Bearded Vulture European Endangered Species Programme (EEP): Annual report 2023

By Dr. Àlex Llopis Dell [1] & Carmen Calero Contreras [2]

[1] *Centre de Fauna Vallcalent, Ptda. Vallcalent 63, 25199 Lleida, Spain.*
Phone number +34 657 47 33 78 (WhatsApp) *a.llopis@4vultures.org*
[2] *Centre de Fauna Vallcalent, Ptda. Vallcalent 63, 25199 Lleida, Spain.*
Phone number +34 645 78 82 54 (WhatsApp) *c.calero@4vultures.org*

SUMMARY

2023 has been an excellent year for the Bearded Vulture Breeding Programme: with an outstanding production of chicks: 47 Bearded Vulture pairs (including one foster pair) laid 80 eggs, from which 37 hatched and 35 survived. From these 35 fledglings, 26 came from the specialized captive breeding centres (26 breeding pairs), and 9 from Zoos, recovery centres and private collections (21 breeding pairs). 11 fertile eggs didn't hatch, and only 2 chicks died.

The breeding success is mainly due to the highest hatchlings' survival rate ever achieved within the EEP (2023 very high survival rate, 94.6%! In average 81.14% 2004-2023).

Signs of ageing are already visible in several pairs: of the 7 experienced breeding pairs that failed in 2021 and in 2022 (two pairs at T. Friedrichsfelde, Chomutov, Nuremberg, Schönbrunn, T. Goldau and one pair at RFZ), only two reproduced in 2023, in Chomutov and Richard Faust Zentrum (pair from RFZ both adults died in 2023).

Of the 5 pairs that produced their first fledgling in 2022, 3 reproduced again in 2023 (RFZ, Asters and Centro de Cría de Guadalentín).

6 new pairs reproduced with success for the first time in 2023 (Alpenzoo, Parc Animalier des Pyrénées, 2 in Centre de Fauna de Vallcalent and 2 in RFZ). Sadly, one of these pairs in CFV lost the female.

RFZ also lost one of its most experienced pairs, the most successful in the history of EEP, so the EEP lost 2 pairs in 2023. In total 10 birds died (6 males & 4 females): 5 adult birds (4 breeding birds), 1 subadult, 2 immatures and 2 juveniles.

21 nestlings born in the EEP have been released in the wild and 14 kept for the captive breeding network with the goal to increase the EEP breeding capacity in the near future. One more fledgling, a wild bird rescued in Catalonia, was released in Andalusia.

15 birds were transferred between different centres belonging to the EEP breeding network, mainly with the aim of forming new pairs. 17 birds could not be transferred for different reasons.

The zoos at Le Pal in France, Zie Zoo in the Netherlands and Nuremberg in Germany have begun construction of new aviaries to house pairs of bearded vultures in 2023. In addition, Centre de Fauna de Vallcalent in Spain has built four new aviaries, and Centro de Cría de Guadalentín, also in Spain, has renovated the aviaries it used to use for Egyptian vultures and adapted them for Bearded Vultures.

Thanks to the financial support from EEP zoos and other organizations, the VCF managed to establish an effective EEP coordination which kept the specialized breeding centre Vallcalent in Catalonia open for 2023 - we thank you for your support, without this the future of the Bearded Vulture in Europe would look bleaker!

TABLE OF CONTENTS

INTRODUCTION

In 1978, the Bearded Vulture Reintroduction Project started in the Alps (FZG 832/78; WWF 1567/78) based on a captive breeding programme. This Bearded Vulture captive breeding network has been included in the European Endangered Species programme (EEP) since the EEP began, and is a VCF-coordinated network of zoos, animal parks, captive breeding centres and private collections aiming to breed this species in captivity for conservation purposes. In 1978, it was clear that only offspring from Zoos could be used, because the autochthonous populations were threatened.

One of the first objectives of the Bearded Vulture captive breeding program was to ameliorate the breeding success of the captive population. This would primarily satisfy the needs of the zoos, stop the importation of wild birds and assure a minimum production of chicks per year for the release. To achieve this first objective a breeding centre was created on the outskirts of Vienna, Richard Faust Breeding Zentrum (RFZ) with the function to coordinate the whole program, to study behaviourally problematic birds, obtain information about the needs of this species to maintain in captivity in well conditions, to reproduce with them and finally develop the housing guidelines for this species. At that time nearly 40 Bearded Vultures were still distributed throughout European zoos, including only one successful breeding pair. From the beginning, it was possible to convince European zoos to cede their birds for this conservation goal and to transfer most of these birds to the Richard Faust Zentrum in Austria. When birds where paired and juveniles were produced at RFZ, they went back to the zoos, and so from 1978-1985 the European breeding network emerged and was a precursor of the later established EEP.

The Bearded Vulture EEP network is composed of a vast number of different types of institutions: private and municipal Zoos, private collections, NGO and Governmental wildlife recovery centres, and several of them are not EAZA (European Aquaria and Zoo Association) members. That's why an international foundation structure (Vulture Conservation Foundation) was created to make sure that all partners accept, respect, and follow the guidelines of the EEP. The Vulture Conservation Foundation´s final goal is to restore the species across its former range in Europe, and establish a European Bearded Vulture meta-population, with connections between the current European autochthonous isolated populations (Pyrenees, Corsica and Crete) with the reintroduced populations, in a continuum that goes from northern Africa (Morocco) to Asia (Turkey & the Caucasus).

The goals of this program are to create a captive stock as genetic reserve and at the same time build an ex-situ genetic reserve from European autochthonous endangered populations (Pyrenees and Corsica). Further to produce chicks able to reproduce as they get sexual maturity and appropriate for the reintroduction, because the final goal of the captive network is the conservation in situ, establishing a wild population capable to survive and reproduce, independently of human intervention. That's why the Logo of the Bearded Vulture EEP is: Quality before Quantity.

Because pair formation in Bearded Vultures can be complicated and dangerous, the EEP decided that it was necessary to create a distinction between centres dedicated exclusively to breeding (zoos and private centres) and centres dedicated to breeding and pair formation (Specialized Breeding Centres: SBCs). The role of the former is to house already established pairs and to breed the maximum number of offspring from them, while the latter, is where specialized staff are responsible for establishing new pairs, taking in new founders (injured birds from the wild), adopting chicks, housing problematic birds, and creating a genetic reserve by receiving specimens from all genetic lineages that make up the EEP. Further in 2018 regarding the losses that the EEP suffered in 2017 (West Nile Virus and aspergillosis), it was necessary to draft a new bird distribution strategy between the Specialized BV captive breeding centres (SBC). This distribution takes in account the potential,

resources, geographical location and the specialization of each SBC, and additionally its supply capacity on birds for the vicinity reintroduction projects.

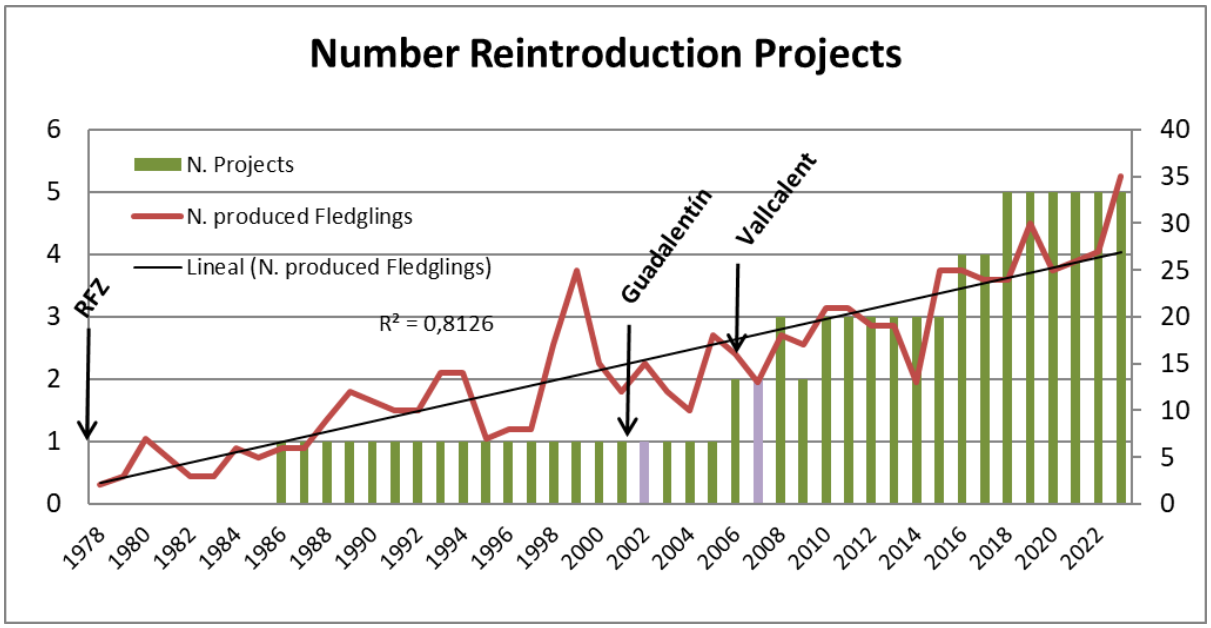
Thanks to this structure the number of yearly produced chicks increased continuously having currently a captive stock from 179 birds distributed in 31 (mainly European) zoos, 2 recovery centres, 2 private keepers, and 3 large (red spots) and 3 smaller (green spots) specialized captive breeding centres. The VCF owns 90.50% of these (n= 162; 74 males & 88 females). From these 179 birds, 82 are males with an average age of 16.1 years old (range from 45 years to 1 years old) and 97 females with an average of 14.3 years old and with a range from 46 years to 1 year old (see table 1 & 2 in Annex).

The distribution of the captive stock over many Zoos lowers bulk risks, e.g. epidemic diseases (December 2023).

The yearly increase on chicks' production makes possible to expand the initial goals and start other reintroduction projects. Nevertheless, in took 20 years between the first release in the Alps, which took place in Austria in 1986, and a second reintroduction project could start. This was in Andalusia in 2006. Afterwards the waiting time for starting a new project has significantly shortened, being possible in 2008 to start a third reintroduction project in Sardinia. Unfortunately, it was necessary to stop the project at the same year because of different internal/release problems. In 2012 Grands Causses (France) could receive first nestlings and three years later a reinforcement project started at the Corsican Island where the population is near verge of extinction. The last but not the least reintroduction project started in 2018, in Maestrazgo (Spain), with the goal to establish a bridge between the Andalusian reintroduced population and the wild Pyrenean one, the same as Grands Causses for the Pyrenean and the Alpine population. In 2021, Berchtesgaden NP, in Germany, also started to release young Bearded Vultures, as part of the Alpine reintroduction project.

