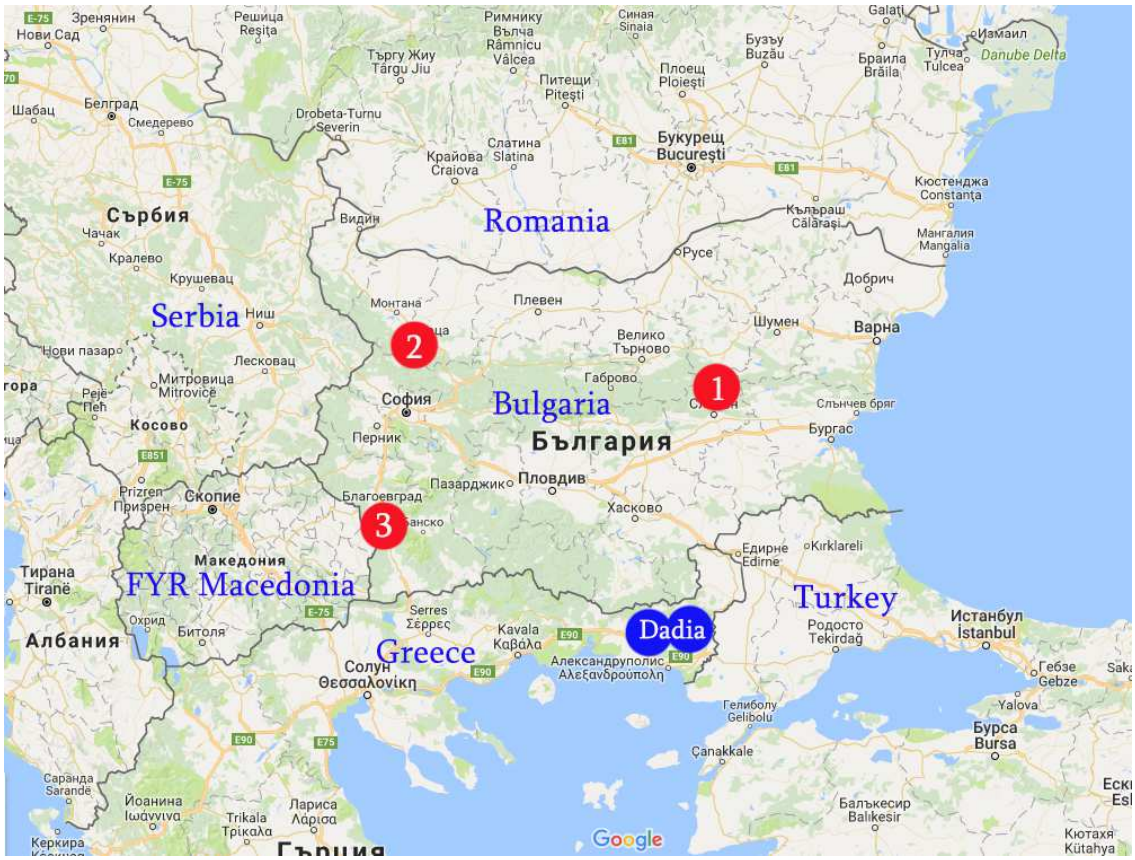

Fig.1. Map of Bulgaria with the three target sites where the Eurasian Black Vulture will be reintroduced and target zones for this Study (red circles) – 1. Sinite kamani & Kotel Mountain; 2. Vrachanski Balkan; Kresna SPA.

1. Sinite kamani & Kotel Mountain

Item	*Data*
General description	Found in mid eastern Bulgaria, part of the Stara Planina (Balkan Mountain) chin. Low-mountainous area (400-1000 m) with foothills with transitional Mediterranean and Continental climate. Loose populated. Large forest patches are mosaically mixed with open pastures and to the north and south with arable land.
Habitat	Heterogeneous. Forest patches of planted Austrian pine are found among larger missives of oak forests. In some places cliffs and steep slopes tree vegetation provide suitable nesting sites.
Food	383 469 equivalent of sheep heads. Livestock density of 48.57 heads per km². Sheep, goats and cattle, as well as free ranging horses are grazing the mountainous pastures. In the southern part near Sliven, large pig farms and slaughterhouses provide large quantities of (potential) food for vultures. The Wolf is present in the mountains, but rarely conflicts with livestock breeders as it feeds mainly on wild boar and red and roe deer, which are abundant in the forests. Two large vulture feeding sites (20 km apart) are supplied with about 15-20 tons per year each, by the two NGOs- Green Balkans and FWFF.
Socio-economic factors	One large city – Sliven (90 000 inhabitants) is found in the southern part of the area. The largest protected area- Sinite Kamani Nature Park is found just above the city. Out of the city agriculture – in the mountain mainly livestock breeding and forestry are the main occupations of the local inhabitants.
Other wildlife and related species	Since 2010 the Griffon Vulture was successfully reintroduced. In 2016 >50 birds are permanently present, 8-10 pairs bred and 5 chicks were produced and the colony increases. 6-8 pairs of Golden Eagle breed in the area. The Egyptian Vulture tends to recover and 3-5 birds are present each summer. Just recently also the White-tailed Sea Eagle is in attempt to re-colonize the area. Eastern Imperial Eagle and the Lesser Spotted Eagle are breeding and frequently present too. The first black vulture in the area for decades was observed in 2013 at the feeding site and since then every year 1-2 individuals are registered.
Strategic importance	The site is found far from Dadia (200 km) to the north. This is the closest step to extend the Eastern Rhodopean black vulture population to Balkan Mountain. If the reintroduction becomes successful, the distance between the black vulture populations in Rhodopes and Crimea will be with 1/3 shorter.
Score	The site is top rated for start of the reintroduction of the black Vulture in Bulgaria. An excellent combination of suitable habitats, food resources, protected areas, active conservation groups, socio-economic importance and strategic position for future successful reintroduction of the black vulture.

