Renewal of the Project

Return of the griffon vulture *Gyps fulvus* to Stara Planina

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Project implementing institutions:
Institute for Biological Research “Siniša Stanković,“
Institute for Nature Conservation of Serbia,
SRP Uvac, SRP Klisura Trešnjice,
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1. INTRODUCTION

The abrupt disappearing of an increasing number of species and entire communities points at a need to protect biodiversity as a priority in environmental protection. Most of the species we call endangered nowadays will vanish over the following decades. The global process of disappearance of a large number of species has led to the passing of conventions which regulate the protection of endangered species at an international level. It is not necessary for all those species and their communities to cease to exist in order for the human society to develop and for this reason the conservationist ideology of "ecologists" is getting more and more support. Some species may be preserved and even reintroduced in the areas from which they have disappeared. Economically important species have greater chances to be the first ones to be preserved and brought back to the places from which they have vanished.

Among animals, most of the bird species are disappearing, with the birds of prey being the most endangered one. Within this broad group, the most endangered is the group of vultures. It is estimated that more than a half of the 23 species living today will disappear by the end of this decade. Out of four species of eagle vultures, in Serbia we have managed to preserve only the griffon vulture. We succeeded in this by applying protection measures on which the griffon vulture depends today. The species that were not this lucky have vanished from the territory of Serbia: the black vulture *Aegypius monachus*, the bearded vulture *Gypaetus barbatus* and the Egyptian vulture *Neophron percnopterus*. A wrong attitude and ignorance about the importance and role of these birds in nature have impacted our careless approach to them and their abrupt disappearance. Control of the griffon vulture has made it possible for us to manage its population.

The Institute for Biological Research "Siniša Stanković" has initiated a programme of measures for the reintroduction of the griffon vulture on Stara Planina (a mountain in Serbia) where this species disappeared around the middle of the 20th century. The Institute for Nature Conservation of Serbia stopped the activities related to the programme of the griffon vulture translocation to eastern Serbia (03 no. 97/4- 20.5.2013) on account of apparently small numbers of the endangered population. The Ministry for Agriculture and Environmental Protection of Serbia approved the translocation of the griffon vulture to Trebinje on 7 April 2015 (no. 353-01-1394/2014-17.) within the programme "The return of the griffon vulture *Gyps fulvus* to Popovo Polje." The programme for the translocation of the griffon vulture to Popovo polje is co-financed by the Institute for the Protection of Cultural, Historic and Natural Heritage of the Republic of Srpska (contract no.: 07/1/692-102/10). With the change in the position of the Institute for Nature Conservation of Serbia and the positive opinion regarding the translocation of the griffon vulture to Trebinje for the needs of the programme related to its reintroduction in the Republic of Srpska, the reasons for not implementing the programme for the return of the griffon vulture to Stara Planina have been annulled. This is why we are renewing the programme for the reintroduction of the griffon vulture to Stara Planina.

2. BACKGROUND

The Fund for Nature Conservation of Serbia, with the project "Monitoring of the griffon vulture *Gyps fulvus* in Serbia," (contract no.: 401-00-119/2007-01/1) has introduced contemporary standards for controlling and managing the griffon vulture population. The Institute for Biological Research "Siniša Stanković" proposed a programme for protection measures which has stopped further deterioration of this species and created conditions for its reintroduction in eastern Serbia. By introducing the standards and population control, the griffon vulture flock has increased 12-fold and has filled up the environmental capacities of western Serbia.

The monitoring of marked individual griffon vultures, using wing markers and satellite transmitters, has shown that the griffon vulture migrations from Uvac towards Greece and further to Israel go along the valley of the Nišava river. These researches confirm justifiability and possibility of returning this species to Stara Planina which is located on the migration route. The flock of around 500 birds that has concentrated at Uvac cannot conquer new space itself, but rather it stays there as a whole, which limits any further growth of the population. By applying a translocation programme, we would enable a return of the griffon vulture to eastern Serbia and a continuation of unhindered population growth of this endangered species.

Nowadays, the griffon vulture cannot spontaneously conquer the areas in eastern Serbia from which it has withdrawn, so we have to help it and bring it back to Stara Planina. Stara Planina was declared the area of exceptional characteristics, "Park prirode" (Nature Park), in 1997 with a strategic goal to protect natural values and develop eastern Serbia.