The substantial increase in number of projects over the last decade is due to the presence of two new Specialised Breeding Centres (see graphic below). Further, thanks the new advice service from the VCF, giving the opportunity EEP-partners after request to receive in situ a visit from a specialist, to help ameliorate the housing conditions and train the staff, the average age of death during the last 11 years at the Breeding Centres (zoos, private collections and recovery centres) could be increase from 15.1 years old (n= 69 birds; 1978-2011) to 19,4 years old (n= 42 birds; 2012-2023). Additionally, all new partners before receiving birds need to have aviaries which follow the housing guidelines of the EEP. All above mentioned made it possible to reduce the death of birds and increase the captive population and the number of breeding pairs. However, with all this effort, it has not been possible to ameliorate the breeding success at the zoos (0.41 fledglings/breeding pair, average 2004-

2023), more than half as low as in the SBCs (0.96 fledglings/breeding pair, average 2004-2023). This is due of the special reproduction biology of the species (late sexual maturity, high level of aggressiveness during breeding season, cainism behaviour by chicks, special diet and feeding behaviour of chicks, etc.) and that zoos, by holding in average only one breeding pair, it takes many breeding years for them to gain experience.



Since 1986, where first release took place in Austria, 402 nestlings have been used for in situ projects: in the Alps (251), Andalucía (88), Grands Causses (36), Sardinia (3), Corsica (10), Maestrazgo (14). The rest of the produced birds were included in the captive breeding network (271). The first reproduction of Bearded Vulture in the wild occurred in 1997 (France) and, until 2023, 461 nestlings have fledged in the Alpine mountains, more than released birds. In 2015 a great event was achieved by the Andalusia Bearded vulture reintroduction project: after nine years of releases the first chick hatched in the wild from a female that was only five years old. Until 2023, 13 fledglings have been produced in the Andalusian mountains.

BREEDING RESULTS 2023

During 2023, a total of 35 fledglings has been produced within the EEP breading network, which is the highest number produced to date in a single breeding season. The main reason for this success is the large number of eggs laid (80 eggs in total, 1,7 eggs per pair), together with a high rate of survival of hatchlings (only 2 chicks died, 5,4%). The Richard Faus Zentrum in Vienna broke the record of fledglings in one centre with 11 chicks successfully produced, surpassing the previous record of 10 chicks. These numbers confirm the good health of the captive breeding programme.

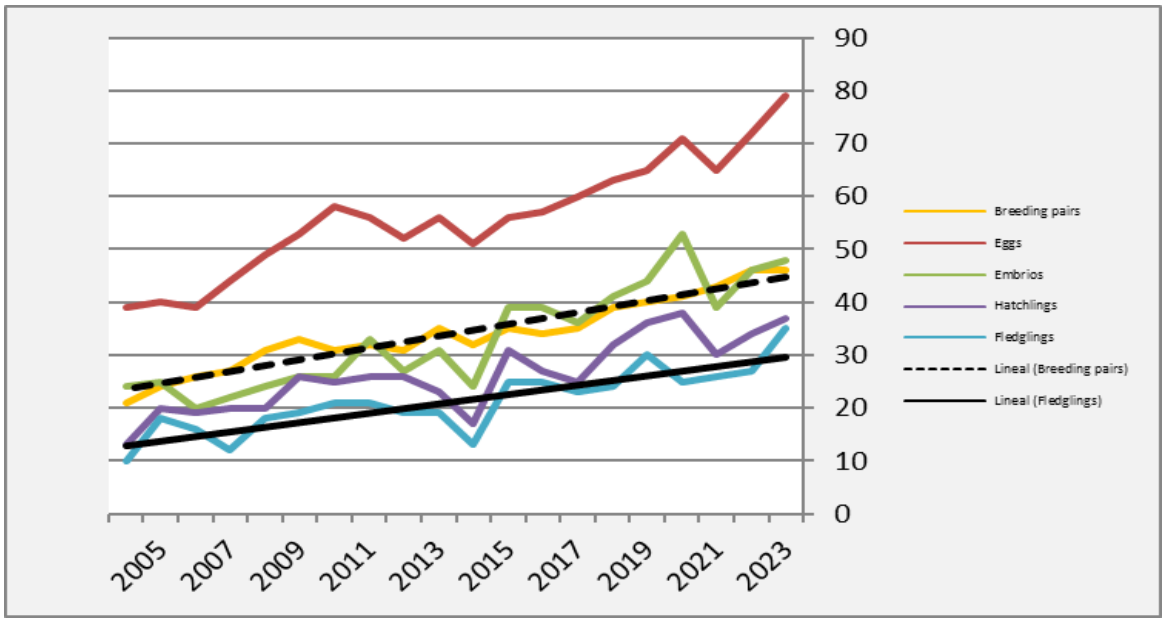
In 2021 and 2022, of 7 experienced pairs failed to produce a chick, only 2 bred successfully during the breeding season 2022-2023: the pair from Chomutov, that produced one chick, and the pair BG017 x BG070 from RFZ, that produced two chicks, becoming the only pair within the EEP to reach the number of 42 fledglings produced together - sadly both died afterwards.

On the other hand, 6 new pairs have reproduced for the first time in 2023 in Alpenzoo, Parc Animalier des Pyrénées, two in Centre de Fauna de Vallcalent and two in RFZ, and 3 of the 5 pairs that produced their first fledging in 2022, reproduced again in 2023, in RFZ, Asters and CCG.

In conclusion, in 2023, 47 bearded vulture laying pairs laid 80 eggs, of which 37 hatched and 35 survived. From these 35 fledglings, 26 came from the specialized captive breeding centres (26 laying pairs; included one foster pair), and 9 from Zoos, recovery centres and private collections (21 breeding pairs). 11 fertile eggs didn't hatch, 2 chicks died.

21 nestlings were released, and 14 birds (5 males and 9 females) were added to the breeding network. Thanks this record on produced chicks, it was possible to offer the maximum number of birds to each release site as it was accorded for an excellent breeding season and also include a high number of birds inside the EEP. The 21 (+ 1 Pyrenean wild recovered fledgling) released fledglings were distributed in 5 ongoing projects as follow: 8 in the LIFE Gyp'Act Project (four in Grands Causses, 2 in Baronnies and two in Vercors release sites), 6 (+1) in Andalusia, 3 in Maestrazgo, 2 in Switzerland and 2 in Berchtesgaden.

This breeding results proves that the Bearded Vulture EEP maintains its production capacity, compensating the pairs that, mainly due to their age, decrease their production capacity, with new pairs, a positive trend, which allows us to remain optimistic for the coming years (see figure below).



Specialized captive breeding centres

This year, the EEP of the bearded vulture has added one more specialized breeding centre to its breeding network: Parc Animalier des Pyrénées. This zoo, located in the heart of Pyrenees, a perfect location for this species, has built a complete breeding unit dedicated to the breeding of the bearded vulture, separated of the zoo and therefor out of the sight of the public, composed of 8 breeding aviaries and an independent nursery. Together with the other five specialized breeding centres -Richard Faust Bartgeier Zuchtzentrum Haringsee (RFZ), Centro de Cría de Guadalentín (CCG), Centre de Fauna Vallcalent (CFV), Breeding centre Asters (Conservatoire d´Espaces Naturels Haute Savoie) and the Breeding centre in Arth-Goldau (Natur und Tier Park Goldau)-, they

were housing 90 individuals on the 31st of December 2022. From these, 26 pairs have laid 47 eggs. 33 showed to be fertile and 26 hatched successfully and all of them fledged with success (15 males and 11 females).

- Richard Faust Bartgeier Zuchtzentrum (RFZ) - Eulen- und Greifvogelstation Haringsee (EGS).

The RFZ, headquarters of the EEP and with a captive stock of 33 birds on the 31st of December 2022, is specialized in the reproduction with founder birds. Further RFZ was responsible to establish the guidelines for captive breeding of this species and to determine the best release method for Bearded Vultures.

This centre had an excellent season, breaking their own record of chicks produced by a single centre, that used to be 10 chicks in one season (record shared with CCG), producing 11 chicks for the first time in the history of the EEP.

As mentioned before, this season only one of their experienced pairs reproduced successfully, the old pair BG017 x BG070, "Jan" x "Hanneke". They produced two chicks, the male BG1168, who showed some delay in his development and was kept in the breeding programme, and the female BG1172, released in Maestrazgo, Spain. With these two chicks, this pair has produced a total of 42 chicks, something never achieved before within the EEP. Both birds died after this breeding season.

However, this centre continues to maintain a good trend: two pairs got the first fledging in 2023 and the one pair that reproduced for the first time in 2022 also got two fledglings in 2023. It's interesting to note that most of the pairs laid a double clutch (7 of the 10 pairs that laid eggs).

In total, 10 laying pairs (one foster pair included; male mat on perches) laid 17 eggs, 12 of them were fertile and only one aborted. All the chicks that hatched survived.

In addition to the two chicks of the pair BG017 x BG070, the pair BG108 x BG175 produced two females, BG1159 and BG1160, both released in Cazorla, in Andalusia, Spain. The pair BG681 x BG560 produced two chicks too, the male BG1185 was released in Melchsee-Frutt, Switzerland, as part of the Alpine reintroduction project, and the male BG1190 was kept in the EEP, but died as a fledgling in October due to an Aspergillosis infection. The pair BG857 x BG835 also produced two females, BG1187 and BG1189, both kept in the EEP program. The male BG1178, from the pair BG468 x BG381, was released in Berchtesgaden, Germany. The male BG1170 from the pair BG087 x BG547 and the female BG1183 from the pair BG080 x BG518, were both kept in captivity in the EEP network since they both are the first descendants of these pairs, and also their fathers are quite old.

Summarizing, two birds were released in Cazorla, in the framework of the Andalusian reintroduction project, one nestling in Melchsee-Frutt CH, one in Berchtesgaden, one in Maestrazgo-Els Ports and 6 included in the EEP.

"Jan" and "Hanneke" the most successful breeding pair inside the EEP, taking care of one of their offspring at the Richard Faust Zentrum © RFZ.

- Centro de Cría de Guadalentín (CCG)

The CCG, with a captive stock of 27 birds at the end of 2022, is the basis of the Andalusia Bearded Vulture reintroduction project. They had 8 breeding pairs that laid 16 eggs in total, of which 6 turned out to be infertile. Two embryos died, 8 chicks hatched and all of them fledged. The pair formed by an experienced male and a young female, BG286 x BG580, that was dissolved last season because the male suffered an accident, was reunited again and laid two eggs, both infertile. They were definitively separated and after the breeding season the female sent to the Centre de Fauna Vallcalent. The young pair BG1006 x BG987 copulated for the first time this year, but they didn't lay.

All chicks are hatched artificially in the brooder, being the clutches from 8 pairs removed between a few days to two weeks before hatching and exchanged with dummy eggs or receive a chick for adoption. From the breeding pair BG410 x BG290, all three eggs were removed on the same laying day or the day after having laid. The first two eggs, artificial incubation is carried out according to the protocol established for the species, being one of its peculiarities to expose the eggs four times a day for 5 minutes at an outside temperature. The third egg was adopted by the breeding pair BG391 x BG360. Unfortunately, all three eggs proved to be infertile. By pair BG362 x BG389, the first two eggs had to be removed on the same laying because the female began to manipulate it inappropriately. During the removal of the second egg, a dummy egg was offered, which was readily accepted by the female. Surprisingly, eight days later the female laid a third egg. The first two eggs aborted and the third showed to be infertile.

