Viability Study for the Reintroduction of the Bearded vulture (Gypaetus barbatus) in the Eastern Balkan mountains and Royak-Provadia Plateau

March 2006
Viability Study for the Reintroduction of the Bearded vulture (Gypaetus barbatus) in the Eastern Balkan mountains and Royak-Provadia Plateau

The current study has been carried out by Ivelin Ivanov, Gradimir Gradev, Dimitar Popov, Simeon Marin, Ivailo Klisurov, Mladen Angelov

Through the financial and expert support of:

FOUNDATION FOR THE CONSERVATION OF THE BEARDED VULTURE

BLACK VULTURE CONSERVATION FOUNDATION

FRANKFURT ZOOLOGICAL SOCIETY

ENVIRONMENTAL PARTNERSHIP FOR CENTRAL EUROPE
Viability Study for the Reintroduction of the Bearded vulture (*Gypaetus barbatus*) in the Eastern Balkan Mountains and Royak-Provadia Plateau

Contents:

1. Introduction
2. Aims of the study
3. Description of the species
4. Conservation status of the species
5. Distribution
6. Biology of the species
7. Reasons for the extinction of the species as a nesting one in Bulgaria and trends in development of threats
   7.1 Poisoning (Use of poison baits against terrestrial predators)
   7.2 Chemical pollution
   7.3 Lead poisoning
   7.4 Illegal shooting
   7.5 Loss and degradation of habitats
   7.6 Decrease of the extensive stockbreeding
   7.7 Change in the methods of carcass disposal
   7.8 Decrease of the game stock
   7.9 Disturbance
   7.10 Power lines
   7.11 Critical minimum of the population.
   7.12 Lack of nature-conservation culture
8. Current state of the Eastern Balkan Mountains and Royak-Provadia Plateau as potential sites for reintroduction of the Bearded vulture
   8.1. General description
      8.1.1. Plants
      8.1.2. Mammals
      8.1.3. Amphibians
      8.1.4. Climate
9. Description of the region
   9.1. Sub-region Sinite Kamani
   9.2. Sub-region Kotlenska Mountain
   9.3. Sub-region Rish Pass
   9.4. Sub-region Kamchiiska Mountain
   9.5. Sub-region Royak-Provadia Plateau
10. General presentation of suitable rock massifs for Bearded vulture reintroduction
11. The Tortoises (*Testudo spp.*) as a food basis for the Bearded vulture in the Eastern Balkan Mountains and Royak-Provadia Plateau
12. Use of poison baits
13. Wolf distribution
14. Other birds of prey in the region
15. Conservation status of the region
16. Tourism as an opportunity for sustainable development of the Bearded vulture population
17. Bearded Vulture Reintroduction Strategy
   17.1. Methods for reintroduction
   17.2. Activities until the start of the Bearded vulture reintroduction program
17.2.1. Implementation of aviary breeding of Bearded Vultures
17.2.2. Starting the Griffon vulture reintroduction program as a “basis” before reintroduction of the Black and Bearded vultures
17.2.3. Decreasing the impact of potential limiting factors
17.2.4. Creation of public opinion in society for the necessity of vulture reintroduction in the Eastern Balkan Mountains and Royak-Provadia Plateau

18. Budget
19. Responsible institutions
20. Relation of the Eastern Balkan Mountains and Royak-Provadia Plateau as a potential site for vulture reintroduction with other potential sites and existing populations
21. Bibliography
1. Introduction

The silhouette of the Bearded vulture (*Gypaetus barbatus*) is chosen for logo of the Bulgarian nature conservation and is a state symbol used for notation of the protected areas in the country. Despite this symbolism, being a species of common occurrence in the end of the 19th and beginning of the 20th century in the Balkan peninsula, (*Hristovitch, 1894*), the Bearded vulture got practically extinct in the 50s-70s of the 20th century. Afterwards only single birds have been observed and it is possible that single pairs existed but these were not sufficient for survival of the species. The main reasons for extinction of the species as well as drastic decline in the other 3 European vultures (Black, Griffon and Egyptian) are: widespread use of poison baits for regulation of the wolf population in the 50s; direct persecution and disturbance. In recent times the main problems are change in habitat structure and serious decline in the food basis.

Since 1985 in the Bulgarian conservation community a discussion is under way and different initiatives for reintroduction of the Bearded vulture have been undertaken. From the late 80s serious conservation measures are implemented for preservation of the other 3 vulture species found in the Eastern Rhodopes mountains.

Achieved basis in the activities for reintroduction of the Bearded vulture and conservation of the other species:

- **Bearded vulture** (*Gypaetus barbatus*)
  - 1992 – the Green Balkans’ Wildlife Rehabilitation and Breeding Centre (WRBC) was established as a starting point for breeding and reintroduction of the Bearded vulture (*Gypaetus barbatus*) and Black vulture (*Aegypius monachus*).
  - 1997 - The WRBC staff has completed training in the Vienna Breeding Unit so to be able to achieve these aims.
  - 1999 - Conception for reintroduction of the Bearded vulture was accepted by the Government (National Nature Protection Service) and the future activities for the reintroduction were included in the National Action Plan for Conservation of Biological Diversity.
  - 2001 – A “National working group for reintroduction of the Bearded vulture” was established. As a member of the working group Green Balkans signed Agreement for Cooperation with the Bulgarian government for collaboration in implementation of the activities for the reintroduction in a long term. 2002 – Green Balkans elaborated and deposited to the Government National Plan for Reintroduction and Conservation of the Bearded vulture in Bulgaria. The plan was accepted by the national working group.
  - 2003 to 2005 - In the framework of the “Balkan Vulture Action Plan”, 3 stages of project “The Bearded vulture – Let’s recover the symbol of Bulgarian nature-conservation” have been implemented with main accent on study of suitable sites for reintroduction of the species
  - 2004 - After a visit to the Vienna Breeding Unit for Bearded vultures, construction of aviary in the WRBC has been completed to make it suitable for accommodation of a pair of Bearded vultures
  - 2005 – On 18 May a “Memorandum of Understanding for Conservation of Vultures in Europe” was signed between Bulgarian Ministry of Environment and Waters and Consortium of NGOs which confirmed the support of the national authority for the program. Green Balkans and the WRBC are members of the consortium.

2. Aims of the study

The current document aims at assessment of the opportunity for reintroduction of the Bearded vulture (*Gypaetus barbatus*) in the Eastern Balkan Mountains and Royak-Provadia Plateau. The study is in compliance with the **IUCN/SSC Guidelines for Re-Introductions** and methodic of viability studies undertaken in France and Spain were used.
3. Description of species

TAXONOMY

**Kingdom:** ANIMALIA  
**Phylum:** CHORDATA  
**Class:** AVES  
**Order:** FALCONIFORMES  
**Family:** ACCIPITRIDAE

MORPHOLOGY

Polytipic. Nominate *barbatus* (Linnaeus, 1758), mountains of Morocco, Algeria, and possibly Tunisia; *aureus* (Hablizl, 1783), mountains of southern Europe and south-west and central Asia from France and Spain to Mongolia and central China, and Middle East south to about Sinai. Extralimital: *meridionalis* Keyserling and Blasius, 1840, south-west Arabia and from Sudan and East Africa south to South Africa; population from hills bordering northern Red Sea perhaps also this race.