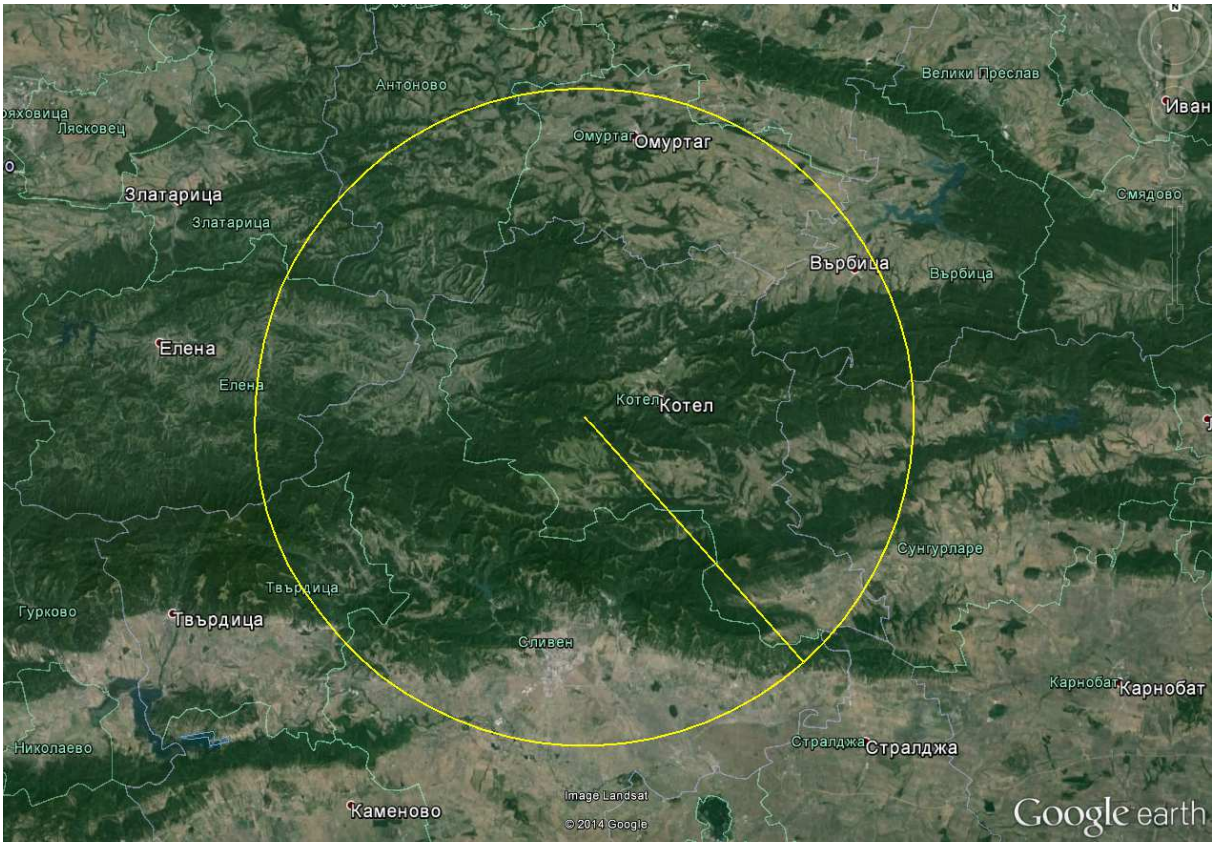

Fig. 2. A 30 km radius with centre (N42.87°; E 26.37°) close to the town of Kotel. In the southern part of the area is the city of Sliven.