From the remaining five pairs, from the pair BG313 x BG330, the male BG1174 and the female BG1177 were released in Maestrazgo-Els Ports, in Spain. From pair BG391 x BG360, the male BG1169 was released in Vercors, in France, and the male BG1184 released in Grands Causses, in France. From pair BG337 x BG317, the male BG1175 was released in Vercors, in France, and the male BG1186 was released in Grands Causses, in France. From pair BG124 x BG329, the male BG1161 was released in Grands Causses, in France. And from pair BG590 x BG658, the male BG 1267 was released in N.P. Castril, in the framework of the Andalusian reintroduction project.

Summarizing, all the fledglings were released: 2 in Maestrazgo-Els Ports, 1 in Andalusia, and 3 in Grand Causses and 2 in Vercors within the project Gyp'Act.

One of the chicks born in Guadalentín Breeding Centre.

- Centre de Fauna Vallcalent (CFV)

This centre is one of the five rehabilitation stations from the Generalitat of Catalonia, located in Lleida (Spain), and has a Bearded Vulture captive breeding Unit, which is managed by the VCF through the EEP species coordinator (staff from the Vulture Conservation Foundation). One of its priorities is to get offspring from difficult birds, which did not reproduce elsewhere, regardless of quantity as is the case of the Guadalentín Breeding Centre (Andalusia, Spain). Furthermore, to treat wild recovered injured birds and to conduct studies/analyses of new treatments as well as prophylaxis.

At the beginning of the breeding season 2022-23, 13 birds were housed in CFV facilities. Four pairs laid 8 eggs, 6 of them were fertile and 3 chicks hatched. The pair BG652 x BG680, the only pair in the EEP consisting of two individuals of Pyrenean origin, laid one egg after four seasons without laying, but unfortunately it was found putrefied in the nest after 40 days of incubation. The old pair, BG297 x BG115, laid two eggs and one of them aborted. The pair BG551 x BG398 laid two fertile eggs for the first time. Sadly, the female died and the eggs were retired from the nest. One of the chicks died just before hatching, the second one hatched successfully and was

adopted by the imprinted male BG368. The fourth pair, BG371 x BG456, that laid for the first time last season but the eggs were infertile, finally produced a chick. They laid three eggs in total, the first one was broken by the male due to inappropriate handling after becoming nervous due to nearby construction work, and the second one aborted in the early stages after being retired.

The three chicks that hatched survived and were kept withing the EEP network because of their rare bloodlines.

The only descendant from the pair BG551 x BG398, the female BG1165, suffered a leg fracture after falling from the platform while following his foster father in May. The bones healed in the wrong position, and the young bird was transferred to the Torreferrusa recovery centre for surgery.

From left to right, different moments of BG1165: assisted hatching; weighing during hand rearing and adoption by BG398.

- Breeding centre Asters (Conservatoire d´Espaces Naturels Haute Savoie)

Asters' centre is located at 700m a.s.l. in Sallanches (near Montblanc, France), giving the best climatology conditions for the species, and has the function to house birds from less common blood lines inside the EEP.

At the end of 2023 the centre was keeping four pairs and a ninth recovered injured bird, Sureau, that was released in 2020 in Baronnies. Of the three adult pairs, the oldest one, BG454 x BG502, laid one egg that resulted in the male BG1162, released in Baronnies, France. The pair BG700 x BG627 laid a double clutch, but only one egg hatched successfully, the other one aborted. The chick, a female named Gypaillette, was kept in the EEP network. The third pair, who laid for the first time last season, didn't lay this year.




The four pairs of Asters breeding centre: Envol and Milutz (BG454 x BG502), Enebro and Bina (BG700 x BG627), Louise and Neige (BG860 x BG662) and Bartgy and Flatta (BG1039 x BG1045)

- Bearded Vulture Breeding Centre in Natur und Tierpark Goldau:

At the end of 2022 the centre was keeping one adult pair, one young pair and two young females. The adult female laid one egg, but it exploded in the nest, so probably was infertile.

- Parc Animalier des Pyrénées bearded vulture breeding unit:

Given the problem that Bearded Vultures are very sensitive to aspergillosis infection, especially if they are exposed to high temperatures in low areas (near sea level), Parc Animalier des Pyrénées, located in the French Pyrenees, built in 2022 a specialised breeding centre 500m from the zoo, at the foot of the Pyrenees, thus offering a place to house birds of high genetic value for the EEP (less common blood lines in the captive network), in climatic conditions that are more suitable to the species. It consists of four double aviaries and a building which includes a small office, nursery and a warehouse for storage and prepare food.

At the end of 2022, this centre hosted 4 bearded vultures, an adult pair and a young pair. The adult pair laid a double clutch, both eggs hatched and both chicks survived, being the first time that this pair reproduced successfully. The female BG1191 was reared by their parents, the female BG1193 was transferred when she was one week old to CCG to be adopted by one pair there. Both birds remained within the EEP network, since they are the first descendants of this pair.

The two hatchlings of Parc Animalier in 2023.

☞ **Summary** 25 breeding pairs (RFZ foster pair excluded) in the specialized captive breeding centres laid 46 eggs. 26 offspring were successfully reared: 15 males and 11 females. Of these chicks, 14 were released at the following sites: 3 in Grand Causses, 1 in Baronnies and 2 in Vercors within the framework of the project GypConnect; 1 in Berchtesgaden in Germany and 1 in Melchsee-Frutt in Switzerland as part as the Alpine reintroduction project; 3 in Maestrazgo and 3 in Andalusia in Spain, plus one wild recovered Pyrenean fledgling that arrived in Vallcalent, was raised in Guadalentín and finally released in Andalusia too. 12 were kept for the EEP.
Finally, five pairs produced their first chick: one in Parc Animalier des Pyrénées, two in CF Vallcalent and two in Richard Faust Zentrum.

Zoos, animal parks, recovery centres & private collections

- Zoos & animal parks and recovery centres

The Zoos play a crucial role in the EEP and the conservation of Bearded Vultures. Although the success rate is on average lower than in the specialized breeding centres, they still contribute substantially to the number of young birds raised annually. Furthermore, by maintaining a captive stock distributed in several separate locations, we decrease the risks (for example, in case of epidemic diseases). In addition, by showing this species as well as publicizing the in-situ conservation efforts to large audiences in several countries, they contribute significantly to raise public awareness about the species. The zoos help to build core support for vulture conservation that would otherwise be impossible to achieve.

On the 31st of December 2022, 31 zoos (mostly European), 2 recovery centres and 2 private collections housed 82 birds.

During the breeding season 2022-23, 21 pairs laid 33 eggs, 15 of them were fertile, 11 hatched and 9 chicks fledged. Alpenzoo, Chomutov Zoo, Helsinki Zoo, Tallin Zoo and Puy du Fou produced respectively one chick each, meanwhile Ostrava Zoo produced two. Regarding the recovery centres, Green Balkans (Bulgaria) and Torreferrusa (Spain) had one chick each. In Belgrade Zoo a chick was killed by the female 2,5h after hatching in the nest with assistance. Something similar happened on Tierpark Friedrichsfelde Berlin, where a chick was killed by their parents 13 days after hatching. Tallinn Zoo continues following the Nest-Box protocol established in 2020 during the pandemic to rear their chick, due to difficulties in transferring the chicks for adoption to other centres.

However, this bird, released in Switzerland, had to be recaptured and included in the EEP captive network due to his tendency to get too close to humans.

Only one pair produced a chick for the first time: the pair BG804 x BG801 from Alpenzoo, in Innsbruck, Austria, and none of the pairs that reproduced for the first time in 2022 repeated success this season (BG234 x BG397 from Montowl laid only an infertile egg and BG611 x BG634 from Belgrade lost their chick). On the other hand, no pair has been lost.

The breeding pairs from Beauval Zoo, Berlin Zoo, La Garenne Zoo, Liberec Zoo, Novosibirsk Zoo, Nuremberg Zoo, Pairi Daiza, Parc des Oiseaux, Parco Natura Viva, Poznan Zoo and Prague Zoo failed to produce a young, as well as the pairs from Tierpark Friedrichsfelde, Montowl and Belgrade already mentioned.

The breeding success at the zoos and recovery centres has been lower than the specialised breeding centres due to a significantly low fertility of the eggs: only 15 of the 33 eggs laid were fertile (45,45% of fertile eggs compared to the 70,21% of the SBCs). However, the egg productivity was similar in both types of centres (1,7 eggs per pair at the zoos and rescue centres and 1,8 at the SBCs).

The following fledglings born in zoos and rescue centres have been released:

- Female BG1163 from the youngest pair of Ostrava Zoo was released in Baronnies (France), same as last year.
- Female BG1164 from Green Balkans Rescue Centre was released in Grands Causses (France).
- Female BG1166 from Torreferrusa Resue Centre was released in Castril, Andalusia (Spain).
- Female BG1171 from Alpenzoo was released in Berchtesgaden N.P (Germany).
- Male BG1180 from Tallinn Zoo was released in Melchsee-Frutt (Switzerland), although it had to be recaptured shortly after and kept in captivity due to behavior problems.
- Female BG1182 from Helsinki Zoo was released in Cazorla, Andalusia (Spain).
- Female BG1188 from Chomutov Zoo also was released in Cazorla, Andalusia (Spain).

Two females stayed in captivity: BG1173 from Ostrava Zoo and BG1195 from Puy du Fou, plus the male BG1180 from Tallin released in Switzerland that had to be captured, as has already been explained.

Left: the breeding pair of Puy du Fou France BG753 x BG653. Right: The breeding pair of Green Balkans Rescue Centre BG461 x BG483, during a double adoption.

Bearded Vulture EEP: results for 2023

The coordinator of the EEP has continued to support centres in need by providing regular advice on incubation, hatching assistance, chick care and adoption. Tierpark Friedrichsfelde Berlin, Puy du Fou France, Nuremberg Zoo, Torreferrussa Recovery Centre and Green Balkans Rescue centre were some of the centres that received continuous support during the rearing of their chicks this season. The specialised centre Parc Animalier des Pyrénées also received assistance about their two chicks.

Summary 21 breeding pairs in the zoos/recovery centres laid 33 eggs, only three fewer eggs than last year with three fewer pairs. From the 33 eggs, 15 showed to be fertile and 11 hatched. 9 nestlings fledged with success (1 males and 8 females). 7 of them, the males only male and 5 females, have been released (1 in Grands Causses and 1 in Baronnies in the framework LIFE project GypConnect in France, 1 in Berchtesgaden (Germany) and 1 in Melchsee-Frutt (Germany) through the ALPINE reintroduction project, and 3 in Andalusia, Spain). The remaining five, 2 females, have been kept for the EEP.