Length: 110-115 cm (tail 42-44 cm)  
Wingspan: 266-282 cm  
Weight: *(Gypaetus barbatus aureus)* in Europe:  
Adult male – 6150 (February), 4500 and 5075 (March), 4750 (April), 7000 (October)  
Adult female – 5600 (May)

4. Conservation status of the species

The sub-species *Gypaetus barbatus aureus* ranges in Europe and on the Balkan Peninsula. This is a threatened species in Europe. Its population comprises not more than 250 nesting pairs (European Union Species Action Plan for the Lammergeier *(Gypaetus barbatus)*, Final Draft, September 1999, compiled by Heredia R., Heredia B.). It has been included into the category SPEC – 3. It has been included into Annex I of the EU Directive on the wild birds as well as in Annex II of the Bern Convention and the Bonn Convention. It has also been included into the Bulgarian Red Data Book, category “extinct species”. Listed in Annex 3 of the Bulgarian Biological Diversity Act; protected under the Environment Protection Act. According to the compensation tariff in cases of damages on nature sites (Official Gazette, issue 116/1997), the envisaged compensation amount ranges from 750 to 1000 BGL.

5. Distribution

*Distribution and population*

The Bearded vulture is widely distributed in the mountain regions of Eurasia and Africa, and a small part of its world area is situated in Europe (Tucker and Heath 1994). There are obviously large populations in Eastern Africa, Central Asia and the Himalayas (del Hoyo *et al.*, 1994). The species is permanently residing in the whole area.  
In Europe, the species could be found in Spain (the Pyrenees), Turkey, France (the Pyrenees and Corsica), Russia and Greece (Crete and the continental part). The European population comprises 167 nesting pairs, and 112 of them are in the EU. The Spanish population consists of more than 50 nesting pairs (this information dates back to 1996). After a serious decrease during the last two centuries that resulted in the extinction of the species in some 10 countries in Central and Southeastern Europe, now the European population is increasing in Spain, becoming stable...
in France and Russia, decreasing in Greece and probably in Turkey. The marginal population in Morocco is extremely threatened as it has suffered a sharp decrease. Since 1986, an initiative for reintroduction is being implemented in the Alps. The following release sites were chosen: Hole Tauern National Park (Austria) in 1986, Bargy / Haute-Savoie (France) in 1987, Swiss National Park / Engadine (Switzerland) in 1991, Alpi Marittime Natural Park (Italy) / Mercantour National Park (France) in 1993, Stelvio National Park (Italy) in 2000. As a result, more than 100 birds have been released and there have already been 7 breeding pairs in 2003 (Annual Report of the Bearded Vulture Reintroduction Programme 2003). One century after the disappearance of Bearded vulture in the Alps; the first chick is born in 1997 in Haute-Savoy. 19 other chicks have flight away in the Alpine sky after him between 1998 and 2004. A new record is attained in 2005 with the birth of 7 chicks, 4 on the French side and 3 on the Italian side. Project for reintroduction in the region of Andalucia, Southern Spain, has started recently.

*Distribution in Bulgaria and the Balkan Peninsula*

According to published data, the species became extinct as a nesting one in Romania in 1935, in Czech Republic – 1942, Serbia and Montenegro – 1956, Bosnia and Herzegovina 1893, Macedonia - 1990 (Tucker and Heath, 1994). Possibly, there are isolated birds or nesting pairs in Albania and Bosnia and Herzegovina. Isolated birds could be found in the continental part of Greece, but there is no evidence of nesting for the last years. Close to Bulgaria a Bearded vulture was observed at Dadia, Greece in 2000 (M. Dimitrov – oral announcement). There are four nesting pairs on the island of Crete. In Macedonia, near the Greek border, there is a bird that is not nesting for certain. In the past, the species was widely distributed in Rila, Balkan Mountains, Vitosha and the Rhodopes (Hristovich, 1894). In the 50s of the 20C the species became extinct in many habitats and was observed in Rila and the Sinite Kamani area (Patev, 1950). It is considered that the species has become extinct as a nesting one in Bulgaria in 1966. After that, there are many observations of isolated specimens. On 16.07.1968, in the vicinity of Ribnize, a specimen was found dead in the area “Sinite Kamani” area (Donchev, 1974 ).On 20 October 1980, a young, sick Bearded vulture was found in Varnino village, district of Varna. During the same period a young specimen was observed in the area Bolata, near Cape Kaliakra (Nonev 1982). During the last decade there have been sporadic observations in the eastern part of the country, mainly of young birds (oral announcement – Hristo Hristov, Emilyan Stoynov). There is also a published observation of a bird in a sub-adult plumage, on 7 March 1999, in the vicinity of Madzharovo, implemented by Emilyan Stoynov:
6. Biology of the species

Breeding

The Bearded vulture breeds in caves and on mountain cliffs at a height of 400-2000 m. There is a case of a nest found at 200 m but the pair was feeding completely in the higher parts of the mountain. It builds a solid nest of sticks and lays one or two eggs in the period late December – early March. Both adult birds take part in the incubation. In 54-58 days, in February or March, the youngsters hatch, and 112-119 days later, in June, they leave the nest. Although both youngsters may hatch, one of them usually dies as a result of aggression in the brood. One of the rare cases when both youngsters have grown up was in Ethiopia in 1996. The young birds stay in the same region until the beginning of the next breeding cycle in November (Heredia, 1990). They reach sexual maturity at about seven years of age or later (del Hoyo, 1994). This bird is usually a monogamist. Polyandric triads (two males and a female) were found for the first time in the Pyrenees in 1979. Since then, the number of such cases has been increasing, in Corsica inclusive; triads occupied 14% of the nesting areas in the Pyrenees in 1996. The nesting results of the triads are similar to those of the pairs that have occupied the same territories before, as well as those of the neighboring pairs. The formation of triads has been explained with the irregular correlation of sexes, scant food availability, high nesting density or genetic connection between the male birds, but so far there is no evidence of the main factor (Donazar 1990, Fasce et al 1993). This phenomenon may have far-reaching effects for the conservation of the Bearded vulture.

Feeding

There is no data in Bulgaria for profound research on the feeding behavior of the Bearded vulture. Interesting fact is the observation of broken tortoise shells in the cliffs, as with the Golden eagle. Presumably, in many regions of the country, where the tortoises are still widely distributed, they could be a significant part of the feeding base of the species. In 1894, Reiser observed a situation when a mule shoulder was raised and dropped on the crags.
The menu of the Bearded vulture consists of bones (up to 85% of the food), rather big bones and meat of dead animals (del Hoyo, 1994). The bird breaks the big bones to small pieces that it could eat, flying off with the bone and dropping it on special cliff slopes. The small animals (birds and rodents) are given to the youngsters and represent a significant part of their food. In the Pyrenees, 88% of the prey objects are mammals, mainly domestic ungulates (sheep or goat limbs), chamois (*Rupicapra rupicapra*) and marmots (*Marmotta marmotta*), 7% birds and 0.7% reptiles (n=152 objects of prey) (Heredia, 1990). A recent research of a youngster still in nest in the Spanish Pyrenees, showed that 59% of the objects of prey are sheep or goats, 25% rabbits, 3% wild boars, 3% cows/horses, 1.6% dogs and 1.6% foxes (n=78 objects of prey) (Margalida et al., in prep).

In Corsica, the menu consists mainly of limbs of domestic ungulates (36% sheep and goats, 33% cattle, mainly calves), pigs (domestic and wild)(16%), mouflons (12%); birds and reptiles rarely occur in the menu (Thibault et al. 1993). It seems that the nesting results of Corsica depend on the particular stockbreeding activities, as the main food sources are seasonally moving herds of goats and free-roaming cattle.

In the Alps, the main food for the released birds is chamois and sheep.

### Artificial feeding

The Bearded vulture takes well the method of artificial feeding. 17 different specimens visited a feeding platform for a day (Heredia 1991). The artificial feeding is main method in the reintroduction and the support to the populations in critical status. Anyway, this is not a sustainable method and it should be used as a temporary measure only.

