INTERNATIONAL
BEARDED VULTURE
MONITORING

Annual report 2022

International Bearded Vulture Monitoring - IBM

Imprint

Author
Mirco Lauper

Version
02/01/2024

Recommended form of citation
Lauper, M & Rauchenstein, K. (2023): Annual Report 2022 - International Bearded Vulture Monitoring (IBM); ed. Vulture Conservation Foundation. pp 1-43.

Contact
ibm@4vultures.org

IBM-members

ASTERS
ENVERGURES ALPINES
JUNTA DE ANDALUSIA
LPO GRANDS CAUSSES
NATIONALPARK HOHE TAUERN
LBV – LANDESBUND FÜR VOGELSCHUTZ BAYERN
PARC NATIONAL DE LA VANOISE
PARC NATIONAL DU MERCANTOUR
PARC NATUREL RÉGIONAL DE CORSE
PARC NATUREL RÉGIONAL DU VERCORS
PARCO NATURALE ALPI COZIE
PARCO NAZIONALE GRAN PARADISO
PARCO NATURALE ALPI MARITTIME - WAON
PARCO NAZIONALE DELLO STELVIO / NATIONALPARK STILFSERJOCH
STIFTUNG PRO BARTGEIER / FONDATION PRO GYPAÈTE
GENERALITAT VALENCIA
VAUTOURS EN BARONNIES
THE VULTURE CONSERVATION FOUNDATION
ALPINIUM

Associated organisations

PARC NATIONAL DES CÉVENNES
PARC NATIONAL DES ÉCRINS
REGIONE AUTONOMA VALLE D'AOSTA

Table of content

1 The IBM & its administration

The international Bearded Vulture monitoring (IBM) is an expanding international network to coordinate the monitoring activities for European Bearded Vulture populations, to unify and manage data collections in a shared database (IBM-database) and to discuss conservation strategies and priorities for this species on an international level.

In 2022 the IBM comprised 19 IBM-partners and 3 associated organisations. The lead partner was the Vulture Conservation Foundation (VCF) and the IBM-database was managed by Mirco Lauper and Katja Rauchenstein, while additional administrative and coordinating work was carried out by Franziska Lörcher. These costs, as well as the costs for rings, database hosting, database upgrade etc. were covered by a budget of 43'618 Euros. The budget was financed by the fee of each IBM-partner and additional funds from MAVA and a Swiss foundation, which for the fifth consecutive year allowed to reduce the partner fee substantially, from 3'000 Euros to currently 1'600 Euros for partners which are releasing birds and 800 Euros for the other partners.

In order to inform the IBM-partners about important news, the latest observations and the development of the Bearded Vulture reproduction in the wild, 9 short reports *IBM Update & Reminder* were sent out in 2022. Collective decisions and discussion were held during the steering committee meetings by phone in April and September 2022, as well as at the physical SC-meeting in November 2022.

2 Summary

A total of 14 Bearded Vultures were released across six different sites in France, Spain and Germany. In the Alpine range, two birds were released in Berchtesgaden (GER) and two in Baronnies (FRA). Two birds were also released in the Massif Central (FRA) and two in Corsica (FRA). In Spain, two birds were released in Maestrazgo and four in Parque Natural de Cazorla in Andalusia (ESP).

This year, a new breeding record was achieved in the Alpine range, with 49 successful reproductions. Out of the 79 occupied territories, breeding attempts were reported in 67 nests, showing varying productivity levels across different regions: 73% in the central Alps, 69% in the north-western Alps, 62% in the southwestern Alps, and 33% in the eastern Alps (with an overall average of 67%). Notably, in eight territories breeding was reported for the first time, including Avers (CHE), Müstair (CHE), Reschen-Resia (ITA), Bramans (FRA), Passy (FRA), Valloire (FRA), and Archiane (FRA). However, breeding failed in Mallnitz (AUT).

Although chicks hatched in two territories in Corsica, Bonifatu and Popolasca, both experienced breeding failures, resulting in no successful reproduction this year.

In the Massif Central, nesting behaviour was observed for the fifth consecutive year in the first occupied territory, involving two male birds, Layrou and Adonis.

In 2022, the ringing system with coloured aluminium rings, which was implemented in 2021, was applied for the second time. As in previous years, all released birds were individually marked with bleached feather patterns and equipped with GPS tags to track their life history and spatial behaviour. Additionally, six wild hatchlings were marked with rings and GPS tags in Italy (Ricky-Rico Livigno), France (Daille, Dome, Elfie, Mojo), and Switzerland (Volta, rings only). In total, the movements of 79 Bearded Vultures (21 wild-hatched and 58 released birds) were tracked via GPS and stored in the WildlifeMonitor in 2022.

Throughout the year, the IBM network recorded over 1’831 observations of Bearded Vultures from nine different European countries (AUT, BEL, CHE, CZE, DEU, DNK, FRA, ITA, NDL) in the IBM database. These observations also provided valuable information on the life history of 63 identified individuals, 11 of which were wild-hatched. Combining this information with data from reproduction monitoring, GPS tracking, and the International Bearded Vulture Observation Days (IOD), a total of 205 individuals were identified on an individual level in 2022: 152 in the Alps, 15 in the Massif Central and Pyrenees, 9 in Corsica, and 9 in Maestrazgo. Furthermore, nearly 2’200 observations were transferred from the ornitho.ch database to the IBM database, allowing regional managers from Switzerland to review and follow up on the information.

Thanks to the diligent monitoring efforts of the local teams, seven cases of dropouts were detected (three in France, two in Switzerland, and one each in Germany and Italy). Once again, GPS data monitoring proved instrumental in preventing or properly investigating several dropouts. This year, four dropouts were successfully prevented, providing valuable insights into the dangers faced by Bearded Vultures, which will hopefully inform future conservation measures.

3 Key facts

14 Bearded Vultures released at 6 sites:

- 2 in Germany in Berchtesgaden (second year with releases)
- 6 in France: 2 in Corsica, 2 in Baronnies and 2 in Grands Causses
- 6 in Spain: 2 birds in Maestrazgo and 4 in Parque Natural de Cazorla

Reproduction

- Alpine range: 79 occupied territories, 67 clutches, 49 fledglings
  - Productivity varied between 73% (centralAlps) and 33% (easternAlps)
- Massif Central: first territory occupied by two male nesting birds since 2018 (Layrou & Adonis)
- Corsica: 2 occupied territories with breeding failure after the chicks hatched.

Monitoring and the IBM-database

- 1'831 observations from 9 countries by 19 IBM-partners and 3 associated organisations
  - 33% of the observed birds could be identified on individual level
- 2'199 ornitho.ch observations were imported to the IBM-database in 2022
- 205 individuals with known origin in the Alps (N=152), the Massif Central & French Pyrenees (N=15), Corsica (N=9) and Maestrazgo (N=9) were identified on individual level
- IOD: 1'161 observers occupied 723 sites and reported 638 Bearded Vulture observations during the International Bearded Vulture Observation Days
- Population size estimates based on IOD 2022 data: 288 – 377 individuals were estimated in the Alpine range, 6-13 in the Massif Central, 12-22 in the Pre-Pyrenees (FRA), 35-65 for Spain (without Pyrenees) and ±2 in Maestrazgo (ESP) respectively.

Markings & telemetry

- All 14 released birds have been marked with a solar powered GPS-tag. In 2022 GPS data of 58 released and 21 wild-hatched birds was stored in the WildlifeMonitor.
- 5 wild-hatched juveniles were ringed and equipped with GPS-tags: Daille, Dome, Mojo, Elfie (all FRA), Livigno (ITA), while Volta (CHE) was only ringed.

7 Dropouts

- 3 mortalities: 2 released juvenile birds: Wally (GER) & Pasturella (Corsica, FRA), one unknown wild-hatched juvenile (ITA)
- 3 recaptures: Roc Genèse (FRA; still in captivity), Canteperdrix (FRA) & Donna Elvira (CHE; both released again)
- 1 recovery: Chick (Volta, W0485) from territory "Berner Oberland" (CHE) was captured and released immediately

4 IBM-standards

The IBM-standards should serve as guidelines for the definitions used for public communications and statistics within the international network of the IBM. Below you find a short overview over the most important definitions, that are based on previous work by Richard Zink in 2009 (Table 1).

4.1 Age class

Table 1: Calendar years (cy) should be used as IBM-standard for age classification. This table should serve as a general standard for the age determination of unknown and known birds recorded in the IBM-database. Grey shaded = potentially breeding birds (see "checked pairs" below).

Entry in the IBM (life stage)	Calendar year (cy)	Real age (years) Jan-Feb | Mar-Dec		Life history event
juvenile (1. cy)	1	-	0	hatch
immature (2. cy)	2	0	1	non-territorial
immature (3. cy)	3	1	2	non-territorial
subadult (4. cy)	4	2	3	non-territorial
subadult (5. / 6. cy)	5	3	4	potential nesting
adult (≥ 6. cy)	6	4	5	potential breeding
adult (≥ 6. cy)	≥7	5	≥6	potential breeding

4.2 Dropout versus breeding failures

Dropouts include all incidents where individuals have been removed from the population (mortality, recapture). This also applies to birds that could be rereleased after the recapture. A recapture is in any case the last solution, which is why it must be assumed that these birds would not have survived without human intervention and would have died under natural conditions.

However, if a hatchling dies at less than 80 days of age, this loss is referred to as breeding failure and it is therefore not included in the dropout statistics.

Age	< 80 days	> 80 days	Type
hatch	→ mortality / recapture		→ breeding failure
hatch		→ mortality, recapture	→ dropout

4.3 Reproduction[1]

Table 2: IBM-standards for reproduction statistics based on previous work by R. Zink (2009).

Potential territory	Area occupied by at least 2 birds showing territorial behaviour → all territories entered in the IBM-database
Territorial pair[2]	Pair[2] occupying a territory with at least one nest → territories with nest or egg-lay date entered in the IBM-database
Checked pair[2]	Pair[2] monitored during the breeding season → territories with nest or egg-lay date entered in the IBM-database → age classification: subadult (5. / 6. cy) or adult (≥ 6. cy)
Breeding pair[2]	Cases of verified egg-laying → date of egg-laying entered in the IBM-database
Breeding success	$\frac{fledglings}{breeding\ pairs}$
Productivity	$\frac{fledglings}{checked\ pairs}$

1 Based on: Monitoring guide (Protocol) Draft Version 0.2 (2009) by Richard Zink

2 Definition of a pair: At least two birds occupying a territory with at least one nest or confirmed fledge

5 Releases

In 2022, a total of 14 Bearded Vultures were released at six sites in the eastern Alps, the western Pre-Alps, in the Massif Central, Corsica as well as in two projects in Spain. The 14 birds have been reared in seven different zoos and captive breeding centres of the EEP (European Endangered Species Programme). Maintaining a sustainable captive breeding population is necessary to keep some captive bred juvenile birds in captivity. The EEP coordination alternates between release and captive breeding stock priority for the distribution of birds. In 2022 priority was put on the captive breeding stock and therefore a reduced number of birds could be released. Furthermore, as breeding success in the captive breeding network was lower than expected, the number of released birds was considerably lower than in previous years. The distribution and number of birds followed the release strategy established and communicated by the EEP coordinator.

For the second time, two juveniles were released in Berchtesgaden (GER), a new release site that is part of the Alpine reintroduction program. Two birds were released in Baronnies (FRA) in the Pre-Alps. Another two juveniles were released in the Massif Central (FRA). The release of two juveniles in the French Pre-Alps and the Massif Central as well as the release of two juveniles in Maestrazgo (ESP) is part of a long-term goal to restore the genetic exchange between the three separated Bearded Vulture populations: the Alps, the Pyrenees and Andalusia. The connection of these populations is still non-existent, since the extinction of the Alpine (around 1900) and Andalusian (1980) Bearded Vulture population and is vital to re-establish the European meta-population. In order to enforce the local reintroduced population in Andalusia, four juveniles have been released in this region in 2022.

The release of two juveniles on Corsica (FRA) is one of the actions taken in order to address the dramatic decrease of the population and secure the survival of this unique genetic pool. The Bearded Vulture population of Corsica is one of the last surviving genetic pools of the former meta-population and has been declining during the last 25 years to currently only four territorial pairs.

All 14 released birds took off for their first flight (Table 3). The average age at the first flight was 119.5 days with a minimum of 101 (Esprit, BG1135) and a maximum of 136 days (Ereta, BG1132).