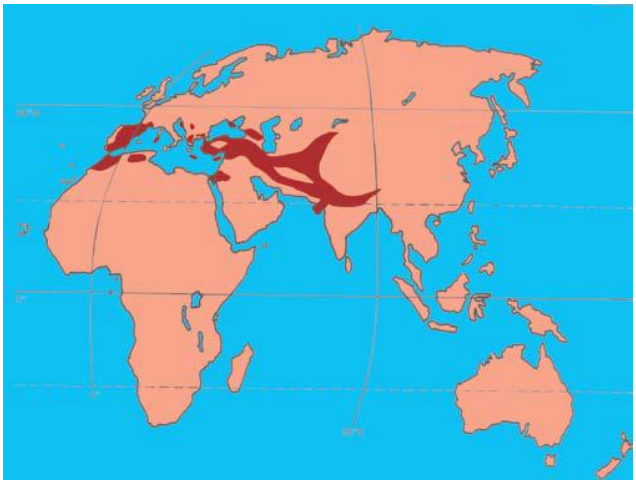
Double-headed griffon vulture in the Nemanides coat-of-arms, Žiča monastery, 1207 - 1218

The griffon vulture is a large and striking bird of prey which with its specific flight has been catching the attention of observers and has awoken inspiration for generations. The legendary bird has had a strong impact on the development of human society and it has been a part of the cultural heritage of ancient peoples and empires throughout the history of civilization. The griffon vulture is a mythical bird, a part of the collective memory of medieval Serbia and we encounter it in the coat-of-arms of the Mrnjavčević, Nemanides, Lazarević and Crnojević dynasties. This exceptional species helps draw the attention of the public to the need to preserve biodiversity and it is often mentioned as an attribute of local communities. Even nowadays, in some parts of Serbia, there are beliefs that the griffon vulture has supernatural powers.

The programmes for the protection of the griffon vulture have had a significant impact on the building of awareness of the need to personally engage in the protection of endangered species. The return of this species to the pastures of Stara Planina, in addition to an ecological importance, also has a specific aesthetic significance and it creates a new quality in our relation towards the nature in which we live. The griffon vulture is an important species for eco-tourism and it enriches and broadens the tourist offer of rural communities.

3. CONTEMPORARY STATUS OF THE GRIFFON VULTURE AND THE DEGREE OF PROTECTION

In the case of the griffon vulture, there is a pronounced geographic variability and it is present in two subspecies. One of them, *G.f.fulvus*, inhabits the subtropical climate belt, the area of the ancient Mediterranean, and it nests between the 29th and 45th degree of the northern latitude, that is, from 10th degree of the west longitude to the 90th degree of the east longitude, in other words, from the Maghreb countries in the west to the Himalayas in the east. The other subspecies, *G.f.fulviscens*, inhabits the Oriental area of the Indian subcontinent from Afghanistan to Siam. It is an endangered species in the entire areal it covers and in the Asian and African sections of the areal it is facing complete eradication.



Griffon vulture's areal

On the Iberian Peninsula, there are ancient numbers of the griffon vulture, such as there used to be in the rest of the areal. Although the Iberian Peninsula is approximately the same size as the Balkan Peninsula, a certain harmony in nomadic livestock breeding has been preserved there, which has caused the numerous population of the griffon vulture. Over 80% of the European population of this species nests in Spain. The griffon vulture withdrew from the Apennine Peninsula in the 17th century, while it managed to stay on Sicily until the 19th century. There are small isolated populations that have survived on the islands of Sardinia and Cyprus, while the island of Crete has a large population. It withdrew from the Alpine parts of Europe in the 19th century.

As far as the Balkan Peninsula is concerned, a small population of 650 couples has persevered. Around 60 couples nest on the Kvarner islands in Croatia. The griffon vulture withdrew from Bosnia and Herzegovina with the onset of the 1992 war. A part of this flock was attracted by the feeding ground at Uvac and in 1995 it also settled in the Mileševka gorge. The griffon vulture withdrew from Montenegro already at the beginning of the 20th century. In Albania it has vanished, while in Macedonia it is deteriorating rapidly and there are now a dozen couples in the south of the country. In Bulgaria, there are 60 nesting couples, in the eastern Rhodope mountains. Greece has marked a 40% decline in the number of birds over the past decade and it is estimated that there are around 30 couples left, excluding the island of Crete. On the island of Crete there are around 150 couples, but they are separated from the remaining continental part of the population due to the large distance between the island and the mainland. In Romania, the griffon vulture species has disappeared. The last nesting was recorded in the Djerdap Gorge in 1956 and this was on the territory of Serbia (this Danube gorge constitutes the border between the two countries).

In the 19th century, the griffon vulture was a numerous and common species that could be encountered throughout the entire territory of Serbia. Recognized colonies in eastern Serbia existed in the Sićevo Gorge, Svrljig Timok Gorge, Jerma Gorge and Vidlič Rock on mountain Stara Planina. The last nesting of the griffon vulture at Vidlič was recorded in 1948, while the last chick from a nest in the Sićevo Gorge was taken in 1958 for the needs of the Belgrade Zoo.