### Habitat requirements

The Bearded vulture forages in regions with alpine and sub-alpine vegetation, mainly at a height of more than 1000 m, where domestic as well as wild ungulates could be found. In winter and early spring it examines regions with an average altitude and steep cliffs, where there is no snow drifted (Thibault et al. 1993). In the Pyrenees, in winter and spring, the bird visits muladares – places near the villages, where carcasses of domestic animals are often deposited. It is likely that in Bulgaria the Bearded vulture used to find food at lower altitude. Indicative of that are areas of the Eastern Balkan Mountains where the species occurred at altitude of 700-800 m. The highest peak there (Balgarka Peak) is 1181 m high.

### Movements

Generally, this is a permanently residing species, although in cases of vast areas and presence of youngsters, it could spread over a large territory. Although since late 80s Bearded vultures have been seen more than 100 times beyond the Pyrenees (M. Hernandez, in litt. 1997), none of the 33 young birds that have been wing-taged in the Pyrenees in the period 1987-1996 have been seen among them (R. Antor in litt. 1997). The average area of 13 of those young birds was 4,932 (950-10,294) sq.km. (Heredia 1990). So far, adult birds have not been put wing-tags or radio transmitters. In the Alps, 70% of the released birds return to the release site, although there was a bird observed at about 1,300 km from the release region, beyond the Alps.

### 7. Reasons for the extinction of the species as a nesting one in Bulgaria and trends in development of threats

#### 7.1 Poisoning (setting of poisonous baits for terrestrial predators).

The extinction of the species on the Balkan Peninsula results to a great extent from mass campaigns for poisoning wolves and foxes in the 50s and 60s. Strychnine was widely used back then. In the beginning of the 80s a new “war to the predators” was declared and then mostly sedative substances as “luminal” and poisons from the phosphoric organic compounds were used. Since late 80s, the use of poisonous baits has been prohibited by the Bulgarian legislation.
It is also prohibited under many international documents. The latest poisoning of vultures in the Eastern Rhodopes was in 1995, when we found four poisoned Griffon vultures. In 1997 a pair was poisoned in the same region. The last case of poisoned Griffon vulture is on 16.02.2006 in the region of Studen kladenets dam (Eastern Rhodopes). The bird was poisoned by zinc phosphate. No other affected birds were present in the area as well as in the area of the artificial feeding ground. That leads us to the conclusion that the bird was poisoned at a quite long distance from the existing colony In the Eastern Balkan mountains the last Bearded vulture was found in 1972 in the “Sinite kamani” area. It was most likely poisoned. There’s data for a poisoned Bearded vulture with strychnine in the Kotel mountain area.

Significance: average
Trend - decreasing

7.2 Chemical pollution

It relates mostly to the influence of various pesticides, heavy metals and chemical substances over the eggs (shell solidity, embryo status). The effect of this threat has not been studied in Bulgaria. In the Eastern Balkan Mountains and Royak-Provadia Plateau there is now heavy metals extraction and this threat is not present up to now. It should be taken into consideration that the heavy metals are stored mostly into the bones, and the Bearded vulture feeds mainly on bones, which may produce negative effect on the species.

Significance: low
Trend – invariable

7.3 Lead poisoning

In Bulgaria there is no data available for the influence of the threat on the Bearded vulture. The lead poisoning is a possible reason for death in regions of intensive hunting (Heredia and Heredia 1992) and migratory routes. The lead could reach the Bearded vultures via prey food, shot by hunters (wood pigeons, thrushes, etc). According a study carried out in Aragon (Spain) on the chronic exposing to lead of 16 birds (including youngsters, juvenile and adult birds), as well as liver and bones samples from 13 birds, revealed that the lead levels are much lower than those that are indicative for the chronic blood poisoning.

Significance: low
Trend – invariable

7.4 Illegal shooting

Till the 80s all raptor birds in Bulgaria have been declared enemies to the “Hunting Administration” and subjected to mass shooting. At present, the Bulgarian legislation prohibits the shooting at raptor birds. Despite all, the heritage is still alive, especially with the old hunters, and they carry on killing raptor birds. Shooting at and possessing stuffed eagle (including all big raptor birds) is a common practice and manifestation of courage and distinguished hunting skills.
The fact that most of the possible regions, chosen for future reintroduction, are protected areas or territories visited by a relatively small number of hunters, which facilitates the control and re-education of the latter, is a chance for the Bearded vulture. In recent years a significant change in the attitude of the hunters and the public as a whole towards birds of prey was observed and this trend is considered to be kept.

Significance: high
Trend - decreasing

7.5 Loss and degradation of habitats

- The risk of progressive nature-unfriendly development of the mountain regions is one of the main threats for the future of the species. The construction of roads, dams, ski resorts with the concomitant construction of infrastructure as well as increase of the tourists’ stream may cause irretrievable loss of habitats.
- In the French part of the Pyrenees, a nesting territory has been abandoned only because of the construction of small hydropower station. Up to now there are no declared investment proposals for construction of small hydropower plants in the Eastern Balkan Mountains and Royak-Provadia Plateau but given the presence of suitable rivers the expectations are that this threat will not be late to come.
- Due to the short period of snow coverage, the Eastern Balkan Mountains area is protected against proposals for construction of large ski tracks and resorts. There are just a few short tracks in the “Sinite kamani” area.
- A totally new threat is the construction of wind farms. “Sinite Kamani” area is known as the windiest place in Bulgaria. There are 4 wind generators constructed already and an investment proposal for a wind farm of 20 generators in close proximity to the Nature Park.
- As in the whole country the forest habitats in the Eastern Balkan Mountains and Royak-Provadia Plateau are under heavy pressure in the last 15 years. As a result many century-old forests have been destroyed entirely or partially that are potential habitat for the Black vulture (Aegypius monachus). In recent years that process starts to get regulated and slowly the forest resources are being used in a more sustainable way.
- It has to be considered that habitat destruction can lead not only to direct extermination of the species but also indirectly through decrease in its natural food (chamois, roe deer, deer, and tortoises).

Significance: average
Trend - increasing

7.6 Decrease of the extensive stockbreeding

Many events such as deprivation of the possibility for migratory breeding of sheep (in winter in Aegean Thrace and in summer – in the mountain regions of the Rhodopes and Balkan Mountains), nationalization of the private property in the 50s, denationalization, privatization and dereliction in the 90s, have led to almost complete destroying of the extensive stockbreeding in Bulgaria. Yet, there are regions, mainly in the mountains and the foothills, where the stockbreeding is the major means of living for the local people. This
implies most significantly to the area of the Eastern Balkan Mountains where great part of the population is Muslim. One of the characteristics of that population is strong affection to the home land and traditional stock breeding. By this indicator the Eastern Balkan Mountains are very similar to the Eastern Rhodopes where there are also many Muslims and extensive stock breeding is well developed. Other characteristic is the widespread breeding of semi-wild pigs. This is a serious food resource for the future vulture reintroduction. The perspective of Bulgaria’s accession to the EU is growth of investment and programs for development of the stockbreeding in the mountain and rural areas. Most likely these investments will be directed towards development of intensive stockbreeding but at least that is an opportunity for increase of the domestic stock numbers in the region.

Significance: high
Trend – increase of stockbreeding

7.7 Change in the methods of carcass disposal

In parallel with nationalization and consolidation in the stockbreeding from the start of the 50s veterinary and sanitary requirements have become stricter. As a result of that on the whole territory of the country incinerating furnaces have been build and all the carrion and slaughter waste have been burnt there. Respectively this system has terminated to a high level the access of the vultures to that food source. After the 90s the system has been destroyed and up to now only 2-3 incinerating furnaces are operating in the entire country. The area they serve does not include the Eastern Balkan Mountains and the Royak-Provadia Plateau. Despite of that this food source remains inaccessible in its better part because the dead animals and slaughterhouse waste are being dump in deep gorges, rivers and pits.