5.1 Release sites 2022

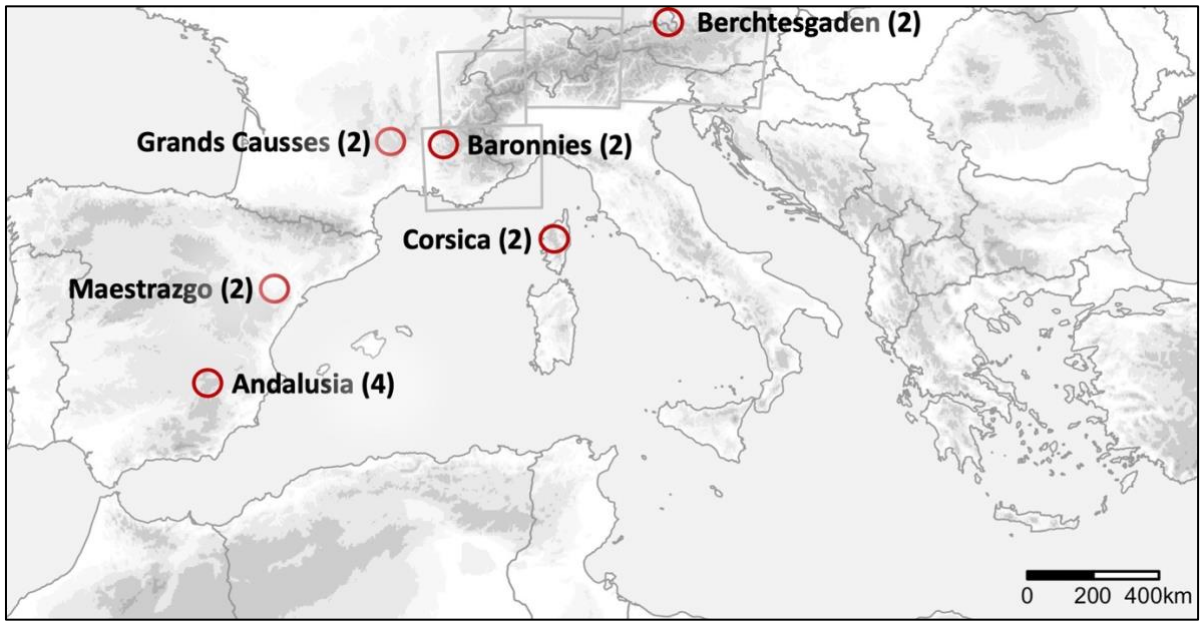


Figure 1: 14 Bearded Vultures were released at six sites in Germany, Spain and France. For the second time, Bearded Vultures have been released in the German Alps in Berchtesgaden. Since 2021 this release site is part of the Alpine reintroduction program and aims to enforce the populations in the eastern Alps. The releases of four birds in the pre-Alps (Vercors) and the Massif Central are part of the long-term project with the aim to re-establish genetic exchange between the Alpine and Pyrenean population. With a similar objective, two birds were released in Maestrazgo (ESP), an area that should serve as "stepping-stone" between the Pyrenean and Andalusian population. With the aim to enforce the growing Andalusian population 4 individuals were released in Cazorla (ESP).

Table 3: Details about 14 Bearded Vultures that have been released within the IBM monitoring area. Birds that died or had to be recaptured in 2022 are written with grey letters (more information see Table 16).

	Place release	BirdID	Name	Sex	Hatch	Fledge	Age at first flight	Place hatch	Date release
ESP	Los Picones, Castril (ESP)	BG1143	Aragon	m	03.03.22	06.07.22	125	Parco Natura viva (ITA)	06.06.22
		BG1141	Jaca	m	03.03.22	25.06.22	114	Green Balkans (BGR)	06.06.22
	Tinença de Benifassà (ESP)	BG1132	Ereta	f	15.02.22	01.07.22	136	CC Guadalentín (ESP)	18.05.22
		BG1135	Esperit	m	21.03.22	30.06.22	101	RFZ Haringsee (AUT)	18.05.22
	Tornillos de Gualay, Cazorla (ESP)	BG1137	Ukrania	m	25.02.22	17.06.22	112	Ostrava Zoo (CZE)	03.06.22
		BG1139	Paz	m	27.02.22	21.06.22	114	CC Guadalentín (ESP)	03.06.22
FRA	Baronnies, Léoux Valley (FRA)	BG1136	Canteperdrix	f	23.02.22	25.06.22	122	CC Guadalentín (ESP)	29.05.22
		BG1138	Riglos	m	26.02.22	25.06.22	119	CC Guadalentín (ESP)	29.05.22
	Corsica, Niolo Valley (FRA)	BG1144	Sulana	m	05.03.22	01.07.22	118	Helsinki Zoo (FIN)	07.06.22
		BG1146	Pasturella	m	07.03.22	29.06.22	114	CC Guadalentín (ESP)	07.06.22
	Grands Causses, Trévezel (FRA)	BG1127	Roc	m	01.02.22	11.06.22	130	Ostrava Zoo (CZE)	09.05.22
		BG1128	Rei del Causse	m	05.02.22	12.06.22	127	Breeding Centre Haute-Savoie (FRA)	09.05.22
GER	Berchtesgaden, Halsgrube (GER)	BG1145	Dagmar	f	06.03.22	02.07.22	118	CC Guadalentín (ESP)	09.06.22
		BG1147	Recka	f	09.03.22	10.07.22	123	CC Guadalentín (ESP)	09.06.22

6 Reproduction in the wild

6.1 Breeding season 2021/2022

In 2022, the IBM-network monitored 82 breeding territories of the Bearded Vulture. Among the 77 monitored territorial pairs and 5 trios, successful clutches were reported from 69 territories. In 8 territories, a clutch was reported for the first time. In 7 territories also a fledgling could be registered: Avers (CHE), Müstair (CHE), Reschen-Resia (ITA), Bramans (FRA), Passy (FRA), Valloire (FRA), and Archiane (FRA), while there was a breeding failure in Mallnitz (AUT).

In the Alpine range, out of 79 breeding units, 67 produced clutches, resulting in 61 hatched birds (a hatch rate of 91%). By the end of summer, 49 young Bearded Vultures successfully fledged, with Switzerland having 21, France 14, Italy 10, and Austria 4 fledglings (Figure 3).

On Corsica, only 2 of the 4 known territories were occupied, similar to the previous year. Although a chick hatched in both territories (Popolasca & Bonifatu), the brood was aborted only a few weeks later.

In the Massif Central, the two released male birds (Adonis 2014 & Layrou 2013) are still displaying territorial behaviour (nesting and copulation) since 2018. Although this couple won't be able to reproduce, it indicates a positive sign of settling territorial birds in the region.

In Andalusia, 3 chicks hatched, but unfortunately, none of them fledged. All three of them died due to avian flu, one of them just shortly before fledging.

As in previous years, the reproduction success and productivity varied significantly among regions with two fledglings in the eastern (33%), 5 in the south-western (62%), 20 in the north-western (69%) and 22 in the central Alps (73%). Overall breeding success was 73%. Which is higher than the breeding success in the previous year but lower than the highest observed breeding success (76%) in 2019.

While breeding success represents the ratio of fledglings to clutches, productivity takes into account territories occupied by mature non-breeding birds. This makes it a more accurate measure of reproductive success, especially in newly establishing populations. In comparison to last year's productivity of 65%, there was an increase to 67% productivity observed.

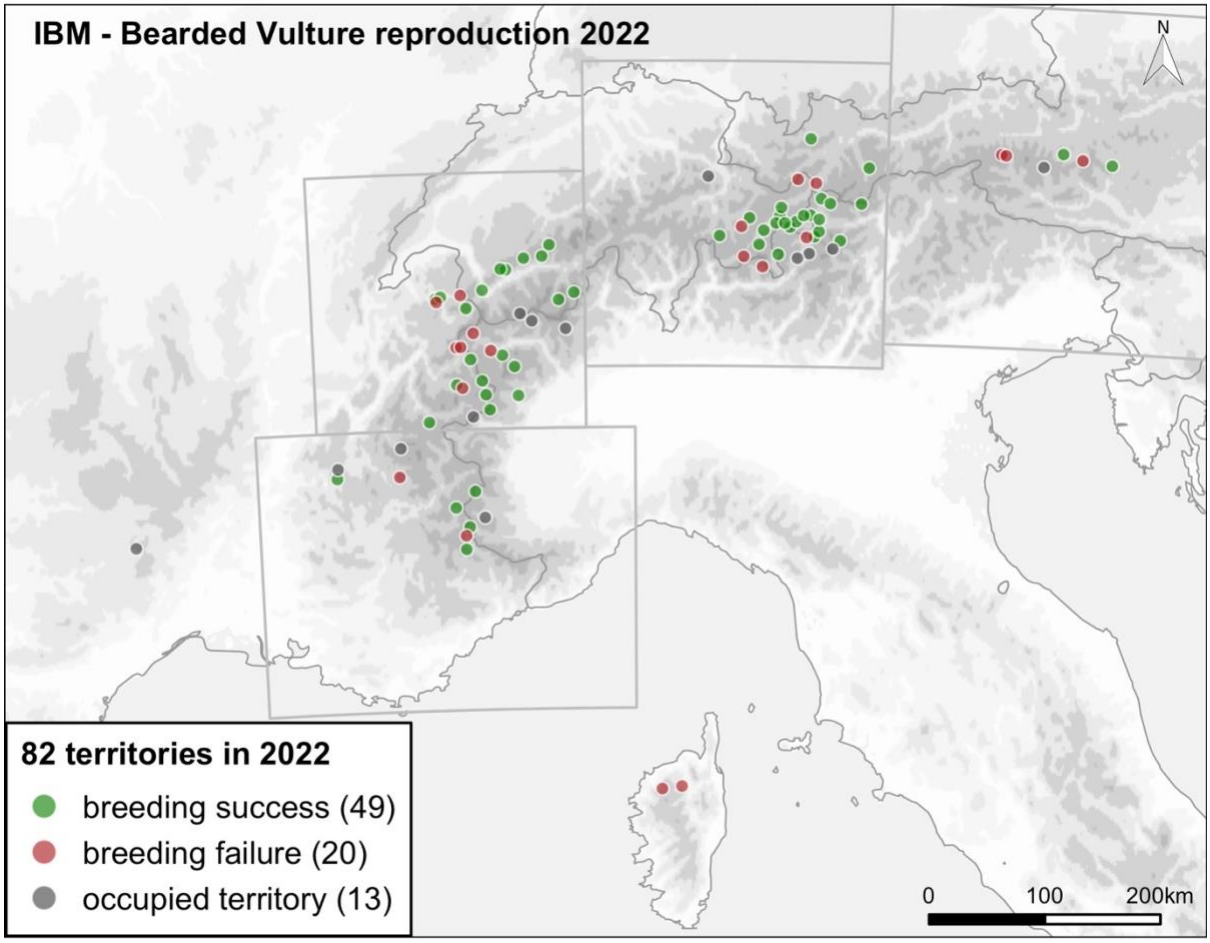


Figure 2: Reproduction status in 82 occupied territories in the Alpine range, Corsica and the Massif Central. With 49 successful reproductions a new record number of wild fledglings has been set. In the Massif Central, the two released male birds, Layrou and Adonis, are still occupying a territory (Jonte amont) for the fourth year. No chick fledged on Corsica. The rectangles represent the 4 monitoring zones: south-western Alps, north-western Alps, central Alps and eastern Alps, from left to right.

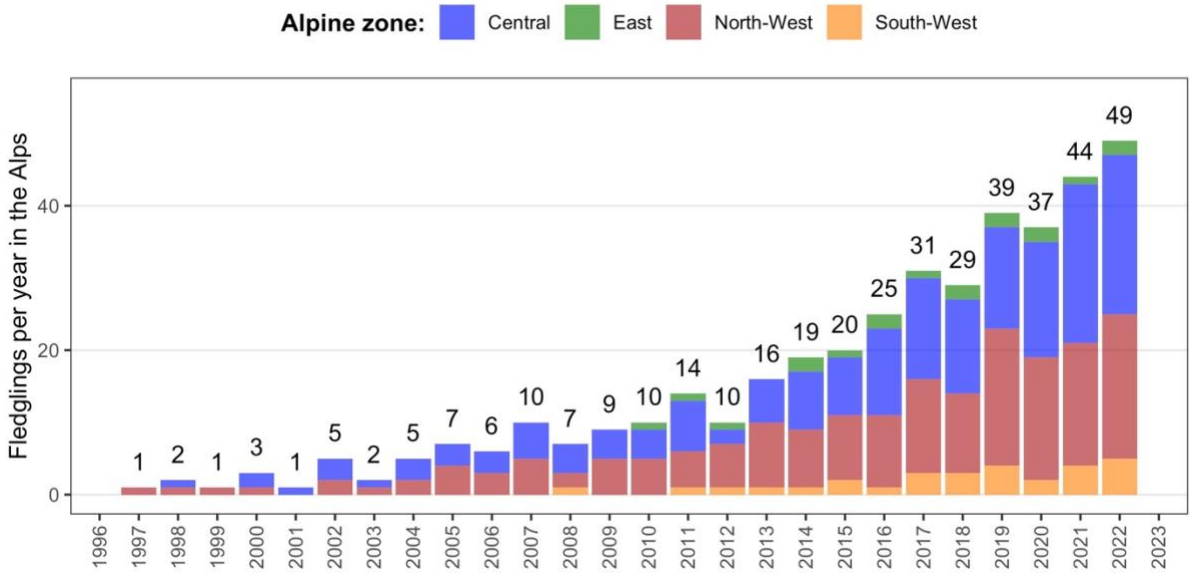


Figure 3. Fledglings per year in the Alpine region, since the first establishment of a pair in 1996.

Table 4: Breeding statistics for the season 2021/2022. See Table 2 for further details about the IBM-standards for breeding statistics.