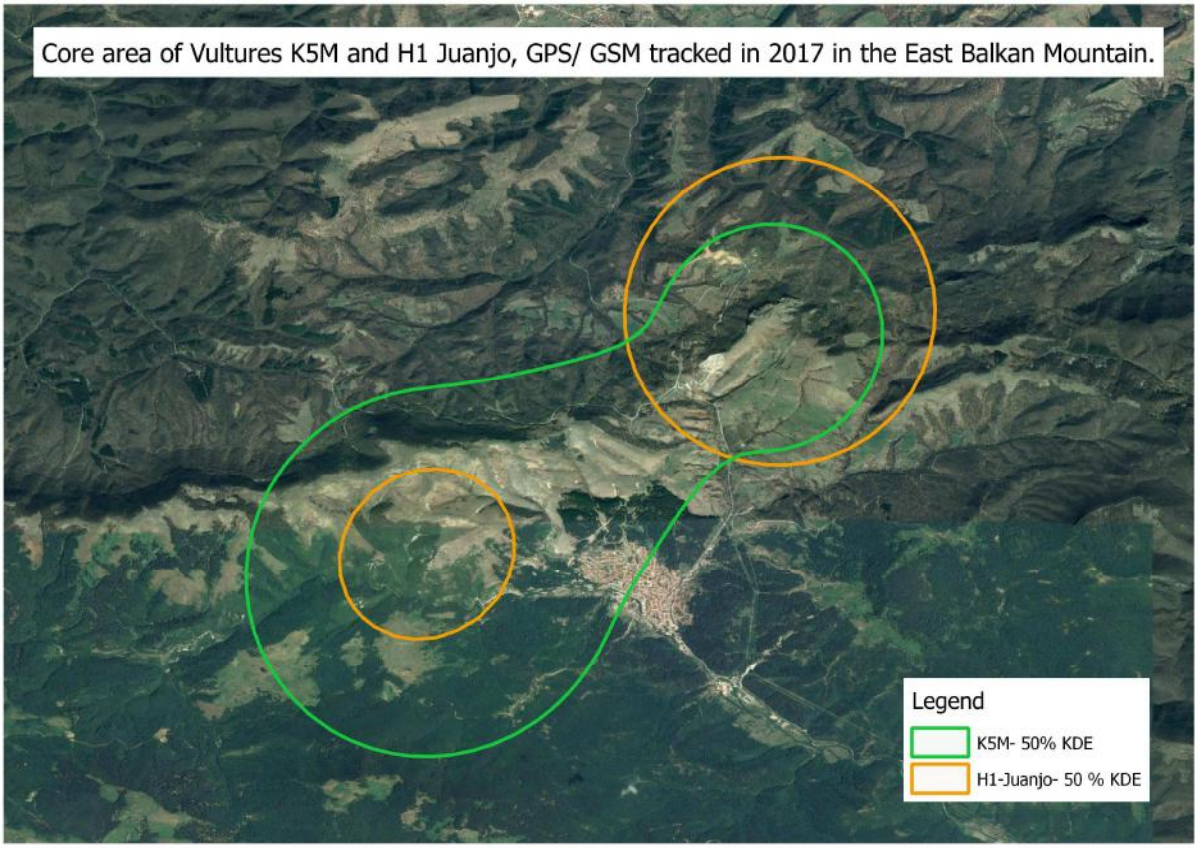

Fig. 3. The 50% home-range of the tracked vultures around Kotel.

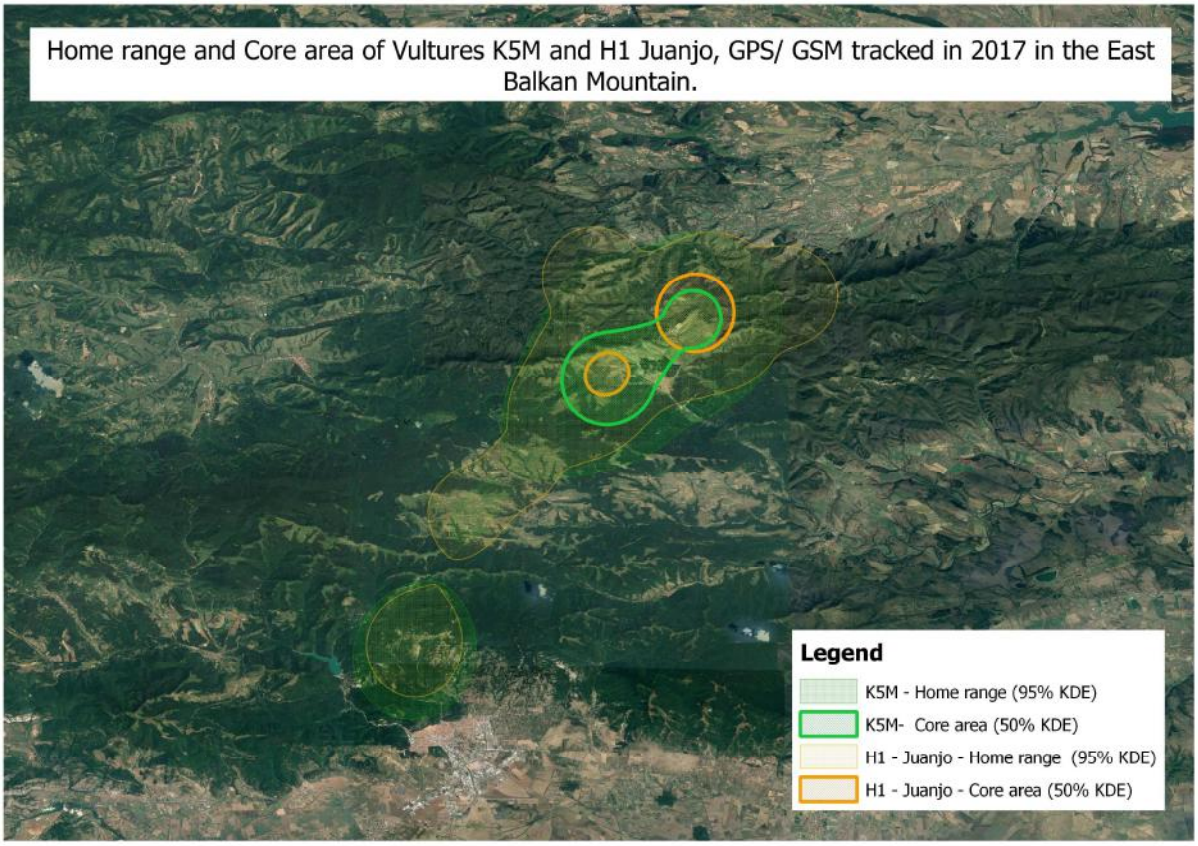

Fig. 4. The 5o% + 95% home-range of the tracked vultures around Kotel and Sliven.