In Europe, the programmes for the return of the griffon vulture started at the beginning of the 1980's and they have shown good results in the south mountain massif Cévennes in France. Successful reintroduction of the griffon vulture in France shows that the return of this species to the Balkan Peninsula is a matter of time. Today, there are several programmes for the return of this vanished species to the Alps mountain massif (Switzerland, Austria and Italy). On the Apennine Peninsula, in the National Park of Abruzzo and on the island of Sicily, programmes for the reintroduction of the griffon vulture have also been initiated. In addition to the programme dealing with the return of the griffon vulture to Stara Planina, there is also a programme for its return to Bosnia and Herzegovina, and Bulgaria. Inspired by the success in France, the European organization Vulture Conservation Foundation has initiated programmes for the replacement of the ancient population from Serbia by introducing griffon vultures from Spain to Bulgaria. The programme started in 2004, but has not provided the desired

results to date. In Serbia there is a resident vital population that has gotten adjusted to and harmonized with the environmental conditions and it is logical that the griffon vulture returns to the Balkans from this population. The Spanish griffon vulture from the Mediterranean is not adjusted to the harsh Balkan environmental conditions with snowy and cold winters, and the only solution that may ensure the return of griffon vultures is proliferation of the resident population from Serbia which is the essence of this project.

The griffon vulture is a species listed in Annex II of the CITES and it represents a very susceptible species which depends on protection measures. The Bern and the Bonn Conventions classify it into Annex II. The griffon vulture is also in the Global IUCN Red List (IUCN, 2007), European IUCN Red List (BirdLife, 2004) and the European Treat Status (BirdLife, 2004) as an endangered species. The SPEC (Species of European Conservation Concern) (BirdLife, 2004) has classified the griffon vulture into the third category of endangered species, while the EU Birds Directive (Council of Europe, 1979) classifies it into Appendix I of endangered species in Europe. An Action Plan has been developed for the reintroduction of this species in the abandoned areas of the Balkans (2004), which recommends development of programmes for the reintroduction of the griffon vulture, as well as of other vulture species, in the Balkans and opening of feeding grounds that would link active nesting areas.

International organizations have started a number of initiatives for improving standards in the application of protection measures, including agreements and conventions which Serbia has accepted even ratifying some of them. The Convention on Biodiversity Protection was ratified by Serbia in 2002. It provides for the opening of *ex-situ* centres for the implementation of standards in the work with strictly protected species and for increasing the chances for survival of endangered species. One such ex- situ spot was opened at SRP Uvac in 2008 and this programme also provides for the opening of another one on Stara Planina. The return and survival of disappeared vulture species and their monitoring is a part of the international “Balkan Vulture Action Plan.”

4. PROJECT GOAL

1. Development of the protected area of the Stara Planina Nature Park and eastern Serbia, creating of conditions for the return of disappeared bird of prey species to Serbia.

2. Introduction of European standards in the protection of endangered species and expert management of protected areas.

3. Setting up a DNA database for the endangered bird of prey species of Serbia. Introducing a protocol in the work with endangered species, their care and keeping. Engaging zoos and creating conditions for the *ex-situ* work related to the protection of endangered species in the protected areas of Serbia.

4. Developing educational materials and creating a need among the citizens to protect the biodiversity. Popularization of protection and of the areas in which it is being implemented.

5. Linking the Balkan populations of the griffon vulture and creating conditions for the return of the vulture species that have disappeared from Serbia. Cooperation on the monitoring and reintroduction programmes for the disappeared vulture species in the Balkans. Establishing links among national parks, nature reserves and protected areas, and opening up of a corridor equipped with feeding grounds along the migration route through Serbia.

Poster made for the international gathering “Return of Vultures to the Balkans,” Uvac, 7 September 2013

5. REASONS FOR THE EXTINCTION OF THE GRIFFON VULTURE IN EASTERN SERBIA

Around the middle of the 20th century, the griffon vulture was a frequent bird in eastern Serbia. Through their diet, griffon vultures are linked at 95% to dead livestock, primarily cattle and sheep. Herds of domestic ruminants used to graze along natural nomadic routes, which beforehand had been used by wide ruminants that had disappeared from the Balkans during the Antiquity. In summers, the herds used to be taken up for grazing on the high mountain pastures of Stara Planina, while in winter shepherds would take them down to lowlands. Parallel to the disappearance of wild ruminants, the griffon vulture adjusted to the feeding on bred ruminants and equines, and it has linked its destiny to the processes in livestock breeding. The significant sanitary role of the griffon vulture in preventing proliferation of diseases by removing dead cattle has been respected among animal keepers.

