Re-introduction of Griffon Vulture *Gyps fulvus* in Kresna Gorge of Struma River, Bulgaria

Annual Report 2016

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Резюме

Това е отчетът за седмата година от началото на реинтродукцията на белоглавия лешояд (*Gyps fulvus*) в Кресненския пролом, която беше започната в началото на 2010 и се изпълнява от Фонд за дивата флора и фауна.

През 2016г. за първи път беше регистрирано успешно гнездене на белоглавия лешояд в Кресненския пролом, като две двойки отгледаха малки, а броят на лешоядите, присъстващи в района продължи да се увеличава и бяха постигнати някои рекордни числености, както следва:

1.) Най-голям брой белоглави лешояди нощуващи в Кресненския пролом – 61 инд. на 29 ноември 2016;

2.) Най –голям брой двойки белогалви лешояди, демонстриращи брачно поведение – осем двойки, от които 4 двойки бяха наблюдавани да копулират, две снесоха яйца и две отгледаха малки;

3.) За поредна година бяха регистрирани голям брой непуснати в рамките на проекта белоглави лешояди - „гости", посетили Кресненския пролом за определено време през годината – над 70 индивида. Така заедно с пуснатите в рамките на проекта, общият брой белоглави лешояди регистрирани през 2016 година в Кресненския пролом надхвърля 110 индивида;

4.) За четвърта поредна година бяха наблюдавани черни лешояди (*Aegypius monachus*) и египетски лешояди (*Neophron percnopterus*) да се хранят на площадката в Кресненския пролом.

5.) За втора поредна година морски орел (*Haliaeetus albicilla*) посещава площадката за подхранване в Дефилето.

За поредна година бяха наблюдавани маркирани белоглави лешояди от Израел, Гърция, Сърбия, Хърватска и от други части на България (вкл. Източни Родопи и Врачански Балкан).

На свой ред индивиди пуснати в Кресненския пролом бяха наблюдавани в Сърбия, Италия, Гърция, Македония, както и в други части на България (Врачански Балкан, Сините камъни, Централен Балкан, Котел и Източни Родопи).

И тази година белоглавите лешояди от Кресненския пролом прекараха най-горещите месеци от годината във високите части на Рила и Пирин. Това освен от радио-предавателите, които носят някои от птиците, беше документирано и от туристи и парковата охрана в района на връх „Вихрен", „Кончето", „Тодорка", „Орлите" и „Спано поле" в НП „Пирин", и „Мальовица", „Ибър" и „Белмекен" от НП „Рила".
Получихме много снимки и данни за наблюдения на птиците от туристи и местни хора.

През 2016 отново бяха регистрирани два смъртни случая на белоглави лешояди от токов удар в района на Кресненския пролом, недалеч от площадката за подхранване, където предпазителите монтирани преди две години бяха „прегоряли" от слънцето и съответно бяха подменени, но след като станахме свидетели на поредните загуби на ценни птици.

Продължават дейностите по подхранване на лешоядите (почти 50 тона харан в 206 подхранвания), като и дейности по предотвратяване на конфликта между животновъди и хищници и дейности за увеличаване на дивеча и екстензивното животновъдство.

Проектът „Живот за Кресненския пролом" LIFE11 NAT/BG/363 приключи в края на ноември 2016, но природозащитните дейности на ФДФФ в района продължават в рамките на проект „Нов живот за лешоядите" LIFE14 NAT/BG/649, финансиран от финансовия инструмент LIFE+ на ЕС и съ-финансиран от Клуба на приятелите на Зоопарк Виена, Австрия и от френските зоопаркове Bioparc de Doue (Биопарк де Доуе) и Зоопарк Sainte Croix.

Abstract

This is the Annual Report for the seventh year of the re-introduction of the Griffon Vulture (*Gyps fulvus*) in Kresna Gorge, started by FWFF in early 2010. In 2016 the Griffon Vulture presence continued to increase in the area with record numbers of simultaneously present individuals at the roosting site - 61 on 21 Noevember 2016 and again registered presence of more than 70 exogenous individuals for some time in different periods of the year. Thus in total over 110 different Griffon Vultures have been observed in Kresna Gorge in 2015 including released within the project, but also migrating, summering, wintering and vagrant birds form other parts of the Balkan Peninsula. Marked birds from Israel, Greece, Serbia, Croatia and other parts of Bulgaria (including Eastern Rhodopi) have been again observed. Birds released in Kresna Gorge were observed in Serbia, Greece and FYR of Macedonia, as well as other parts of Bulgaria (Vrachanski Balkan, Sinite Kamani, Central Balkan, Kotel, and Eastern Rhodopi). This year the Griffon Vultures spent even more time in the National Parks of Rila and Pirin during the hot summer months, where they have been recorded by the transmitters they bring, but also they were directly observed and photographed by tourists and park authority in the area of Vihren and Todorka peaks, Koncheto, Orlite and Spano Pole in Pirin National Park.

This year for fourth year in a row, Black Vulture (*Aegypius monachus*) was observed in the area of Kresna Gorge. The same is the situation with the Egyptian Vulture of which two subadult birds were present in the summer.

For second year observations of White-tailed Sea Eagle *Haliaetus albicilla* were recorded.

Two mortality cases of juvenile Griffon Vulture due to electrocution were again registered not far from the feeding site in the Gorge. Necessary measures for further safeguarding the dangerous pylons were dully taken.

Conservation measures for improving the habitat for vultures in Kresna Gorge are still underway – providing food for the vultures – about 50 tons in 206 feeding events, against poison activities, compensation for farmers and prevention programme against livestock depredation, eco-tourism

promotion, insulation of dangerous power-lines, introduction of rare breeds of cattle, Fallow deer etc.

FWFF continued to work in the frame of the project "Conservation of birds of prey in Kresna Gorge, Bulgaria" supported by LIFE+ financial instrument of EC and co-funded by private donors as Friends of Vienna Zoo, Austria and Bioparc Zoo de Doue, France, but this project officially ended in November 2016. The actions will continue within the new one LIFE project "Bright future for the Black Vulture" LIFE14 NAT/BG/649, where Green Balkans is coordinating beneficiary, while FWFF, VCF, Junta de Exrtamadura and EuroNatur are associated beneficiaries.

Key words: Eurasian Black Vulture, *Aegypius monachus*, Egyptian Vulture *Neophron percnopterus. Pirin National Park, Rila National Park*

Transfers

In 2016 three captive bred Griffon Vultures were transferred to the acclimatization aviary in Kresna Gorge imported from BIOPARC Zoo de Doue, France. One born in 2015 was transferred by plane on 06.01.2016 and two others, born in 2016 were transferred by plane on 02.10.2016, and accordingly set into the aviary in Kresna Gorge.

Releases & Fledged in the colony

Two chicks fledged successfully in August 2016. One of these (the chick of the pair B35-P x B61) was marked with a green ring and a blue wing-tag B74-XX. The other (chick of the pair M60-X x B39-H) remained unmarked. The B74-XX was present in the area of the colony until late October 2016, when disappeared. Having in mind this is the time of the year, when the most of the young birds from Balkans migrate south, we trust this happened with B74-XX too.

