

The Reintroduction of the Bearded Vulture, *Gypaetus barbatus aureus* into the Alps

Hans Frey and Maarten Bijleveld van Lexmond

ABSTRACT

Within the framework of the European Bearded Vulture Project (Frankfurt Zoological Society Nr. 832/78 and WWF Nr. 1657) started in 1978, 35 young captive-born Bearded Vultures *Gypaetus barbatus* have been released by means of the 'hacking' method since 1986. Release took place at Rauris, Austria (17 birds) as from 1986; in the Haute Savoie, France (15 birds) as from 1987; and in the Swiss National Park (3 birds) as from 1991. Three birds were reported dead and two birds had to be taken back into captivity. Young birds from all three release sites - maximum distance 600km - came into contact with each other. Up to now, pair formation has been observed in three cases, and as from 1991 nest-building as well. One additional and final release site is being planned at the French-Italian Nature Reserve of Mercantour-Argentera.

INTRODUCTION

Stemmler (1932) initiated the debate on the reintroduction of the Bearded Vulture into the Alps for the first time since the extermination of the species. His proposal to the Swiss National Park Commission as early as 1922 met, however, with resistance. Impressed by the breeding results of the Zoological Garden of Sophia (Schumann 1928; Peters 1935) Stemmler had already in those days the idea to use captive bred birds for this purpose. Also Heinroth (1927) discussed reintroduction and suggested the creation of feeding places as tourist attractions.

Following an unsuccessful attempt with wild-caught birds from Afghanistan in France (Géroudet 1979), Walter, WWF Austria, inspired by the remarkable and regular breeding successes of the Alpenzoo Innsbruck (Psenner 1976; Thaler & Pechlaner 1978), proposed an internationally co-ordinated reintroduction project, exclusively based on captive breeding. FZG (Frankfurt Zoological Society) and WWF considered this application and agreed to finance the main aspects of the Bearded Vulture project (FZG 832/78; WWF 1657/78). At an international meeting in Morges, Switzerland, in 1978 the basic guidelines and *modus operandi* were elaborated (Bijleveld 1979). Preparations for the first release of captive-born young birds demanded a long period of time. The establishment of a sufficiently large captive population in numerous European zoological gardens alone required nearly ten years and is still continuing (Frey 1988). Intensive public information as well as field research were equally important activities in this phase of the project. Yearly meetings and the Bearded Vulture Bulletin became important instruments of coordination.

RELEASING TECHNIQUE

In 1986 it was decided to carry out a pilot study at the beginning of the release phase. Based on the results of the earlier field studies (Müller & Buchli 1982) Rauris in the Hohen Tauern of Salzburg was selected as the first release site. As recently as the 1980s lone Bearded Vultures of unknown origin had again and again shown up in this region (Hummel 1982; Tratz, 1951, 1963). In line with the project's objective, i.e. the establishment of a breeding population totally independent of human intervention, a release method was chosen close to the natural juvenile development of the Bearded Vulture: hacking back with the use of eyries (Frey 1985). Nestlings are placed in imitation nests in small groups to guarantee social contact. This is done as soon as they are able to feed independently, i.e. at the age of about three months. Only young birds raised by parents or foster-parents of the same species and brought into contact with each other while still in the parental nest, are being used. Bearded Vultures breed from the month of December. Consequently, they reach the right age at about the middle of May. At the release site a team of collaborators takes over the daily care and surveillance of the nestlings. Feeding is carried out avoiding direct contact by throwing food into the nesting niche. Guarding takes place from a far-away observation point. Records are kept of all events and activities in relation to the Bearded Vultures. To ascertain an almost perfect supervising system, small radio-transmitters were fixed onto the backs of the vultures during the pilot release of 1986 (d'Oleire-Oltmanns *et al.* 1989). The emitted signals were registered with mobile direction finders and two automatic receivers (Sonnblick, Schmittenhöhe).

The applied release technique relies on two basic principles: 1. the imprinted attachment of the young birds to the release site and 2. the supposition that the basic search for food is determined by instinctive behaviour, and that after the ending of ontogenesis, i.e. the completion of the development of in-born instincts such as to search for food and the typical bone breaking behaviour, nothing prevents the released Bearded Vulture from reaching total independence.

RESULTS

Young birds fly from their nest at the age of about four months. From this moment on, food is distributed near the nesting cliff and quickly consumed by the vultures. Already at the age of 4^o-5 months additional food from the wild is being taken, especially skeletons of sheep on the nearby alpine pastures. Since from the early age of six months independence from artificially provided food resources is obtained and, at least in part, the birds start to leave the release area, artificial feeding is consequently stopped in the month of August.