Famous Serbian geographer and ethnologist Jovan Cvijić stated that nomadic livestock breeding in Serbia had started to wane after the departure of the Ottoman Empire and the division of the territory into smaller states. Following the Balkan Wars (1912–1913), these obstacles led to an interruption in the nomadic routes that on the territory of Serbia and the central Balkans used to be as much as 500 km long, linking the mountain range Prokletije with the Sutla valley in Slovenia and Šar Planina with the lowlands around Thessaloniki. The nomadic herdsmen have stopped moving with their herds. They have settled at lower altitudes, going from 600 m to 800 m a.s.l. and the herds have been taken to mountains only in summer. The cattle has no longer been taken down to valleys in winter, but has been kept in stables and fed with hay. The changes in livestock breeding have directly reflected on the availability of food for griffon vultures during the winter period. In winter, the livestock has been kept in barns and has been unavailable to the cleaners of nature. Veterinary measures have also imposed mandatory destroying of dead animals, which has additionally influenced the disappearance of this species.

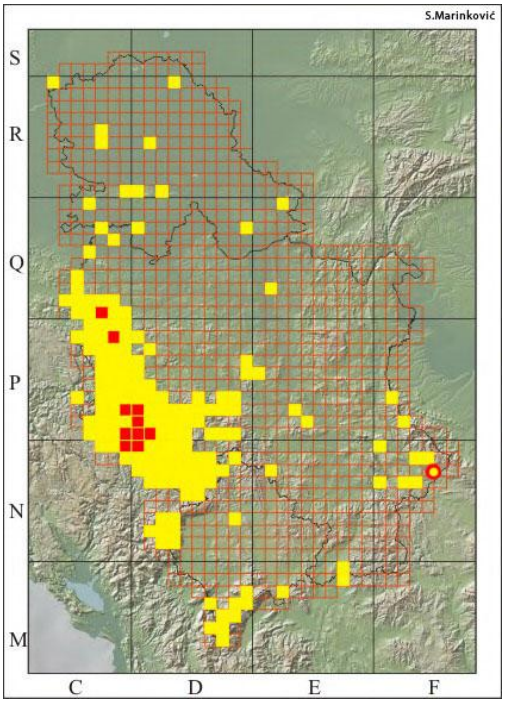
Hunting didn't use to have a decisive impact on this species, since the local population has respected the griffon vulture for the sanitary role it has played in nature and it has been considered a useful species and declared the protector of herdsmen and shepherds, in other words it was seen as a semi-divine bird. After WWII, hunting societies started to carry out a systematic action of killing "pests" at hunting grounds, by placing poisonous baits for wolves, jackals, dogs and foxes. Wolves and foxes are primarily hunters and they are not efficient at locating dead animals, that is, the poisonous baits, like griffon vultures are. These actions were conducted for two decades and they exterminated the griffon vulture in eastern Serbia. Within the scope of these actions, carried out only in 1959, 700 griffon vultures were killed, in other words, more griffon vultures than there are in Serbia today. Within a matter of a couple of years the actions of placing poisonous baits exterminated the black vulture and the bearded vulture that anyway do not reach the numbers of the griffon vulture. Despite the fact that there are conditions for the survival of the griffon vulture in eastern Serbia, this species is not capable of returning to the abandoned area itself. The programme proposes measures required for the return of the griffon vulture to Stara Planina and its spontaneous proliferation throughout eastern Serbia.

6. SELECTION OF THE LOCATION

"Park prirode" Stara Planina (Stara Planina "Nature Park") is a strategically designated area as a haven for the protection of endangered species, development of tourism and creating an offer that would attract people to go back to the mostly uninhabited areas. The griffon vulture is a symbol of protection of endangered species in Europe and it is an important species for the development of eco-tourism. In western Serbia, we have a control over a vital population of the griffon vulture whose further growth is limited by the filled-up capacities of the setting. By transferring the griffon vulture to eastern Serbia where it disappeared almost 70 years ago, we are bringing the lost values of this area back to life. The griffon vulture monitoring programme, financed by the Fund for Environmental Protection of Serbia, has built up an infrastructure at the Uvac Reserve earmarked for support in the implementation of the griffon vulture translocation programme.