In 2016 nine Griffon Vultures were released in Kresna Gorge. Four of them were captive bred – three in BIOPARC Zoo de Doue, France (Doue, 0H and 0X), one in Sainte Croix Zoo in France, while the other five were rehabilitated Spanish birds (F83-67, F86-23, F89, F84-34; F69-89). The Griffon Vulture F62-45 was recaptured in February 2016 and released again in July 2016. Two of the captive bred and two of the rehabilitated birds were released on 21.02.2015 and 15.04.2015 after three months of acclimatization. Two of the rehabilitated birds escaped on their own (thus considered soft released) on 09.01.2016, 03.03.2016, after 12 and 14 months of acclimatization respectively. A captive bred one and a rehabilitated one also escaped on 22.03.2016 after 2 and 14 months of acclimatization respectively. Two rehabilitated and one captive bred were hard released after 18, 23 and 2.5 months of acclimatization respectively. Another escapee (thus soft released) is the captive bred 0H that left the aviary on 10.11.2016 about a month after the setting into the aviary.

All they, but two – F69-89 and F86-23 adapted well and were permanently present at the feeding site in Kresna Gorge until the end of the year. The F69-89 was recaptured in August, a month after the release and was released again in October 2016. F86-23, was not seen since April- one month after the release.

Table 1. Releases & fledged Griffon Vultures and their observations in 2016 in Kresna Gorge

N	ID of the bird\ month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	45	x	recap					x	x	x	x	x	x
2	8		x	x	x	x	x	x	x	x	x	x	x
3	F83-67	x	x	x	x	x	x	x		x	x	x	x
4	F86-23			x	x								
5	F84-34			x				x	x	x	x	x	x

6	F69-89							x	recap		x	x	x
7	B74-XX								x	x	x		
8	OH											x	x
9	OX												x
10	F89												x

recap-means the bird was recaptured

Monitoring

Methods

The vultures were frequently (every 2 to 4 days) observed by binoculars and spotting scopes at the feeding site and the known roosting sites.

In 2016 we continued to use blue wing-tags with orange (enlightened to “gold”) inscription, but we introduced new scheme of two vertically set symbols of a digit and a letter (common letters for the Cyrillic and Latin alphabets) as follows: 0H, XX, 2X, X5, and the like.

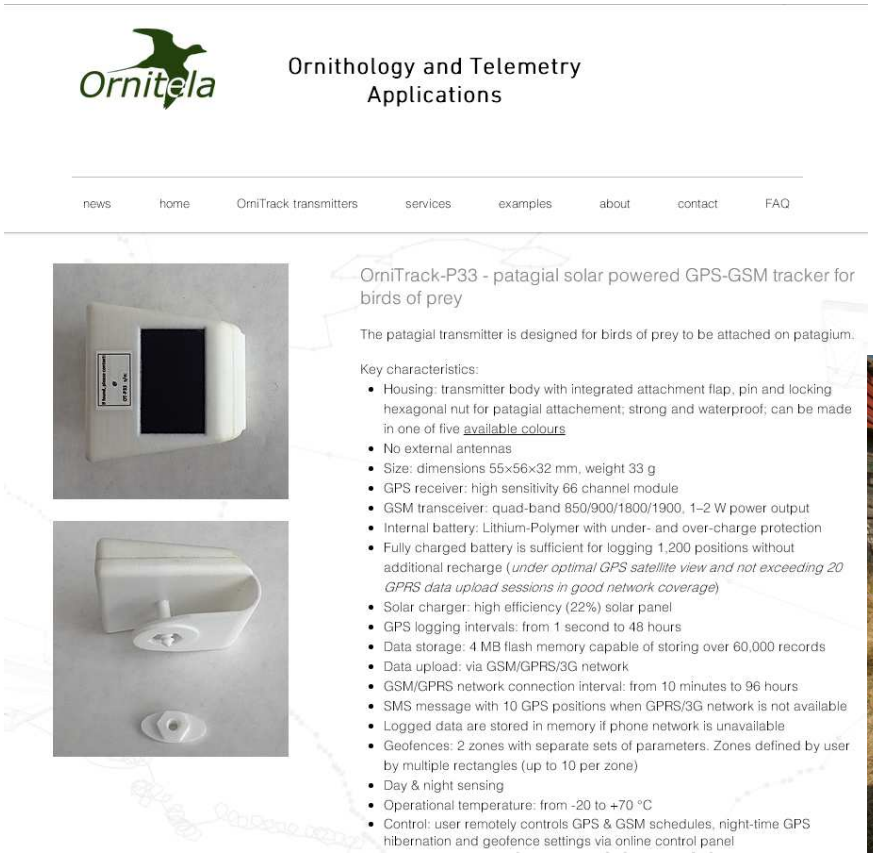
In 2016 some more of the released birds were equipped with blue rings with letter F and two digits (ex. F64) and a double vertical digit blue wing-tag with yellow inscription as shown above.

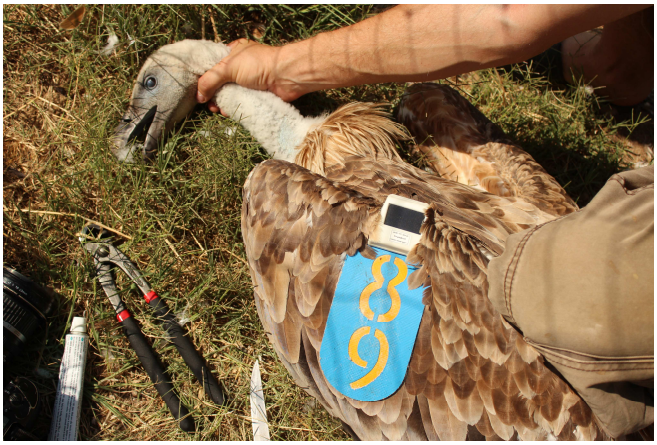
Figures 1, 2, 3 and 4. The marking scheme for Griffon Vultures released in Kresna Gorge in the period 2013-2016.




In 2016 we fitted with GPS/GSM transmitters two more released within the project vultures and one wild-caught. We introduced new type of attachment GPS/GSM tag. Patagial tag was developed in purpose for our project by Ornitela Ltd. http://www.ornitela.com/patagial-transmitter . So far two prototypes are deployed and data processed.

Figures 5, 6, 7 and 8. The newly developed patagial GPS/GSM transmitter for Griffon Vulture.





We are using local people and tourists' reports about observations of vultures to keep track on vultures' whereabouts in the area. In 2016 we initiated a Facbook request for people who visit the mountains to report their sightings and pictures of the vultures and this proved to be very successful (see next chapter).

This year we continued to use a camera trap to the feeding site and counted and recognized the present individual Griffon Vultures. We succeeded to take pictures of vultures that we were unable to recognize from a distance, as well to take pictures of Black Vulture (*Aegypius monachus*), Egyptian Vulture (*Neophron percnopteurs*), White–tailed Sea Eagle (*Halieaeetus albicila)* using the feeding site.

Digiscoping and determination of different individuals

We continued to use digiscoping and took pictures of all observed birds with 400 mm Canon lenses and Canon 7D camera in RAW format. After that digitally enlarged on a PC screen and improved through *Adobe PhotoShop* we found the number of the photographed birds either pictured from a hide or in flight or anywhere.

We continued using the sophisticated "***visual marking***" method (Stoynov & Peshev 2014). We made several thousand photographs of Griffon Vultures, but also of Black Vultures, Egyptian Vultures, Eagles and others mostly in flight with the goal to determine the different individuals. After removing

the inappropriate pictures, remained more than 5000, which were catalogued with *Adobe LightRoom*.