In conclusion, in 2023, 47 bearded vulture laying pairs (including a foster pair; male mat on perches) laid 80 eggs, from which 37 hatched and 35 survived (see Table 3 in Annex - Breeding pairs in 2023). From these 35 survived fledglings, 21 nestlings were released: 6 in Andalusia (plus one wild recovered Pyrenean fledgling), 8 in the framework of the LIFE project GypConnect (4 in Grands Causses, 2 in Vercors and 2 in Baronnies), 2 in Switzerland, 2 in Germany, and three in Maestrazgo. The remaining birds, 14, were added to the breeding network (see Table 4 in Annex – Offspring in 2023). From these 35 fledglings, 26 came from the specialized captive breeding centres (26 breeding pairs), and 9 from Zoos, recovery centres and private collections (21 breeding pairs).

Out of the 43 not hatched eggs, 22 were infertile, 5 putrefied, 5 unknowns (broken and disappeared in the nest), 8 aborted and 3 died during the hatching process.

Breeding results 2023 overview:

	Laying Pairs	Eggs	Fertile E.	Hatchlings	Fledglings
SBC's	**26**	**47**	**33**	**26**	**26**
Richard Faust	10*	17*	12	11	11
Guadalentín	8	16	10	8	8
Vallcalent	4	8	6	3	3
T.Goldau	1	1	0	0	0
Asters	2	3	3	2	2
Parc Animalier	1	2	2	2	2
BC's	**21**	**33**	**15**	**11**	**9**
Zoos/Priv.	19	29	9	9	7
Recovery Centers	2	4	4	2	2
TOTAL	**47**	**80**	**48**	**37**	**35**

**1 foster pair included*

LOSES	incubation (fertile eggs)	before internal pick (fertile eggs)	hatching	adoption	rearing	Total
SBCs	4	3			0	7
BCs	4				2	6
TOTAL	8	3			2	13

One of our protagonists photographed by Hansruedi Weyrich.

TRANSFERS / INCREASES / LOSSES

Transfers

The final goal of bird transfers is to increase the genetic variability of the captive stock, and at the same time assure in the long term a minimum number of chicks produced per year to satisfy the ex-situ (captive breeding network, EEP) and in-situ (birds release) needs. Therefore, the number of breeding pairs must at least be maintained, and this can be only achieved by building continuously new pairs for replacing potential future loses or breeding failures and assure a minimum yearly production of chicks. In general, the pair bonding scheme is drafted at the same time when the destination of the descendants is determined; genetics and location are the most important criteria to be considered.

During 2023, 15 individuals were transferred, 7 males and 8 females, between 13 different locations to build new pairs or because of reconstruction of aviaries.

On the 19th of February, the female BG1157 born in Richard Faust Zentrum in 2022, was transferred from this centre to Parc Animalier des Pyrénées.

On the 26th of May, Richard Faust Breeding Centre received the young male BG1155 from Puy du Fou, born in 2022, and the female BG1149 from Beauval Zoo, born the same year, to be paired together.

On the 30th of May, the female BG576, born in 2009 in RFZ, returned there after spending 12 years in Frankfurt Zoo.

On the 3rd of June, the male BG1156, born in 2022, was transferred from Tallinn Zoo to Tierpark Goldau. Unfortunately, she died in November due to a Pox Virus infection.

On the 6th of June, the pair of fledglings BG1168 and BG1183, both born in 2023, were transferred from RFZ to Schönbrunn-Vienna Zoo, after the rehabilitation of their aviary.

On the 7th of October, the male BG1035, born in 2019 in Liberec Zoo, was transferred from Green Balkans Rescue Centre to Centre de Fauna de Vallcalent.

On the 26th of October, two birds were transferred from Centre de Cría de Guadalentín in Andalusia to Centre de Fauna de Vallcalent in Catalonia: the young male from 2022 BG1152, and the female from 2009 BG580, this one to be paired with the founder male BG551, who lost his female the previous years.

On the 12th of November, the female born in 2023 in Asters BG1194 Gypaillette, was transferred to Centre de Fauna de Vallcalent.

On the 30th of November, the pair consisting of male BG1153, born in 2022 in Centre de Fauna de Vallcalent, and the female BG1133, born Centre de Fauna de Torreferrusa in the same year, were transferred from Mon-Natura Planes de Son to Centre de Fauna de Vallcalent because Mon-Natura closed their animal facilities.

Finally, two young chicks were transferred from their birth centres to Centro de Cría de Guadalentín to be adopted and raised there: the male BG1181 from Centre de Fauna de Vallcalent on the 29th of March and the female BG1193 from Parc Animalier des Pyrénées on the 5th of April.

Right: Young bearded vulture being transported. Left: BG1168 Dagobert in Schönbrunn Zoo, Vienna

Increases:

In 2023, 14 juvenile reproduced birds (6 males and 8 females) have been included in the EEP, with the goal to increase the breeding capacity of the EEP (see table 4 in annexes for more details), although two of them, the male BG1190 and the female BG1183, died before the end of the year. Furthermore, the wild male Roc Genese, born in 2016, the first bearded vulture tagged in the French Pyrenees, was included in the captive breeding programme in 2023 after being found with an injured wing in October 2022 and declared unreleasable. Sadly, he was found dead in October 2023.

Losses:

During 2023, 10 birds died within the EEP network, 6 males and 4 females, fortunately not as many has last year. 3 birds died at Richard Faust Zentrum due to their advanced age, all of them played important roles in the conservation of this species: Winnie, the first to be released in the Alps in 1986, and Jan and Hanneke, the pair that has produced more chicks in the whole breeding programme. 3 more died from Aspergillosis infection, showing that this fungal infection, whether primary or secondary, remains one of the main causes of death in the breeding programme. One more bird died due to an infection, in this case a poxvirus. Another bird, who also had respiratory problems, died from a reaction to an anti-inflammatory drug. One more drowned in the pool of his aviary and the last one from lead intoxication.

On the 9th of January, the 21-year-old female BG398 died at Vallcalent breeding centre of kidney failure caused by an anti-inflammatory drug intoxication, Mavacoxib. This drug was used with good results in Helgalaldia rescue centre in France with the bird Roc Genèse. It was given to BG398 because she was showing respiratory problems and was even making long interruptions while incubating, so the clutch was removed. One of those eggs hatched in the incubator after the mother died.

On the 12th of May, the 37-year-old female BG091 was euthanised in RFZ after becoming very weak and apathetic. She was the first bird to be released in Hohe Tauer N.P. in Austria in 1986. In January of the following year she was rescued and included in the breeding programme.

On the 3rd of August, the 39-year-old female BG070 Hanneke died during the anaesthesia. She was not sleeping in the platform and a was smell was detected as she flew, so she was checked, and maggots were found in her rump and cloaca. She was also suspected of having problems expelling large coprolites, a problem she had for years and even underwent surgery for this. Together with her partner for 35 years, Jan, they were the pair that produced more chicks in the history of the EEP, 42 chicks in total. Unfortunately, Jan, BG017, also died this year, on the 10th of November, at the age of 44. He was euthanised after stopped eating and stayed on the ground for two days. He was almost blind and had many symptoms of severe senile decay.

On the 4th of September, the 3-year-old male BG1061, Sureau, died of a severe Aspergillosis infection at RFZ. He felt from the hacking and broke her left wing, after which he was included in the EEP programme.

On the 2nd of October, the 6-month-old male BG1190 died of an Aspergillosis infection as well at the RFZ.

On the 31st of October, the 8-year-old mal Roc Genèse, drowned in the water pool of his aviary in RFZ. In was wild born in Pyrenees and tagged in the nest in 2016. He was found in the ground with a dislocation in his right shoulder and some wounds and included in the breading programme after being declared unreleasable.

On the 27th of November, the 1-year-old male BG1156 died in Tierpark Goldau due to a Pox virus infection.

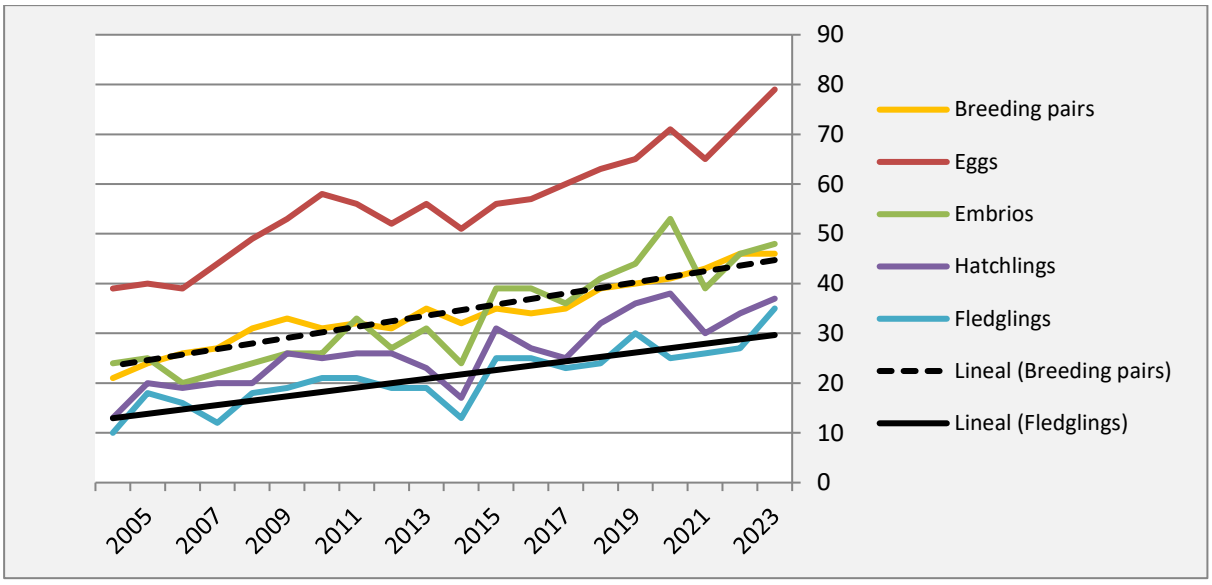
On the 15th of December, the 5-year-old male BG977 died at Riga Zoo because of a lead intoxication, after ingesting lead pellet from a cow.

On the 22nd of December, the 10-month-old female BG1183 Lotte died in the Veterinary University of Vienna. She was taken there from Schönbrunn Zoo after being apathic and showing dyspnoea when being caught. She was treated for Aspergillosis and transferred to RFZ, but she relapses and finally was euthanised.

STATUS BEARDED VULTURE EEP

On the 31st of December 2023, there were 179 birds included in the EEP (seven more than 2021). From them, 82 were males and 97 females, being the average age between males and females almost the same: for males 16.1 years old (range from 45 years to 1 years old) and for females 14.3 years old (range from 46 years to 1 year old). Even though there are very old birds, the average is still very low, showing the existence of a high number of young individuals (≤7 years old), what represents the 28.5% of the total captive population, but the sex distribution in this age group favours females (21 males and 30 females). In contrast, in the >7 years age group, the distribution is more similar but also favours females (61 males and 67 females), existing a total surplus of 15 females inside the EEP. Nevertheless, we can find males and females in each age class, what gives a pyramid shape on age distribution and reflects demographically a very healthy and stable captive population (see annex table 2). The actual Bearded Vulture EEP population structure makes possible to guarantee a stable yearly production on chicks covering the EEP needs and the on-going reintroduction projects as well.