	Zone	Potential territories	Territorial pairs	Checked pairs	Breeding pairs	Hatches	Fledglings	Failures	Breeding success	Productivity
Alpine range	**2022**	**79**	**74**	**73**	**67**	**61**	**49**	**18**	**73%**	**67%**
	East	6	6	6	5	3	2	3	40%	33%
	Central	32	30	30	28	25	22	6	79%	73%
	North-West	30	29	29	27	26	20	7	74%	69%
	South-West	11	9	8	7	7	5	2	71%	62%
	2021	**73**	**69**	**68**	**61**	**53**	**44**	**17**	**72%**	**65%**
	East	6	6	6	3	2	1	2	33%	17%
	Central	30	28	28	25	23	22	3	88%	79%
	North-West	28	28	28	27	22	17	10	63%	61%
	South-West	9	7	6	6	6	4	2	67%	67%
	2020	**61**	**56**	**54**	**53**	**44**	**37**	**16**	**70%**	**69%**
	East	3	3	3	3	2	2	1	67%	67%
	Central	24	22	22	21	17	16	5	76%	73%
	North-West	28	25	23	23	20	17	6	74%	74%
	South-West	6	6	6	6	5	2	4	33%	33%
Corsia										
	2022	2	2	2	2	2	0	2	0%	0%
	2021	2	1	1	1	1	0	1	0%	0%
	2020	4	4	4	2	1	1	1	50%	25%
Massif Central										
	2022	1	1	1	0	0	0	0	-	-
	2021	1	1	1	0	0	0	0	-	-
	2020	1	1	1	0	0	0	0	-	-

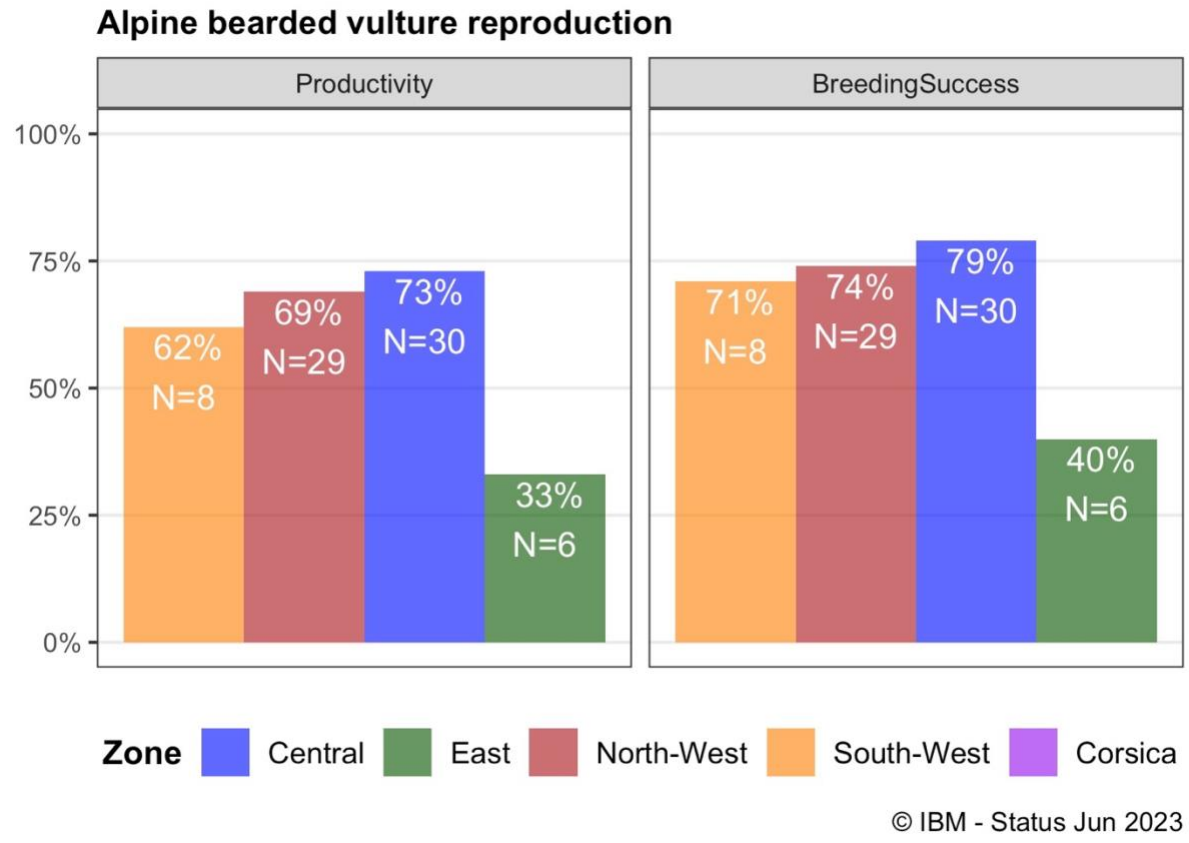


Figure 4: Productivity and breeding success vary within the different alpine zones with the highest productivity and breeding success in the central Alps. Note that sample size N (breeding territories) varies considerably among regions. See Table 2 for further details about the IBM-standards for breeding statistics.

Table 5: Reproduction in the eastern and central Alpine range. Territories with no clutch in previous years are marked with an asterisk (*).

	Territory	Nest	Parent1	Parent2	Parent3	Clutch	Hatch	Fledge	Failure	Chick	First clutch	First fledge	Total clutches	Total fledglings
Alps total	**79**	**72**	**79**	**79**	**5**	**67**	**61**	**49**	**18**	**61**	**1996**	**1997**	**580**	**402**
Eastern Alps	**6**	**6**	**6**	**6**	**1**	**5**	**3**	**2**	**3**	**3**	**2001**	**2010**	**43**	**18**
AUT	Gastein/Rauris	x	Andreas Hofer	Alexa	-	16/01 (±3)	18/03 (±3)	29/07	-	Gastein/Rauris2022 (W460)	2003	2010	20	8
	Gschlöß	x	Pinzgarus	Glocknerlady	-	14/01 (±1)	12/03	-	21/03	Gschlöß2022 (W456)	2014	-	4	0
	Heiligenblut	x	Fortuna	Ambo	-	-	-	-	-	-	2001	-	1	0
	Katschberg	x	Hubertus 2	Romaris	-	10/01 (±2)	08/03	25/06 (±5)	-	Katschberg2022 (W451)	2010	2012	13	10
	Mallnitz *	x	Felix2	Charlie	-	06/02 (±5)	-	-	14/04 (±1)	-	-	-	-	-
	Prägraten	x	Lea	Joker	El Dorado	09/02 (±10)	-	-	17/04	-	2018	-	4	0
Central Alps	**32**	**30**	**32**	**32**	**0**	**28**	**25**	**22**	**6**	**25**	**1998**	**1998**	**235**	**178**
	2	2	2	2	0	2	2	2	0	2	2019	2019	6	5
AUT	Lechtal	x	Madagaskar	Natura	-	15/01 (±8)	13/03	07/06 (±3)	-	Lechtal2022 (W479)	2019	2019	4	3
	Ötztal	x	adult	adult	-	14/01 (±3)	11/03	22/07	-	Ötztal2022 (W454)	2021	2021	2	2
	18	18	18	18	0	17	14	13	4	14	2007	2007	128	96
	Albula	x	wild-hatched (≥6.cy)	Diana-Stelvio	-	28/12 (±1)	22/02 (±2)	13/06 (±2)	-	Chaya (W444)	2008	2008	15	12
	Avers *	x	adult	adult	-	01/02 (±5)	25/03 (±2)	01/08	-	Avers2022 (W462)	-	-	-	-
	Bergün	x	GT0116	GT0117	-	11/01 (±1)	08/03 (±1)	05/07	-	Bergün2022 (W452)	2016	2016	7	6
	Buffalora	x	Ingenius	Retia	-	01/01 (±4)	19/02 (±3)	26/06	-	Buffalora2022 (W433)	2017	2017	6	4
	Foraz	x	wild-hatched (≥6.cy)	GT031	-	14/01 (±2)	09/03 (±2)	26/06 (±3)	-	Yolanta (W453)	2012	2014	11	9
	Maloja	x	Rurese	Folio	-	07/01	-	-	19/04	-	2016	2016	6	2
	Martina	x	adult	wild-hatched (≥6.cy)	-	11/01 (±5)	-	-	11/03 (±6)	-	2020	2021	3	1
	Müstair *	x	wild-hatched (≥6.cy)	wild-hatched (≥6.cy)	-	08/02 (±7)	03/04 (±2)	06/08 (±10)	-	Müstair2022 (W470)	-	-	-	-
CHE	Ofenpass	x	Livigno	Ortler	-	27/01 (±7)	22/03 (±7)	20/07 (±5)	-	Aithon II (W492)	2007	2007	13	11
	Ova Spin	x	adult	GT0171	-	17/12 (±2)	10/02 (±4)	21/06	-	OvaSpin2022 (W432)	2015	2018	7	5
	Pontresina	x	wild-hatched (≥6.cy)	GT0163	-	07/01 (±2)	02/03 (±2)	20/07 (±2)	-	Chasper (W447)	2019	2019	4	4
	Poschiavo	x	GT057	GT038	-	04/01 (±2)	21/02 (±2)	21/06	-	Poschiavo2022 (W443)	2013	2013	10	10
	Sinestra	x	Samuel	Moische-Livigno	-	17/02 (±2)	10/04 (±3)	-	21/05 (±5)	Sinestra2022 (W472)	2012	2013	11	8
	Spöl	x	wild-hatched (≥6.cy)	GT090	-	20/01 (±2)	17/03 (±2)	16/07	-	Spöl2022 (W459)	2014	2014	7	5
	Tantermozza	x	Zebru	GT048	-	02/01 (±3)	18/02 (±8)	21/06 (±7)	-	Gionny (W441)	2007	2007	16	12
	Tinizong	x	Cravallo	Inge	-	11/01 (±2)	-	-	07/03 (±3)	-	2020	2021	3	1
	Trupchun	x	Urbano	GT062	-	10/01 (±3)	05/03 (±3)	08/07 (±1)	-	Werni (W449)	2017	2019	6	4
	Vaettis *	x	Noel-Leya	adult	-	-	-	-	-	-	-	-	-	-
	12	10	12	12	0	9	9	7	2	9	1998	1998	101	77
	Foscagno	-	GT0132	GT0129	-	-	-	-	-	-	2011	2011	1	1
	Livigno	x	Cic	Moische	-	15/01 (±2)	10/03 (±2)	28/06 (±2)	-	Ricky-Rico_Livigno (W466)	1999	2000	24	20
	Ortler	x	adult	Jo	-	08/01	03/03	29/06	-	Loki-Trafoi (W448)	2016	2017	7	5
	Pejo-Rabbi *	x	adult	adult	-	-	-	-	-	-	-	-	-	-
	Planeil	x	Blick	subadult (5./6.cy)	-	07/02 (±7)	02/04 (±7)	21/07 (±3)	-	Planeil2022 (W488)	2013	2021	7	2
ITA	Reschen-Resia *	x	adult	adult	-	15/01	10/03 (±1)	29/06	-	Reschen-Resia2022 (W487)	-	-	-	-
	Schnals	x	Pep-Albula	adult	-	06/01	01/03	25/06	-	Schnals2022 (W465)	2013	2018	6	5
	Sondalo *	-	adult	adult	-	-	-	-	-	-	-	-	-	-
	Sondrio	x	adult	adult	-	08/01 (±2)	03/03 (±2)	-	16/03 (±9)	Sondrio2022 (W438)	2021	-	2	0
	Val Martello	x	adult	Temperatio	-	16/01	11/03	05/07	-	Gippo-Martell (W467)	2015	2015	8	8
	Valle del Braulio	x	Tell	Stift	-	01/12 (±4)	24/01 (±4)	-	10/02 (±9)	Braulio2022 (W430)	1998	1998	25	17
	Zebru	x	Heinz-Serraglio	Felice	-	23/12 (±3)	15/02 (±3)	29/06 (±2)	-	Bepi-Zebrù (W464)	2002	2002	20	18

Table 6: Reproduction in the north- and south-western Alpine range. Territories with no clutch in previous years are marked with an asterisk (*).