Marking of wild vultures

To establish the origin of wild Griffon Vultures present in Kresna Gorge as well as to follow with which age groups the released Project birds are dispersing we capture and mark the birds on passage through a hole in the aviary's roof mesh in a manner described by (Iezekiel, Woodly & Hatzofe 2003). Blue wing-tags and green rings were used, as well as GPS/GSM tags, when available.

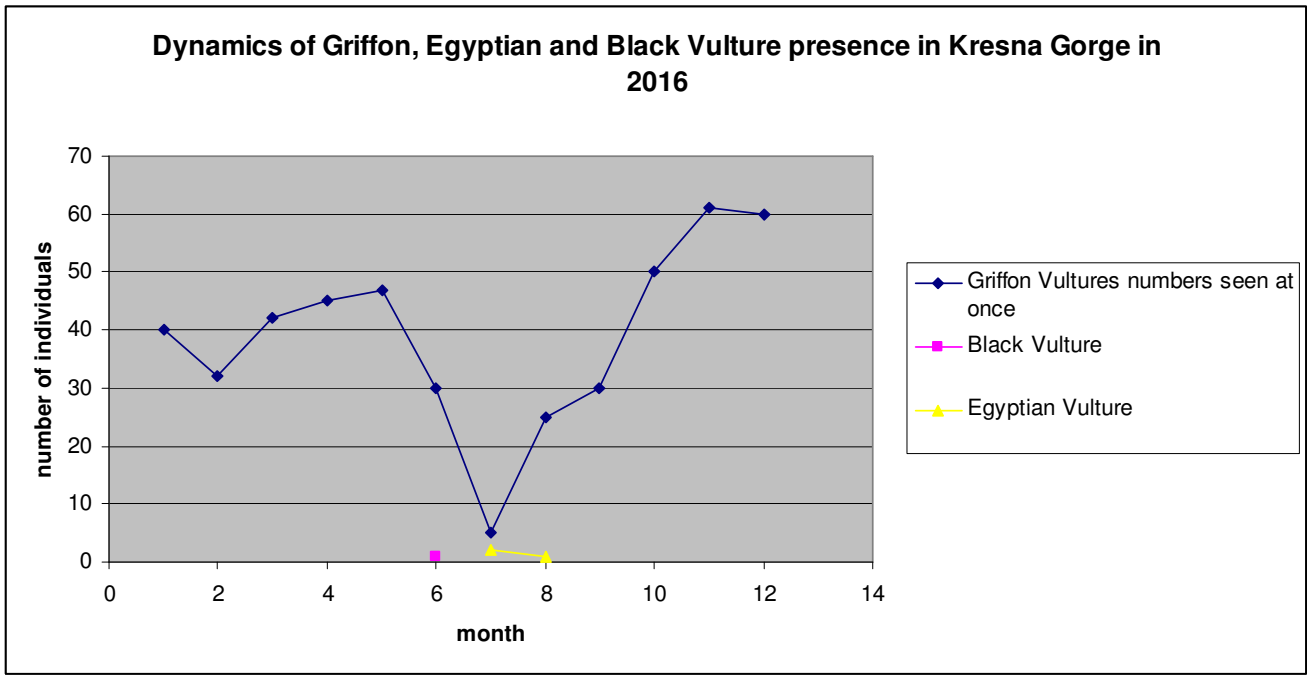
Results

In 2016 the Griffon Vulture presence was stable in Kresna Gorge with record numbers of simultaneously present individuals at the feeding site 47 on 9 May 2016 and 61 on 21 November 2016. The registered presence of minimum 20 exogenous marked and minimum of 50 unmarked individuals for some time in different periods of the year resembles the result from 2015. Thus in total minimum 110 different Griffon Vultures have again been observed in Kresna Gorge in 2016 including released within the project, but also migrating, vagrant, wintering or summering birds form other parts of the Balkan Peninsula. Marked birds from Israel, Greece, Serbia, Croatia and other parts of Bulgaria (including one marked juvenile of the year from Eastern Rhodopes (B3A-3A) and another one from Vrachanski Balkan (B2C)) have been observed. Birds released in Kresna Gorge were observed in Serbia, Italy, Greece and FYR of Macedonia as well as other parts of Bulgaria (Vrachanski Balkan, Sinite Kamani, Central Balkan, Kotel, and Eastern Rhodopes). This year too, the Griffon Vultures spent the hottest summer months in Pirin National Park and sometimes in Rila Natioanl Park, where they have been reported by the tourists, shepherds and Park officers.

***Table 2**. Numbers of Griffon Vultures and Egyptian and Black Vultures observed in Kresna Gorge in 2016*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Number of Griffon Vultures observed at once at the feeding or roosting site	40	32	42	45	47	30	5	25	30	50	61	60
Number of Egyptian Vultures							2	1				
Number of Eurasian Black Vultures						1						

***Figure 9**. Seasonal dynamics in numbers of Griffon, Egyptian and Black Vultures in Kresna Gorge in 2016 (birds observed at once within the month)*



Mortalities and misfortunes

On 15 and 16 June 2016, two wild young Griffon Vultures were found electrocuted in two subsequent days near the villages Rakitna and Mechkul in Kresna Gorge. Actions for safeguarding the electric pylons were dully taken.

Since the end of the breeding season 2016, the successfully reproducing female B39-H is missing, the reason is unknown.

Dispersals and movements

G10 was released 21.09.2010 and observed several times since then in Eastern Balkan – 07.06.2012 and Eastren Rhodopes – 30.07.2012, Dadia 13.02.2013, but we have not her from it for a while. In 2016 it was several times observed and photographed in Eastern Rhodopes as an adult that probably breeds in the area – 19.09.2016, 15.10.2016, 25.12.2016 (BSPB- Volen Arkumarev).

B41-H was released in Kresna Gorge 22 October 2011 and moved away from the area shortly after the release, reaching Dadia in Greece. In 2016 it was frequently observed in Eastern Rhodopes (BSPB-Volen Arkumarev), where it most probably breeds.

B17- M was released 25 June 2012 and was frequently present at the feeding site in Kresna Gorge. In early 2016 it was observed on Demir Kapiya in FYR of Macedonia (Bobi Delov) to express breeding behavior with B95-5. Few days latter the pair has returned to Kresna Gorge.

B19- C was released 29 Jun 2012 and was frequently present at the feeding site in Kresna Gorge. 25-30.05.2016- Vitachevo, FYR of Macedonia by Emanuel Lisichanets- NCA Aquila. Later it returned to Kresna Gorge and is frequently seen in the area.

B25- E was released 25 Jul 2012, but was recaptured in November 2012 and released again 20 Feb 2013. This bird moves a lot around the feeding sites on the Balkans. This year it was reported to copulate with K36 on 20.02.2016 Vrachanski Balkan (George Stoyanov).

B63 was released 14 Mar 2012 and was frequently present at the feeding site in Kresna Gorge. Since 2013 it moved away from Kresna Gorge and was reported mainly from Eastren Rhdopes. In 2016 it is frequently present there (BSPB- Volen Arkumarev) and probably breeds in the area;

B97- 7 was released 28 May 2014 stayed for two weeks around the feeding site in the Gorge and on 29 Jun 2014 was reported from Vrachanski Balkan (George Stoyanov) and is permanently observed there in 2016 too.

F88-56 - Hard released 15.04.2015 and permanently present in Kresna Gorge. On 18.07.2016 it was observed in Eastern Rhodopes (BSPB- Volen Arkumarev). In autumn 2016 it is again permanently observed in Kresna Gorge.