But, as it has been previously mentioned, from the 7 experienced breeding pairs that failed in 2021 and in 2022 (two pairs at T. Friedrichsfelde, Chomutov, Nuremberg, Schönbrunn, T. Goldau and one pair at RFZ), only two reproduced in 2023 (Chomutov and RFZ; the last one both adults died in 2023), showing the negative effect their advanced age is having on their reproductivity. Further, from the five pairs which bred with success for the first time in 2022 (Montowl, Belgrade, one pair in Asters, one pair at Richard Faust Zentrum and one pair in Guadalentín), three have successfully reproduced again in 2023. On the other hand, in 2023 six new pairs produced for the first time a fledgling (Alpenzoo Innsbruck, Parc Animalier des Pyrénées, two pairs in Vallcalent breeding centre and two pairs in Richard Faust Zentrum). These new pairs make possible to increase the breeding parameters as in previous years (in 2021 43 laying pairs, 65 eggs, 26 fledgelings; 2022 47 laying pairs, 73 eggs, 27 chicks fledgelings; 2023 47 laying pairs, 80 eggs, 35 fledglings) especially in the total number of breeding pairs, showing a continuous upward trend (see graphic below).

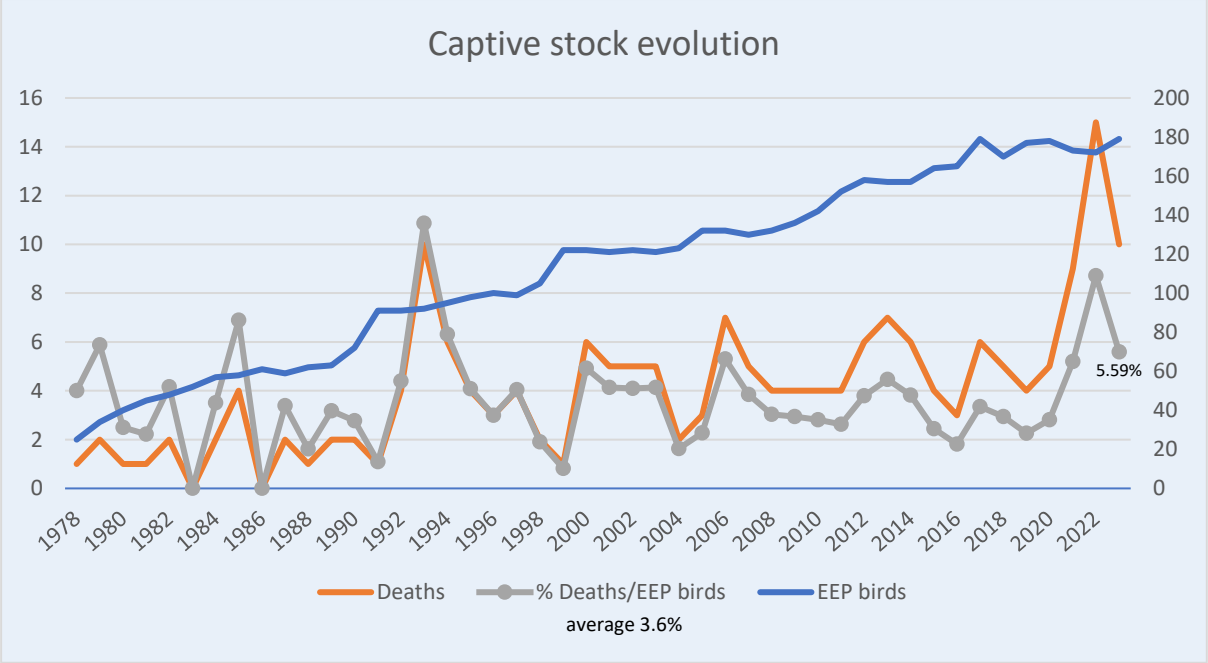


This can be possible only because every year a minimum number of produced fledglings are included in the breeding programme, replacing old pairs that have stopped breeding and even increase the total number of breeding pairs. Consequently, the annual number of produced chicks has been positively affected, with a current number >25 fledglings/year, and even with a record of 35 fledglings in 2023.

Potential breeding pairs		2016	2017	2018	2019	2020	2021	2022	2023
High probability	Number	7	6	8	7	10	10	9	8
	clutch	6	5	8	7	10	10	9	8
	hatchling	2	1	4	5	5	5	3	5
	fledgling	1	0	2	3	1	2	3	5
Medium probability	Number	13	12	11	10	6	9	11	6
	clutch	3	2	3	5	0	4	2	2
	hatchling	1	1	0	0	0	3	0	1
	fledgling	1	1	0	0	0	3	2	1
Low probability	Number	5	8	8	8	10	16	9	8
	clutch	0	2	2	1	1	3	1	1
	hatchling	0	0	0	0	0	0	0	0
	fledgling	0	0	0	0	0	1	0	0
Total potentail pairs		**25**	**26**	**27**	**25**	**26**	**35**	**29**	**22**
N. pairs sexual maturity in 1-2 years					10	10	3	6	5

This strategy has made possible that during the last years the number of potential pairs which can produce a chick has been stable around 25 pairs (see table above). Also, the number of pairs classified into high, medium, and low probability to breed with success has remained stable.

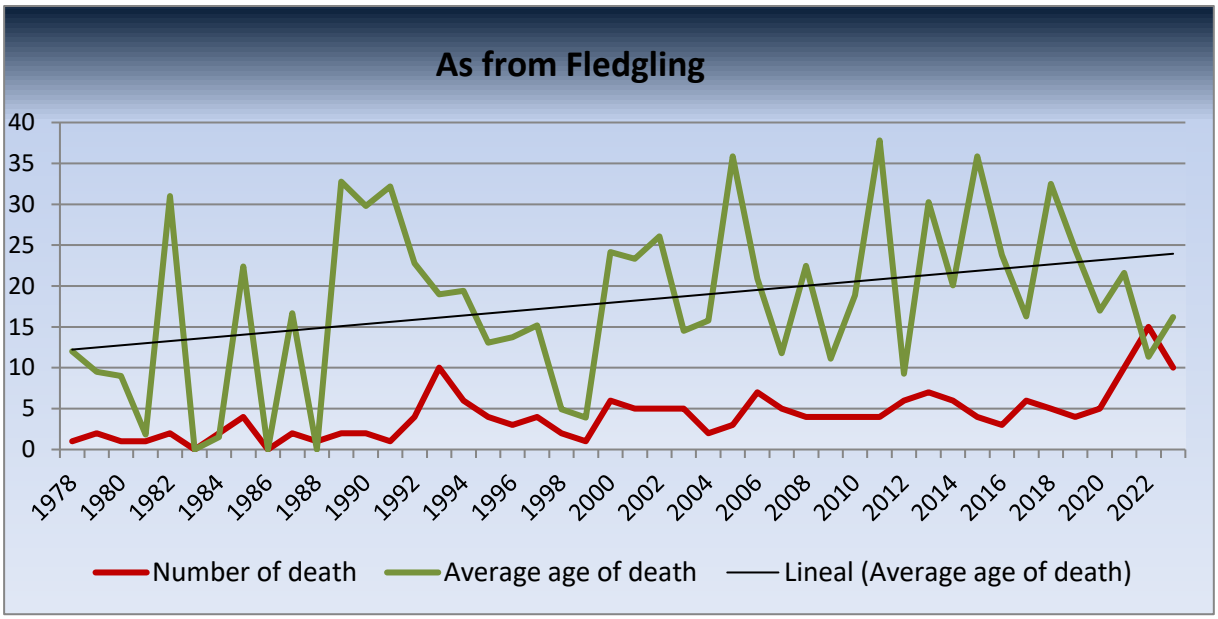
Although the number of bird losses in 2023, has been lower than the year before (10 and 15 birds respectively), it is still above the average of annual bird loss over the last years with a similar population size (6.46 deaths/year; 2011-2023 with a population size from 152-179 birds). The percentage of bird losses in relation to population size in 2023 has been also above the average (5.59% for 2023; average 3.60% 1978-2023) (see graphic below).



Nevertheless, the losses recorded this year are expected to have a minimal impact on the captive breeding population, as most of the affected breeding birds were of advanced age (n = 3; two of which required euthanasia) and five new pairs have started to reproduce in 2023. The only loss of reproductive significance was that of a breeding female at her optimal reproductive age, which died from drug intoxication. The drug involved (Mavacoxib) had previously been administered successfully to another Bearded Vulture; however, in this case, it resulted in fatal toxicity, presenting clinical signs consistent with NSAID intoxication. The rest were non-breeding specimens: four were unpaired juveniles (three succumbing to aspergillosis and one to avian pox), one was a wild-recovered handicapped bird with very limited reproductive potential, and one was a subadult male. But an additional pair in Guadalentín had to be separated, since the male was aggressive towards the female, damaging one of her eyes.

Although these losses, when combined with the high losses suffered by the EEP during the previous two years, they could have a severe long-term impact if not compensated within a short period. It should also be noted that from the 46 breeding pairs in 2023, 12 are composed of aging individuals (≥30 years; 10 males and 5 females), of which will increasingly fail to reproduce in the future. Therefore, since 2023, a higher number of chicks produced have been incorporated into the EEP to compensate these losses.

Unfortunately, this again year four young birds died (three on aspergillosis and one on avian pox), maintaining the average age of death low (see graphic below). On the other hand, 60% of the death has been for different causes reducing the number of loses due to diseases (three due to senility, one on drug intoxication, one drowned in the pool and one on lead intoxication.



On the other hand, the EEP was created as a basis for the reintroduction projects approved by the VCF/EEP, which entails a commitment on the part of the EEP to supply a minimum number of birds annually for all current projects. Nevertheless, the supply of birds for the projects must never jeopardize the future of the EEP and a balance has always been sought between both sides, giving priority to reintroduction projects for some years and to the breeding programme for others. Following this dynamic the number of birds included in the EEP during the period 2004-2023 was as follows:

- During the **EEP priority years**, the average number of birds included in the breeding programme has been 10.91 individuals.
- During the **reintroduction projects priority years**, the average number of total birds included in the breeding programme has been only 5.6 individuals.

In the same period the average number of deaths per year has been 5.60 birds/year, 2.4 birds/year below the **total number** of included birds per year in the breeding program (8.0). However, the real average number of birds included in the breeding programme is only 6.3, as several of those individuals have died before reaching sexual maturity.