	Territory	Nest	Parent1	Parent2	Parent3	Clutch	Hatch	Fledge	Failure	Chick	First clutch	First fledge	Total clutches	Total fledglings
NW Alps	**30**	**27**	**30**	**30**	**3**	**27**	**26**	**20**	**7**	**26**	**1996**	**1997**	**256**	**177**
	9	8	9	9	1	8	8	8	0	8	2007	2007	54	42
	Bagnes	-	adult	adult	-	-	-	-	-	-	2016	2016	4	2
	Coude du Rhône	x	adult	subadult (5./6.cy)	-	21/01 (±5)	17/03 (±8)	13/07	-	Coude du Rhône2022 (W477)	2019	2019	4	3
	Derborence_down	x	subadult (5./6.cy)	adult	-	30/12	21/02 (±1)	19/06	-	Derborence_down2022 (W434)	2012	2012	10	9
	Derborence_Vérouet	x	Pablo	Guillaumes	Gildo	17/12 (±15)	12/02 (±10)	12/06	-	Derborence_Vérouet2022 (W483)	2007	2007	11	7
CHE	Kandertal	x	GT0138	GT0126	-	14/01	04/03 (±1)	02/07	-	Volta (W485)	2020	2020	3	3
	Leukerbad	x	adult	adult	-	13/12 (±4)	04/02 (±3)	09/06	-	Leukerbad2022 (W431)	2012	2015	7	5
	Saas	x	adult	adult	-	26/12 (±6)	18/02 (±8)	14/06 (±1)	-	Saas2022 (W484)	2019	2019	4	4
	Sionne	x	adult	adult	-	15/01 (±3)	07/03 (±3)	02/07 (±2)	-	Sionne2022 (W450)	2019	2019	3	3
	Zermatt	x	Smaragd	adult	-	27/12 (±8)	20/02 (±5)	09/06 (±4)	-	Zermatt2022 (W435)	2016	2016	7	6
	14	14	14	14	1	14	14	9	5	14	1996	1997	158	103
	Andagne	x	adult	adult	-	03/02	26/03	23/07	-	Andagne2022 (W475)	2011	2014	9	5
	Aravis	x	wild-hatched (≥6.cy)	wild-hatched (≥6.cy)	-	02/01 (±1)	27/02 (±1)	30/06	-	Elfie (W437)	2006	2009	17	10
	Bargy	x	wild-hatched (≥6.cy)	wild-hatched (≥6.cy)	wild-hatched (≥6.cy)	25/01 (±1)	25/03 (±3)	-	24/04 (±4)	Bargy2022 (W468)	1996	1997	26	20
	Bargy BIS	x	wild-hatched (≥6.cy)	adult	-	20/01 (±2)	18/03 (±2)	12/07 (±1)	-	Cenise (W463)	2016	2017	7	5
	Bourg-Saint-Maurice	x	adult	adult	-	04/01	28/02	-	28/04	Bourg-Saint-Maurice2022 (W493)	2016	2017	7	5
	Bourg-Saint-Maurice-2	x	Schils	adult	-	26/12	19/02	-	18/03	Bourg-Saint-Maurice22022 (W491)	2020	-	2	0
	Bramans *	x	adult	wild-hatched (≥6.cy)	-	28/01	20/03	23/07	-	Bramans2022 (W476)	-	-	-	-
FRA	Passy *	x	wild-hatched (≥6.cy)	wild-hatched (≥6.cy)	-	10/02 (±15)	05/04 (±15)	07/07 (±2)	-	Anterne (W471)	-	-	-	-
	Peisey-Nancroix	x	adult	adult	-	21/01	14/03	16/07	-	Dome (W478)	2005	2005	18	14
	Pralognan	x	adult	adult	-	24/01	28/03	21/07	-	Pralognan2022 (W474)	2018	2018	5	4
	Sixt Fiz	x	wild-hatched (≥6.cy)	adult	-	31/12 (±6)	24/02 (±1)	-	07/04 (±4)	Sixt-Fiz2022 (W436)	2007	2009	16	9
	Termignon	x	Stelvio	Gelas	-	16/12	03/03	-	14/05	Termignon2022 (W481)	2002	2002	21	15
	Val dIsère	x	adult	adult	-	03/02	04/03	06/07	-	Daille (W480)	1999	2002	23	13
	Valloire *	x	adult	adult	-	25/01	24/03	21/07	-	Gypipon (W482)	-	-	-	-
	7	5	7	7	1	5	4	3	2	4	2010	2012	44	32
	Bionaz	x	adult	adult	-	-	-	-	-	-	2019	-	3	0
	Chamoussière	x	Michegabri	wild-hatched (≥6.cy)	-	18/01	13/03 (±1)	11/07	-	Chamoussière2022 (W457)	2011	2012	12	9
	Gressoney *	x	subadult (5./6.cy)	adult	-	-	-	-	-	-	-	-	-	-
ITA	Usseglio	x	Italia 150	adult	-	16/02 (±1)	29/03 (±1)	27/07 (±1)	-	Eolo (W490)	2019	2019	4	4
	Val di Rhemes	x	adult	adult	adult	28/01	23/03 (±1)	-	25/04	Val di Rhemes2022 (W461)	2010	2012	12	9
	Valdigne	-	adult	adult	-	13/01 (±30)	-	-	15/04 (±20)	-	2010	2019	5	3
	Valnontey	-	Fontvieille	adult	-	28/12 (±1)	21/02 (±1)	16/06 (±2)	-	Valnontey2022 (W442)	2015	2015	8	7
SW Alps	**11**	**9**	**11**	**11**	**1**	**7**	**7**	**5**	**2**	**7**	**2008**	**2008**	**46**	**29**
	9	8	9	9	1	7	7	5	2	7	2008	2008	46	29
	Archiane *	x	adult	Gerlinde	-	03/02 (±1)	27/03	02/08	-	Ambane (W469)	-	-	-	-
	Bonette	x	GT150	Bellemotte	-	09/01 (±1)	01/03 (±1)	01/07 (±1)	-	Mafate (W446)	2017	2017	6	6
	Chambeyron-Ubayette	x	Cassos	Rimani	-	06/01 (±1)	26/02	10/07	-	Mojo (W440)	2016	2020	7	3
	Malaval	x	Basalte	GT0140	GT0141	10/01	05/03	-	06/03	Malaval2022 (W439)	2018	2018	5	3
FRA	Pedane *	x	subadult (5./6.cy)	Pamela (3.cy)	-	-	-	-	-	-	-	-	-	-
	Source de la Tinée	x	Rocca	Girasole	-	19/01 (±1)	15/03 (±1)	-	23/04 (±2)	Source de la Tinée2022 (W458)	2013	2015	9	5
	Source de lUbaye	x	Sereno	GT036	-	04/01 (±2)	25/02 (±3)	24/06 (±2)	-	Deneb (W445)	2008	2008	13	10
	Val dEntraunes	x	Tenao	adult	-	14/01 (±1)	12/03 (±1)	10/07	-	Val dEntraunes2022 (W455)	2019	2022	4	1
	Veneon1 *	-	adult	adult	-	-	-	-	-	-	-	-	-	-
	2	1	2	2	0	0	0	0	0	0	-	-	0	0
ITA	Maira *	x	Roman	subadult (5./6.cy)	-	-	-	-	-	-	-	-	-	-
	MVG *	-	adult	Léoux (5./6.cy)	-	-	-	-	-	-	-	-	-	-

Table 7: Reproduction in Corsica and the Massif Central. The IBM does not include reproduction data for Corsica before 2018. As in the previous year, no reproduction has been reported from the Massif Central, where two male birds have established a territory since 2018. Territories with no clutch in previous years are marked with an asterisk (*).

	Territory	Nest	Parent1	Parent2	Parent3	Clutch	Hatch	Fledge	Failure	Chick	First clutch	First fledge	Total clutches	Total fledglings
Corsica	**2**	**2**	**2**	**2**	**0**	**2**	**2**	**0**	**2**	**2**	**2018**	**2018**	**11**	**2**
FRA	Bonifatu	x	Bonifatu 1	Bonifatu 2	-	12/01 (±7)	08/03 (±5)	-	12/04 (±3)	Bonifatu2022 (W486)	2018	2018	4	2
	Popolasca	x	Popolasca 1	Popolasca 2	-	11/02 (±10)	05/04 (±10)	-	14/04	Popolasca2022 (W489)	2019	-	4	0
Massif Central	**1**	**1**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
FRA	Jonte amont *	x	Layrou	Adonis	-	-	-	-	-	-	-	-	-	-

7 Observations

7.1 IBM-network & -monitoring area

Bearded Vulture observations are collected within the area of the International Bearded Vulture Monitoring (IBM) network. Regional coordinators from national parks, regional nature parks or NGO's (Table 8) are responsible for a certain area (20 areas in 2022, see Figure 5), where the professionals collect and validate reported Bearded Vulture observations that are later stored in the IBM-database.

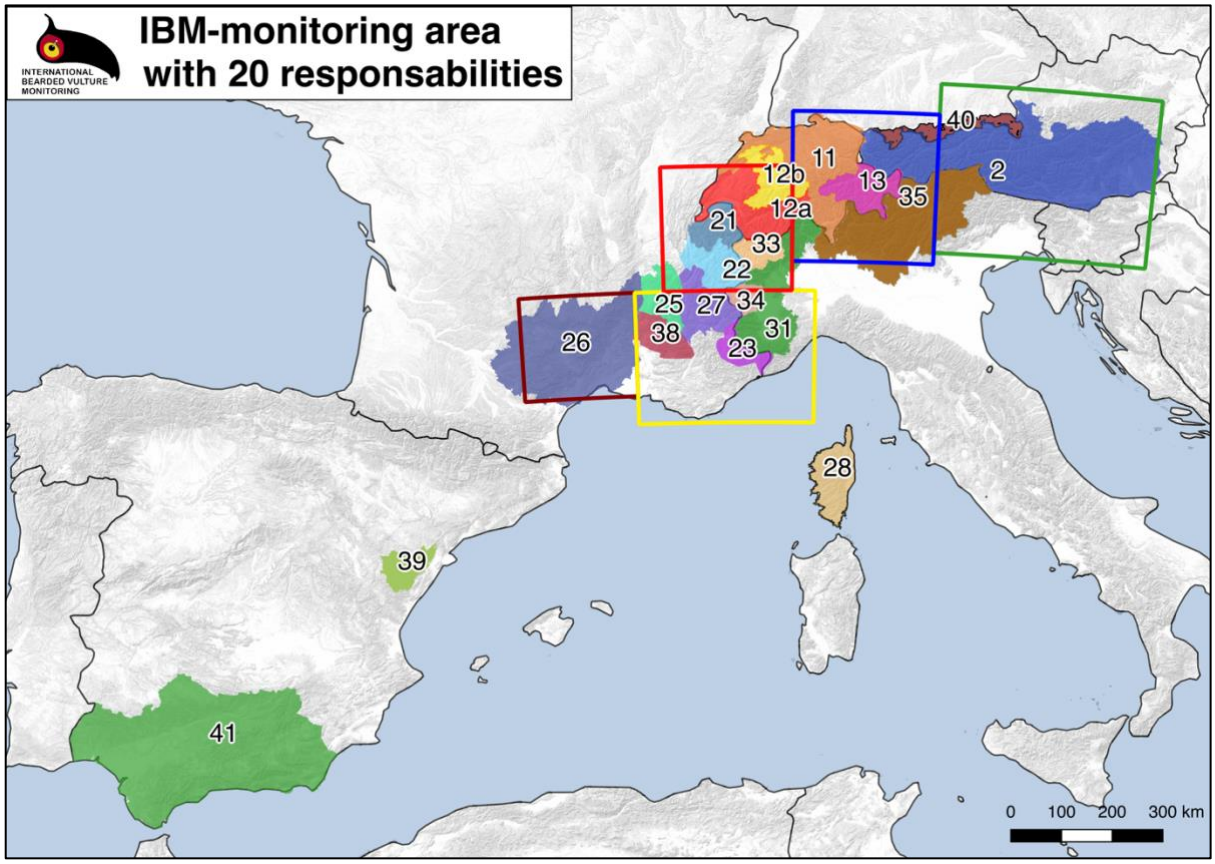


Figure 5: 20 Areas of responsibility that form the International Bearded Vulture Monitoring Network.

Table 8: IBM-partners and associated organisations (*) that collect data within their area of responsibility.

Collecting centre ID	Responsible organisation	Country
2	*Hohe Tauern National Park*	AUT
11	*Stiftung Pro Bartgeier Central*	CHE
12a	*Stiftung Pro Bartgeier north-west*	CHE
12b	*Stiftung Pro Bartgeier south-west*	CHE
13	*Stiftung Pro Bartgeier east*	CHE
21	*ASTERS*	FRA
22	*Parc National de la Vanoise*	FRA
23	*Parc National du Mercantour*	FRA
25	*Parc Naturel Régional des Vercors*	FRA
26	*LPO Grands Causses*	FRA
26	*National Park of Cevennes **	FRA
27	*Envergures Alpines*	FRA
28	PNR de Corse	FRA
38	*Association Vautours en Baronnies*	FRA
39	*Parc National des Écrins**	FRA
31	*Parco Naturale Alpi Marittime*	ITA
33	*Parco Nationale Gran Paradiso*	ITA
33	*Regione autonoma valle d'Aosta**	ITA
34	*Parco Naturale Alpi Cozie*	ITA
35	*Parco Nazionale dello Stelvio*	ITA
39	*Maestrazgo - Els Ports*	ESP
41	*Junta de Andalucia*	ESP
40	*Landesbund für Vogelschutz - LBV*	GER
40	*Alpinum*	GER

7.2 Visual observations

In 2022, 1’831 Bearded Vulture observations from 9 different countries in Europe have been registered in the IBM-database. For 620 (34%) observations it was possible to identify the observed individual, for 161 (9%) cases there are hypotheses about the bird’s identity, while it was not possible to identify the individuals in 1’050 (57%) observations (Figure 6).

63 individuals (11 of them wild-hatched) were identified by at least one visual observation, while some birds have been observed several times in 2022. Two birds have even been observed over 45 times in 2022. The most frequently observed birds are Roman (BG854, Alpi Marittime 2015) with 50 and Eglazine (BG1069, Grands Causses 2020) with 48 observations (Table 9).

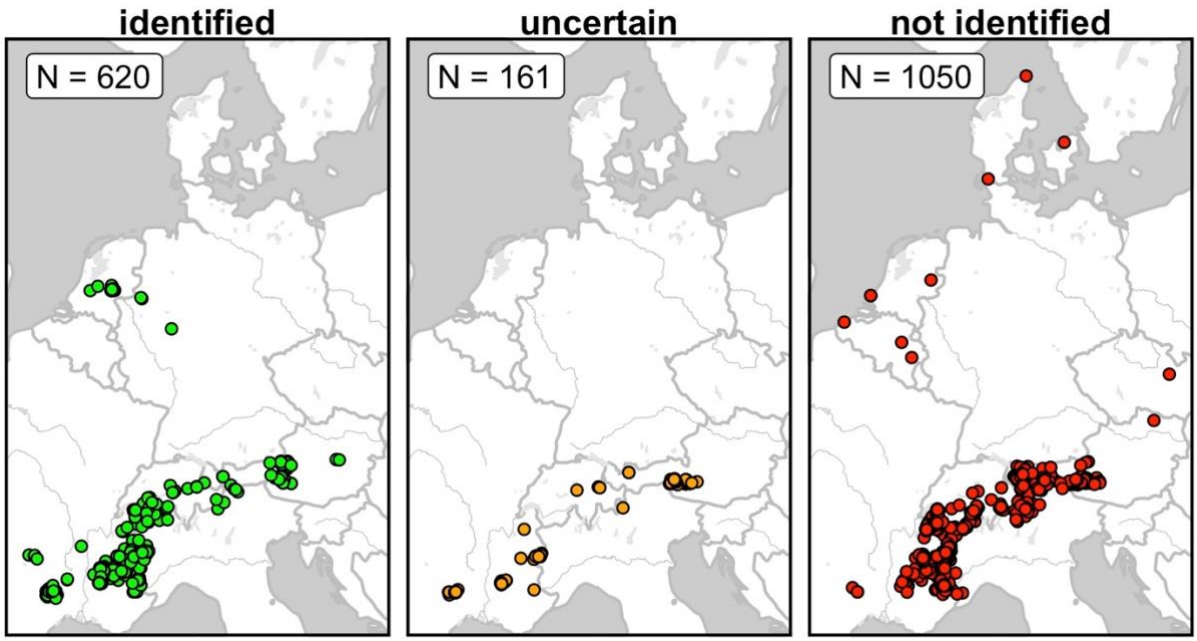


Figure 6: Overview of the 1'831 Bearded Vulture observations that have been reported in 2022. In 34% of all observations the observed bird could be identified on the individual level (620 identifications).