As from 1986 releases have taken place at Rauris. Intensive contact occurs at times between birds of different age groups. Older Bearded Vultures accept, in most cases, the presence of younger congeners, and let these accompany them on their extended flights, returning all together to the nesting area. Apart from permanently present older Bearded Vultures, other individuals which fledged from this site also always returned at sporadic and long intervals. Thus, at certain moments, 9-10 different Bearded Vultures were observed in the valley of release in the summer months of 1990 and 1991. Individual marking is obtained by bleaching particular wing and tail feathers. These marks can be well observed on flying birds over large distances, i.e. 2km and over. They remain visible well into the second year and sometimes up to the third year. After that, identification is only possible with the help of colour bandings. These, however, are only visible under very favourable circumstances. Particularly sedentary individuals can later on also be identified through moulting gaps.

Telemetry was abandoned in 1987. The results did not meet expectations, and especially the automatic receivers did not function in those cases where Bearded Vultures disappeared or found themselves at risk.

Due to the increase in captive breeding releases became also possible in the Haute Savoie, France, as from 1987, and in Switzerland (Swiss National Park) as from 1991. A fourth and final release site is being planned in the Maritime Alps, i.e. in the joint Regional/National Park of Argentera (Italy) and Mercantour (France). These release sites are situated approx. 300km apart and cover the entire Alpine range. The fourth release site would also serve to create a link with the

nearby natural population of Corsica.

Tables 1-3 give an overview of the number and sex ratio of all hitherto released juvenile Bearded Vultures. In all, 35 Bearded Vultures were released since 1986. After six years the outcome is the following:

1. Released birds found dead

Before being able to leave its nest in Haute Savoie a male died of disease in 1991.

The female "Melusine", released in 1987 in Haute Savoie, was found dead in a state of decomposition in Diemtigtal, Adelboden, Switzerland, on the 30th July 1989. The spot where found was in an avalanche gully at an altitude of 2000m. The stomach contents revealed the hoofs of a newly born chamois, while nearby the remains of some sheep were found. Thus it could be concluded that death took place in May or early June. "Melusine" fell victim to an avalanche.

The third documented case of death concerned the male "Robespierre", released in Haute Savoie in 1989. It collided with a high-tension wire and broke a wing. Subsequently trampled upon by cattle, the bird died shortly after having been recuperated.

2. Birds taken back into captivity

The female "Winnie", released as a latecomer in 1986, was little active and not very independent from the beginning. On the 18th of January 1987 it was found with its feathers frozen with ice but otherwise unhurt, in the Mölltal at a distance of 60km.

"Hubertus", a male released in Rauris in 1990, was unable to fly at the age of five months. It had also to be taken back into captivity.

3. Missing Bearded Vultures

The male "Saturnin" was released in Haute Savoie, France, in June of 1987. Having left the eyrie successfully it disappeared suddenly in mid-July, since when observations of this animal have been lacking.

In Rauris, the male "Heinz", released in 1987, was regularly observed until September. From then on no indications as to its whereabouts exist. Contrary to "Saturnin", this bird was already independent and the time of its disappearance was not unusual. Also other Bearded Vultures left the release area at this age. But of these, however, certified observations from other Alpine regions do exist.

Table 1. Bearded Vultures released at the Rauris Site in the period 1986-1991.

Year of release	Name	Sex	Origin
1986	Hans	M	Wassenaar
	Fritz	F	Innsbruck
	Ellen	F	Innsbruck
	(Winnie)	F	Grunau)
1987	Heinz	M	Wassenaar
	Nina	F	La Garenne
1988	Alexa	F	Innsbruck
	Ulli	M	Haringsee ¹
	Paradatsch	F	Grunau
1989	Karl	M (?)	Haringsee
	Joey	M	Haringsee
	Colleen	F	Innsbruck
	Baselisk	F	Haringsee
1990	(Hubertus)	M	Haringsee)
	Lotte	F	Haringsee
1991	Nicola	F	Haringsee
	Diana	F	Haringsee

The birds in parentheses were brought back into captivity.

¹In the context of the Bearded Vulture Project this central breeding station is usually described as the Vienna Breeding Unit.

Table 2. Bearded Vultures released at the site in Haute Savoie, France, in the period 1987-1991.