Thanks to this dynamic incorporation of birds, the number of potential breeding pairs -including pairs which will arrive to their sexual maturity in 1-2 years-, has been able to be maintained between 22-36 pairs (period 2016-2023). Further, the total number of included birds into the EEP has been higher than the number of deaths (161 to 113 respectively; period 2004-2023). However, it should not be forgotten that the number of individuals from native European populations (n= 18 birds) and the recovered released birds still alive (n= 5 birds), incorporated into the program has had a significant influence on the total number of birds incorporated into the EEP (23 birds; 14.28% of the total number of incorporations). However, almost half

of them (10 birds) were handicapped individuals, and six already died. Furthermore, several birds died before arriving sexual maturity, being the real number of incorporation 125 individuals. By considering the total number of incorporations (n=161) and total number of bird losses (n=113) during the period 2004-2023, the real average number of new incorporations per year has been 2.4 birds/year.

During the last two years, investments on installations have been done in different zoos/breeding centres (total 28 aviaries) to increase the housing capacity, and in middle-long term to increase the yearly chick production inside the EEP. But to achieve this goal it is important to fill as soon as possible the empty aviaries with birds (35-40 birds).

If we consider the dynamics of incorporation of individuals into the breeding programme, thanks to the wonderful results achieved in 2023 it was possible to satisfy the EEP and releases, giving us the chance for 2024 to adapt according to the breeding results. However, we should not forget that the priority of incorporating primarily descendants from less common blood lines is due that having already 179 birds included in the EEP and its goal is a captive stock from minimum 200 birds, the remaining birds to be chosen to reach these 200 individuals shall strictly follow genetic and sex criteria.

Furthermore, inside the EEP there is still a lack of males (10 birds), with most of the unpaired females being from 2022 or 2023. This gives us a margin of one or two years before finding the corresponding male for each female, as males generally arrive sexual maturity a few years before females. Consequently, by 2024, the needs of the EEP will have to be taken into account, including a minimum number of birds produced in 2024 to ensure long-term ability to provide a minimum of birds to all on-going and future projects.

NEW BREEDING CENTRES

Throughout 2023, several centres built new aviaries or rebuilt old ones to adapt them to the birds' needs. The two specialised breeding centres located in Spain continued working to increase their housing capacity to host bearded vultures, and three zoos (Zie Zoo in Netherlands, Nuremberg Zoo in Germany and Le Pal Zoo in France), build new aviaries following the EEP housing guidelines.

Guadalentín breeding centre (Spain)

In 2023, six old aviaries that used to keep Egyptian vultures were renovated and adapted for bearded vultures, increasing the capacity of the centre, one of the largest within the EEP network.

Guadalentín breeding centre rebuild the old Egyptian vultures' aviaries to adapt them for bearded vultures.

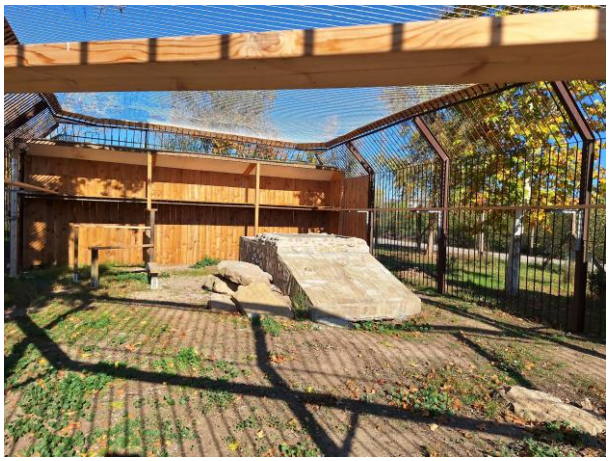
Centre de Fauna Vallcalent (Spain)

In 2023, the Bearded Vulture Captive Breeding Unit in Vallcalent recovery centre continued with the plan of increasing its capacity to become one of the three largest centres of the EEP together with Richard Faust Zentrum in Viena and Centro de Cría de Guadalentín in Andalusia, expanding his goals, not only to concentrate in pairs formation, look for a solution for pairs with low productivity, and adaptation of birds with physical or behavioural problems, but also to produce a higher number of chicks. Two double aviaries have been built within the framework of the LIFE project GypAct', so that this centre will now be able to accommodate up to 8 more bearded vultures (4 pairs). Furthermore, the installation of a comprehensive video surveillance system has continued and is expected to be completed in 2024. The aim is for each aviary to be equipped with three high-quality video-cameras, which will allow the birds to be monitored at all times and, above all, reduce the loss of eggs and chicks due to a lack of visibility of what is happening in the nest.

One of the new double aviaries being built in Vallcalent breeding within the framework of the LIFE project GypAct'.


Vallcalent breeding centre new aviaries completed.

Furthermore, an enclosure for mammals located in the public area has been adapted for Bearded Vultures so that a pair with feather problems can be displayed to the public. This pair are siblings recovered from the wild being unable to fly. Their problem is genetic in origin, and it is not advisable to breed them. By being on public display, they can act as ambassadors for the work being done with the species at European level, without having to visit the breeding unit and disturb the breeding birds.




Vallcalent recovery centre with the new enclosure to exhibit a pair of non-breeding Bearded Vultures to the public.

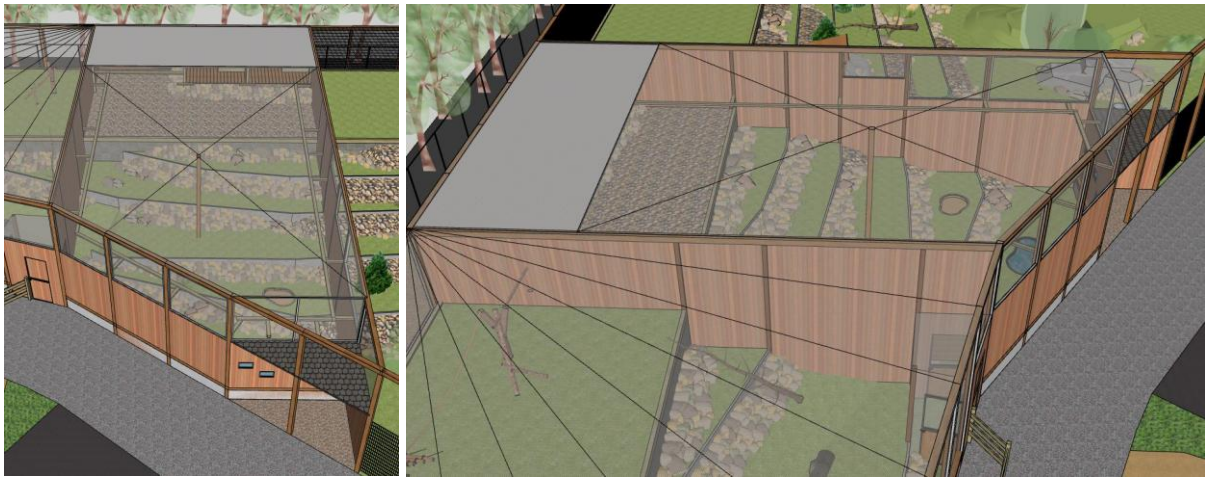
Le Pal Zoo (France)

In November 2023 Le Pal Zoo have started the construction of a double aviary outside of the exhibition area, assigning one of them for a Bearded Vulture pair. The whole process is being supervised by the EEP coordinator, and it is foreseen that it will be ready to receive a pair of young Bearded Vultures in 2024.

Construction of new aviary in Le Pal Zoo.

Zie Zoo (Netherlands)

In 2023, as planned the previous year, the construction of a new aviary started. It is expected to be fully completed and ready to welcome a pair of bearded vultures in 2024.



Design of the new aviary being built at Zie Zoo

Nuremberg zoo (Germany)

In July 2023, Nuremberg Zoo has started with the construction of a double aviary outside from the public area in the quarantine station in Mittelbüg, with the goal to increase their breeding and adoption capacity, and also as support for the new release site in N.P. Berchtesgaden. The construction is foreseen to be finished in October 2024.

Different stages of the construction of the new aviary at Nuremberg Zoo.

OUTLOOK / NEWS

BEARDED VULTURE VACCINATION AGAINST WEST NILE VIRUS

The vaccination protocol implemented in 2022 in Vallcalent Breeding Centre and Jerez Zoo while the study in collaboration with Dra. Ursula Höfle (SaBio (Health and Biotechnology) National Game and Wildlife Research Institute IREC (CSIC-UCLM) in Ciudad Real, Spain) was conducted, has continued in 2023. The private collection of Montowl in Italy also started to vaccinate its three bearded vultures in 2023.

Once seroconversion has been confirmed, it has been decided that birds that have already received three doses in previous years will receive only one booster dose, while any new birds in these centres, either because they were born during the last year or because they have been recently transferred, will receive three doses, spaced 3 and 4 weeks apart respectively. It was decided not to continue with blood sampling to check for seroconversion due to the additional stress this causes to the birds.

STUDY TO GET BLOOD REFERENCES VALUES FROM 90 DAYS OLD NESTLINGS

The protocol for taking blood samples from 90-day-old chicks that was established in 2022 continued during 2023 as planned. The aim is to obtain reference values for each of the different blood parameters (biochemistry and haematology), so that in the future it will be possible to determine the health status of a young Bearded Vulture in a more accurate way. To reduce stress as much as possible the following protocol was developed:

1. **for the nestlings to be released:** to extract a blood sample the day when the nestling is removed from the adults for the transfer to the release site. That would give us additionally picture of its condition before sending it to its release site, even if the results will arrive later when the nestlings are already in the hacking cave.
2. **for the nestlings included in the EEP:** to extract a blood sample when the nestling is around 90 days old. By including this group, in a few years' time we will have a significant sample size and consequently be able to determine the average value of each parameter.

Not all the centres included in the EEP have been able to follow this protocol, due to the difficulties some centres have in accessing laboratories capable of performing these analyses, although a big number of them have participated. Furthermore, significant differences have been observed in some parameters, meaning that it will take several years for the amount of data to be large enough to obtain reliable reference values.

EUROPEAN VULTURE CONFERENCE 2023

From 14 to 17 November 2023, in Cáceres, Spain, the European Vulture Conference 2023 took place. With about 400 attendees representing 46 countries, the conference underscored the importance and commitment to securing the future of vultures worldwide. It boasted a packed scientific programme featuring research with 110 standard talks, 20 speed talks, four keynote speeches, two roundtables, one workshop and 61 posters, offering a unique opportunity to all participants to expand their network, showcase their work, foster collaborations, and learn from leading experts on critical issues in vulture conservation and research.

The European Vulture Conference 2023 in Cáceres, Spain.

Thanks to the good cooperation in the Bearded Vulture EEP, the goal to re-establish an European meta-population is getting closer.