Table 9: Overview of all 1'831 observations from 9 different countries reported in the IBM-database for the year 2022. The older a bird is and the more often it has been observed, the darker it is highlighted in green. The longer a bird has not been observed before 2022, the darker it is highlighted in red.

Bird	Sex	Age (cy)	Observed ...			AUT	BEL	CHE	CZE	DEU	DNK	FRA	ITA	NDL	Total	Ornitho.ch
			before period	in period	total											
Adonis (BG794)	m	9	05.02.21	30	319	-	-	-	-	-	-	30	-	-	**30**	-
Alexa (BG100)	f	35	04.10.21	1	99	1	-	-	-	-	-	-	-	-	**1**	-
Altitude (W313)	f	4	-	1	1	-	-	1	-	-	-	-	-	-	**1**	-
Ambane (W469)	u	1	-	3	3	-	-	-	-	-	-	3	-	-	**3**	-
Ambo (BG392)	f	21	29.03.13	1	121	1	-	-	-	-	-	-	-	-	**1**	-
Andreas Hofer (BG260)	m	27	03.10.21	2	72	2	-	-	-	-	-	-	-	-	**2**	-
Aven (BG1067)	f	3	22.12.21	31	36	-	-	-	-	-	-	31	-	-	**31**	-
Bavaria (BG1112)	f	2	06.11.21	17	18	11	-	-	-	6	-	-	-	-	**17**	-
BelArosa (BG1119)	m	2	20.12.21	7	12	-	-	7	-	-	-	-	-	-	**7**	-
Caeli (BG998)	m	5	13.09.21	3	18	3	-	-	-	-	-	-	-	-	**3**	-
Calandreto (BG948)	m	6	22.12.21	19	59	-	-	-	-	-	-	19	-	-	**19**	-
Canteperdrix (BG1136)	f	1	-	24	24	-	-	-	-	-	-	24	-	-	**24**	-
Cévennes (BG1032)	m	4	22.12.21	12	55	-	-	-	-	-	-	12	-	-	**12**	-
Charlie (BG910)	f	7	16.10.20	1	113	1	-	-	-	-	-	-	-	-	**1**	-
Cierzo (BG899)	m	7	13.07.20	1	22	-	-	1	-	-	-	-	-	-	**1**	-
Clapas (BG975)	m	5	29.12.21	16	174	-	-	-	-	-	-	16	-	-	**16**	-
Dagmar (BG1145)	f	1	-	3	3	1	-	-	-	2	-	-	-	-	**3**	-
Donna Elvira (BG1117)	f	2	21.11.21	2	5	-	-	2	-	-	-	-	-	-	**2**	-
Eglazine (BG1069)	f	3	30.12.21	48	111	-	-	-	-	3	-	6	-	39	**48**	-
Elvio (BG1026)	m	4	02.10.21	11	71	-	-	-	-	-	-	11	-	-	**11**	-
Emparis (W284)	f	4	12.05.21	2	5	-	-	1	-	-	-	-	1	-	**2**	-
Eolo (W490)	u	1	-	9	9	-	-	-	-	-	-	-	9	-	**9**	-
Fario (BG1079)	f	3	06.02.21	14	17	-	-	-	-	-	-	14	-	-	**14**	-
Felix2 (BG793)	m	9	10.11.21	1	123	1	-	-	-	-	-	-	-	-	**1**	-
Finja (BG1003)	f	5	09.12.21	1	25	-	-	1	-	-	-	-	-	-	**1**	-
Fortuna (BG843)	m	8	09.11.21	1	47	1	-	-	-	-	-	-	-	-	**1**	-
Fortunat (BG1068)	m	3	12.11.21	6	21	-	-	3	-	-	-	3	-	-	**6**	-
Fredueli (BG1001)	m	5	02.10.21	4	30	-	-	4	-	-	-	-	-	-	**4**	-
Friday For Flying - Livigno (W396)	m	2	-	1	1	-	-	-	-	-	-	-	1	-	**1**	-
Gerlinde (BG759)	f	10	06.03.21	2	186	-	-	-	-	-	-	2	-	-	**2**	-
Gypsy (W209)	m	6	07.12.21	5	18	-	-	4	-	-	-	1	-	-	**5**	-
Italia 150 (BG660)	m	12	15.12.21	20	91	-	-	-	-	-	-	-	20	-	**20**	-
Jo (BG169)	f	31	05.07.21	1	235	-	-	-	-	-	-	-	1	-	**1**	-
Kirsi (BG764)	m	10	31.12.21	8	101	-	-	-	-	-	-	8	-	-	**8**	-
Kobalann (BG1063)	f	3	11.11.21	23	83	-	-	1	-	-	-	16	6	-	**23**	-
Lapie (W251)	m	5	31.03.19	4	8	-	-	-	-	-	-	4	-	-	**4**	-
Layrou (BG761)	m	10	30.12.21	34	338	-	-	-	-	-	-	34	-	-	**34**	-
Léoux (BG950)	f	6	31.12.21	13	33	-	-	-	-	-	-	1	12	-	**13**	-
Luzerna (BG1071)	f	3	18.11.20	4	8	-	-	3	-	-	-	-	1	-	**4**	-
Madagaskar (BG665)	m	12	04.06.19	2	54	2	-	-	-	-	-	-	-	-	**2**	-
Mistral (BG1022)	m	4	14.12.21	18	103	-	-	-	-	-	-	17	1	-	**18**	-
Natura (BG464)	f	18	22.04.07	1	12	1	-	-	-	-	-	-	-	-	**1**	-
Noel-Leya (BG797)	m	9	19.11.21	1	14	-	-	1	-	-	-	-	-	-	**1**	-
Novo (BG1098)	m	2	02.12.21	27	68	5	-	-	-	-	-	16	6	-	**27**	-
Ophrys (BG1078)	f	3	27.08.21	30	41	-	-	-	-	-	-	30	-	-	**30**	-
Pamela (BG1031)	f	4	18.12.21	12	82	-	-	-	-	-	-	12	-	-	**12**	-
Penti2020 (W349)	f	3	10.10.21	1	7	1	-	-	-	-	-	-	-	-	**1**	-
Peyre (BG1116)	m	2	30.12.21	5	8	-	-	-	-	-	-	5	-	-	**5**	-
Pierro (W301)	m	4	13.09.21	1	5	-	-	1	-	-	-	-	-	-	**1**	-
Pradines (BG1122)	f	2	27.12.21	7	12	-	-	-	-	-	-	7	-	-	**7**	-
Prazon-sixt-fer-a-cheval (W346)	u	3	11.10.21	3	4	-	-	3	-	-	-	-	-	-	**3**	-
Pyrenees (BG1094)	f	2	15.12.21	7	8	-	-	-	-	-	-	7	-	-	**7**	-
Recka (BG1147)	f	1	-	5	5	1	-	-	-	4	-	-	-	-	**5**	-
Rei del Causse (BG1128)	m	1	-	11	11	-	-	-	-	-	-	11	-	-	**11**	-
Riglos (BG1138)	m	1	-	20	20	-	-	-	-	-	-	20	-	-	**20**	-
Roc (BG1127)	m	1	-	7	7	-	-	1	-	-	-	6	-	-	**7**	-
Roman (BG854)	m	8	31.12.21	50	200	-	-	-	-	-	-	-	50	-	**50**	-
Simay (BG983)	m	5	14.10.21	1	63	-	-	-	-	-	-	1	-	-	**1**	-
Smaragd (BG675)	m	12	10.11.21	1	56	-	-	1	-	-	-	-	-	-	**1**	-
Telemark (BG1101)	m	2	31.12.21	17	58	-	-	2	-	-	-	14	1	-	**17**	-
Tenao (BG755)	m	10	22.12.21	2	106	-	-	-	-	-	-	2	-	-	**2**	-
Vidoc (W356)	f	3	-	1	1	-	-	1	-	-	-	-	-	-	**1**	-
Wally (BG1113)	f	2	-	4	4	1	-	-	-	3	-	-	-	-	**4**	-
unknown						215	-	10	1	16	2	332	628	2	**1'206**	2'199
wild hatched						-	3	-	-	-	1	-	-	1	**5**	-
Total	**33/27/3**					**248**	**3**	**48**	**1**	**34**	**3**	**715**	**737**	**42**	**1'831**	**2'199**

7.2.1 Ornitho.ch data

Another 2'199 Bearded Vulture observations have been reported on the Swiss ornithologist reporting platform *ornitho.ch.* Even though these observations were not validated by the IBM-partner network, these observations deliver information about Bearded Vulture hotspots and future focal areas (Figure 7).

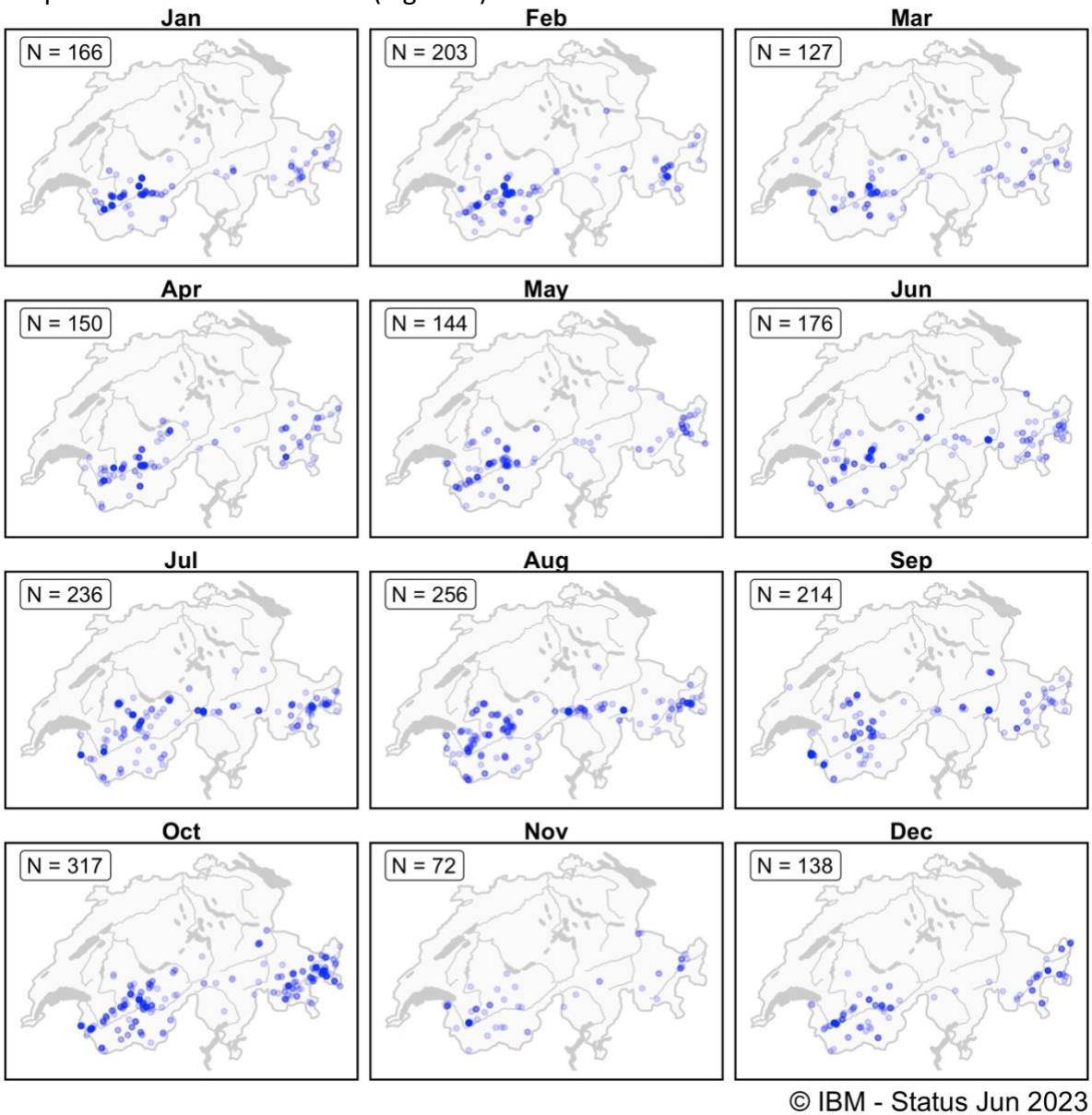


Figure 7. All observations classified as Bearded Vulture observations on Ornitho.ch in 2022. The points are shown with 20% coverage, so five overlapping observations appear in dark blue.

7.3 Individual identification

Thanks to the sophisticated marking system of the IBM, it was possible to identify 182 Bearded Vultures in 2022 (Table 10, Table 11, Table 12 and Table 13). Data from observations, the reproduction monitoring, telemetry as well as the IOD were used to gain valuable information about Bearded Vultures on the individual level.