F82-78 - Soft released 19.08.2015 and permanently present in Kresna Gorge. On 27.07.2016 and 16.09.2016 it was observed in Eastern Rhodopes (BSPB- Volen Arkumarev). In autumn 2016 it is again permanently observed in Kresna Gorge.

In 2016 the group of Griffon Vultures from Kresna Gorge was frequently reported from and photographed in Pirin National Park. It seems the birds are moving there in the hot summer days of June to September to drink water and to benefit from carcasses of grazing on the alpine pastures livestock. Roosting sites in the mountain were reported in the area of “Orlite”, but also from Spano Pole. Here we report on sightings and pictures provided by tourists, shepherds, local people and others that provided their data to us:

In 2016 after an intensive Facebook campaign we obtained very interesting data for the presence and whereabouts of the Griffon Vultures from Kresna Gorge in high mountainous areas of Pirin National Park and Rila National Park. We publish here the reports of tourists, birdwatchers, cattle and sheep-herders, nature lovers and others that provided their data and pictures:

1. Ivailo Madjarov (through Facebook) - "On 23.07.2016 I have observed around noon 3-4 large birds to soar over Spano Pole in Pirin".

2. Ivaylo Nikolov (through Facebook) – "Three pictures - from a friend taken 05.07. 2016 (Upper Vlachinsko lake under Vihren Peak). He told me about 4-5 Griffon Vultures. One of these with yellow wing-tags, other one with blue. There are also unmarked birds."

3. Pepi Sakarev (through Facebook) – "One picture - The end of April 2016 on Todorka Peak and the area around Vihren. The bird seems to be Number 8."

4. Vera Peltekova (Through Faecbook) – $ Today 23.07.2016 we saw about 10 Griffon Vultures until we were climbing Malyovitsa in Rila from the green side. They suprized us – last year we saw them on Spano Pole in Pirin."

5. Maya Petkova (through Facebook) " I saw one on 08.07.2016 around the Sinanitsa Gate (Sinanishka porta)"

6. Ilko Drenkov (чрез ФБ) – "On 23.07.2016 around 14.00 o'clock I saw one to fly from Vlachinski lakes towards Vichren and Hvoinati Peaks. Later it turned down to Muratov peak and Spano Pole."

7. Yordan Pulev (through Facebook) - " there are vultures on Karaulite in Pirin – I counted five – they were lended, while I was on Banderishki Chukar - 22 07.2016."

8. Polya Gencheva (through Facebook) – "On 21 and 22.07.2016 – two Griffon Vultures over the Sinanista Peak, very close above our group. (picture)."

9. Lyudmil Petrov (through Facebook) – "On 23.07.2016 I saw about 18 Griffon Vultures in the valley of Bashliiska reka, most probably because nearby were four dead calves. According to the hut owners of Spano pole hut, there are minimum of 28 Griffon Vultures in the area."

10. Nikolay Dautov (through Facebook) – "On 23.07.2016 one was soaring above Straneto under the Koncheto in Pirin. There was a large herd of goats with two shepherds."

11. Tsvetan Tsekov (through Facebook) – "On 24.07.2016 few flew over Kutela and Banski Suhodol".

12. Pavel Pavlov (through Facebook)- " I saw two vultures on 24.07.2016, around 16.30 o'clock, soaring around Mozgovishki Chukar in direction to Todorka – passed the ridge above Vasilashka river."

13. Daniela Dineva (through Facebook)- "I saw 3 Griffon Vultures from Muratov peak, 12.7.2016 (picture in flight of K47)."

14. Yordan Kutsarov (through Facebook) – "Friends of mine have observed a large group of vultures around the Chairski lakes. There has been a dead cow."

15. Ivanka Demireva (through Facebook) – " In the beginning of August 2016 I saw one vulture to fly above Muratov peak and continued to Donchovi Karauli."

16. Stanislav Milkov (through Facebook) – "On 07.08.2016 one vulture flew over Sinanitsa peak".

17. Dimitar Parvanov (pers.comm.) – "On 12.08.2016 we saw 2 Griffon Vultures around Bunderitsa Gate (from Vihren hut).

18. Boris Barov (pers. comm.) – "In the beginning of August 2016 one Griffon Vulture over Spano Pole."

19. Petko Boyadjiev (through Facebook) – "This young unmarked Griffon Vulture I photographed over Tipitsite peaks in Pirin on 11.08.2016 (picture attached)."

20. Elena Smilkova (through Facebook) – "On 17.08.2016 under Razlozhki Suhodol– pictures of three Griffon Vultures in flight."

21. Nikolay Dautov (through Facebook) – "(Picture of three Griffon vultures in flight)- On 21.08.2016 in the morning were flying in the area of Banderishki Chukar, Karaulite, Muratov peak. They were flying high. Around 13.00 o'clock,was tring to land between Bashliiski Tsirkus and Banderishki Chukar."

22. Wladimir Milushev (pers. comm.) – "On 28.08.2016, 13:50 o'clock I saw 3 Griffon Vultures to fly over Todorka Peak. The flew from north to south and were heading towards Tevno Lake. On 29.08.2016 I saw 2 Griffon Vultures over Vihren Peak (11.00 o'clock."

23. Yordan Hristov (Through Facebook) "On 05.10.2016 a friend of mine saw a Griffon Vulture in Ibar Reserve in Rila National Park."

24. Pepi Sakarev (through Facebook) "Picture of seven Griffon Vultures feeding on a dead cow carcass near Tevno Lake in Pirin".

On 11.08.2016 Hristio Peshev visited Pirin National Park in the area of Bashliiska reka and observed more than 30 Griffon Vultures flying in the area and lending and feeding on dead cow carcasses. Some of the pictures are here:

Figures 10, 11, 12 and 13. The Griffon Vultures and preferred habitat in Pirin National Park in 2016.