Canyon habitats are the places of nesting of the griffon vulture. The nesting of the griffon vulture in the Djerdap Gorge (the Danube) has been recorded in literature since the 19th century. Together with the colonies in the gorges of the Cerna and the Nera in Romania, these are the most northern colonies for this Mediterranean species. Through their feeding, these colonies have been linked to the Pannonian and Wallachian plains during winter times, while in summer they have been used to fly to the Carpathian Mountains in Romania searching for herds. The nesting grounds used to be located on the sunny Romanian side which is suitable for nesting and any released birds would nest there, rather than in Serbia. In the last decades there has been no recorded flight of the griffon vulture in the Đerdap Gorge and the difficult monitoring circumstances and impossibility to monitor introduced individuals owing to the border area (border between Serbia and Romania) have made us give up this region.

The decades-long monitoring of the griffon vulture in Serbia has depicted the route which this species follows during its seasonal migrations to the colonies in Greece and Bulgaria, thus bringing together its fragmented areal in the Balkans. The route goes along the edges of the Ibar Gorge and the valleys of the Zapadna Morava and Nišava. This direction is active today as well and on the basis of monitoring marked griffon vultures from Uvac we can assess that it is used quite intensively. The migratory part of the griffon vulture population which consists of 46% of young birds engages in these flights every year, going to Greece and Bulgaria, while 18% go as far as Israel and even farther. Along this migratory route, there is a large probability that any introduced birds would soon adapt and mix with the wild population passing along this corridor. In the Sićevo Gorge, the griffon vulture used to nest until 1959, but this narrow passageway is also attractive for the road transportation routes. The European road and railway corridor which links Europe and Asia passes through the Sićevo Gorge, which decreases the chances for any successful reintroduction of the griffon vulture. The quarries at the entrance to and exit from the Sićevo Gorge have discouraged any planning of the reintroduction in these sections.



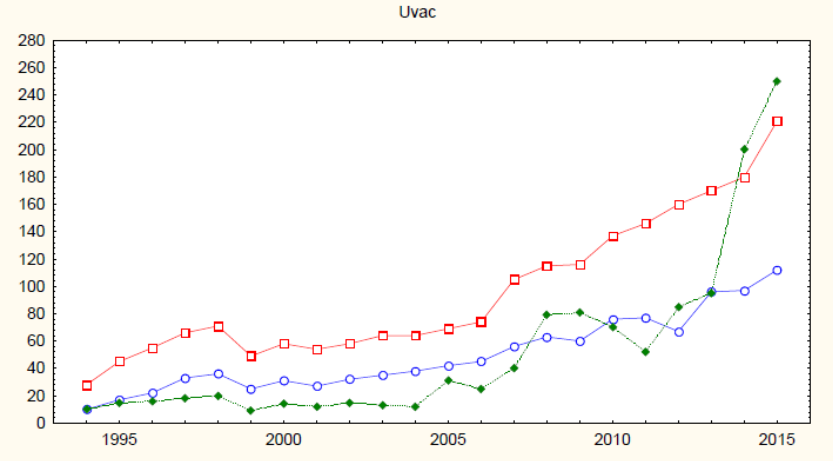
The griffon vulture in Serbia in the past 30 years. The colonies are marked by red squares and the observation points by yellow squares.

The rocks of Stara Planina consist of serpentine which is not suitable for the nesting of the griffon vulture, with exception of the south lime ridge, Vidlič, where the griffon vulture was recorded nesting in 1948. The rock at Mečja Glava above village Rsovac, as well as the gorge of the Visočica river "Vladikine ploče," constitutes a historic nesting site for this species. Old villagers remember these birds, when as children they used to herd sheep on Stara Planina. When renewing the areal, the griffon vulture unmistakably inhabits its former nesting sites and even the same nests. The Egyptian vulture and the bearded vulture used to nest at Vidlič which makes it possible that a programme of reintroduction of disappeared species is developed for these species as well. The black vulture, which is seen more and more frequently in Serbia, also migrates with griffon vultures along the same corridors. The European programme for the establishing of the black vulture in Bulgaria is being prepared for the reintroduction of the species from 2017 and therefore with a griffon vulture colony on Stara Planina this would enable its return to Serbia, as well.

7. JUSTIFIABILITY OF THE PROJECT IMPLEMENTATION

There are dozens of griffon vultures flying every year over Stara Planina either on their way to the Middle East or when flying back. Together with griffon vultures, this migration route is also used by black vultures, a species that has stopped nesting in Serbia. It is necessary to provide conditions in order

for griffon vultures to be able to use this space. The decades-long demographic monitoring of the griffon vulture populations has enabled us to manage this species, as well as its resettlement. Changes in livestock husbandry have a direct impact on the possibility to provide food for the griffon vulture which is fully dependent on livestock breeding. The link that ties griffon vultures to livestock breeding allows us to manage successfully its numbers and distribution. With the applied protection measures, the population has propagated in an unhindered manner depending on the capacities of the habitat. Feeding grounds for depositing dead cattle provide additional food especially during the critical winter period, while in summer months, the birds may also get additional food here while carrying out their sanitary role on the pastures of Stara Planina.