We would like to thank our sponsors:

Mr. Novacek Rene

Vulture Conservation Foundation VCF
email: info@4vultures.org, www.4vultures.org
Facebook Vulture Conservation Foundation | Zürich | Facebook
X Vulture Conservation Foundation (@4Vultures) / X

ANNEX I

Table 1: EEP stock and its distribution as on 31st December 2022

N. ♂	N. ♀	LOCATION	COUNTRY	Age ♂	Age ♀	PARENTAGE {m/f} / {m/f}	GENERATION ♂	GENERATION ♀	REMARKS
1024	982	Aachen zoo	Germany	4	5	{500/513} / {410/290}	F1 / F2/F3	F2	
753	653	Acad. Puy du Fou	France	10	12	{371/103} / {124/041}	F3/F2 / F2/F3	F2	
	1155			1		{753/653} /	F4-F3/F3-F4 / F3		
912	889	Amnéville Zoo	France	7	7	{461/483} / {286/153}	F2/F3 / F3-F4/ F3	F1	
454	502	ASTERS	France	18	17	{108/175} / {179/281}	F2/F3 / F2	F2	
700	622			11	13	{286/153} / {371/103}	F1	F3-F2/F2-F3	
860	627			8	13	{500/513} / {371/103}	F1 / F2/F3	F3-F2/F2-F3	
1039	1045			4	4	{681/560} / founder	F1 / F4-F3/F3-F4	F0	
1061				3		{201/044}	F1/F2		
763	635	Beauval Zoo	France	10	13	{129/481} / {159/270}	F3/F1	F1	
	1149				1	/ {763/635}		F4/F2 / F2	
611	634	Beozoo	Serbia	13	13	{199/107} / {034/130}	F1/F2	F1/F2	
	1142				1	/ {611/634}		F2/F3 / F2/F3	
298	320	Berlin Zoo	Germany	25	24	{122/108} / {018/272}	F2	F2	
124	329	CC Guadalentín	Spain	33	24	{131/132} / {043/040}	F1	F1	
286	580			33	14	founder / {201/044}	F0	F1/F2	
313	330			24	24	{009/006} / {108/119}	F1/F2	F2-F3/F2	
337	317			24	24	{201/044} / {017/070}	F1/F2	F2	
362	389			23	21	{080/081} / {199/107}	F2	F1/F2	
391	360			21	23	{124/041} / {018/272}	F2	F2	
410	290			20	25	{286/153} / {134/135}	F1	F1	
590	658			14	12	{223/329} / {199/107}	F2/F3	F1/F2	
947	908			6	7	{223/725} / founder	F2/F1	F0	
1006	987			5	5	{681/560} / {500/513}	F1 / F4-F3/F3-F4	F1 / F2/F3	
973*	1010*			6	5	{GT099/493} / {GT099/493}	?/ F2/F3	?/ F2/F3	Feather problems
1050	911			4	7	founder / {431/436}	F0	F1 / F3/F2	
	976				5	/ {362/389}		F3 / F2/F3	Cataracts
	1120				2	/ {763/635}		F4/F2 / F2	
1152				1		{313/330} /	F2-F3 / F4-F3/F3		
500	513	CF Torreferrussa	Spain	17	16	founder / {009/006}	F0	F1/F2	
297	115	CF Vallcalent	Spain	25	34	{086/104} / {019/021}	F2	F1	
371	456			21	18	{105/178} / {286/153}	F2/F1	F1	
551	398			15	21	founder / {159/270}	F0	F1	
652	680			14	14	founder / founder	F0	F0	

Bearded Vulture EEP: results for 2023

N. ♂	N. ♀	LOCATION	COUNTRY	Age ♂	Age ♀	PARENTAGE {m/f} / {m/f}	GENERATION ♂	GENERATION ♀	REMARKS
662	668	CF Vallcalent	Spain	12	12	{371/103} / {172/290}	F3/F2 / F2/F3	F2/F3 / F2	
368				23		{159/270} /	F1		Handraised
1091	588			4	14	founder / {371/103}	F0	F3-F2/F2-F3	
340	338	Chomutov Zoo	Czech Rep.	24	24	{018/272} / {134/135}	F2	F1	
826	978	FPWC - CWR	Armenia	23?	5	founder / {826/828}	F0 / F1		
	576	Frankfurt Zoo	Germany		14	/ {108/175}		F2/F3 / F2	
788	281	Helsinky Zoo	Finland	9	26	{297/115} / {131/132}	F3/F2	F1	
804	801	Alp. Innsbruck	Austria	9	9	{340/338} / {371/103}	F3/F2	F3-F2/F2-F3	
847	829	La Garenne Zoo	Zwitzerland	8	8	{313/330} / {108/175}	F2/F3 / F3-F4/F3	F2/F3 / F2	
180	274	Liberec Zoo	Czech Rep.	38	37	{161/162} / founder	F1	F0	
654	656			12	12	{108/175} / {180/274}	F2/F3 / F2	F2/F1	
1153	1133	MónNatura	Spain	1	1	{763/635} / {500/503}	F4/F2 / F2	F1 / F2/F3	
748	832	Moscow Zoo	Rusia	10	8	{108/175} / {180/274}	F2/F3 / F2	F2/F1	
	726	Nikolaev Zoo	Ucraina		15	/ founder		F0	
744	657	Novosibirsk Zoo	Rusia	27	12	founder / {223/329}	F0	F2/F3	
1008	1158			24	?	founder / founder	F0	F0	
18	336	Nuremberg Zoo	Germany	44	24	{019/021} / {201/044}	1	F1/F2	
993	896	Oasi Sant' Alessio	Italy	5	7	{199/107} / {399/278}	F1/F2	F2 / F2/F3	
325	322	Ostrava Zoo	Czech Rep.	24	24	{017/070} / {152/153}	F2	F1	
207	233			29	28	{017/070} / {122/118}	F2	F2	
850	747	P. Animalier Pyrénées	France	8	10	{223/725} / {286/153}	F2/F1	F1	
1154	1096			1	2	{431/436} / {399/278}	F1 / F3/F2	F2 / F2/F3	
894	598	Parc des Oiseaux	France	7	13	{286/153} / {145/276}	F1	F2 / F2/F3	
664	659	Parc Pairi Daiza	Belgium	12	12	{391/360 / {017/070	F3	F2	
451	469	Parco Nat. Viva	Italy	18	18	{108/175} / {018/272}	F2/F3 / F2	F2	
914	903	Plock Zoo	Poland	7	7	{461/483} / {174/118}	F2/F3 / F3/F4 / F3	F2	
328	561	Poznan Zoo	Poland	24	15	{080/081} / {313/330}	F1	F2/F3 / F3-F4/F3	
511	519	Prague Zoo	Czech Rep.	16	16	{002/003} / {105/178}	F1	F2/F1	
1065	1072			3	3	{410/290} / {431/436}	F2	F1 / F3/F2	
234	397	Priv. Montowl	Italy	28	21	{086/104} / {201/044}	F2	F1/F2	
	620				13	/ {172/290}		F2/F3 / F2	
591		Priv. B. Sloman	England	14		{080/081} /	F1		

Bearded Vulture EEP: results for 2023

N. ♂	N. ♀	LOCATION	COUNTRY	Age ♂	Age ♀	PARENTAGE {m/f} / {m/f}	GENERATION ♂	GENERATION ♀	REMARKS
461	483	RC Green Balkans	Bulgaria	18	17	{199/107} / {108/175}	F1/F2	F2/F3 / F2	
1035				4		{654/656} /	F3/F4 / F3 / F3/F2		
1034	999			4	5	{399/278} / {340/338}	F2 / F2/F3	F3/F2	
17	70	Richard Faust Center	Austria	44	39	{019/021} / {022/023}	F1	F1	
108	175			34	31	{065/040} / {152/153}	F1/F2	F1	
212	107			29	35	{152/153} / {150/151}	F1	F1	
594	892			14	7	{172/290} / {223/725}	F2/F3 / F2	F2/F1	
399	278			21	26	{159/270} / {065/074}	F1	F1/F2	
468	381			18	22	{223/132} / {159/270}	F2/F1	F1	
87	547			37	15	{014/010} / {105/178}	F1	F2/F1	
681	560			15	15	founder / {371/103}	F0	F3-F2/F2-F3	
857	835			8	8	{468/453} / {399/278}	F3/F2 / F2	F2 / F2/F3	
	619				13	/ {297/115}		F3/F2	
80	518			38	16	{019/021} / {087/054}	F1	F1	
327	6			24	45	{105/178} / {019/020}	F2/F1	F1	
	969				6	/ {145/276}		F2 / F2/F3	
	1044				4	/ {431/436}		F1 / F3/F2	
	1048				4	/ {431/436}		F1 / F3/F2	
	1108				2	/ {468/381}		F3/F2 / F2	
	1157				1	/ {857/835}		F4/F3 / F3 / F3 / F3/F4	
	91				37	/ {005/006}		F2	
201	44			35	43	founder / {002/003}	F0	F1	
977	1007	Riga Zoo	Letonia	5	5	{297/115} / {108/175}	F3/F2	F2/F3 / F2	
431	436	Tallinn Zoo	Estonia	23	19	founder / {180/274}	F0	F2/F1	
1156				1		{431/436} /	F1 / F3/F2		
437	503	Tierpark Friedrichsfelde	Germany	19	17	{180/274} / {294/292}	F2/F1	F3 / F2/F3	
174	118	Tier.Goldau	Switzerland	31	34	{134/135} / {154/155}	F1	F1	
	1106				2	/ {788/281}		F4/F3 / F2	
1066	1028			3	4	{298/320} / {371/103}	F3	F3-F2/F2-F3	
	1020				4	/ {180/274}		F2/F1	
	209	Walsrode	Germany		29	/ {150/151}		F1	
844	673	Zoobotanic Jerez		8	11	{337/317} / {313/330}	F2/F3 / F3	F2/F3 / F3-F4/F3	

**Wild born descendant from released birds*

Table 2: Age distribution of bearded vulnures within the EEP as on 31st December 2022