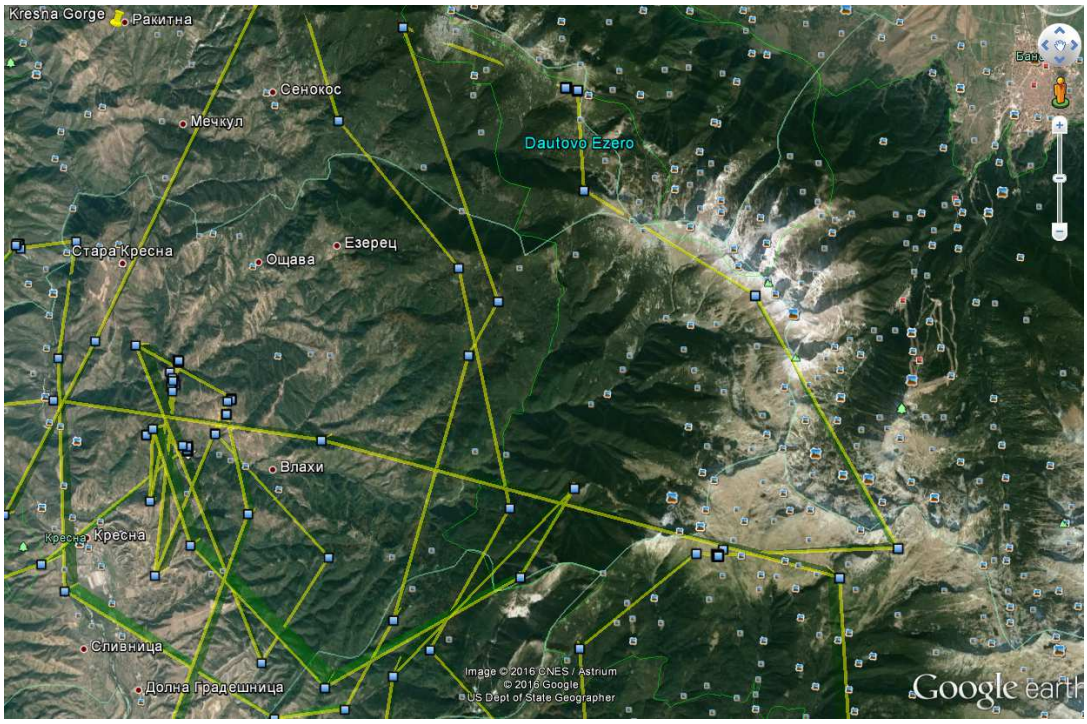
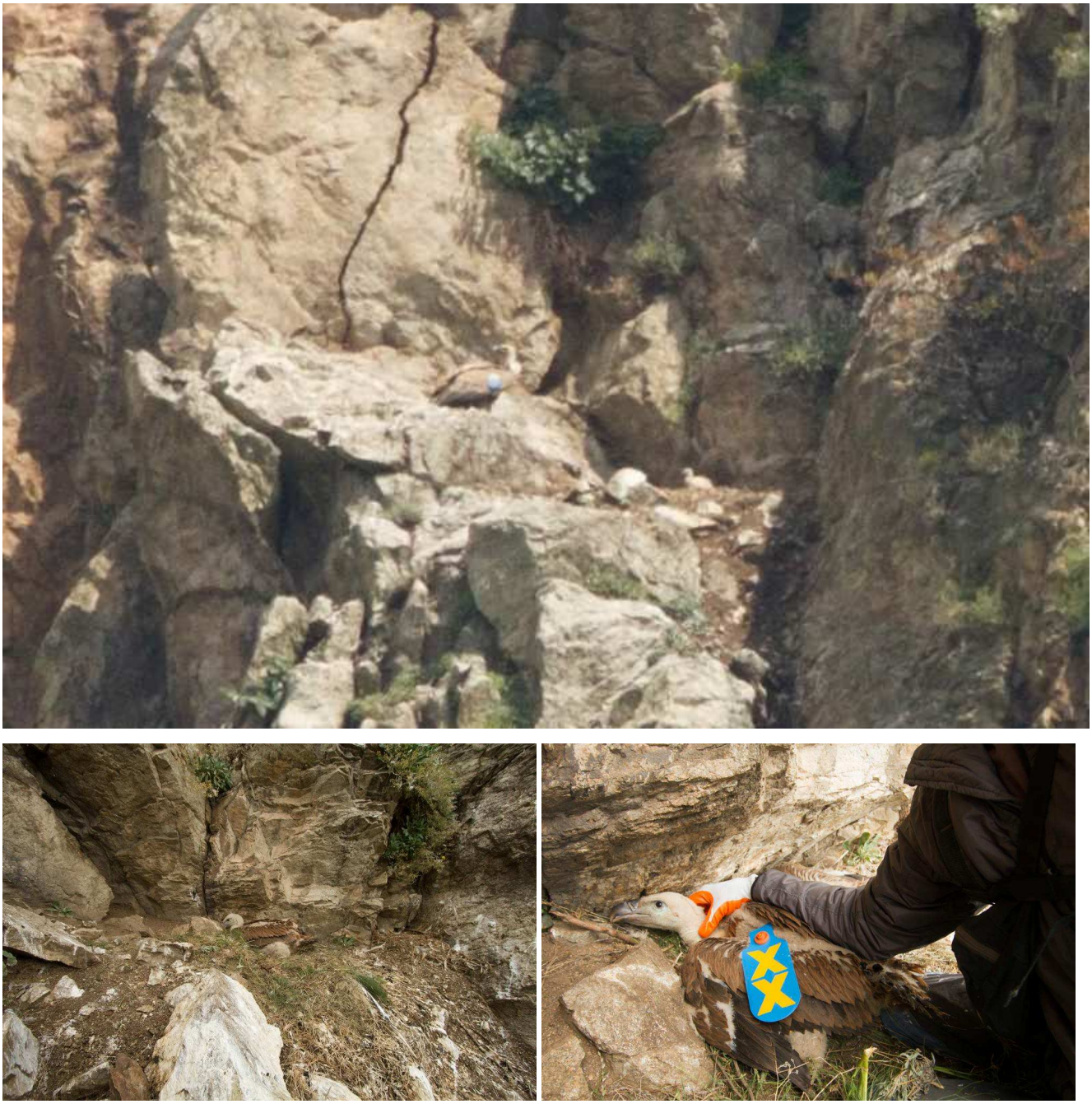


Figure 14. Data from GPS/GSM transmitter also shows some of the movements of Griffon Vultures in Pirin National Park.

Breeding

First successful breeding of Griffon Vultures in Kresna Gorge was registered in 2016. Two pairs laid eggs and the two successfully hatched and fledged their chicks. The first egg was laid from the pair B35-P x B61 on 29.01.2016q and hatched successfully on 27.03.2016 and fledged on 03.08.2016. This chick was marked into the nest with a green ring B74 and a blue wing-tag XX.



Figures 15, 16 and 17. Successful reproduction of a pair of Griffon Vultures in Kresna Gorge in 2016.

Figure 18. The chick B74-XX successfully fledged and taking food at the feeding site in Kresna Gorge on 07.09.2016.

The second egg was laid by the pair M60-X x B39-H on 05.02.2016. The chick hatched on 03.04.2016 and fledged in mid August 2016. The chick remained unmarked.

The other 4-6 pairs expressed breeding behavior to different extent and finally remained non-reproducing. This may be attributed to the immaturity of one or the two partners.

In 2016 eight pairs expressed breeding behavior. Here are the details:

№	male	female	Nest No.	Date of nest occupation	Date of first copulation	Date of egg laying	Notes
1	M60-X	B39-H	№3	21 Nov 2015 copulations in the last year nest №2	21.11.2015	05.02.2016 laid egg in a new nest No.3.	In January 2016 the pair has changed the nest. The egg hatched on 03.04.2016, the chick fledged in mid August 2016.
2	O	G92	№4	January 2016	16.02.2016	Laying was not detected.	Moved to Demir Kapia in Macedonia, but returned to Kresna Gorge.
3	K47	K44	№8	January 2016	31.01.2016 and 16.02.2016 and frequently	Laying was not detected.	Fight with the pair O x G92 for the nest No.4

					afterwards		
4	M	B95-5	№2	January 2016	28.01.2016	Laying was not detected.	Took nest No.2 from the pair X x H.
5	B96-6	B00-A	№1	January 2016	16.02.2016	Laying was not detected.	Took the nest of the pair that was breeding in 2011.
6	B35-P	B61	№5	December 2015	Unseen	29.01.2016-laid egg.	Chick hatched on 27.03.2016 and fledged successfully on 3 August 2016. Marked in the nest B74-XX.
7	C	Wild	?				Observed display flights and fight with other pairs for nests.
8	K	Wild	?				Observed display flights and fight with other pairs for nests.

Table 2. Breeding pairs and breeding performance of the Griffon Vulture pairs in Kresna Gorge in 2016.