Changes in the numbers of griffon vulture couples (red) and chicks (blue) in Serbia and tons of food (green) delivered to the feeding grounds.

Spontaneous renewal of the griffon vulture population goes slowly and it takes a whole century provided the conditions remain unchanged. A female griffon vulture lays only one egg, as there are no natural enemies and this is sufficient for a natural reproduction of the species. Over their life span, a couple raises 10 to 15 chicks. The fragmentation of the habitat, poisonings, transmission lines, inundating of canyons, opening of quarries and other factors have increased mortality to the limits of survival. Increasingly more numerous plans to build wind farms constitute an additional threat that diminishes any chances for this species to renew its previous areal in eastern Serbia spontaneously.

An increase in the numbers of the griffon vulture in Serbia is a consequence of the implementation of a protection measures programme. The flock that has been developed at Uvac constitutes a necessary resource for the reintroduction of the griffon vulture on Stara Planina, as well as in other areas of the Balkans. A minimal number from the natural population is used for the implementation of the programme, without any significant impact on its overall numbers. An increased competition at the feeding ground prevents some twenty couples annually to nest at Uvac owing to the

filled up capacities of the environment and therefore relocation of them would enable further unhindered growth of the species.

The griffon vulture is a species that has an economic significance for the development of local communities. Creating of new types of offer in protected areas allows for the involvement of the local population in the development of sustainable eco-tourism. Surveys conducted in Pirot and Niš show that local residents almost unanimously support the idea of the reintroduction of the griffon vulture to Stara Planina. The support of Municipality Pirot, the manager of the protected area "Srbijašume" and businessmen from eastern Serbia fully justifies the initiating of this programme.

8. PROJECT STRUCTURE AND CONTENTS

1. Education of the local population and raising of awareness of the importance of reintroduction of the griffon vulture to Stara Planina.

2. Setting up of the "Centre for the reintroduction of the griffon vulture" in Rsovci.

3. Setting up of the feeding ground for griffon vultures on Stara Planina.

4. Reintroduction of the griffon vulture and monitoring of the introduced individuals.

1. Education and raising of awareness of the need and importance of reintroduction of the griffon vulture to Stara Planina

The campaign for getting the attention of the public as regards the idea of returning the griffon vulture to Stara Planina has been going on since the onset of the programme in 2009. We have organized a number of lectures and debates, and we have printed visibility material, posters, books and leaflets, in addition to which we have also made films with the aim to win over the public for the programme of reintroduction of the griffon vulture to Stara Planina. According to the surveys conducted in Pirot and Niš, the citizens are in favour of the return of the griffon vulture to Stara Planina and 86% consider that it is beneficial for the entire region and that it will help develop tourism, as has been the case at the Uvac Reserve. A petition has been initiated for the support of the citizens and so far a thousand individuals have signed it at the address www.vulture.org.rs. We have had contacts with potential sponsors of this programme, as well as interested organizations and citizens from the area in which the programme is being implemented, such as Pirot, Knjaževac and Niš.

The educational contents of the griffon vulture translocation programme are implemented through all the phases of the programme and they would continue as an offer for the visitors to the protected area also after the implementation of the programme. The goal is that everybody, even those individuals who are not particularly interested, has information about the programme and that they are aware that somebody cares and invests assets into the protection of these birds.

Creating a need among the citizens to recognize for themselves the natural values of their own environment and to preserve them as their own constitutes a part of the translocation programme. We are going to start a campaign against the use of poisons in nature, for this was the main reason why this species disappeared from eastern Serbia in the first place. We are going to ensure both the training and the linking of local associations which would over time take on a part of the activities. The support from the RTS (Radio-Television of Serbia), TV Pirot and local media makes it possible to inform the local population and opens up a possibility of their involvement and giving their personal contribution to the programme for the return of the griffon vulture. After the implementation of the programme, the plan is to open a visitors' centre at the ethno-places Rsovci and Slavinja where visitors could get information, promotional and educational materials emphasizing the values of the Stara Planina Nature Reserve.

A poster for the promotion of the programme.

A part of the activities also includes organization of schools in nature, engaging of university and secondary school students in summer camps within the programme of volunteers who would monitor the birds in nature. The griffon vulture is an exceptional species which creates a need in people to have a harmonious relation with nature. Educational programmes basically promote development of traditional livestock breeding on Stara Planina by pointing out its natural values. The idea has been proposed to the

European programme for sustainable development and use of low intensity livestock breeding as renewable resources of organic food production.

A leaflet distributed to local residents printed in 2500 copies.