This information allows to draw conclusions about the life history of individuals, which forms the basis for survival analyses in order to better understand and manage the reintroduction process of this endangered species. Furthermore, such life history data is essential for population modelling and predictions about the development of the Bearded Vulture population.

*Table 10. List of all birds that have been identified in 2022 with "origin" in the eastern Alpine range. Wild-hatched birds are marked with a prefixed "W" or "GT" in the BirdID. "Identification" describes the data basis that was used for their record: r = reproduction, i = IOD, t = telemetry, o = observation. Sorted by their region of origin (territory or release site). * = territory of hatch from juvenile birds from 2022.*

Bird	BirdID	Sex	Hatch	Death	Age (cy)	Origin (release site, territory, country)		Territory	Identification
Eastern Alpine range									**29**
Kruml8	W460	u	2022		1	Gastein/Rauris		Gastein/Rauris (AUT)*	r
Cravallo	W156	m	2015		8	Katschberg		Tinizong (CHE)	r
Katschberg2022	W451	u	2022		1	Katschberg		Katschberg (AUT)*	r
Ötztal2022	W454	u	2022		1	Ötztal		Ötztal (AUT)*	r
Felix2	793	m	2014		9	NP Hohe Tauern, Debantal		Mallnitz (AUT)	r,o,i,t
Fortuna	843	m	2015		8	NP Hohe Tauern, Dorfertal		Heiligenblut (AUT)	r,o,i,t
Lea	840	m	2015		8	NP Hohe Tauern, Dorfertal		Prägraten (AUT)	r
Glocknerlady	718	f	2012		11	NP Hohe Tauern, Fleißtal		Gschlöß (AUT)	r
Inge	720	f	2012		11	NP Hohe Tauern, Fleißtal		Tinizong (CHE)	r
Ambo	392	f	2002		21	NP Hohe Tauern, Gastein		Heiligenblut (AUT)	r,o,i
Smaragd	675	m	2011		12	NP Hohe Tauern, Habachtal	AUT	Zermatt (CHE)	r,o
Hubertus 2	446	m	2004		19	NP Hohe Tauern, Kals		Katschberg (AUT)	r
Romaris	528	f	2007		16	NP Hohe Tauern, Kals		Katschberg (AUT)	r
Joker	420	f	2003		20	NP Hohe Tauern, Mallnitz		Prägraten (AUT)	r
Caeli	998	m	2018		5	NP Hohe Tauern, Mallnitz			o,t
El Dorado	372	f	2001		22	NP Hohe Tauern, Matrei		Prägraten (AUT)	r
Alexa	100	f	1988		35	NP Hohe Tauern, Rauris		Gastein/Rauris (AUT)	r,o,i
Andreas Hofer	260	m	1996		27	NP Hohe Tauern, Rauris		Gastein/Rauris (AUT)	r,o,i
Pinzgarus	558	m	2008		15	NP Hohe Tauern, Rauris		Gschlöß (AUT)	r
Rurese	559	m	2008		15	NP Hohe Tauern, Rauris		Maloja (CHE)	r
Charlie	910	f	2016		7	NP Hohe Tauern, Untersulzbachtal		Mallnitz (AUT)	r,o,i
Bavaria	1112	f	2021		2	Berchtesgaden, Halsgrube			o,i,t
Wally	1113	f	2021	15.04.22	1	Berchtesgaden, Halsgrube	GER		o,t
Dagmar	1145	f	2022		1	Berchtesgaden, Halsgrube			o,i,t
Recka	1147	f	2022		1	Berchtesgaden, Halsgrube			o,i,t
Retia	357	f	2000		23	NP Stilfserjoch, Martell		Buffalora (CHE)	r
Stift	393	f	2002		21	NP Stilfserjoch, Martell	ITA	Valle del Braulio (ITA)	r,i
Ortler	439	f	2004		19	NP Stilfserjoch, Martell		Ofenpass (CHE)	r
Temperatio	495	f	2006		17	NP Stilfserjoch, Martell		Val Martello (ITA)	r,i

*Table 11. List of all birds that have been identified in 2022 with "origin" in the central Alpine range. Wild-hatched birds are marked with a prefixed "W" or "GT" in the BirdID. "Identification" describes the data basis that was used for their record: r = reproduction, i = IOD, t = telemetry, o = observation. Sorted by their region of origin (territory or release site). * = territory of hatch from juvenile birds from 2022.*

Bird	BirdID	Sex	Hatch	Death	Age (cy)	Origin (release site, territory, country)		Territory	Identification
Central Alpine range									**56**
Lechtal2022	W479	u	2022		1	Lechtal	AUT	Lechtal (AUT)*	r,i
Pep-Albula	W119	m	2013		10	Albula		Schnals (ITA)	r
Chaya	W444	u	2022		1	Albula		Albula (CHE)*	r
Avers2022	W462	u	2022		1	Avers		Avers (CHE)*	r,i
Bergün2022	W452	u	2022		1	Bergün		Bergün (CHE)*	r
Buffalora2022	W433	u	2022		1	Buffalora		Buffalora (CHE)*	r,i
Yolanta	W453	u	2022		1	Foraz		Foraz (CHE)*	r,i
Müstair2022	W470	u	2022		1	Müstair		Müstair (CHE)*	r,i
Heinz-Serraglio	W45	m	2007		16	Ofenpass		Zebru (ITA)	r,i
Aithon II	W492	u	2022		1	Ofenpass		Ofenpass (CHE)*	r
OvaSpin2022	W432	u	2022		1	Ova Spin		Ova Spin (CHE)*	r
Chasper	W447	u	2022		1	Pontresina		Pontresina (CHE)*	r
Poschiavo2022	W443	u	2022		1	Poschiavo		Poschiavo (CHE)*	r
Spöl2022	W459	u	2022		1	Spöl		Spöl (CHE)*	r
Gionny	W441	u	2022		1	Tantermozza		Tantermozza (CHE)*	r,i
Werni	W449	u	2022		1	Trupchun		Trupchun (CHE)*	r
Ingenius	621	m	2010		13	Calfeisen, Vaettis		Buffalora (CHE)	r,i
Madagaskar	665	m	2011		12	Calfeisen, Vaettis		Lechtal (AUT)	r,o,i
Noel-Leya	797	m	2014		9	Calfeisen, Vaettis		Vaettis (CHE)	r,o,t
Schils	802	m	2014		9	Calfeisen, Vaettis	CHE	Bourg-Saint-Maurice-2 (FRA)	r,t
Ewolina	838	f	2015		8	Melchsee-Frutt			t
Cierzo	899	m	2016		7	Melchsee-Frutt			o,i,t
Finja	1003	f	2018		5	Melchsee-Frutt			o,t
Fredueli	1001	m	2018		5	Melchsee-Frutt			o,t
Fortunat	1068	m	2020		3	Melchsee-Frutt			o,t
Luzerna	1071	f	2020		3	Melchsee-Frutt			o,t
BelArosa	1119	m	2021		2	Melchsee-Frutt			o,t
Donna Elvira	1117	f	2021		2	Melchsee-Frutt			o,i,t
Moische	146	f	1991		32	NP Engadin, Zernez		Livigno (ITA)	r,i
Jo	169	f	1992		31	NP Engadin, Zernez		Ortler (ITA)	r,o
Cic	186	m	1993		30	NP Engadin, Zernez		Livigno (ITA)	r,i
Tell	283	m	1997		26	NP Engadin, Zernez		Valle del Braulio (ITA)	r,i
Gildo	299	f	1998		25	NP Engadin, Zernez		Derborence_Vérouet (CHE)	r
Veronika	321	f	1999		24	NP Engadin, Zernez			t
Felice	375	f	2001		22	NP Engadin, Zernez		Zebru (ITA)	r,i
Folio	463	f	2005		18	NP Engadin, Zernez		Maloja (CHE)	r
Natura	464	f	2005		18	NP Engadin, Zernez		Lechtal (AUT)	r,o,i
Blick	524	m	2007		16	NP Engadin, Zernez		Planeil (ITA)	r
Samuel	526	m	2007		16	NP Engadin, Zernez		Sinestra (CHE)	r,i
Livigno	W08	m	2000		23	Livigno		Ofenpass (CHE)	r,i
Moische-Livigno	W11	f	2002		21	Livigno		Sinestra (CHE)	r
Urbano	W122	m	2013		10	Livigno		Trupchun (CHE)	r,i
Penti2020	W349	f	2020		3	Livigno			o,t
Friday For Flying - Livigno	W396	m	2021		2	Livigno			o,t
Ricky-Rico_Livigno	W466	m	2022		1	Livigno		Livigno (ITA)*	r,i,t
Loki-Trafoi	W448	u	2022		1	Ortler		Ortler (ITA)*	r
Planeil2022	W488	u	2022		1	Planeil		Planeil (ITA)*	r,i
Reschen-Resia2022	W487	u	2022		1	Reschen-Resia	ITA	Reschen-Resia (ITA)*	r
Schnals2022	W465	u	2022		1	Schnals		Schnals (ITA)*	r
Gippo-Martell	W467	u	2022		1	Val Martello		Val Martello (ITA)*	r
Stelvio	W02	u	1998		25	Valle del Braulio		Termignon (FRA)	r,i
Diana-Stelvio	W07	f	2000		23	Valle del Braulio		Albula (CHE)	r,i
Zebru	W12	m	2002		21	Zebru		Tantermozza (CHE)	r,i
Rimani	W93	f	2011		12	Zebru		Chambeyron-Ubayette (FRA)	r,i
Severino-Zebru	W372	m	2021		2	Zebru			t
Bepi-Zebrù	W464	u	2022		1	Zebru		Zebru (ITA)*	r,i

*Table 12. List of all birds that have been identified in 2022 with "origin" in the north-western and south-western Alpine range. Wild-hatched birds are marked with a prefixed "W" or "GT" in the BirdID. "Identification" describes the data basis that was used for their record: r = reproduction, i = IOD, t = telemetry, o = observation. Sorted by their region of origin (territory or release site). * = territory of hatch from juvenile birds from 2022.*

Bird	BirdID	Sex	Hatch	Death	Age (cy)	Origin (release site, territory, country)		Territory	Identification
North-western Alpine range									**33**
Mison	W230	f	2017		6	Bagnes			t
Coude du Rhône2022	W477	u	2022		1	Coude du Rhône		Coude du Rhône (CHE)*	r
Derborence_down2022	W434	u	2022		1	Derborence_down		Derborence_down (CHE)*	r
Derborence_Vérouet2022	W483	u	2022		1	Derborence_Vérouet		Derborence_Vérouet (CHE)*	r
Volta	W485	f	2022		1	Kandertal	CHE	Kandertal (CHE)*	r
Leukerbad2022	W431	u	2022		1	Leukerbad		Leukerbad (CHE)*	r
Saas2022	W484	u	2022		1	Saas		Saas (CHE)*	r
Sionne2022	W450	u	2022		1	Sionne		Sionne (CHE)*	r
Zermatt2022	W435	u	2022		1	Zermatt		Zermatt (CHE)*	r
Andagne2022	W475	u	2022		1	Andagne		Andagne (FRA)*	r
Neige	W198	m	2016		7	Aravis			t
Gypsy	W209	m	2017		6	Aravis			o,t
Elfie	W437	u	2022		1	Aravis		Aravis (FRA)*	r,i,t
Gemapi	W196	f	2016		7	Bargy			t
Lapie	W251	m	2018		5	Bargy			o,t
Pierro	W301	m	2019		4	Bargy			o,t
Vidoc	W356	f	2020		3	Bargy			o,t
Sunny	W397	m	2021		2	Bargy			t
Cenise	W463	u	2022		1	Bargy BIS		Bargy BIS (FRA)*	r
Bramans2022	W476	u	2022		1	Bramans	FRA	Bramans (FRA)*	r
Anterne	W471	u	2022		1	Passy		Passy (FRA)*	r
Altitude	W313	f	2019		4	Peisey-Nancroix			o,t
Bellecote	W361	u	2020		3	Peisey-Nancroix			t
Dome	W478	u	2022		1	Peisey-Nancroix		Peisey-Nancroix (FRA)*	r,t
Pralognan2022	W474	u	2022		1	Pralognan		Pralognan (FRA)*	r
Sixt Buet	W285	f	2019		4	Sixt Fiz			t
Prazon-sixt-fer-a-cheval	W346	u	2020		3	Sixt Fiz			o,t
Daille	W480	u	2022		1	Val dIsère		Val dIsère (FRA)*	r,t
Gypipon	W482	u	2022		1	Valloire		Valloire (FRA)*	r
Pablo	359	m	2000		23	Haute-Savoie, Bargy		Derborence_Vérouet (CHE)	r
Chamoussière2022	W457	u	2022		1	Chamoussière		Chamoussière (ITA)*	r
Eolo	W490	u	2022		1	Usseglio	ITA	Usseglio (ITA)*	r,o
Valnontey2022	W442	u	2022		1	Valnontey		Valnontey (ITA)*	r
South-western Alpine range									**34**
Ambane	W469	u	2022		1	Archiane		Archiane (FRA)*	r,o,i
Mafate	W446	u	2022		1	Bonette		Bonette (FRA)*	r
Mojo	W440	u	2022		1	Chambeyron-Ubayette		Chambeyron-Ubayette (FRA)*	r,t
Emparis	W284	f	2019		4	Malaval			o,t
Cassos	W104	u	2012		11	Source de lUbaye		Chambeyron-Ubayette (FRA)	r
Deneb	W445	u	2022		1	Source de lUbaye		Source de lUbaye (FRA)*	r
Val dEntraunes2022	W455	u	2022		1	Val dEntraunes		Val dEntraunes (FRA)*	r
Girun	904	f	2016		7	Baronnies, Léoux Valley			t
Léoux	950	f	2017		6	Baronnies, Léoux Valley		MVG (ITA)	r,o,i,t
Clapas	975	m	2018		5	Baronnies, Léoux Valley			o
Simay	983	m	2018		5	Baronnies, Léoux Valley			o,i,t
Pamela	1031	f	2019		4	Baronnies, Léoux Valley		Pedane (FRA)	r,o,i,t
Canteperdrix	1136	f	2022		1	Baronnies, Léoux Valley			o,t
Riglos	1138	m	2022		1	Baronnies, Léoux Valley	FRA		o,t
Gelas	279	f	1997		26	PN du Mercantour, Vignols		Termignon (FRA)	r
Guillaumes	411	f	2003		20	PN du Mercantour, Vignols		Derborence_Vérouet (CHE)	r
Fontvieille	520	f	2007		16	PN du Mercantour, Vignols		Valnontey (ITA)	r,i
Rocca	516	m	2007		16	PN du Mercantour, Vignols		Source de la Tinée (FRA)	r,i
Tenao	755	m	2013		10	PN du Mercantour, Vignols		Val dEntraunes (FRA)	r,o,i,t
Stephan	616	m	2010		13	PNR Vercors, Trechenu-Creyers			i
Bellemotte	708	f	2012		11	PNR Vercors, Trechenu-Creyers		Bonette (FRA)	r,i
Gerlinde	759	f	2013		10	PNR Vercors, Trechenu-Creyers		Archiane (FRA)	r,o,i
Kirsi	764	m	2013		10	PNR Vercors, Trechenu-Creyers			o,i
Elvio	1026	m	2019		4	PNR Vercors, Trechenu-Creyers			o,t
Mistral	1022	m	2019		4	PNR Vercors, Trechenu-Creyers			o,t
Kobalann	1063	f	2020		3	PNR Vercors, Trechenu-Creyers			o,t
Novo	1098	m	2021		2	PNR Vercors, Trechenu-Creyers			o,t
Telemark	1101	m	2021		2	PNR Vercors, Trechenu-Creyers			o,i,t
Sereno	348	m	2000		23	PN Alpi Marittime, Argentera		Source de lUbaye (FRA)	r,i
Michegabri	488	m	2006		17	PN Alpi Marittime, Argentera		Chamoussière (ITA)	r,i
Girasole	549	f	2008		15	PN Alpi Marittime, Argentera	ITA	Source de la Tinée (FRA)	r,i
Elena	613	f	2010		13	PN Alpi Marittime, Argentera			i
Italia 150	660	m	2011		12	PN Alpi Marittime, Argentera		Usseglio (ITA)	r,o,i
Roman	854	m	2015		8	PN Alpi Marittime, Argentera		Maira (ITA)	r,o,i,t