In 2016 a new formed captive pair of Griffon Vulture K0J x K8X also laid egg in February 2016. The incubation lasted for three weeks, and stopped, when we found the egg broken. The reason for the failure remained unknown.

Figures 19 and 20. Captive pair K0J x K8X laid egg and incubate in FWFF's wildlife Center in Rakitna..

Attracted exogenous birds

From the 70+ exogenous birds that visited Kresna Gorge in 2016, seventeen were marked and their origin established. Seven Griffon Vultures ringed in Serbia, one in Croatia, two in Israel, one in Greece, four released and one wild-caught marked from the re-introduction project sites in Balkan Mountain in Bulgaria and one from Bulgarian part of Eastern Rhodope were observed in Kresna Gorge in 2016. Two were wild juveniles from Eastern Rhodopes and Vrachanski Balkan. Details follow here:

G92 – a Griffon Vulture captured as juvenile near Nestos Gorge in Greece in 2010 rehabilitated in the Hellenic Wildlife Hospital and released back on the same place in 2011 (Theodora Skartsi – pers. comm.) was present frequently at the feeding site in Kresna Gorge since 14.06.2012 and it is since then frequently present and formed pair in the area with B34-O and made a breeding attempt in 2016.

CSC – a Griffon Vulture ringed as a juvenile in the nest on 12.05.2015 on Cres Island in Croatia (Goran Susic pers. comm.) was present at the feeding site in Kresna Gorge on 24.05.2016.

S05 - 1 – a Griffon Vulture ringed as juvenile in the nest in Serbia (Sasha Marinkovich pers. comm.) was present at the feeding site in Kresna Gorge from 06.04.2016 to 19.06.2016. For one day it moved and was seen at the feeding site Vitachevo in Macedonia on 30.05.2016 (NCA Aquila - Emanuel Lischanets – pers. comm.).

S12 - 11 – a Griffon Vulture ringed as juvenile in the nest in Serbia (Sasha Marinkovich pers. comm.) was present at the feeding site in Kresna Gorge permanently from 28.03.2016 to 09.04.2016.

S27 - 16 – a Griffon Vulture ringed as juvenile in the nest on 06.06.2014 in Uvats colony in Serbia (Sasha Marinkovich pers. comm.) was present at the feeding site in Kresna Gorge permanently from 05.06.2015 to the end of December 2016 – it was permanently present in the area for year and a half now.

S?? - 17 – a Griffon Vulture ringed as juvenile in the nest in Serbia (Sasha Marinkovich pers. comm.) was present at the feeding site in Kresna Gorge from 26.03.2016 to 11.04.2016.

S?? - 28 – a Griffon Vulture ringed as juvenile in the nest (2015) in Serbia (Sasha Marinkovich pers. comm.) was present at the feeding site in Kresna Gorge on 19.04.2016, and also 26.09.2016 and 27.09.2016.

S42 - 29 – a Griffon Vulture ringed as juvenile in the nest (2015) in Serbia (Sasha Marinkovich pers. comm.) was present at the feeding site in Kresna Gorge from 04.11.2016 to 12.11.2016.

K3X – an immature Griffon Vulture released in the frame of LIFE08 NAT/BG/278 at Vrachanski Balkan Nature Park (Western Balkan Mts., Bulgaria) on 23.03.2014, was present at the feeding site in Kresna Gorge from 19.04.2015 and since then it is permanently present at the feeding and roosting site in area (last recorded late December 2016).

K5U – an immature Griffon Vulture released in March 2015 in the frame of LIFE08 NAT/BG/278 at Vrachanski Balkan Nature Park (Western Balkan Mts., Bulgaria) was present at the feeding site in Kresna Gorge on 01.10.2015 and since then it is permanently present at the feeding and roosting site in area (last recorded late December 2016).

K6F – an immature Griffon Vulture released in the frame of LIFE08 NAT/BG/278 at Vrachanski Balkan Nature Park (Western Balkan Mts., Bulgaria) was present at the feeding site in Kresna Gorge from 16.09.2015 and since then it is permanently present at the feeding and roosting site in area (last recorded late December 2016).

K9C – an immature Griffon Vulture released in 2015 in the frame of LIFE08 NAT/BG/278 from Central Balkan National Park, Bulgaria was present in Kresna Gorge on 02.04.2016.

B3A–B3A - a Griffon Vulture ringed as a juvenile in the nest (2016) in the Bulgarian part of Eastern Rhodope, marked by BSPB in the area of Madjarovo (BSPB – Volen Arkumarev and Stoycho Stoychev pers. comm.) was present at the feeding site in Kresna Gorge from 04.11.2016 and is still in the area until the end of the year (wintering).

B67-B67 - a Griffon Vulture ringed when was caught in the aviary in Kotlenska Planina, Bulgaria in May 2015 (Lachezar Bonchev/FWFF, Ivelin Ivanov/Green Balkans pers. comm.) was present at the feeding site in Kresna Gorge on 08.05.2016.

B2C – a juvenile Griffon Vulture fledged in 2016 from Vrachanski Balkan (the only marked naturally fledged chick from the area) arrived at the feeding site in Kresna Gorge on 04.11.2016 and was present until the end of the year (wintering).

P30 – a Griffon Vulture captured and marked in Israel in 2014 (O.Hatzofe – pers. comm.) was present at the feeding site in Kresna Gorge on 27.10.2016.

S33 - a Griffon Vulture ringed in Israel in October 2015 (as wintering or on passage bird, born 2015 - Ohad Hatzofe, pers. comm.) was present in Kresna Gorge from 24.05.2016 to 11.07.2016.

Griffon Vultures wild-caught and marked on passage in Kresna Gorge and their whereabouts

Attracted by the feeding site and the conspecifics into the aviary some wild Griffon Vultures that pass through during migration or spent some time in Kresna Gorge are entering the acclimatization aviary on their own. We use this opportunity to mark them and to try to establish their origin, or to learn more about their whereabouts. Since 2012 we marked 8 Griffon Vultures with wing-tags of which two were fitted also with GPS/GSM transmitters. Details for recoveries follow here:

X (left wing) – aged using molting pattern as bird born in 2013 was caught, marked and released on 10.01.2014. It was present in Kresna Gorge until the spring of 2015, when left the area, but has returned again in October 2015 and is frequently present until the end of the year 2016.

B94- 4 - aged using molting pattern as bird born in 2013 was caught, marked and released on 28.05.2014. First time observed after the release on 16.06.2014- Vrachanski Balkan (George Stoyanov- pers. comm.); 09.06.2015 – Studen kladenets (Marin Kurtev – pers.comm.); 08.07.2015 – Kotel (Lachezar Bonchev - FWFF); July 2015- Vrachanski Balkan (George Stoyanov- pers. comm.); 01.10.2015 in Kresna Gorge; 14.05.2016 – Eastern Rhodopes (BSPB – Volen Arkumarev); 18.09.2016- Vrachanski Balkan (George Stoyanov).

B95- 5 - aged using molting pattern as bird born in 2012 was caught, marked and released on 28.05.2014. On 01.06.2014 was observed at Demir Kapiya, FYROM (Metodiya Velevski- pers. comm.) together with other birds from Kresna Gorge, but which later returned; On 26.07.2014 returned to Kresna Gorge and was present all the time until 25.06.2015 –when was again observed at Demir Kapiya, FYROM (Bobi Delov- pers. comm.); 26.06.2015- Vitachevo Feeding site, FYROM (Emanuel Lisichanets- pers. comm.); in the early July 2015 returned to Kresna Gorge and is till present, while trying to breed with the male B17-M.