2. Organizing of the “Centre for the reintroduction of the griffon vulture” in Rsovci

For the implementation of the programme it is necessary to set up an aviarium and organize a Centre for Reintroduction with the help of donations coming from business companies in Municipality Pirot, participation of the Administrator of the protected area and support of the Ministry of Agriculture and Environmental Protection or the Green Fund which Serbia is obliged to set up. A plot of land which is situated close to the monastery of St. George has been ceded to Municipality Pirot for the implementation of the programme. The Centre at Stara Planina would include a cage with the floor area of 375 m^2, with dimensions of 25 m x 15 m, and with a height of 3-4 m. The aviarium would have a light construction, soil base and it would be made of wire with covered north wall which would protect the birds from rain and bad weather. The aviarium would have an orientation towards the feeding ground and the rocks where nesting was historically recorded. In the direct proximity of the cage, there would be a container where the necessary equipment for work would be placed, as well as a freezer and a CCTV system that would be connected by internet. The site is very close to the Pirot - Visočka Ržana road, that is, at the entrance into the Rsovac village and it has all the necessary conditions and infrastructural possibilities.

For the feeding of the birds, we would be using dead livestock out of the natural mortality from the nearby farms. The daily food needs of a griffon vulture are 450 grams, that is, for a 10 bird strong flock, it would suffice less than 5 kg a day, which would amount to 1.5 t a year. A smaller capacity cooling facility would ensure availability of regular food supply. The birds would be under regular veterinary supervision and control of the associates working on the programme.

Youngsters at a rest point after their first flight, Uvac

3. Organizing of the feeding ground for griffon vultures on Stara Planina

Functioning of the feeding ground for griffon vultures is a part of the project of the Institute for Nature Conservation of Serbia. According to the programme, three feeding grounds have been opened: Bela Palanka, Rsovci and Dimitovgrad, but they are not functioning. To start with, it would be enough to make one of them functional and later develop more feeding grounds along the route followed by griffon vultures on their way from Uvac to the Middle East.

A European programme has been initiated that would link together all the corridors for the return of vultures to the Balkans by opening feeding grounds in the protected areas that are located along these routes. For the needs of the griffon vulture reintroduction programme, it is necessary to establish a feeding ground before releasing the first birds in the nature, usually in the winter period, when the attracting of the birds is most significant. In cooperation with veterinary services and slaughter-houses, it is necessary to ensure supplying of food to the feeding ground at the level of 5-8 tons a year. The functioning of the feeding ground and the proliferation of this protection measure in eastern Serbia would be planned in accordance with the griffon vulture reintroduction programme. Feeding grounds as the sites for the gathering up of birds are important for monitoring and development, and for the bird-watching tourism. Organization of photo-safaris, as an attraction of the protected area, could be offered to tourists.

According to the European legislation, it is recommended to open feeding grounds in the areas where necrophagous species live. The recycling of the slaughter-house waste and exposing of the livestock natural mortality in the places specifically provided for such purposes and accessible to the birds does not require any major financial investment, while providing earnings in livestock breeding. Incineration of 1 t of organic waste costs 96 euros and its consequence is pollution of the environment by gases. Only in Spain, 9.8 million tons are recycled annually by using griffon vultures as the cleaners of nature.

By opening feeding grounds we are bringing harmony back into the natural processes that have been taking place for thousands of years. The feeding ground at Vidlič represents an important point on the griffon vultures' migration route. The birds find the feeding ground by observing the behaviour of other birds, griffon vultures or ravens. With the lifting up of griffon vultures on the morning thermals, from Vidlič to the heights that go from 2500 m to 3000 m, the birds would be visible at large distances, which would be a sign for other migrating griffon vultures that they can find food there. It was in this way that the Uvac Reserve attracted birds from the Balkans and there is no reason why this should not be repeated on Stara Planina.

Poster marking an anniversary of the griffon vulture protection in 2014

4. Reintroduction of the griffon vulture and monitoring of the introduced individual birds

The introducing of birds into new space allows for further unhindered growth of the griffon vulture population in Serbia. The griffon vulture lives in communities (colonies) within which it meets all of its life needs and has very developed social behaviour. All the birds within the flocks recognize one another and they build mutual hierarchical relations. Griffon vultures collectively scrutinize areas looking for food because it is the only efficient way for finding dead animals. For this reason it is necessary before releasing the birds to set up a society in which the birds would get to know one another and build mutual relations. Individual birds do not stand a great chance to survive in nature. For the reintroduction we would use birds from the natural population and in this way we would reduce a fierce competition that is present in the colony at Uvac.