Significance: average
Trend - unclear

7.8 Decrease of game stock

During the last 15 years, the poaching on big game as well as the destruction of its habitats have assumed serious proportions. As a result, the game populations of Chamois (Rupicapra rupicapra), Red deer (Cervus elaphus), Fallow deer (Dama dama), Roe deer (Capreolus capreolus), Hare (Lepus capensis) and Wild boar (Sus scrofa) have suffered considerable decrease. The Chamois is considered entirely extinct in the Eastern Balkan Mountains and the Royak-Provadia Plateau area. There are several game breeding stations, the biggest of which is “Sherba” where there are good populations of Wild boar, Red deer and Roe deer. Generally in the last years there is a trend for decrease in the poaching and slow recovery of the game stocks.

Significance: high
Trend – increase in the game stocks

7.9 Disturbance

The Bearded vulture is very sensitive to disturbance. With reference to this, the implementation of out-of-control tourism and mountaineering, as well as hunting battues, military activities and drills, delta-gliding, treasure-hunting and collection of herbs is extremely critical. New threat especially for the Royak-Provadia Plateau (Madara Rock Massif) is paragliding. Practice of this sport in recent years has led to send off of Egyptian vultures (Neophron percnopterus) pair that used to nest there. That can compromise the success of eventual vulture reintroduction there.
The greatest concerns for successful reintroduction of the Bearded and Griffon vultures in the area of the “Sinite Kamani” Nature Park are climbing and unregulated tourism. In recent years there are efforts for creation of “quiet zones” in the park (where tourism and climbing are forbidden) so to ensure suitable conditions for reintroduction of the vultures. Between Kotel mountain and “Sinite Kamani” is situated a large area (about 25 km) – “Novo selo” military ground. Restricted access for non-military people creates significant tranquility in the region. On the other hand when military drills are on the area is quite busy. Still the military ground is situated at quite a distance from the rock massifs of “Sinite Kamani” and Kotel to create disturbance for the vultures.

Significance: average
Trend - increasing

7.10   Power-lines

There is no data for Bearded vultures affected by power lines in Bulgaria. It can be expected that this is one potential threat especially for juvenile birds reintroduced in the nature. In the “Sinite Kamani” area close to the feeding site there is a power line. Before reintroduction of vultures in the area the lines are envisaged to be laid underground.

Significance: low
Trend – increasing.

7.11   Critical minimum of the population

The lack of stable breeding populations of the Bearded vulture in countries adjacent to Bulgaria and regions adjacent to the Balkans is an obstacle for recovery of the species in its traditional habitats. Several breeding pairs on Island of Crete and probably such in other parts of the Balkans lack the potential for development and increase of the Bearded vulture population and probably lack the potential for survival of the species on the Balkans!.

Significance: high
Trend – increasing

7.12   Lack of nature-conservation culture

The lack of elementary environmental culture has been one of the reasons for the extinction of the Bearded vulture. In the recent years, there are many nature-conservation organizations and programs in Bulgaria, which work along these lines, and the change in the people’s attitude towards many environmental issues could be easily seen. Another chance is the fact that the Bearded vulture has been declared symbol of the nature conservation in Bulgaria. The “nostalgia” for its extinction is rather strong, which is supposed to evoke a different attitude in its possible reintroduction.

Significance: average
Trend – decreasing

8.   Current status of the Eastern Balkan Mountains and Royak-Provadia Plateau as potential sites for reintroduction of the Bearded vulture:

8.1. General description of the area:
The Eastern Balkan Mountains cover an area of 3998.6 sq. km and its average height is 385 m. It reaches Cape Emine on the Black Sea. Kotlensko – Varbishka Mountain stretches to the Luda Kamchia River defile (Highest peak-Razboina 1128 m). This part is deeply carved by tributaries of Luda Kamchia and Goliama Kamchia rivers whose long valleys determine northern and southern borders. Kotlenska Mountain is comprised mostly of limestone and Karsts. The crest of Kotlensko – Varbishki part is crossed by three low passes: Kotlenski, Varbishki and Rishki. On the east the main morphologic crest follows the low, wide and flat Eminska mountain /520 m high/ and Kamchiiska Mountain /highest point – Kamenik peak, 627 m/. Their northern slopes are steep. From Vratnik pass on the southeast is the southern crest of the Eastern Balkan mountain. It comprises of separate low mountains – Slivenska Mountain /highest point, Balgarka peak 1181 m/, Grebenets /427 m high/ and Stidovska mountain /highest point, Ushite peak, 1011 m/. Further east the crest of the Balkan mountain lowers even more and turns into low and bare Karnobatsko-Aitoska Mountain /highest point, Iliica peak, 684 m/, and loses its chain structure in the hills westerly to the Black sea coast. The low altitude of the Eastern Balkan Mountains is due to the weaker raise of the morph structures in the Neogene.

The climate in the Eastern Balkan Mountains is under Black Sea influence. Rainfall increases in winter and spring (Emona village, Burgas region – winter 28%, spring 21%) and decreases in summer (Emona village, Burgas region – summer-19%). Winter river drain is about 40% and summer drain about 10%.

### Average rainfall in mm

<table>
<thead>
<tr>
<th>Station, altitude /m/</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
<th>VII</th>
<th>VIII</th>
<th>IX</th>
<th>X</th>
<th>XI</th>
<th>XII</th>
<th>Annual average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aitos, 92 m</td>
<td>40</td>
<td>29</td>
<td>32</td>
<td>42</td>
<td>56</td>
<td>77</td>
<td>50</td>
<td>33</td>
<td>30</td>
<td>47</td>
<td>51</td>
<td>51</td>
<td>538</td>
</tr>
<tr>
<td>Sliven, 275 m</td>
<td>44</td>
<td>36</td>
<td>37</td>
<td>49</td>
<td>72</td>
<td>80</td>
<td>50</td>
<td>35</td>
<td>34</td>
<td>49</td>
<td>56</td>
<td>54</td>
<td>596</td>
</tr>
</tbody>
</table>

### Average temperatures in °C

<table>
<thead>
<tr>
<th>Station, altitude /m/</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
<th>VII</th>
<th>VIII</th>
<th>IX</th>
<th>X</th>
<th>XI</th>
<th>XII</th>
<th>Annual average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aitos, 92 m</td>
<td>1.2</td>
<td>2.2</td>
<td>5.9</td>
<td>10.9</td>
<td>16.1</td>
<td>20.3</td>
<td>23.1</td>
<td>22.4</td>
<td>18.8</td>
<td>13.4</td>
<td>8.2</td>
<td>3.1</td>
<td>12.1</td>
</tr>
<tr>
<td>Sliven, 275 m</td>
<td>1.2</td>
<td>2.1</td>
<td>6.0</td>
<td>11.3</td>
<td>16.3</td>
<td>20.2</td>
<td>22.8</td>
<td>22.4</td>
<td>18.6</td>
<td>13.0</td>
<td>7.6</td>
<td>3.0</td>
<td>12.0</td>
</tr>
</tbody>
</table>

Predominant forests in the Eastern Balkan Mountains are oak and beech, a small relict forest of Silver fir (Abies alba) is preserved /at altitude 400 m/. Near Sliven widely spread is a Balkan endemic plant - Astragalus thracicus and near Aitos Bulgarian endemic plant: - Astragalus aitosensis.