MALE								FEMALE						
						45	6							
					17	18	44							
						43	44							
						42								
						41								
						40								
						39	70							
					80	180	38							
						87	37	274*	91					
							36							
						201*	35	107						
						108	34	118	115					
					124	286*	33							
							32							
						174	31	175						
							30							
					207	212	29	209						
						234	28	233						
						744*	27							
							26	281	278					
					297	298	25	290						
313	325	327	328	337	340	1008*	24	338	336	330	329	322	320	317
			362	368	431*	826*	23	360						
						371	22	381						
					391	399	21	398	397	389				
						410	20							
						437	19	436						
			451	454	461	468	18	456	469					
						500*	17	503	502	483				
						511	16	519	518	513				
					551*	681*	15	726*	561	560	547			
			590	591	594	652*	14	680*	598	588	580	576		
						611	13	635	634	627	622	620	619	
				654	662	664	12	673	668	659	658	657	656	653
						700	11							
				748	753	763	10	747						
					788	804	9	801						
		844	847	850	857	860	8	835	832	829	1158*			
				894	912	914	7	911	908*	903	896	892	889	
					947	973	6	969						
				977	993	1006	5	1010	1007	999	987	982	978	976
	1024	1034	1035	1039	1050*	1091*	4	1048	1045*	1044	1028	1020		
				1061	1065	1066	3	1072						
							2	1120	1108	1106	1096			
		1152	1153	1154	1155	1156	1	1157	1149	1142	1133			

minimum age

* founder

Table 3: Breeding pairs and their results in 2023

COUNTRY	PAIR	LAY DATE	HATCH DATE
AUSTRIA			
Alpenzoo Innsbruck	BG 804240338 x BG 801371103	1st: 04th Jan 2nd: ? Jan	26th Feb Disappeared
Richard Faust Zentrum	BG 201 x BG044002003	1st: 06th Jan	Putrefied
	BG 108065040 x BG 175152153	1st: 26th Nov 2nd: 08th Dec	19th Jan 27th Jan
	BG 017019021 x BG 070022023	1st: 29th Dec 2nd: 05th Jan	23rd Feb 28th Feb
	BG 399159270 x BG 278065074	1st: 14th Jan	Aborted
	BG 468223132 x BG 381159270	1st: 12th Jan 2nd: 06th Feb	6th Mar Infertile
	BG 087014010 x BG 547105178	1st: 04th Jan 2nd: 11th Jan	25th Feb Broken
	BG681 x BG560371103	1st: 18th Jan 2nd: 27th Jan	12th Mar 22nd Mar
	BG080019021 x BG518087054	1st: 08th Jan 2nd: 15th Jan	Putrefied 10th Mar
	BG857468453 x BG835399278	1st: 22nd Jan 2nd: 28th Jan	15th Mar 20th Mar
	BG212152153 x BG107150151	1st: 28th Jan	Infertile
BELGIUM			
Pairi Daiza	BG664391360 x BG659017070	1st: 19th Feb 2nd: ? Feb	Infertile Infertile
BULGARIA			
Rescue Centre Green Balkans	BG 461199107 x BG 483108175	1st: 14th Dec 2nd: 23rd Dec	6th Feb Infertile
ESTONIA			
Tallinn Zoo	BG 431 x BG 436180274	1st: 13th Jan 2nd: 20th Jan	7th Mar Aborted
FINLAND			
Helsinki Zoo	BG 788297115 x BG 281131132	1st: 16-17th Jan	10th Mar
FRANCE			
Beauval Zoo	BG 763129482 x BG 635159270	1st: 28th Feb	Putrefied

Asters Breeding centre	BG 454108175 x BG 502179281	1st: 08th Dec	31st Jan
	BG 700286153 x BG 627371103	1st: 29th Jan 2nd: 06th Feb	Aborted 29th Mar
Parc Animalier de Pyrénées	BG 850223725 x BG 747286153	1st: 21st Jan 2nd: 31st Jan	21st Mar 27th Mar
Puy du Fou	BG 753371103 x BG653124041	1st: 28th Feb	22nd April
GERMANY			
Tierpark Friedrichsfelde Berlin	BG 437180274 x BG 503294292	1st: 25th Jan 2nd: 30th Jan	Disappeared 27th Mar (died 9th April)
Berlin Zoo	BG 298122118 x BG 320018272	1st: 27th Jan	Infertile
Nuremberg Zoo	BG 018019021 x BG 336201044	1st: 09th Jan 2nd: 18th Jan	Aborted (37 days of incubation) Infertile
ITALY			
Centre Monticello (M. Albertini)	BG 234086104 x BG 397201044	1st: 22nd Dec	Infertile
Parco Natura Viva	BG 451108175 x BG 469018272	1st: 30th Dec 2nd: 7th Jan	Infertile Aborted (37 days of incubation)
RUSSIA			
Novosibirsk Zoo	BG 744 x BG 657223329	1st: 2nd Jan	Infertile/Broken
SERBIA			
Belgrade Zoo	BG 611199197 x BG 634034130	1st: 18th Jan	4th Mar (died 2 hours later)
SPAIN			
Centro de Cría Guadalentín	BG 286 x BG 580201044	1st: 5Th Feb 2nd: 12th Feb	Infertile Infertile
	BG 313009006 x BG 330108119	1st: 4th Jan 2nd: 14th Jan	26th Feb 5th Mar
	BG 391124041 x BG 360018272	1st: 02nd Jan 2nd: 17th Jan	24th Feb 11th Mar
	BG 337201044 x BG 317017070	1st: 07th Jan 2nd: 19th Jan	1st Mar 13 Mar
	BG 362080081 x BG 389199107	1st: 16th Dec 2nd: 21st Dec 3rd: 29th Dec	Aborted (after 30 days) Aborted (after 10 days) Infertile

	BG 410286153 x BG 290134135	1st: 22nd Jan	Infertile
		2nd: 29th Jan	Infertile
		3rd: 15th Feb	Infertile
	BG 124131132 x BG329043040	1st: 08th Dec	30th Jan
	BG590223329 x BG658199107	1st: 1st Dec	23rd Feb
Centre de Fauna Vallcalent	BG 297086104 x BG 115019021	1st: 16th Dec	Aborted
		2nd: 13th Jan	8th Mar
	BG551 x BG398159270	1st: 18th Dec	Aborted (just before hatching)
		2nd: 25th Dec	16th Feb
	BG371105178 x BG456286153	1st: 20th Dec	Broken
		2nd: 30th Dec	Aborted (2 weeks incubation)
		3rd: 15th Jan	9th Mar
	BG652 x BG680	1st: 28th Jan	Putrefied
Centre de Fauna Torreferrussa	BG 500 x BG 513009006	1st: 24th Dec	Infertile
		2nd: 30th Dec	20th Feb
TS-REPUBLIC			
Liberec Zoo	BG 180161162 x BG 274	1st: 09th Dec	Putrefied
		2nd: 16th Dec	Infertile
	BG 654108175 x BG 656180274	1st: 22nd Dec	Aborted
Chomutov Zoo	BG 340018272 x BG 338134135	1st: 05th Jan	Infertile
		2nd: 21st Jan	17th Mar
Ostrava Zoo	BG 207017070 x BG 233122118	1st: 28th Dec	Putrefied
		2nd: 5? Jan	28th Feb
	BG 325017070 x BG 322152153	1st: 14th Dec	05th Feb
Prague Zoo	BG 511108175 x BG 519105178	1st: 13th Dec	Infertile
		2nd: 7th Mar	Infertile
SWITZERLAND			
Breeding Centre Goldau/Rigi	BG 174134135 x 118154155	1st: 28th Dec	Putrefied

Table 4. Destination Offspring in 2023

STUDBOOK	PARENTAGE	SEX	BREEDING	DESTINATION
BG 1159	BG 108 x BG 175	f	RFZ	RELEASE (Guadalentín, Andalusia, SPAIN)
BG 1160	BG 108 x BG 175	f	RFZ	RELEASE (Guadalentín, Andalusia, SPAIN)
BG 1161	BG 124 x BG 329	m	CCG	RELEASE (Aveyron, Grands Causses, FRANCE)
BG 1162	BG 424 x BG 502	m	Asters	RELEASE (Baronnies, Leroux-Valley, FRANCE)
BG 1163	BG 325 x BG 322	f	Ostrava Zoo	RELEASE (Baronnies, Leroux-Valley, FRANCE)
BG 1164	BG 461 x BG 483	f	Green Balkans	RELEASE (Aveyron, Grands Causses, FRANCE)
BG 1165	BG 551 x BG 398	f	CF Vallcalent	**BREEDING** (CF Vallcalent, SPAIN)
BG 1166	BG 500 x BG 513	f	Torreferrusa	RELEASE (Castril, Andalusia, SPAIN)
BG 1167	BG 590 x BG 658	m	CC Guadalentín	RELEASE (Castril, Andalusia, SPAIN)
BG 1168	BG 017 x BG 070	m	RFZ	**BREEDING** (RFZ, AUSTRIA)
BG 1169	BG 391 x BG 360	m	CCG	RELEASE (Vercors, FRANCE)
BG 1170	BG 087 x BG 547	m	RFZ	**BREEDING** (Green Balkans, BULGARIA)
BG 1171	BG 804 x BG 801	f	Alpenzoo	RELEASE (Bertchtesgaden, GERMANY)
BG 1172	BG 017 x BG 070	f	RFZ	RELEASE (P.N. Tinença, Maestrazgo, SPAIN)
BG 1173	BG 207 x BG 233	f	Ostrava Zoo	**BREEDING** (CF Vallcalent, SPAIN)
BG 1174	BG 313 x BG 330	m	CC Guadalentín	RELEASE (P.N. Tinença, Maestrazgo, SPAIN)
BG 1175	BG 337 x BG 317	m	CC Guadalentín	RELEASE (Vercors, FRANCE)
BG 1176[1)]	BG 611 x BG 634		Belgrade Zoo	DIED in the nest
BG 1177	BG 313 x BG 330	f	CCG	RELEASE (P.N. Tinença, Maestrazgo, SPAIN)
BG 1178	BG 468 x BG 381	m	RFZ	RELEASE (NP Berchtesgaden, GERMANY)
BG 1179	BG 115 x BG 297	m	CF Vallcalent	**BREEDING** (CF Vallcalent, SPAIN)
BG 1180	BG 431 x BG 436	m	Tallinn Zoo	RELEASE (Melchsee-Frutt, SWITZERLAND) (Recaptured)
BG 1181	BG 371 x BG 456	m	CF Vallcalent	BREEDING (CC Guadalentín, SPAIN)
BG 1182	BG 788 x BG 281	f	Helsinki Zoo	RELEASE (Guadalentín, Andalusia, SPAIN)
BG 1183[2)]	BG 080 x BG 518	f	RFZ	DIED as fledgling
BG 1184	BG 391 x BG 360	m	CC Guadalentín	RELEASE (Aveyron, Grands Causses, FRANCE)
BG 1185	BG 681 x BG 560	m	RFZ	RELEASE (Melchsee-Frutt, SWITZERLAND)
BG 1186	BG 337 x BG 317	m	CC Guadalentín	RELEASE (Aveyron, Grands Causses, FRANCE)
BG 1187	BG 857 x BG 835	f	RFZ	**BREEDING** (Green Balkans, BULGARIA)
BG 1188	BG 340 x BG 338	f	Chomutov Zoo	RELEASE (Guadalentín, Andalusia, SPAIN)
BG 1189	BG 857 x BG 835	f	RFZ	**BREEDING** (Nuremberg Zoo, GERMANY)
BG 1190[4)]	BG 681 x BG 560	m	RFZ	DIED as fledgling
BG 1191	BG 850 x BG 747	f	Parc Animalier Pyrénées	**BREEDING** (CF Vallcalent, SPAIN)
BG 1192[5)]	BG437 x BG 503	f	Tierpark Berlin	DIED
BG 1193	BG 850 x BG 747	f	Parc Animalier Pyrénées	**BREEDING** (CC Guadalentín, SPAIN)
BG 1194	BG 700 x BG 627	f	Asters	**BREEDING** (CF Vallcalent, SPAIN)
BG 1195	BG753 x BG 653	f	Puy Du Fou	**BREEDING** (Le Pal, FRANCE)

1) killed by the female shortly after hatching.
2) Recaptured because showed high affinity towards humans, transferred to CF Vallcalent for breeding.
3) Born with several health problems; died because of severe aspergillosis infection on 22nd December 2023.
4) Died because of severe aspergillosis infection on 2nd October 2023.
5) Died of weakness at 13 days old and was eaten by its parents.