Fig. 5 and 6. Landscapes from Kotel Mountain.

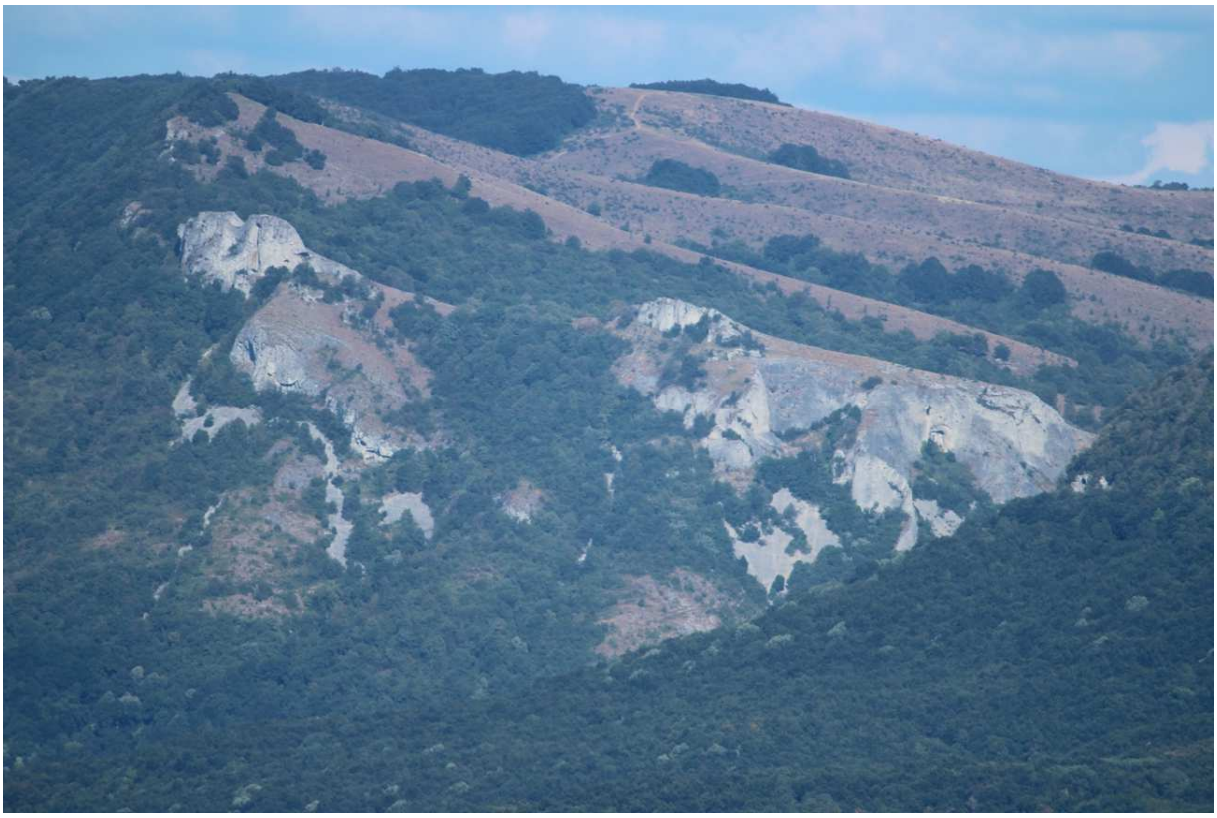

Fig. 7 and 8. Landscapes from Sinite Kamani & Kotel Mountain.

Comparison of the number of livestock in Burgas district in 1905 and South-East economic region in Bulgaria in 2012.

	Type of livestock	Total in Bulgaria in 1905 in .000	Total in Bulgaria in 2012 in .000	Total in Burgas District (11,857 km²) in 1905 in .000	Density = Number of livestock/km² in 1905	Total in South-East region (19,799 km²) 2012 in .000	Density = Number of livestock/km² in 2012
1	Bovine	2,200	540	205	17	57	2,9
2	Equine	720	130	71	6	No data	No data
3	Ovine+ Caprine	9,500	1,360	1,281	108	249	12,5
4	Porcine	460	530	49	4	146	7,4
5	Birds	6,400	1,400	528	44	2,000	101

Sinite kamani & Kotel Mountain

Municipality	Area	Sheep/goats	Desnity of ovine/caprine per sq km	cattle	Density of bovine per sq.km	equines	Total Density
Sliven	1366	49737	36,41	15000	10,98	267	47,59
Kotel	858	28965	33,76	5500	6,41	136	40,33
Omurtag	401	34100	85,04	7700	19,20	0	104,24
Varbitsa	419	13822	32,99	5436	12,97	10	45,99
Sungurlare	794	20361	25,64	5261	6,63	104	32,40
Total	3838	146985	38,30	38897	10,13	517	**48,57**

NB! Only for comparison with the best known vulture areas in Bulgaria and one of the best in Balkans - Eastern Rhodopes

Eastern Rhodopes

Municipality	Area sq km	Sheep/goats	Density caprine per sq km	cattle	Density bovine per sq km	equines	total Density
Ivailovgrad	813	16097	19,80	4613	5,67	84	25,58
Madjarovo	247	10482	42,44	5300	21,46	31	64,02
Stambolovo	276	7873	28,53	4254	15,41	2	43,95
Kardjali	547	18229	33,33	11478	20,98	58	54,41
Momchilgrad	358	22533	62,94	12106	33,82	91	97,01
Krumovgrad	836	21654	25,90	14790	17,69	122	43,74
Kirkovo	537	14680	27,34	15616	29,08	19	56,45
Total	3614	111548	30,87	68157	18,86	407	**49,84**

For example in Kotlenska Planina, the Agro-Prom Complex during the Communist period has got about 40 sheep farms within 5 km from the main breeding and roosting sites of griffon, Egyptian and cinereous vultures. Each sheep farm has had a pastures of some 25-40 hectares and 350 sheep ewes, which accounts to about 14 000 sheep.