Year of release	Name	Sex	Origin
1987	Melusine	F (d)	Wassenaar
	Saturnin	M	Innsbruck
	Marie Paradise	F	Innsbruck
1988	Balthazar	?	Wassenaar
	Melkior	?	Innsbruck
1989	Assignat	F	La Garenne
	Danton	M	Wassenaar
	Robespierre	M (d)	Haringsee ¹
	Marie-Antoinette	F	Innsbruck
	Charlotte	F	Grunau
1990	Yvan	F	Haringsee
	Robin	F	Haringsee
1991	Republic	M	Haringsee
	-	M (d)	Haute-Savoie
1991	Savoie	F	Dortmund

(d) found dead

¹ see caption Table 1.

Table 3. Bearded Vultures at the site in Engadin, Switzerland in 1991.

Year of release	Name	Sex	Origin
1991	Settschient	M	Haringsee ¹
	Moische	F	Haringsee
	Margunet	M	Tierpark Berlin

¹ see caption Table 1.

The distribution of the remaining juvenile Bearded Vultures in the Alpine region is quite remarkable. They occupy by preference the former strongholds of the species in the range of its distribution. However, the availability of food also plays an important role in the choice of a territory, e.g. Alpine meadows with sheep, epidemics among wild animals like chamois (scabies and blindness) and areas rich in avalanches and wild animals. Rich food sources do bind Bearded Vultures sometimes for months on end to a relatively small area, while in other cases reconnaissance flights of over 100km are carried out, which take up a few days and always end in an early return to the point of departure. In only exceptional cases do such excursions lead Bearded Vultures to untypical regions. This happened to the female "Baselisk", observed on the coastal cliffs near Trieste at the age of eight months. Young birds released from all the hitherto used release areas are in contact with each other, thereby covering distances of over 600km.

In 1989 the first pair formation took place in the Hohe Tauern, Austria. The male "Ulli" and the female "Paradatsch", both released in Rauris in 1988, formed a pair in the summer of 1989, the male having taken the initiative. In the autumn the young pair started to show interest in an old Golden Eagle eyrie. They stayed together during 1990 and 1991. Almost daily the pair is to be found in the Krumltal, where it has developed territorial behaviour and only tolerates juvenile congeners in the vicinity of the nesting cliff. In September 1991 the male took possession of a Raven's nest and subsequently the pair constructed on top of this an impressive nest from branches and sheep

wool. Pair formation equally took place within the French release area.*

From field experiences with 35 Bearded Vultures during six years the following conclusions can be drawn:

1. The release technique used came up to expectations and prognoses. The released Bearded Vultures distribute themselves over the whole Alpine range. Already at the age of six months they become independent of artificial feeding, and at this point in time the bone breaking behaviour starts to develop. One of the goals of the project was thus reached, being the establishment of a free-living population independent of food provided by man.

2. Behaviour towards humans varies from indifference to curiosity. Tourists on roads are ignored, while persons who find themselves at conspicuous spots in the landscape draw the immediate attention of Bearded Vultures. They overfly them to inspect at sometimes very short distances, a kind of behaviour also known from "wild" Bearded Vultures. This unusual lack of shyness for a bird of prey has, up to now, not been a disadvantage. There were no offences by hunters, proof of the acceptance and understanding on the part of the hunting community in the countries concerned. The short flight distance, on the other hand, facilitates accurate observations, sketching and photography, which in turn allows for a fairly good documentation of the reoccupation of the Alps. Aggressiveness against humans, often demonstrated by hand-reared, falsely imprinted Bearded Vultures, has never been observed.

3. Intentional disturbance or threatening of domestic grazing animals or wild ungulates, including direct attacks, were never observed. Alpine Marmots react to Bearded Vultures as they would to Golden Eagles or Griffon Vultures, i.e. they give the alarm call for aerial enemies in the shape of a long-drawn whistle. They, too, were never attacked by Bearded Vultures.

4. Interactions between Bearded Vultures and Golden Eagles show a great deal of variation. As larger predators are generally absent, Golden Eagles have some importance in providing food. Golden Eagles are extremely tolerant towards Bearded Vultures. Only rarely do attacks occur, for instance, when they try to steal presumed prey from Bearded Vultures such as skins of Alpine Marmots. On the other hand Golden Eagles are successfully attacked and driven away by Bearded Vultures in the vicinity of their nesting cliff. Likewise juvenile Bearded Vultures are defended against Golden Eagles by older individuals. In winters with little snow and therefore few avalanches, Bearded Vultures can be found in the close proximity of Golden Eagle families, making use of the left-overs. Progress of this long term project has, so far, been encouraging. Losses were only slight in comparison to natural populations. This is probably explained by the fact that optimal biotopes are as yet not occupied by territorial breeding pairs. For that reason, it is difficult at this stage to make prognoses of the future successful development of the overall project.