*Table 13. List of all birds that have been identified in 2022 with "origin" in the Massif Central (FRA) and the French Pyrenees, in Maestrazgo (ESP) and on Corsica (FRA). Wild-hatched birds are marked with a prefixed "W" or "GT" in the BirdID. "Identification" describes the data basis that was used for their record: r = reproduction, i = IOD, t = telemetry, o = observation. Sorted by their region of origin (territory or release site). * = territory of hatch from juvenile birds from 2022.*

Bird	BirdID	Sex	Hatch	Death	Age (cy)	Origin (release site, territory, country)		Territory	Identification
Massif Central & Pyrenees									**15**
Layrou	761	m	2013		10	Grands Causses, Trévezel		Jonte amont (FRA)	r,o,i,t
Calandreto	948	m	2017		6	Grands Causses, Trévezel			o,i
Eglazine	1069	f	2020		3	Grands Causses, Trévezel			o,t
Fario	1079	f	2020		3	Grands Causses, Trévezel			o,i,t
Ophrys	1078	f	2020		3	Grands Causses, Trévezel			o,i,t
Peyre	1116	m	2021		2	Grands Causses, Trévezel			o,t
Pradines	1122	f	2021		2	Grands Causses, Trévezel	FRA		o,t
Pyrenees	1094	f	2021		2	Grands Causses, Trévezel			o,t
Rei del Causse	1128	m	2022		1	Grands Causses, Trévezel			o,i,t
Roc	1127	m	2022		1	Grands Causses, Trévezel			o,t
Basalte	716	m	2012		11	Grands Causses,Frépestel		Malaval (FRA)	r,i
Adonis	794	m	2014		9	Grands Causses,Frépestel		Jonte amont (FRA)	r,o,i
Cévennes	1032	m	2019		4	Grands Causses,Frépestel			o,t
Aven	1067	f	2020		3	Grands Causses,Frépestel			o,t
Roc Genèse		m	2016		7	Pyrenees	FRA		t
Maestrazgo									**9**
Alos	992	m	2018		5	Tinença de Benifassà			t
Amic	995	m	2018		5	Tinença de Benifassà			t
Bassi	1033	m	2019		4	Tinença de Benifassà			i,t
Boira	1040	f	2019		4	Tinença de Benifassà			t
Celest	1073	f	2020		3	Tinença de Benifassà	ESP		t
Dalila	1109	f	2021		2	Tinença de Benifassà			t
Dena	1104	f	2021		2	Tinença de Benifassà			t
Ereta	1132	f	2022		1	Tinença de Benifassà			t
Esperit	1135	m	2022		1	Tinença de Benifassà			i,t
Corsica									**6**
Muntagnolu	890	m	2016		7	Corsica, Niolo Valley			t
Luna	959	f	2017		6	Corsica, Niolo Valley			t
Cintu	1042	m	2019		4	Corsica, Niolo Valley	FRA		t
Orba	1041	f	2019		4	Corsica, Niolo Valley			t
Pasturella	1146	m	2022	26.07.22	1	Corsica, Niolo Valley			t
Sulana	1144	m	2022		1	Corsica, Niolo Valley			t

7.4 Population estimate based on IOD 2022

On the 8th of October, during this year's Focal Day, a total of 1'160 observers benefited from mostly favourable weather conditions and participated in the 17th annual Bearded Vulture census. Despite unfavourable weather conditions at some observation sites on the north side of the main Alpine ridge (30% of sites), visibility was generally good (47%) or moderate (24%). As a result, 638 Bearded Vultures were observed at 271 out of the 723 occupied sites (37%).

Collaborating with 19 IBM partners and several associated organisations, synchronous observations were conducted at 677 sites on the focal day and an additional 46 sites during the IOD period. Experts and monitoring responsibles, familiar with the local situation, played a key role in estimating the population size in their respective regions and identifying individual birds. By compiling, evaluating, and summarizing the observations and estimates across the monitoring area, an overview of the age class distribution was obtained and compared with the predicted population size based on demographic modelling (Schaub et al., 2009) at the Alpine scale.

The Alpine population of Bearded Vultures was estimated to range between 288 and 377 individuals, slightly lower than the estimate of 413 individuals from the demographic model. However, consistent with previous years, the estimated age class distribution closely matched the predicted values of the demographic model, with a slight underestimation of the number of subadult birds due to difficulties in accurate identification in the field. The estimated age class distribution was as follows: 61% adults, 4% subadults, 10% immature, and 13% juveniles. The population estimate and age class distribution were derived from observation data collected during the focal day, combined with estimates of unobserved individuals present in the specific region, including territorial birds, fledglings, and GPS-tagged birds (N = 80 in 2022), among others.

The Bearded Vulture population in the Massif Central was estimated to vary between 6 and 13 individuals. While approximately 12 to 22 individuals were estimated to be present in the Aude region of the French Pyrenees. In Spain, outside of the Pyrenees, the Bearded Vulture populations were estimated to range between ±2 individuals in Maestrazgo and 35-65 individuals in Andalusia and Rioja. Consistent with previous years, no Bearded Vultures were observed in Bulgaria, where the species has been extinct since 1972.

During this year's IOD, multiple Bearded Vulture individuals were identified in the Alps (N=71), the Massif Central (N=6), and Spain (N=17), while an additional 26 individuals were identified in the Alps with lower probability. Furthermore, 68 animals were tracked using GPS tags, but only 12 out of the 45 animals present in the Alpine region could be visually identified by observers. These individual-based data are valuable for understanding the life-history of the Bearded Vultures and can be used to calculate parameters for demographic modelling. The availability of such international-scale individual-based information is unique and enables the estimation of survival rates and monitoring of the project's progress in understanding the development of the Bearded Vulture populations.

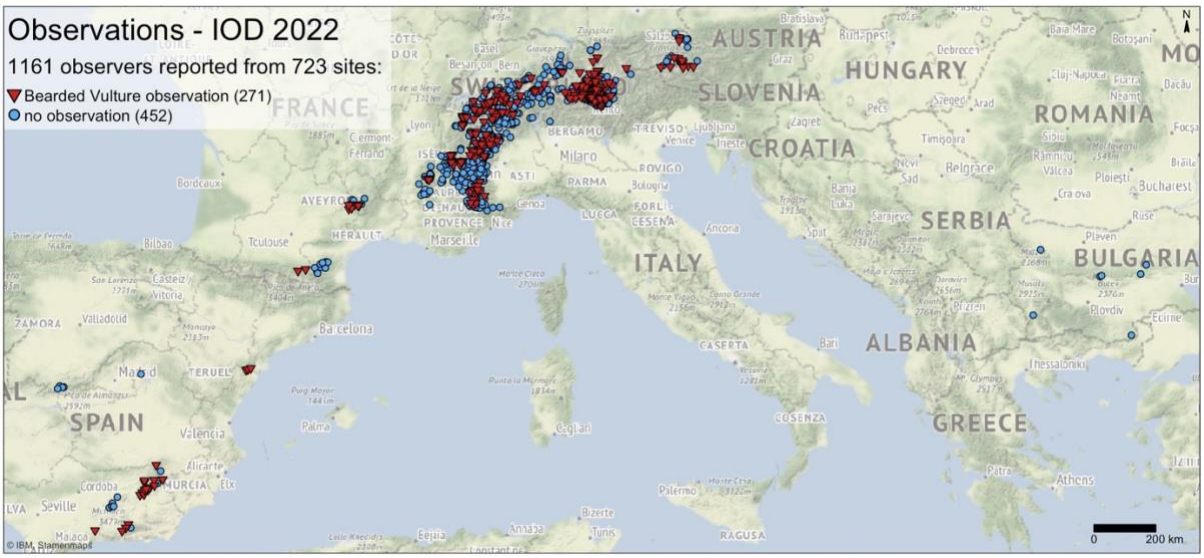


Figure 8. Distribution of all 723 observation sites during the IOD 2022 in Europe. Red triangles depict those sites where Bearded Vultures have been observed at least once during the IOD period 8th 16th of October 2022 (N=271) while no observations have been reported from sites marked with a blue dot (N=452).

*** The complete IOD 2022 report can be found online on www.gyp-monitoring.com***

8 Markings

Individual based monitoring makes the International Bearded Vulture Monitoring unique among monitoring projects of this scale. By the end of 2022, more than 85'800 Bearded Vulture observations were stored in the IBM-database, ~30% of them from identified individuals. The marking of released and wild-hatched birds is of major importance to follow the life history and reveal the behavioural patterns of the individuals in order to understand the demography and track the development of the reintroduction process. Therefore, young Bearded Vultures are marked with rings (chapter 8.1), some feathers are bleached (chapter 8.2) as well as tagged with GPS-tags (chapter 8.3) before they are released into the wild or in the nest before fledging(Figure 10).

8.1 Rings

Due to the limited number of two-digit alphanumeric codes and the rare possibilities to actually decipher a ring code in the field, the IBM-steering-committee has decided to use coloured aluminium rings with a two-digit code for ringing starting in 2021. The colours are intended to facilitate identification without the need to decipher the code. In addition, the combination of numbers and colours provides more options for individual rings, which will allow this system to continue for the next years.

This adaptation has further improved the existing marking system, because apart from the colours, the rings remain the same as in the previous years. The colour of the right ring can also be used to identify whether the animal was ringed in an odd year (red, orange, purple) or an even year (blue, green, black).

Two rings with inverted identical codes but different orientation were used in 2022. This inversion improves legibility, as it is more likely to be able to read both characters of the code. The right aluminium ring is marked with a country-specific code of the national ringing centre (Table 14), while the left IBM-ring is marked with the two-digit code and IBM-contact details.

Small engraving facing up **6 available ring colours**

Figure 9: IBM-ringing system since 2022: 2 Aluminium rings in the six colours red, orange, purple, blue, green and black with large two-digit code and a smaller engraving for the national code (right) and aluminium standard IBM-engraving (left) facing up.

Table 14: Engravings for the country-specific national code (####) and the IBM-standard ring.