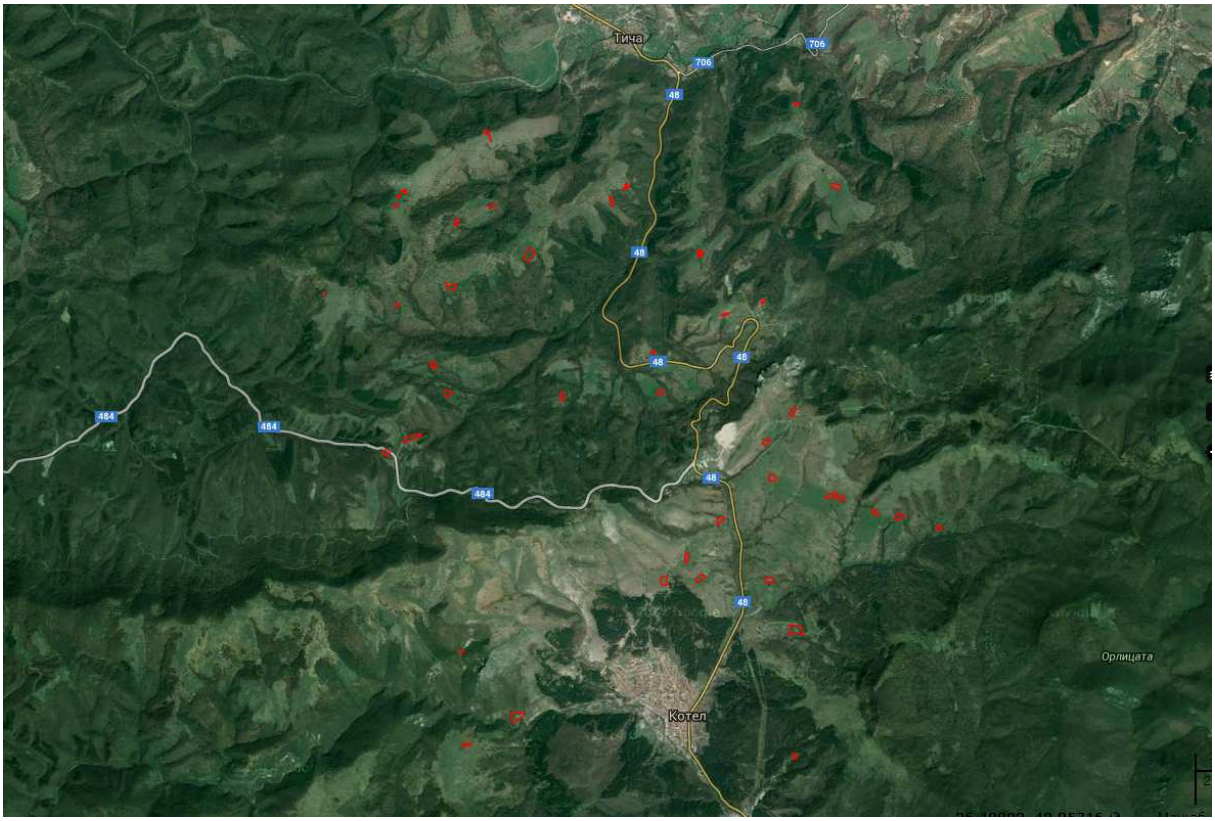

Fig. 9. A picture from Google Earth shows the sheep farms around the town of Kotel from the Communist period.

Today only about 25% of these farms are in use, while the number of sheep is about 1/7 from the Communist period – 2,100 heads in 2018. Today there are more cattle and horses – 760-900 heads – a situation, which is generally better for the griffon vultures, but not good for the Egyptian and cinereous vultures. In total, calculated through livestock units (1 LU = 1 cow= horse= 6.6 sheep and or goats) there were 2,121 LU at 5 km radius around Kotel in 1988, while in 2018 there are 1,028. This situation of the livestock in Kotel area – only about ½ from the best known period, compared to the country in general, where it is just one tenth, is not too bad. The problem is, however, this amount of livestock is concentrated in a rather small area, without coherence with other such sites and the shift to cattle and horses instead of sheep. The preference of large livestock (cattle and horses) is mainly free ranging and although problematic in some points is a good tool to avoid depredation from wolf and jackal, but also this is a response to the lack of or non-reliable labour.