It is justifiable to use individual birds that have hatched in captivity if there is no available natural population or if their numbers in nature is below a critical limit required for its survival. Reproducing of individual birds in captivity and their reintroduction into nature would include into programmes for the protection of endangered species the Belgrade Zoo and the Palić Zoo, and later also other zoos that could use their reproduction in cages. In this way, we would manage to upgrade the mandatory standards in the work with endangered species (*ex-situ*). The birds hatched in captivity have a reduced adaptive capability to survive in nature, but the protection (*ex-situ*) is the only way for the species that we no longer have in nature such as the Egyptian vulture, the black vulture or the bearded vulture. The zoos could also help the species whose numbers are so low that each individual has a major significance for their survival, such as the eastern imperial eagle, *Aquila heliaca*, or the saker falcon, *Falco cherrug*, in

Serbia. The zoos should develop programmes for the reproduction of endangered species, thus playing a positive role in the society and justifying their *raison d'être*. The involvement of zoos also has an educational importance and this helps win over public opinion required for the support to the programme of reintroducing disappeared species.

When setting up a flock which we are bringing into a new environment, we must make sure that the sexes are well balanced and that the flock comprises birds of different age, including also dominant alpha individuals that lead the flock. Establishing of molecular monitoring is required for creating a flock intended for a resettlement. Through the researches conducted so far, we have collected an abundant database which is deposited at the laboratory of the Institute for Biological Research "Siniša Stanković". This database of samples allows us to plan and monitor introduced individual birds.

Around 46% of young birds, up to three years of age, have a pronounced wandering instinct and it is to be expected that these birds immediately leave the area in which they have been released which disqualifies them for the reintroduction programme. Still, the birds that fly away from Stara Planina will go back to Uvac, so they would not be lost for the griffon vulture population in Serbia. The set up couples and older youngsters are not migratory and they do not undertake wandering from the place in which they have been released, but rather stay locally, which enables a control of the birds and their bonding to the envisaged area.

The flocks set up in a cage would be released into nature successively in spring, a more favourable part of the year, over a period of 5 years. All the birds would be marked by visible markers in order to be able to monitor their further destiny. The flock would consist of 6 to 12 birds and the procedure would be repeated 3 to 4 times until a colony has been created and an integration of the introduced individuals with the wild population has been recorded.

Individual dominant birds within the flock would carry a satellite platform which would enable monitoring of the flock in real time and a possibility of intervention in case of any unforeseen events.

By standardizing the monitoring and by involving volunteers in the operations of the programme, we would introduce a monitoring of this species in conformity with the protocols applied in western Serbia.

The positive experiences of the griffon vulture reintroduction programme in the South Massif in France have shown that the process of mixing introduced birds with the birds from the natural populations of Spain from larger distances goes rather quickly with the setting up of mixed couples after a few years. Cooperation with the Bulgarian organizations DZHP, BPPS, VO, DPVB and others at the programme for the reintroduction of the griffon vulture to Stara Planina and in western Bulgaria, as an international regional cooperation programme, constitutes a part of the Balkan Vulture Action Plan, an action plan for the reintroduction of the disappeared species of vultures and eagles. At the distance of 42 km, at the "Vračanski Balkan" Nature Park, there has been a release of griffon vultures from Spain as a measure of the European Union for the return of vultures to the Balkans. Cooperation and exchange of information increase the chances for griffon vultures to survive with the support of volunteers on both sides of the border. In this way, the griffon vulture would be successfully settled and the standards

proclaimed by the European Commission would be introduced into the programmes for the management of natural properties and protection of biodiversity.

A bird hatched at the Belgrade Zoo in 2016 is a candidate to be among the first ones to spread its wings on Stara Planina

9. EXPECTED RESULTS

The griffon vulture on Stara Planina would represent an attraction for the entire region and Europe. In addition to the economic significance of this species, there is also its esthetical and cultural importance, and its return after 70 years would serve as a role model for the protection of other species. The reintroduction of the griffon vulture to Stara Planina is a part of the programme for the return of disappeared vulture species to Serbia and the Balkans.

Light construction case on the Bulgarian side of Stara Planina, in Vraca, 42 km away from Rsovci

Some species have a particular importance for the development of human culture and a strong impact on the economy and local communities that cannot be ranked in line with the familiar criteria, but cannot be discarded either. The griffon vulture has a special influence on people by raising their awareness of the global importance of protecting biodiversity and the need to cooperate on these programmes. This legendary bird has inspired generations before us and who knows what it may offer to the generations yet to come. Similar programmes for the protection and reintroduction of other species and animals are often not as well accepted by the local communities as the griffon vulture programme, but perhaps it will be precisely through the implementation of this programme that the public will become more sensitive for less attractive, but important programmes for the protection of endangered species.