B2A - aged using molting pattern as bird born in 2014 was caught, marked and released on 22.07.2015. It was equipped with GPS/GSM transmitter. Less than a week after the release it moved to Eastern Rhodope. It is still there, while frequently moves from the Greek part of the mountain to the Bulgarian part along Arda River valley and back. In August 2016, the transmitter stopped working, while the bird was still in Eastern Rhodopes.

2X - aged using molting pattern as bird born in 2015 was caught, marked and released on 26.10.2015. This bird was photographed in Serbia in 2016.

X5 - aged using molting pattern as bird born in 2013 was caught, marked and released on 26.10.2015. This bird was photographed in FYR Macedonia and Greece (Kaymakchalan) in 2016, but also was frequently present in Kresna Gorge.

Other species

The Griffon Vultures presence and the feeding site became a reason for attraction and observations of other rare and threatened species in the area like White –tailed Sea Eagle *Haliaeetus albicilla*, two Egyptian Vultures *Neophron percnopterus* and an Eurasian Black Vultures *Aegypius monachus*.

Eurasian Black Vulture *Aegypius monachus*

An immature Eurasian Black Vulture (Figure 10 and 11) was observed and photographed on 03.06.2016 at the feeding site in Kresna Gorge. The bird was present in the area until 13.06.2016.

Figure 21 and 22. *Immature Eurasian Black Vulture in Kresna Gorge in June 2016.*

Egyptian Vulture *Neophron percnopterus*

Two subadult Egyptian Vultures were present and photographed at the feeding site in June 2016. The two birds kept together for few days around the feeding site. One of these remained in the area until 22.08.2016.

Figure 23. *Adult Egyptian Vultures in Kresna Gorge in July 2016. Picture by Hristo Peshev/FWFF.*

Figure 24 and 25. *Two different subadult Egyptian Vultures photographed in Kresna Gorge in July 2016.*

White-tailed Sea-eagle *Haliaeetus albicilla*

A White-tailed Sea-eagle was photographed at the feeding site in Kresna Gorge on 11.01.2016. It was feeding with a group of Griffon Vultures.

***Figure 26**. White –tailed Sea Eagle at the feeding site in Kresna Gorge, picture by Hristo Peshev/FWFF.*

Urgent Conservation actions

As such actions we recognize those providing an immediate effect and are not necessarily sustainable, but increasing the extinction time of a threatened species. Such actions may be implemented for endangered species to support them increase at least to a better conservation status or until any sustainable and long-term measures produce results. We recognize these to be feeding of vultures, to minimize dispersal and avoid poisoning. Nest guarding to ensure safe reproduction, brood management and captive birds release to increase recruitment, insulation of dangerous power-lines etc.

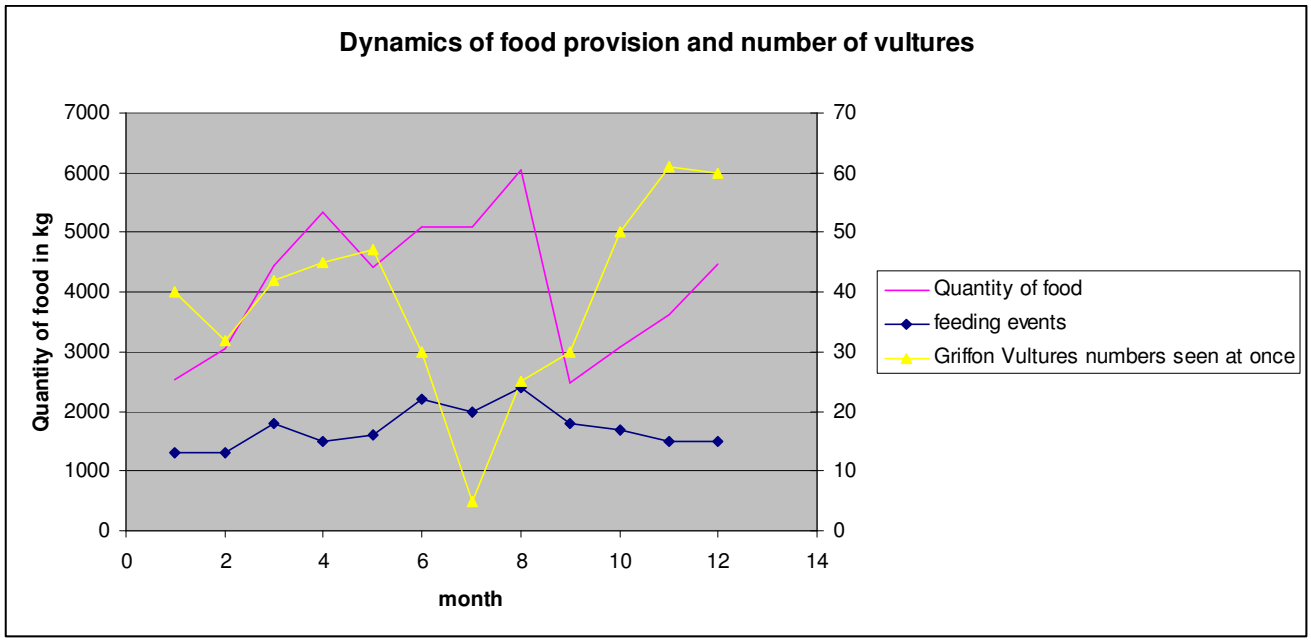
Feeding

In 2016 we continued to organize feeding of vultures at minimum 3 to 4 times per week (and every time upon availability of carcasses – sometimes up to 7 days a week). About 50 tons of carcasses were deposed in 206 events at the feeding site in 2016. This has proven to be the most important factor for attachment of the formed group released in 2012 and the new released birds in the period 2013 - 2016 in the area, as well as for the successful adaptation and survival of newly released birds. Corpses of dead animals collected in the villages around the Gorge were used to feed the vultures. The feeding site continues to work as official dump site for dead animals in the area. When larger animal corpse was available during the summer months, meat was preserved in a freezer and disposed in smaller quantities more frequently. In addition to the vultures' feeding Programme of FWFF, in minimum 29 cases we received reports about vultures feeding on carcasses elsewhere in the area of Kresna Gorge, or in the near-by Maleshevska or Pirin Mountains. Occasional foraging movements of small groups of vultures to the feeding site in the area of Vitachevo in FYR of Macedonia were also reported (Emanuel Lisichanets/ NCA Aquila, pers.comm.). In the table bellow could be seen the frequency and amounts of food deposited to the feeding site near the village of Rakitna in Kresna Gorge. Also the numbers of the vultures present in the area and the reported feeding events outside the feeding site.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	total
Feeding events	13	13	18	15	16	22	20	24	18	17	15	15	**206**
Amount of food in kg	2530	3040	4405	5305	4400	5080	5090	6055	2465	3070	3620	4460	**49520**
Vultures present	40	32	42	45	47	30	5	25	30	50	61	60	-
Other feeding events	1	1	1	1	2	4	6	5	3	2	1	2	**29**

Table 3. Number of feedings and amount of food provided by FWFF in Kresna Gorge in 2016..

On the graph bellow (Table 4.) could be seen, that the intensification of the feeding leads to increase of the number of vultures in the area. This is also true for the presence of other vulture and scavenger species like the Eurasian Black Vulture, Egyptian Vulture, White–tailed Sea Eagle and others. Not least, the permanent availability of food leads to repeated visits by vultures not native for Kresna Gorge and with the time their number increases.