2. Vrachanski Balkan

Item	*Data*
General description	Found in north-western Bulgaria, part of the Stara Planina (Balkan Mountain) chain. Law to Mid-mountainous area (500-1500 m) with foothills with Continental climate. Loose populated. Large forest patches are mosaically mixed with open mountain ridges - pastures and to the north with arable land. Large river valley with huge limestone cliffs of up to 400 m walls.
Habitat	Heterogeneous. Forest patches of planted Austrian pine are found among larger missives of oak and beech forests. Large areas represent cliffs and steep slopes with tree vegetation that may provide suitable nesting sites. In some places single pines are found in cliffs, providing classic black vulture's nesting habitat. In 1931 in this area cliff nesting of black vultures was reported.
Food	148 000 equivalent of sheep heads and density of 5.18 livestock heads per km². Sheep, goats and cattle, as well as free ranging horses are grazing the mountainous pastures. In the northern part near Montana, but also Sofia to the south, large pig farms and slaughterhouses provide large quantities of (potential) food for vultures. The Wolf is present in the mountains, but rarely conflicts with livestock breeders as it feeds mainly on wild boar and red and roe deer, which are abundant in the forests. The BPPS in cooperation with the administration of the Nature Park supply a large feeding site for vultures (40 tons a year).
Socio-economic factors	One large city – Vratsa (54 000 inhabitants) is found in the northern part of the area. The largest protected area- Vrachanski Balkan Nature Park is found just above the city. Out of the city, agriculture – in the mountain mainly livestock breeding and forestry are the main occupations of the local inhabitants.
Other wildlife and related species	Since 2010 the Griffon Vulture was successfully reintroduced. In 2016 - >50 birds are permanently present, 8-10 pairs bred and 4 chicks were produced and the colony increases. 5-8 pairs of Golden Eagle breed in the area. The Egyptian Vulture tends to recover and 2-4 birds are present each summer. The first black vulture in the area for decades was observed in 2016 at the feeding site.
Strategic importance	The site is found far from Dadia (330 km) to the northwest towards the direction of the Griffon Vulture colonies in Serbia, Croatia and Italy, where from the connection with France and Spain would be established. If the reintroduction becomes successful, the distance between the black vulture populations in Rhodopes and pre-Alps (France) will be with 1/5 shorter.
Score	The site is second rated for start of the reintroduction of the black vulture in Bulgaria. Very good combination of suitable habitats, (potential) natural and manageable food resources, protected areas, active conservation group, socio-economic importance and strategic position for future successful reintroduction of the black vulture.

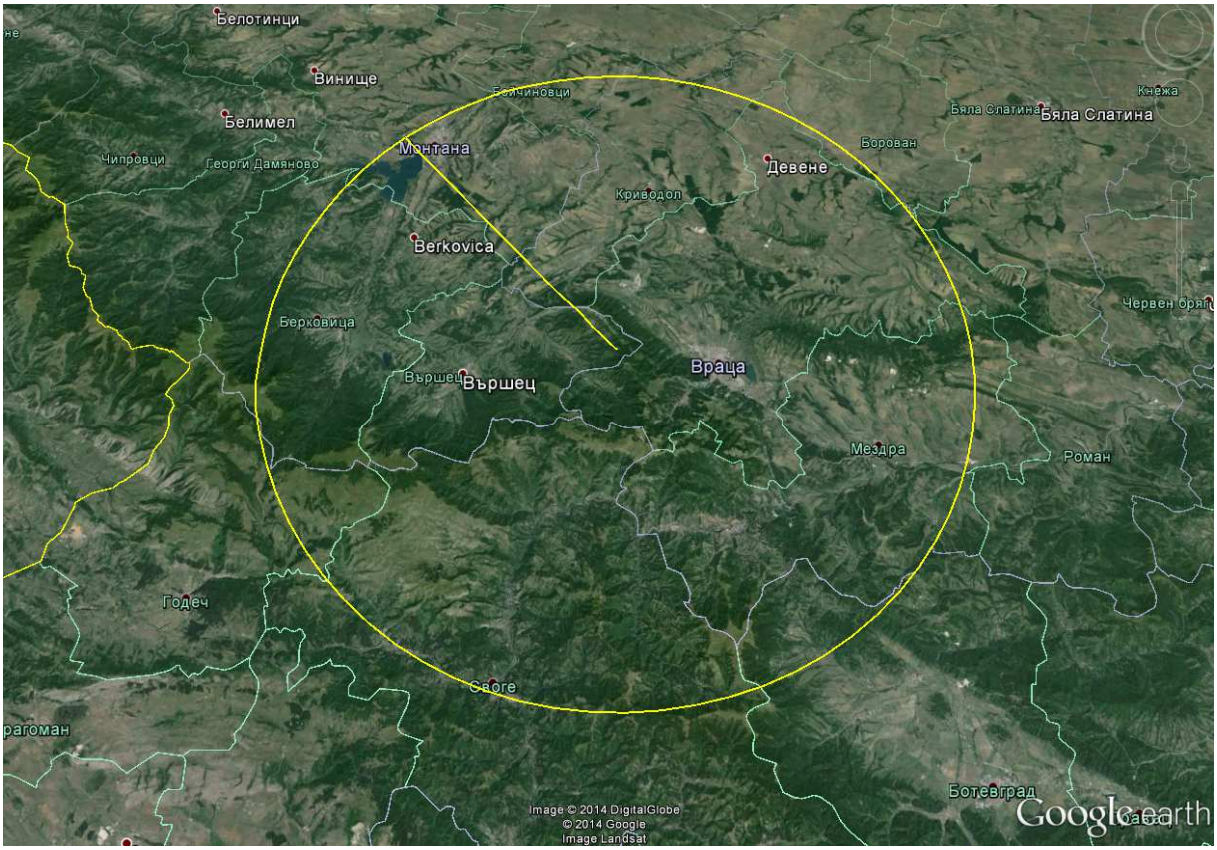

Fig. 11. A 30 km radius with centre (N 43.22°; E 23.44°) close to the town of Vratsa.