The relief of the Eastern Balkan Mountains and Royak-Provadia Plateau is determined by Kamchia river valley and its tributaries. The main part of the rock massifs suitable for vulture reintroduction is along Kamchia valley. Kamchia River has well forested river basin. From its entire area forests cover 2600 sq. km. or 49%. Almost half of that area is low forests which are most widespread. The other half is forested with oak and beech. The latter 2 species cover the highest parts of the Eastern Balkan Mountains with beech forests being less than the oak forming large spots within these. Kotlenska and Varbishka mountains are almost entirely covered by beech while the easterly Karnobatska and Tichanska mountains are mostly oak covered. Oak forests are predominant also in the southern part of Preslaviska Mountain. Ash and Elm forests characterize a 3 km stretch on the right bank from the influx of the two rivers to their estuary. This strip is known as Longoza.
9. Description of the region

Given the vast area of the Eastern Balkan Mountains and Royak-Provadia Plateau for better visualization of the results of the study for suitability of the area the region is divided in 5 sub-regions. The division is made mainly for better visualization of the food basis and habitat conditions of each sub-region and the other components of the study are presented for the entire territory. The division is made on geographical principle and follows the funding stages of the studies by the “Balkan Vulture Action Plan”.

9.1. Sub-region Sinite Kamani

Habitat conditions

On the north and east the sub-region borders with Kotlenska Mountain and on the west with Tvardishka Mountain. On the south is spread the Thracian plain. The territory is characterized by several peaks carved with deep valleys: Bakgarka peak – 1181 m, Stidovska Mountains – 1011 m, Grebenets – 1034 m. Just under Balgarka peak in a site called Karandila some of the greatest rock massifs in the Eastern Balkan Mountains are situated. The high parts of the peaks are covered by beech forests and artificially planted pines. In the lower areas there are vast open areas.
Food basis

During the study on the food base the following methods were used:

- **For the domestic stock** is used data by the Agrostatistics of the Ministry of Agriculture and Forestry (MAF). The number of the stock is calculated by adding 20% to the Agrostatistics data due to the lowered data of the statistics. The number of Ungulates (Perissodactyles) due to the lack of information for them has been calculated by the formula: X=number of cattle * 0.33. (Georgieva, N.(2002), Domestic stock in 2001, 2002, Bulletin № 28, MAF, Agrostatistics Unit). All data have been added and compared with the field questionnaires filled during the study.

- **Game**: The used data is from spring census of the game in Bulgaria done by National Forestry Board.(Iankulov, R. (1998). Game stocks in Bulgaria: state and perspectives. Gora magazine, 6 –7, 22-23.)

A key moment in the assessment of the food resources is the accessibility of the vultures to the dead animals. That’s why we present average data for the dropping out (dying) of domestic stock and game in the region.

**Domestic stock**

- Goats: 22500
- Cattle: 19950
- Pigs: 19400
- Sheep: 58000
- Perissodactyle: 5000

<table>
<thead>
<tr>
<th></th>
<th>Average natural waste in kg for a hectare</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goats</td>
<td>1.36</td>
</tr>
<tr>
<td>Sheep</td>
<td>3.51</td>
</tr>
<tr>
<td>Pigs</td>
<td>1.17</td>
</tr>
<tr>
<td>Perissodactyle</td>
<td>5.30</td>
</tr>
<tr>
<td>Cattle</td>
<td>0.96</td>
</tr>
</tbody>
</table>
Game

9.2. Sub-region Kotlenska Mountains

Habitat conditions

Kotlenska Mountain borders with Tvardishka Mountain on the north and with Slivenska Mountain on the south. On the east it reaches Rish pass. The highest points are Razboina peak-1128 m and Kaleto – 899 m. This is predominantly forest covered area with comparatively few open areas. There are several not very big rock massifs. The biggest and most suitable for vultures is Zlostten. Other suitable area is Jurushki skali.
**Food basis**

During the study of the food base the same methods are used as in the previous sub-region.

**Domestic stock**

![Graph showing domestic stock numbers](image)

**Game**

![Graph showing game numbers and waste](image)

**9.3. Sub-region – Rish pass**

**Habitat conditions**

This is a pass (gorge in the mountain) determined by a small tributary of Kamchia River. The pass is surrounded by steep rock massifs with altitude between 600 to 800 m. These are the most suitable rock massifs for Bearded vulture in the Eastern Balkan Mountains. Small reservoir is constructed along Kamchia River. Northern and Southern slopes of the mountain are steep and inaccessible thickly covered with broad-leaved forests. Along the crest there are vast open areas (pastures).
Food basis

Except conventional forms of stock breeding this area and Royak-Provadia Plateau are unique to Bulgaria with breeding of semi-wild pigs. As the implemented study revealed this is a serious potential food source for the vultures. The way the pigs are bred (free range to feed) creates opportunity for the vultures to access easily the natural dropping out. Additional plus is that due to the pigs use of poison baits is totally unacceptable for the local people. Unfortunately another potential food source suffers from the semi-wild pigs. That is the tortoises usually eaten by the pigs.

Domestic stock
9.4. Subregion Kamchia mountain

Habitat conditions

This is the most eastern part of the Eastern Balkan Mountains that reach the Black Sea on the east. The highest peaks altitude is 621 m and 527 m. In the western part of the sub-region there is a large reservoir on Kamchia River along which there are suitable rock massifs for vultures.
**Food basis**

The above said concerning the semi-wild pigs for the Rish pass applies fully to Kamchia Mountain, too.

*Domestic stock*

![Diagram showing domestic stock numbers](image)

*Game*

![Diagram showing game numbers](image)

9.5. Royak-Provadia Plateau

*Habitat conditions*

This is a plateau with total area 121 830 ha, bordering the northern slopes of the Eastern Balkan Mountains. These two regions are divided by Kamchia River valley. Along the valley long rock chains (several kilometers) with limestone origin are situated. These rock chains together with the chains along the plateau edge are extremely porous with many rock niches. These rocks are the most suitable habitats for vultures in the Eastern Balkan Mountains. Due to their low altitude (about 300 m) these are not of highest priority for the Bearded vulture. The highest point is Svrakite peak – 389 m.
**Food basis**

**Domestic stock**

![Domestic stock chart](chart1.png)

**Game**

![Game chart](chart2.png)
11. The Tortoises (*Testudo* spp.) as a food basis for the Bearded vulture in the Eastern Balkan Mountains and Royak-Provadia Plateau

Due to the fact that data for the food of the Bearded vulture in Bulgaria and on the Balkans is missing the role of the tortoises in its food is unknown. Indirectly we can assume quite certainly that in the reintroduction the tortoises will play a major role in the food of the Bearded vulture! The main reason for that are numerous observations in the past (mostly by word of mouth) of Bearded vultures dropping and breaking tortoises on rocks. It used to be a main characteristic related to the Bearded vulture by the local people. On the other hand in some areas there are Golden eagles (*Aquila chrysaetos*) pairs in whose food tortoises comprise up to 60-70%. Considering the quite similar food of the two species is another reason to assume that the tortoises will be a serious component in the food of the Bearded vulture! Unfortunately the tortoise populations are declining considerably and they become rarer in some regions. The Eastern Balkan Mountains and Royak-Provadia Plateau are exceptions where the population of the two tortoises is still strong. (*Testudo graeca* and *Testudo hermanni*).

For the study of the tortoise population is used data from the Bulgarian Herpetological Society (Vulko Biserkov – 2004).
12. Use of poison baits

Use of poison baits against predators is the main reason for the extinction of the Bearded vulture as well as the other vulture species in the past and presently is the greatest potential threat for the vulture reintroduction programs’ success! Fortunately a major change in that can be observed during the years. During the 3-year-study a region was determined where the local hunting group was setting poison baits against jackals every year. As a result up to 70 jackals have been submitted to the local forestry service. This area is at State Forestry Sadovo within the Kotlenska Mountain sub-region. After Green Balkans’ intervention in the last year this practice was ceased but the region is still under supervision.