*Note: Unfortunately "Ulli" disappeared suddenly in the late spring of 1992 and is supposed to have met with accidental death. "Paradatsch" is still present in the Krumltal.

REFERENCES

- BIJLEVELD, M. 1979. Preface: Meeting on reintroduction of the Bearded Vulture, *Gypaetus barbatus aureus* (Hablizl 1788), into the Alps. Report of proceedings, Morges, 17-18 Nov. 1978. IUCN, Morges.
- D'OLEIRE - OLTMANNS, W., U. MACK & R. BÖGEL 1989. Radiotracking of Bearded Vultures *Gypaetus barbatus* and Griffon Vultures *Gyps fulvus* in the Alps. In: Meyburg, B.-U. & R. Chancellor (Eds.): *Raptors in the Modern World* WWGBP, Berlin, 345-352.
- FREY, H. 1985. Die Verwilderung von Bartgeiernestlingen über Horste - Detailvorschlag zur Durchführung. Swiss Wildl. Inf. Service, Univ. Zürich, Bull. Proj. Bearded Vulture 7, 13-18.
- FREY, H. 1988. Biologie, Zucht und Wiederansiedlung des Bartgeiers (*Gypaetus barbatus*). *Die Voliere* 11, 45-50.
- GÉROUDET, P. 1979. Short history of the project. In: I.U.C.N. (Eds.): Meeting on reintroduction of the Bearded Vulture *Gypaetus barbatus aureus* (Hablizl 1788) into the Alps. Report of proceedings, Morges, 17-18 Nov. 1978, 2-6.

- HEINROTH, O. 1927.** *Die Vögel Mitteleuropas* II. Behrmüller, Berlin - Lichtenfelds.
- HUMMEL, D. 1982.** Wieder ein Bartgeier (*Gypaetus barbatus*) in den österreichischen Alpen. *Egretta* 25, 49-52.
- MÜLLER, H.U. & CH. BUCHLI 1982.** *Projekt Bartgeier. Vergleich von fünf potentiellen Wiedereinbürgerungsgebieten im Alpenraum.* Fornat, Zürich. 100 pp.
- PETERS, H.B. 1935.** Beitrag zur Brutbiologie des Bartgeiers (*Gypaetus barbatus*). *Vögel ferner Länder* 9, 2-5, 41-47, 76-79, 92-96.
- PSENNER, H. 1976.** Haltung und Zucht des Bartgeiers (*Gypaetus barbatus*). *Zool. Garten N.F.* 46, 293-304.
- SCHUMANN, A. 1928.** Über die erfolgreiche Zucht von *Gypaetus barbatus* im Königlich Zoologische Garten von Sofia. *Mitt. königl. naturw. Inst. Sofia* 1, 145-155.
- STEMMLER, C. 1932.** *Die Adler der Schweiz.* Hallberg & Büchting, Leipzig.
- STRAUBINGER, J. 1990.** Vogelwelt im östlichen Chiemgau, Grundlagen zur Avifauna des Rupertiwinkels. Abhandlungen der Kreisgruppe Traunstein des Landesbundes für Vogelschutz (LBV) in Bayern e. V., 61.
- THALER, E. & H. PECHLANER 1978.** Volierenbrut und Handaufzucht beim Bartgeier (*Gypaetus barbatus aureus*): Beobachtungen aus dem Alpenzoo Innsbruck. *Gefied. Welt* 103, 21-25.
- TRATZ, P. 1951.** Der Bart- oder Lämmergeier ein ständiger Bewohner der salzburgischen Alpen. *Die Vogelwelt* 72, 177-180.
- TRATZ, P. 1963.** Ergänzendes zum Vorkommen des Europäischen Bartgeiers. *Anz. orn. Ges. Bayern* 6, 470-471.

Dr. M. Bijleveld van Lexmond,
Foundation for the Conservation of the Bearded Vulture (F.C.B.V.)
En Levremont
CH-1143 Apples
Switzerland

Dr. Hans Frey,
Institut für Parasitologie und Allgem. Zoologie
Veterinärmedizinische Universität
Linke Bahngasse 11
1030 Vienna, Austria