Vrachanksi Balkan

Municipality	Area	Sheep/goats	Density of ovine/caprine per sq km	cattle	Density of bovine per sq km	equines	Density
Svoge	868	8903	10,26	2174	2,50	638	3,25
Mezdra	519	7728	14,89	2182	4,20	269	4,75
Vratsa	706	18699	26,49	4219	5,98	614	6,88
Varshets	240	350	1,46	684	2,85	110	3,31
Godech	374	5029	13,45	2348	6,28	1066	9,16
Berkovitsa	470	8555	18,20	2111	4,49	39	4,61
Total	3177	49264	15,51	13718	4,32	2736	**5,18**

NB! Only for comparison with the best known vulture areas in Bulgaria and one of the best in Balkans - Eastern Rhodopes

Eastern Rhodopes

Municipality	Area sq km	Sheep/goats	Density caprine per sq km	cattle	Density bovine per sq km	equines	total Density
Ivailovgrad	813	16097	19,80	4613	5,67	84	25,58
Madjarovo	247	10482	42,44	5300	21,46	31	64,02
Stambolovo	276	7873	28,53	4254	15,41	2	43,95
Kardjali	547	18229	33,33	11478	20,98	58	54,41
Momchilgrad	358	22533	62,94	12106	33,82	91	97,01

Krumovgrad	836	21654	25,90	14790	17,69	122	43,74
Kirkovo	537	14680	27,34	15616	29,08	19	56,45
Total	3614	111548	30,87	68157	18,86	407	**49,84**

Fig. 10. Landscape from Vrachanski Balkan.

3. Kresna SPA

The size of the Natura 2000 zone is too small to represent the foraging range of large vultures. That is why the site is named as Kresna Gorge/Pirin. The Kresna Gorge is the central place where the vultures are roosting and breeding and Pirin is large enough but also includes vital part of the summer pastures where livestock is concentrated.

Item	*Data*
General description	Found in south-western Bulgaria, along the Struma valley, between the highest mountains in Bulgaria Rila and Pirin, which are also declared National Parks. Law to high-mountainous area (300-2900 m) with foothills with Mediterranean and mountainous climate. Densely populated valley and loose populated mountains. Large forest patches are mosaically mixed with open mountain ridges – pastures and rarely arable land.

Habitat	Heterogeneous. Forest patches of autochthonous and planted Austrian pine, Scots pine and Bosnian pine are found in the mountains – 800- 1800 m. Flat-topped trees are found on high altitudes away form people. In the Kresna Gorge a strict reserve preserves Mediterranean forest patches of Juniperus excelsa that forms suitable, but limited in space nesting habitat for black vulture at low altitude.
Food	Sheep, goats and cattle, as well as free ranging horses are grazing the mountainous pastures. The Wolf is present in the mountains and frequently conflicts with livestock breeders, which is a potential threat for illegal use of poisoned baits, especially in the lower parts of the area. The mountain pastures above 2000 m are used for free range pasturing of livestock in summer and the vultures prefer to feed there. The FWFF supply a large feeding site for vultures (>40 tons a year).
Socio-economic factors	One large city – Blagoevgrad (70 000 inhabitants) is found in the northern part of the area. The largest protected areas- Rila National Park, Pirin National Park and the Rila Monastery Nature Park are all found around the city. Out of the city, agriculture – in the mountain mainly livestock breeding, forestry and tourism are the main occupations of the local inhabitants.
Other wildlife and related species	Since 2010 the Griffon Vulture was successfully reintroduced. In 2016 – more than 50 birds are present, 8-10 pairs are formed, 4 bred and 2 chicks were produced and the colony increases. 3-4 pairs of Golden Eagle breed in the area. The Egyptian Vulture tends to recover and 2-3 birds are present each summer as well as black vultures – 5 different individuals in 2015.
Strategic importance	The site is found far from Dadia (280 km) to the west towards the direction of the Griffon Vulture colonies in Serbia, Croatia and Italy, where from the connection with France and Spain would be established. In combination with the potential reintroduction in Vrachanski Balkan, Kresna Gorge will be connection with the Griffon Vultures colonies in Republic of Macedonia and western Greece, providing possibility to be re-occupied by the black vulture in future.
Score	The site is third rated for start of the reintroduction of the black vulture in Bulgaria. Very good combination of suitable habitats, natural food resources, protected areas, active conservation group, socio-economic importance and strategic position for future successful reintroduction of the black vulture. The only concern is the potential use of poisoned baits, which despite of being addressed for years is still a potential threat.