In 2005 “Anti-poison platform” has been created where all key institutions related to poison use and prevention of that take part. Excluding such accidental cases the practice of poison baits use in the Eastern Balkan Mountains and Royak-Provadia Plateau is terminated. As mentioned above in the point Food basis raising of semi-wild pigs helps considerably for non-use of poison baits.

13. Distribution of wolf (Canis lupus)

The wolf (Canis lupus) is a key element in the food chain of the vultures as they depend on it for provision of food! After the mass poisoning campaigns in the 50s the wolf populations in the entire country have been decreased to a minimum and it got extinct in many areas. After the halt of the poison campaigns in the 80s the wolf started to recover its numbers and to return to its typical habitats. There it finds a rich food basis thanks to the actively developed game breeding (artificial breeding of the game in hunting stations). As a result the wolf population reaches a “boom” in its development and numbers that can’t be “accommodated”. After that mass breeding and consumption of the game stocks (as a result of poaching) in recent years the wolf started to...
normalize its numbers to a sustainable population in accordance with each region’s characteristics. In its entirety the wolf population is evaluated currently to about 2500. In the Eastern Balkan Mountains distribution of the wolf reaches somewhere near the Rish pass. From there on only single vagrants are found mostly in winter time. Its population is stronger in Varbishka, Kotlenska and Slivenska Mountains.

14. Other birds of prey in the region

Key species to have relation to the Bearded vulture (can be considered indicators for suitability of the region) are the Golden eagle (Aquila chrysaetos) and the Raven (Corvus corax). According to the NATURA 2000 sites in the Western Rhodopes there are 11 pairs of Golden eagle and with those outside the NATURA 2000 sites there is a total of about 20 pairs. The Raven is a distributed all over the area and is found in every suitable nesting habitat. Great advantage for the region is of course the presence of Egyptian vulture (Neophron percnopterus) pairs. In the “Sinite Kamani” sub-region until 1995 there used to nest 3 pairs of Egyptian vulture. Currently the species is observed regularly during migration and non-breeding birds reside in the area. In Kotlenska Mountain only wandering birds are observed. In Rish Pass and Kamchiiska Mountain are nesting a pair in each. 3-5 pairs nest in Royak-Provadia Plateau.
<table>
<thead>
<tr>
<th>Site Code</th>
<th>Royaksko - Provadiisko Platea</th>
<th>Kojlenka planina</th>
<th>Trite bratala</th>
<th>Yavozor Tsonovi</th>
<th>Yavozor Poroi</th>
<th>Kamchya planina</th>
<th>Gorna Luda Kamchiya</th>
<th>Kamchiya</th>
<th>Riski prohod</th>
<th>Atokska planina</th>
<th>Sinte kamani</th>
<th>Trvadilka planina</th>
<th>Sveti Las - Gorna</th>
<th>Terziiski bar</th>
<th>Grebenec</th>
<th>Preslavskya planina</th>
<th>reka Blyagornitsa</th>
</tr>
</thead>
<tbody>
<tr>
<td>BG0000104</td>
<td>BG0000111</td>
<td>BG0000117</td>
<td>BG0000119</td>
<td>BG0000122</td>
<td>BG0000124</td>
<td>BG0000126</td>
<td>BG0000133</td>
<td>BG0000136</td>
<td>BG0000137</td>
<td>BG0000149</td>
<td>BG0000151</td>
<td>BG0000164</td>
<td>BG0000211</td>
<td>BG0000277</td>
<td>BG0000419</td>
<td>BG0000420</td>
<td>BG0000421</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Species Name</th>
<th>Royaksko - Provadiisko Platea</th>
<th>Kojlenka planina</th>
<th>Trite bratala</th>
<th>Yavozor Tsonovi</th>
<th>Yavozor Poroi</th>
<th>Kamchya planina</th>
<th>Gorna Luda Kamchiya</th>
<th>Kamchiya</th>
<th>Riski prohod</th>
<th>Atokska planina</th>
<th>Sinte kamani</th>
<th>Trvadilka planina</th>
<th>Sveti Las - Gorna</th>
<th>Terziiski bar</th>
<th>Grebenec</th>
<th>Preslavskya planina</th>
<th>reka Blyagornitsa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accipiter brevipes</td>
<td>1p</td>
<td>1p</td>
<td>R</td>
<td>&gt;2p</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accipiter gentilis</td>
<td>6p</td>
<td>P</td>
<td></td>
<td>P</td>
<td>P</td>
<td>&gt;6p</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accipiter nisus</td>
<td>1p</td>
<td>1p</td>
<td>3p</td>
<td>10-12p</td>
<td>1p</td>
<td>2p</td>
<td>3-5p</td>
<td>15-20p</td>
<td>3p</td>
<td>4p</td>
<td>7-8p</td>
<td>56-67p</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aquila chrysaetos</td>
<td>1p</td>
<td>2p</td>
<td>1p</td>
<td>3p</td>
<td>2p</td>
<td>1p</td>
<td>C</td>
<td>1p</td>
<td>&gt;11p</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aquila heliaca</td>
<td></td>
<td></td>
<td></td>
<td>4-5p</td>
<td>1p</td>
<td>3p</td>
<td>2-3p</td>
<td>P</td>
<td></td>
<td></td>
<td>21-23p</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aquila pomarina</td>
<td>2p</td>
<td>1p</td>
<td>2i</td>
<td>1p</td>
<td>1p</td>
<td>4-5p</td>
<td>1p</td>
<td>3-4p</td>
<td>2p</td>
<td>2-3p</td>
<td>P</td>
<td>&gt;23-28p</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buteo rufinus</td>
<td>7p</td>
<td></td>
<td>1-3p</td>
<td>C</td>
<td>2-3p</td>
<td>2p</td>
<td>1i</td>
<td></td>
<td>&gt;12-15p</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Circaetus gallicus</td>
<td>3p</td>
<td>1p</td>
<td>1p</td>
<td>1p</td>
<td>2p</td>
<td>1p</td>
<td>R</td>
<td>2p</td>
<td>1p</td>
<td>&gt;1-2p</td>
<td>16-17p</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Circus aeruginosus</td>
<td>1p</td>
<td></td>
<td>1p</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3p</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Falco peregrinus</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>R</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Falco subbuteo</td>
<td>4p</td>
<td></td>
<td>1p</td>
<td>1p</td>
<td>1p</td>
<td>1p</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7p</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Falco tinnunculus</td>
<td>4p</td>
<td>1p</td>
<td>3p</td>
<td>1p</td>
<td>1p</td>
<td>7-10p</td>
<td>2p</td>
<td>1p</td>
<td>4-5p</td>
<td>10-15p</td>
<td>2p</td>
<td>3-5p</td>
<td>3p</td>
<td>2-3p</td>
<td>1p</td>
<td>45-58p</td>
<td></td>
</tr>
<tr>
<td>Hieraaetus pennatus</td>
<td>3p</td>
<td></td>
<td>1p</td>
<td>R</td>
<td>1p</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&gt;5p</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milvus migrans</td>
<td>1p</td>
<td></td>
<td>1p</td>
<td>1p</td>
<td>1p</td>
<td>3p</td>
<td>8p</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neophron percnopterus</td>
<td>5p</td>
<td></td>
<td>1-2p</td>
<td>1p</td>
<td>R</td>
<td></td>
<td></td>
<td>0-2p</td>
<td>7-10p</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pandion haliaetus</td>
<td>1p</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>V</td>
<td></td>
<td></td>
<td></td>
<td>&gt;1p</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pernis apivorus</td>
<td>7p</td>
<td>1p</td>
<td>1p</td>
<td>1p</td>
<td>6-8p</td>
<td>2p</td>
<td>2p</td>
<td>2p</td>
<td>1p</td>
<td>R</td>
<td>3-5i</td>
<td>3p</td>
<td>1p</td>
<td>5p</td>
<td>P</td>
<td>&gt;32-34p</td>
<td></td>
</tr>
</tbody>
</table>

*These are the minimum numbers observed, as i=individuals, p=pairs, R=rare breeder, V=very rare breeder, C=common breeder.