Figures 27. Dynamics of feeding events and food quantity and vulture presence in Kresna Gorge in 2016.

Long-term Conservation Actions

As such actions we recognize those that not necessarily provide an immediate effect, but are sustainable and change the habitat and the local people attitude to better for the target species. Such actions rarely are regarded to a certain endangered species, which could be stated as *flagship species*, but more for its habitats and entire ecosystem.

Restoration of food source for vultures

The action for reintroduction of the Fallow deer in the area continues.

In 2016 three offspring were produced from three Fallow Deer hinds in the fenced sanctuary of FWFF. With two mture males transferred to newly established Game Reserve near Razlog, number of the Fallow Deer flock in the FWFF's Sanctuary in Kresna Gorge is now 15 (6 stags, 2 yearling males, 4 hinds and three offspring). Release will be started when the herd number reaches 50. This could be achieved sooner if some more animals are obtained from other breeding facilities.

FWFF continues to keep a herd of Rhodope Short Horn Cattle in Kresna Gorge. The herd is doing well and increasing. More and more farmers are now interested to start to raise this breed, while it proven very adaptable and good for the area (forage use and predators protection).

We analyzed the livestock data in the area and compared it to Eastern Rhodopes, where the number of livestock is the best for the vultures in the country.

Pirin/Kresna Gorge

Municipality	Area	ovine/caprine	Density of ovine/caprine per sq km	bovine	Density of bovine per sq km	equine	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**

Eastern Rhdopes

Total	3614	111548	30,87	68157	18,86	407	**49,84**

Table 4. Data for livestock number and density in Pirin/Kresna Gorge and comparison with the Eastern Rhodopes. Source VetIS December 2016.

Data from VetIS in the end of 2016. The data for the equines is not reliable, because the horses and donkeys are not ear-tagged (chipped) and thus do not occur in the data base. It is certain that the number of horses and donkeys is may be 10 to 20 times bigger than presented here. The data for sheep/goats and cattle is reliable. One can see that in the best area for the vultures in Bulgaria (Eastern Rhodopes), there are 30.87 sheep/goats per km², while in Pirin/Kresna Gorge this figure is very close by, with 27.33. However, there is a great difference in the density of cattle, where it is 18.86 animals per km² in Eastern Rhodopes and only 7.07 in Pirin/Kresna Gorge. So, there is some more space for the cattle number to rise in Pirin/Kresna Gorge. Probably this could be achieved with introduction of lighter breeds such as the autochthonous Bulgarian Grey and Rhodope Short Horn Cattle.

Against poison activities

The compensation programme and the public awareness activities are continuing in their full spectrum. It seem, however, that the feeding site operation in an area with permanent wolf presence is the most effective anti-poison tool. Maintaining permanent feeding sites for vultures in regions of sympatric presence with wolf is an irreplaceable conservation tool.

Overview

In 2016 we reached the next important threshold for establishment of a colony of the Griffon Vulture in Kresna Gorge – the successful reproduction. Two pairs bred successfully and their chicks fledged in 2016.

With the continuation of releases and successful reproduction into the wild, as well as the intensive feeding programme the group of Griffon Vultures in Kresna Gorge is enlarging smoothly. These factors are attracting more and more exogenous birds and the Kresna Gorge is now a host of more than 40 permanently occurring and 70-100 passing, wintering or summering Griffon Vultures. The Kresna Gorge is more and more playing the role of an important "stepping stone" site and a Vulture Safe Area for the vultures in this part of the Balkans.

The releases of immature Griffon Vultures should continue with at least 10 birds per year until natural colony is established and begin to produce by ten juveniles per year.

The formation of six-eight breeding pairs and successful reproduction of two of them are good signs for establishment of a colony of the species in Kresna Gorge.

The permanent feeding two to three times a week seems very important to fix the birds in the area and it should continue and may be some municipal and state authorities could also be involved in feeding sites maintenance (e.g. Municipality of Simitli, Municipality of Kresna, Pirin National Park, Rila National Park, Rila Monastery Nature Park etc.).

The continuing spontaneous return of the Eurasian Black Vulture should be boosted with starting releases of captive bred and/or rehabilitated birds in Kresna Gorge as soon as possible

. A new LIFE project that is aiming the reintroduction of Black Vulture on three sites in Bulgaria has been approved in 2015 and its implementation started. Within this project "Bright future for the Black Vulture in Bulgaria" LIFE14 NAT/BG/649 it is planned Black Vultures imported from Extremadura, Spain to be released from 2018 onwards in two places in Balkan Mountain and Kresna Gorge.

As much as possible 20 kV power-line pylons should be safeguarded for birds in Kresna Gorge. The Electricity companies should be encouraged to take action on their own.

The actions for establishment of wild population of Fallow deer and establishment of extensive raised sheep and cattle herds should continue.

Feeding sites in the high mountain areas of Rila and Pirin National Parks should be established, as these areas are obviously preferred by the vultures in summer, and lesser risk of poisoning or electrocution exists there.

The poisoning is still hard to control along Struma Valley and this will obviously always be the case until people and predators share the same habitat. Thus feeding of vultures on traditional feeding sites still is a must, while any measures for minimizing the poison baits use are underway as permanent and long-term measures.

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FWFF is one of the associated beneficiaries, that is in charge with the actions in Kresna Gorge and Kotlenska Planina (Kotel Mountain). The other associated beneficiaries within the Project are Vulture Conservation Foundation (VCF), Junta de Extramadura and EuroNatur.

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References

IEZEKIEL S., B. WOODLY, O. HATZOFE. 2003. Cage trap for *Gyps fulvus*. Vulture News No.49/ Sept. 2003. VSG. Endangered Wildlife Trust. South Africa.

STOYNOV E., PESHEV H. 2011. Re-introduction of Griffon Vulture (*Gyps fulvus*) in Kresna Gorge of Struma River, Bulgaria, Annual Report 2010**,** *Fund for Wild Flora and Fauna, Blagoevgrad.* **http://www.fwff.org/programs-2/welcome-back-home-2010-2020-decade-of-reintroduction-of-localy-extinct-species-in-bulgaria/griffon-vulture-reintroduction-in-kresna-gorge/**

STOYNOV E., PESHEV H. 2012. Re-introduction of Griffon Vulture (*Gyps fulvus*) in Kresna Gorge of Struma River, Bulgaria, Annual Report 2011**,** *Fund for Wild Flora and Fauna, Blagoevgrad.*

STOYNOV E., PESHEV H. 2013. Re-introduction of Griffon Vulture (*Gyps fulvus*) in Kresna Gorge of Struma River, Bulgaria, Annual Report 2012**,** *Fund for Wild Flora and Fauna, Blagoevgrad.*

STOYNOV, E. & PESHEV, H. 2014. Re-introduction of Griffon Vulture *Gyps fulvus* in Kresna Gorge of Struma River, Bulgaria, Annual Report 2013**,** Fund for Wild Flora and Fauna, Blagoevgrad.

ZUBEROGOITIA I., J. DE LA PUENTE, J. ELORRIAGA, R. ALONSO, L. PALOMARES, J. E. MARTINEZ. 2013. The flight feather molt of Griffon Vultures (*Gyps fulvus*) and associated biological consequences. The Raptor Research Foundation, Journal Raptor Research. 47(3):292–303