Kresna Gorge/ Pirin

Kresna Gorge/Pirin

Municipality	Area	Sheep/goats	Density of ovine/caprine per km²	cattle	Density of bovine per sq km	equines	Total density
Simitli	529	20700	39,13	2600	4,91	60	44,16
Razlog	506	9750	19,27	4600	9,09	373	29,10
Bansko	475	13100	27,58	2200	4,63	92	32,40
Gotse Delchev	330	12100	36,67	3000	9,09	226	46,44
Sandanski	998	19400	19,44	10200	10,22	353	30,01
Strumyani	355	11700	32,96	1200	3,38	29	36,42
Kresna	344	9900	28,78	1200	3,49	58	32,44
Total	3537	96650	27,33	25000	7,07	1191	**34,73**

NB! Only for comparison with the best known vulture areas in Bulgaria and one of the best in Balkans - Eastern Rhodopes

Eastern Rhodopes

Municipality	Area sq km	Sheep/goats	Density caprine per sq km	cattle	Density bovine per sq km	equines	total Density
Ivailovgrad	813	16097	19,80	4613	5,67	84	25,58
Madjarovo	247	10482	42,44	5300	21,46	31	64,02
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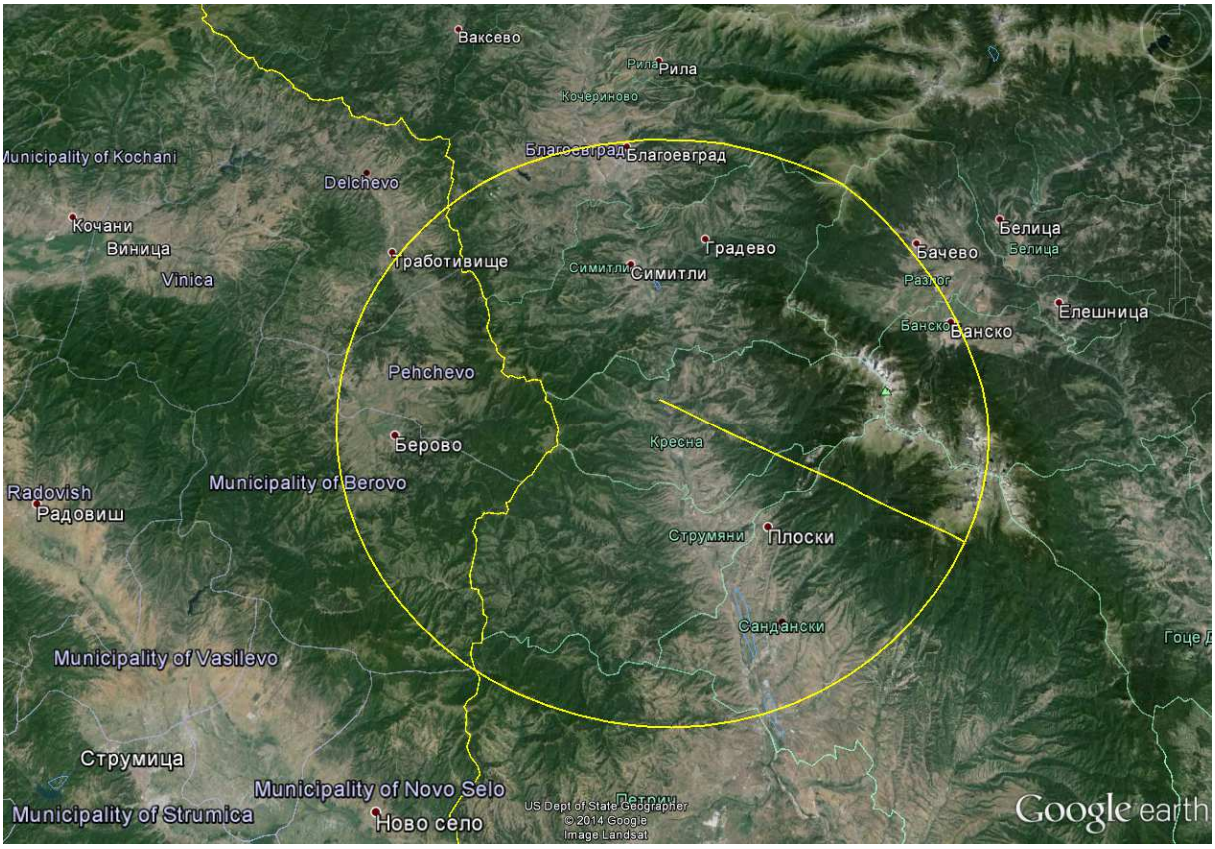

Fig. 12. A 30 km radius with centre (N 41.76°; E 23.14°) close to the town of Kresna.

Conclusions

- Inaccessibility of food

The afforestation of secondary steppe habitats and the decline in grazing of livestock above the timberline in mountains, as well as the intensification of livestock farming and the related management of the livestock carcasses and slaughter offal by means of collection and incineration, lead to inaccessibility of otherwise available food resources for vultures.

- Decline of natural food base

The extirpation of wild ungulates in the pre-historic and early historic times and their replacement by livestock reared in an extensive way, has led to a shift in the vultures food base for quite a long period of time. Nowadays quite some areas are abandoned due to urbanization processes and some places are again available for the wildlife. A process of rewilding should be facilitated to restore the natural processes by precise planning and implementation of reintroductions and adaptive management techniques.

- Decline or lack of extensive and pastoral livestock breeding

The number of pastoral livestock declined some 10 times from pre– and Communist period to date. The current socio-economic situation in Bulgaria leads to low interest in investments and starting business with extensive and pastoral livestock breeding. This is mainly due to lost traditions, destroyed or lacking infrastructure (roads, barns, watering places etc.) and disturbed land's and thus farm's organisation (mainly land possession and fragmentation).

Problems to be addressed

1. Food for vultures
- wild prey (souslik, hare, ungulates, etc.)
- livestock
- food management and feeding sites
2. Making the livestock farming possible and persistent
- land possession and consolidation
- barns and roads
- seasonal pastures
- watering places
- personnel
- local strategies and common understandings
- create specific market opportunities
3. Site by site Action plan