### 15. Conservation status of the region

In the last 3 years ecological network NATURA 2000 was completed in the Eastern Balkan Mountains and Royak-Provadia Plateau. All potential nesting habitats of vultures are within NATURA 2000 sites.
Reserves in Eastern Balkan Mountains

“Momin grad” Reserve is situated at around 10 km south of Varbitsa town. It is designated in 1960 with the purpose conservation of century-old beech forest. It covers 10.9 ha of steep terrain with northeastern exposure and 800 – 880 m altitude.

"Kersenlika - Ardashlaka" Reserve was created in 1951 in Kotlenska mountain in the lands of Borintsi and Straldja villages some 17 km from the town of Kotel. Its area is 114.5 ha on the left bank of Kersenlishka River and its main goal is conservation of the lowest natural area covered by Silver Fir (Abies alba) that covers about 30% of the reserve’s territory. The other 70% are Hornbeam (Carpinus betulus) mixed with Scots Pine (Pinus silvestris), Aspen (Populus tremula), Silver Fir (Abies alba), Durmast oak (Quercus petraea), Norway Spruce (Picea abies) and European Beech (Fagus silvatica).

"Orlitsa" Reserve is created in 1984 on area of 566.5 ha in unique Karst complex with numerous caves, precipices, streams with the aim of primal ecosystems of European beech conservation as well as rare birds’ habitats.

"Kalfata" Reserve with area 46.9 ha was designated in 1968 in the lands of Poliatsite village for conservation of century old oak forests

"Valchi pass" Reserve - 43,9 ha, designated in 1968 in the Golitsa village land for conservation of the typical for these sites mixed forests.

"Kirov Dol" Reserve- 51,5 ha, designated in 1968 in the Dolen chiflik village lands for conservation of Turkey, Hungarian Oak and European Beech forests.

"Varbov dol" Reserve with 70,6 ha was designated in 1968 with the aim of mixed oak forests conservation in Asparuhovo village lands.

"Kutelka" Reserve - 645,1 ha created in 1983 for conservation of rare birds habitats.
6. Tourism as an opportunity for sustainable development of the Bearded vulture population

Other countries’ experience shows that ornithological tourism plays a major role in securing income for long-term sustainable development of the reintroduced vulture populations. Local people in the regions where reintroduction will take place can considerably support the vultures’ conservation if they see economical benefit in that.

Results of the 2005 study reveal that tourism opportunities are not bright at all. There is no suitable infrastructure (roads), lack of hotels. Exceptions are Royak-Provadia Plateau and partly Rish pass where daily tours can be conducted for tourists residing on the Black Sea. Another exception of the general trend is “Tsonevo” reservoir and especially Asparuhovo village. More than 10 family hotels were built there including traditional cuisine, angling, biking, etc. The village is close to “Wonderful Rocks” landmark and the rock chains of Royak-Provadia Plateau – potential vulture reintroduction sites! Relatively good tourist potential exists in “Sinite Kamani” area as well as in the Kotel area where good historical and folklore conditions are present. Still in the last 2-3 years liveliness and slow investment in the tourism in that area is observed. This process may be helped by vulture reintroduction programs as additional tourist attraction!

![Map of possibilities for the development of ornitho-tourism (vulture watching) in the Eastern Balkan Mountains](image)

17. Bearded Vulture Reintroduction Strategy

Taking into consideration the biology of the species, characterizing the Bearded vulture as a resident bird, even though there are single cases of settling in long distance, we cannot count on a natural return of the species on the Balkan Peninsular in the near future, in spite of the increasing populations in the Alps and Spain.

The only possibility for the restoration of the species is its reintroduction. The Western countries have gained significant experience in the reintroduction of this species, as since 1986 a reintroduction project has been run in the Alps and recently another reintroduction project has
started in Andalucia, Southern Spain. 6 release sites have been chosen in the Alps where more than 100 birds have been released there have already been 7 breeding pairs in 2003. The first chick from the Alps Reintroduction program was born in 1997 in Haute-Savoy. 19 other chicks have flight away in the Alpine sky after him between 1998 and 2004 with a new record being attained in 2005 with the birth of 7 chicks, 4 on the French side and 3 on the Italian side.

In 2002 Green Balkans prepared and put forward in the government a National plan for conservation as well as a Strategy for reintroduction of the Bearded vulture in Bulgaria.

The plan was approved also by the national work group on the species.

The current study is in the context of the Reintroduction Strategy and follows **IUCN/SSC Guidelines for Re-Introductions**, approved at the 41st meeting of the IUCN Council, May 1995.

### 17.1. Reintroduction methods

The methods of practical release of birds bred in captivity show that the construction of additional facilities and aviaries in the wild is not necessary. The young birds, at the age of 2-3 weeks are kept in natural rock niches or artificially constructed ones before they fly away. In this period the human potential available in the structures, implementing the reintroduction is crucial, as many people are needed for the raising of the fledglings until their flying off and for their day-to-day tracking during the first months of free life afterwards. The monitoring should go on periodically in time, as this process would continue for years.

The birds must be marked, and while the adopted practice is bleaching their feathers, the best way is proved to be attaching radio-transmitters.

The experience from the Alps proves that a minimum of 100 birds should be released in order to obtain a vital population. Only 30-40% of them reach maturity. And the whole process, running even at present takes more than 20 years.

The current study and historical data show that in the Eastern Balkan Mountains and Royak-Provadia Plateau exist suitable preconditions for a Bearded vulture reintroduction program. Despite of that, the following objective prerequisites wouldn’t allow the process to start immediately:

- On the first place is the adopted practice to start reintroduction with more common species, such as the Griffon vulture (*Gyps fulvus*) in this case. The reintroduction of Griffon vultures in the Eastern Balkan Mountains and Royak-Provadia Plateau would prove the eligibility of the area to allow further reintroduction of consecutively the Back and the Bearded vultures.
- Second is the lack of enough birds, “produced” in captivity, which could be redirected from the reintroduction projects in the Alps and Andalusia to Bulgaria.
- On the third place stays the threat of lack of expert human potential to deal with a present start of the Bearded vulture reintroduction. The necessity of gaining experience implementing initially a program for reintroduction of Griffon vultures supports this thesis.

Taking into consideration these assumptions we provide for the following sequence and schedule for implementing vulture reintroduction in Bulgaria, including the Eastern Balkan Mountains and Royak-Provadia Plateau:

- **Griffon vulture** (*Gyps fulvus*) – start until 2007-2008
- **Black vulture** (*Aegypius monachus*) - start 2009-2010
- **Bearded vulture** (*Gypaetus barbatus*) - start 2011-2015

### 17.2 Activities until the start of the Bearded vulture reintroduction program
Until the start of a real Bearded vulture reintroduction in 2011 the following actions are required:

17.2.1. Implementation of aviary breeding of Bearded Vultures:

- Securing birds for artificial breeding.

The issue where should birds for breeding in Bulgaria be taken from remains controversial. The most suitable geographical population is that from the Balkan Peninsula (subspecies *Gypaetus barbatus aureus*), but unfortunately this population is almost extinct. Only 4 pairs still exist on the island of Crete and possibly some more in continental Greece and Albania. Therefore the only possibility is using birds from the breeding program of the Foundation for Conservation of the Bearded vulture.

As soon as possible ensuring of birds (a breeding pair if possible), would have a key significance on the forming of positive public position on the whole process of vulture reintroduction in Bulgaria.

- Potential sites for keeping, breeding and preparation of the young birds for reintroduction.

The most suitable place for raising and breeding of Bearded vultures at present is the Wildlife Rehabilitation and Breeding Center (WRBC) in Stara Zagora. Among the advantages of the Center are strategic geographic location, favorable climate and the presence of the best veterinarian specialists in Bulgaria. The Center uses the service of a specialized veterinarian clinic. The team, operating in the WRBC has completed a training course in Vienna Breeding Unit for Bearded vultures, as well as a training course in the Aegina Wildlife Hospital – Greece. The WRBC is a part of the international network of rescue centers, the IWRC. The Center operates also with a suitable infrastructure for raising and breeding of the four vulture species. A great advantage in future release of birds into the wild is the existing network of voluntary collaborators of the WRBC from all over the country.

A potential other suitable place for raising and breeding of Bearded vultures is the system of zoos. Their poor financial condition and lack of clarity and succession on their future running and management do not allow their engagement in such a long-term program as breeding of Bearded vultures and preparation of the young birds for reintroduction at present. Only the Sofia Zoo could carry out similar functions, but significant improvement on the staff qualification and raising and breeding conditions is required. The fact that the first pair of Bearded vultures in Europe, bred in captivity and managed to raise 8 juveniles in the period 1915-1928 were raised in the Sofia Zoo has to be taken into consideration.

17.2.2. Starting the Griffon vulture reintroduction program as a “basis” before reintroduction of the Black and Bearded vultures

For that purpose a standard methodology of bird adaptation in aviaries at suitable sites and their further release must be used. Fastest and greatest effect of creation of sustainable populations will be achieved if reintroduction programs are started simultaneously in all sub-regions. This will be the most expensive and human resources – consuming way.
The other approach is designation of one or two sites and release of high number of birds there which to take over the suitable sites. It has to be taken into account that distances between all the regions are very small (20-30 km by air) so the vultures most likely will take over the most suitable for them site no matter in which sub-region they have been adapted and released.

17.2.3. Decreasing the impact of potential limiting factors

The prevention work on all above mentioned potential limiting factors (poisoning, habitat changes, and decrease of food basis) should continue.

17.2.4. Creation of public opinion in society for the necessity of vulture reintroduction in the Eastern Balkan Mountains and Royak-Provadia Plateau

Hard work and a series of measures are needed to prepare the society and institutions for the process of vulture reintroduction and gain as many followers of the cause as possible.

18. Budget

Bulgaria is a country in transition, which is on the brink of accession to the European Union. This event is expected to significantly change the economic situation in the country. Taking into consideration the fact that the Bearded vulture reintroduction is provided to start as late as 2011-2016, it is very difficult to forecast the costs needed for this period. For the 5-year-period 2007-2011 until the start of the reintroduction it is necessary to secure funds for receiving, raising and eventual breeding of Bearded vultures in the WRBC. After the start of the programs for reintroduction of Griffon and Black vultures in various areas of the country it is also expected a certain part of the released birds not to succeed to successfully adapt and enter the WRBC. Resources for their raising have to be envisaged.

<table>
<thead>
<tr>
<th>Costs</th>
<th>Total (euro)</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Food, maintenance, warden, keeper</td>
<td>25 000</td>
<td>5000</td>
<td>5000</td>
<td>5000</td>
<td>5000</td>
<td>5000</td>
</tr>
<tr>
<td>2 Infrastructure development (new aviaries, adapted for vultures)</td>
<td>25 000</td>
<td>5000</td>
<td>5000</td>
<td>5000</td>
<td>5000</td>
<td>5000</td>
</tr>
</tbody>
</table>

19. Responsible institutions

There is not enough potential in none NGO or institution in Bulgaria to implement vulture reintroduction program on its own. That’s why unification of efforts is required as well as distribution of responsibilities and tasks among all NGOs and institutions.

Green Balkans is the most experienced and greatest organization working for vulture conservation in the Eastern Balkan Mountains. This is the organization with highest human potential for implementation of the Bearded vulture reintroduction program as well as preceding Griffon vulture reintroduction programs.

Compulsory partner is FWFF which possesses good experience in the Kotlenska mountain region.

Other partner is Directorate of Nature Park “Sinite Kamani”. It is not only one of the priority areas for reintroduction but staff committed to the process is present. During a long-year partnership good relations have been created between the NP Directorate staff and Green Balkans that is a good basis for a successful vulture reintroduction program.
Hunting and Fishing Societies is another key partner. During the 3 year study great part of our work was directed towards hunters and foresters. As a result there are many people attracted to the idea of vulture return at “their” places. Vet services. Great part of the Green Balkans team that implemented that study is people with Vet education. Due to the good contacts with the vets many followers have been attracted who will be very useful mostly in the prevention of poison use and provision of food for the vultures. The Wildlife Rehabilitation and Breeding Centre will play a key role in implementation of each reintroduction program for the 3 vulture species in Bulgaria. It is expected that there the imported vultures will get through adaptation period; rescue service will be provided to birds in distress from the reintroduction programs. Captive breeding of vultures program will be started so to provide birds for the reintroduction programs.

20. Relation of the Eastern Balkan Mountains and Royak-Provadia Plateau as a potential site for vulture reintroduction with other potential sites and existing populations

Except Eastern Balkan Mountains and Royak-Provadia Plateau in Bulgaria exist and other suitable sites for reintroduction for the Bearded as well as Black and Griffon vultures. Following the criteria of area eligibility, we have compiled a comparative assessment on the potential of each site for the three species of vultures:

<table>
<thead>
<tr>
<th>Site</th>
<th>Griffon vulture</th>
<th>Black vulture</th>
<th>Bearded vulture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vrachanski Balkan, Western Balkan Mountains</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Central Balkan, Central Balkan Mountains</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Kotel, Eastern Balkans Mountains</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Sinite kamani, Eastern Balkans Mountains</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rizhki passage, Eastern Balkan Mountains</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Kotel – Sinite kamani – Rish, Kamchiyska Mountains and Royak-Provadia plateau (altogether)</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Kamchiyska Mountains and Royak-Provadia Plateau (Komunare)</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Eastern Rhodopes – Kurdzali Reservoir, the valley of the Borovitsa River (Jenda)</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Studen kladenets Reservoir (Hunting Reserve)</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Byala reka (Eastern Rhodopes)</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Dobrostanski ridge – Prespa – Western Rhodopes</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>The valley of the Vucha River (including Trigrad), Western Rhodopes,</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Rila Mountains</td>
<td>1</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>South-western Mountains (Osogovo, Malashevska, etc.)</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

This assessment could serve for prioritizing and defining the sequence of the implementation of the reintroduction programs for the various species. It is seen that the Western Rhodopes is the most suitable place for Bearded vultures. Next by priority are Central Balkan and Eastern Balkan
Mountain. Eastern Balkan Mountain and Royak-Provadia Plateau are most suitable for starting Griffon vulture reintroduction followed by Black vulture reintroduction. We attach a map for the relations of eventual vulture populations in the Eastern Balkan Mountain and Royak-Provadia Plateau with other suitable territories and existing populations.
21. Bibliography

- European Union Species Action Plan for the Lammergeier (Gypaetus barbatus), Final Draft, September 1999, compiled by Heredia R., Heredia B.