Country	Right aluminium ring	Left aluminium ring
AUT	AB#### KLIVV.AT AB#### KLIVV.AT	Contact ibm@4vultures.org
CHE	Vogelwarte Helvetia Sempach GYP####	Contact ibm@4vultures.org
DEU	Radolfzell Germania www.ring.ac AAB###	Contact ibm@4vultures.org
ESP	Contact ibm@4vultures.org	Contact ibm@4vultures.org
FRA	Museum Paris TZ#### 4vultures.org	Contact ibm@4vultures.org
ITA	INFS OZZANO (BO) ITALY MC#### ring.ac	Contact ibm@4vultures.org

8.2 Markings 2022

8.2.1 Released birds[3]

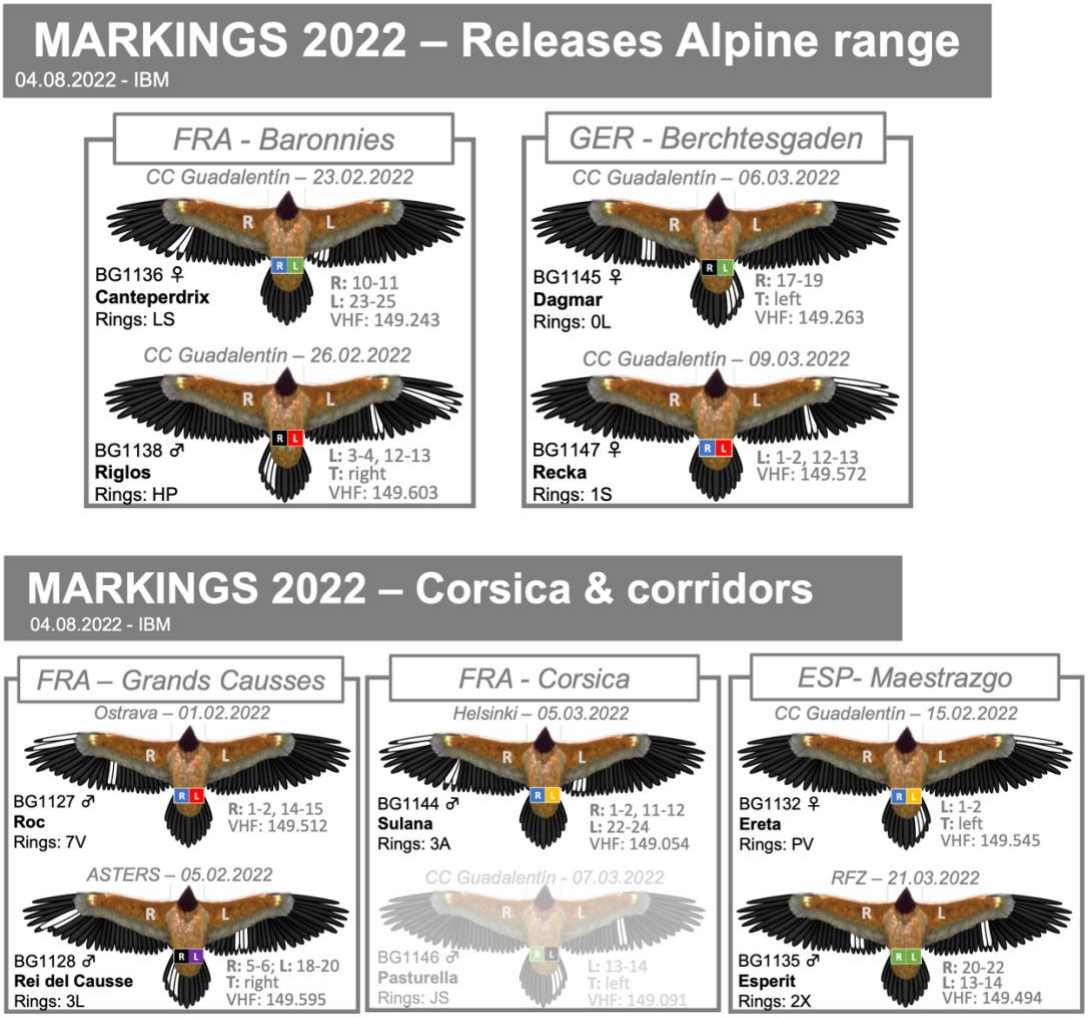


Figure 10: Marking patterns of 10 Bearded Vultures released in 2022.

[3] *Download this file on: www.gyp-monitoring.com --> Downloads --> Marking pattern*

BG1137. "Ukrania"
Birth date: 25/02/2022.
Birthplace: Ostrava Zoo.
Rings:
Left-Purple (TX)
Right-Green (49)
GPS: 191943
Release site: Cazorla.
Release date: 03/06/2022.
Left wing: 2, 3, 13, 14.
Sex: Male.

BG1139. "Paz".
Birth date: 27/02/2022.
Birthplace: CCG.
Rings:
Left-Red (49)
Right-Blue (TX)
GPS: 191942
Release site: Cazorla.
Release date: 03/06/2022.
Left wing: 10, 12, 13.
Sex: Male.

BG1141. "Jaca"
Birth date: 03/03/2022.
Birthplace: Green Balkans, Bulgaria.
Rings: 13
Left-Orange
Right-Blue
GPS: 215590
Release site: Castril.
Release date: 06/06/2022.
Right wing: 20, 21 ,22.
Left wing: 20, 21, 22.
Sex: Male.

BG1143. "Aragón"
Birth date: 03/03/2022.
Birthplace: Parco Natura Viva, Italia.
Rings: 6H
Left-Green
Right-Black
GPS: 215591
Release site: Castril.
Release date: 06/06/2022.
Right wing: 2, 3, 20, 21 ,22.
Sex: Male.

Figure 11. Markings of 4 birds released in Andalusia in 2022.

8.2.2 Wild-hatched birds

The IBM-network plans to intensify its efforts to mark wild hatched animals in the future, as marking of wild hatchlings delivers insight into their behaviour and survival and which are keystone factors to follow and understand the developments of the Bearded Vulture reintroduction project. In 2022 six wild-hatched birds have been marked in France (4), Italy (1) and Switzerland (1) (Figure 12). As no chicks survived the avian flu in Andalusia, no chicks could be marked this year.

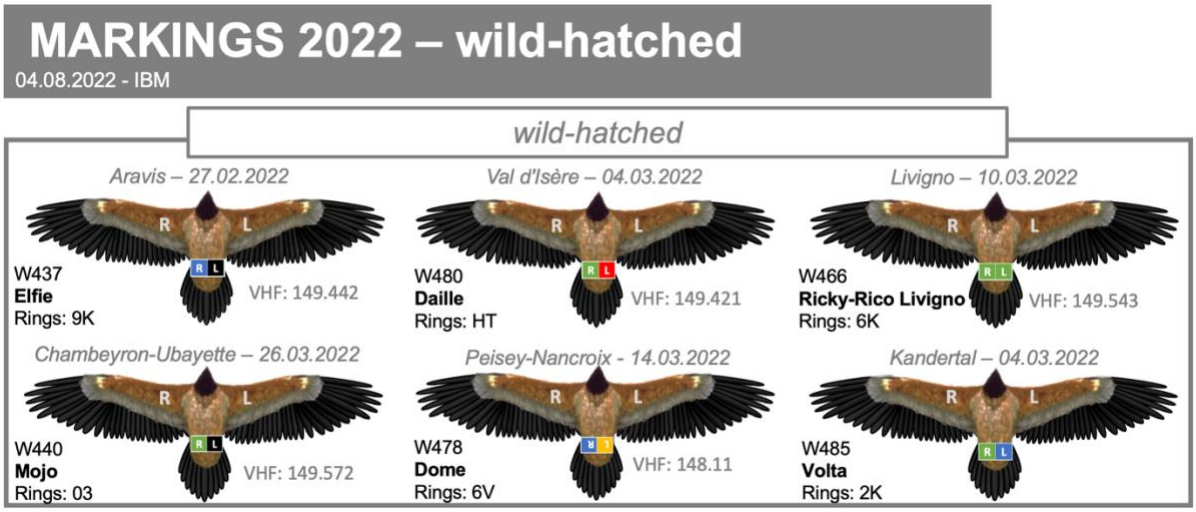


Figure 12. Five wild-hatched birds have been marked with GPS/GSM tags and coloured rings in 2022 in the Alpine range. Volta (W485) was only ringed.

8.3 GPS-tagged birds in 2022

In order to gain insight into their life history, the first wild fledglings were ringed in Haute Savoie, France in 2013. Modern monitoring methods, such as GPS-tags, have been continuously developed and well-proven with the reintroduced Bearded Vultures. Such data provide valuable information on mortality (dropout) cases and the spatial behaviour of the released birds. With successful natural reproduction, the proportion of wild-hatched Bearded Vultures in the population is steadily increasing.

In order to gain knowledge about the spatial behaviour of wild-hatched birds, it was therefore decided to mark two wild fledglings (Neige and Gemapi) with GPS-tags for the first time in 2016. Since then, another 24 wild-hatched juveniles (2 in 2017, 5 in 2018, 4 in 2019, 7 in 2020, 6 in 2021) were marked with a GPS-tag and in 2022 it was even possible to mark 5 wild-hatched individuals (Daille, Dome, Elfie, Mojo, Ricky-Rico Livigno); see Figure 12).

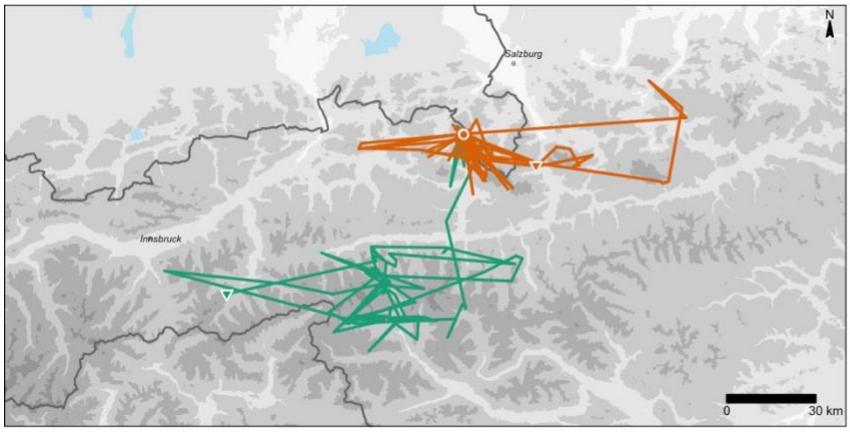
In total, movements of 79 Bearded Vultures (22 wild-hatched and 57 released birds) were followed by GPS-tracking and stored in the WildlifeMonitor in 2022 (Table 15). Besides sixteen adult birds, most of the tagged birds are non-adult individuals. With 39 males, 33 females and 7 unknowns the sex-ratio is fairly balanced.

8.4 Lost GPS-tags

The following birds lost their GPS tags in 2022:

- BelArosa (Melchsee-Frutt, CHE) and Telemark (Baronnies, FRA) were both GPS-tagged before their release in 2021 and lost their tags already after a few months in 2022 (see Table 15). The tags were recovered and later observation of the birds confirmed their state of health.
- Bellecote's tag stopped working on the 30.4.22 and was never found due to difficult terrain. As the bird was not observed since then, it is unknown if the tag was lost or the bird died. Bellecote was GPS-tagged in the nest in Peisey-Nancroix (FRA) in 2020.
- Penti2020 lost the tag after the breaking point opened. In general, all GPS tags are equipped in such a way (breaking point) that the transmitter drops off after a certain time. However, normally the breaking point lasts longer as Penti2020 was only equipped in the wild in 2020 in Livigno (ITA).
- Boira (Maestrazgo, ESP) and Orba (Corsica, FRA) both lost their tag in their fourth calendar year. Both birds were equipped before their release in 2019.

8.5 GPS-trajectories 2022 by region of birds hatched in 2022 (released and wild-hatched)

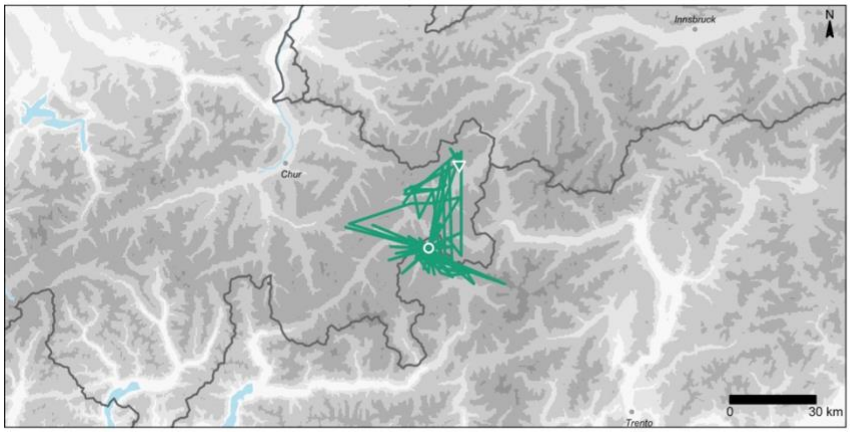


Eastern Alps

GPS-data 2022

— Dagmar (released - 2022)
— Recka (released - 2022)

▼end
● start

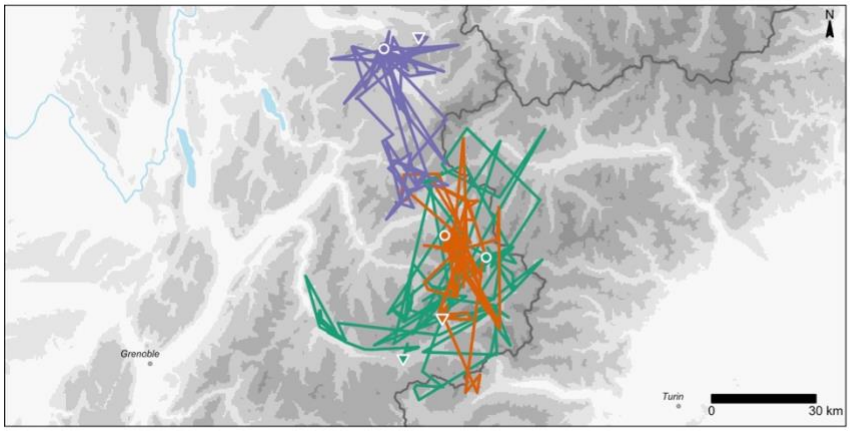


Central Alps

GPS-data 2022

— Ricky-Rico-Livigno (wild - 2022)

▼end
● start

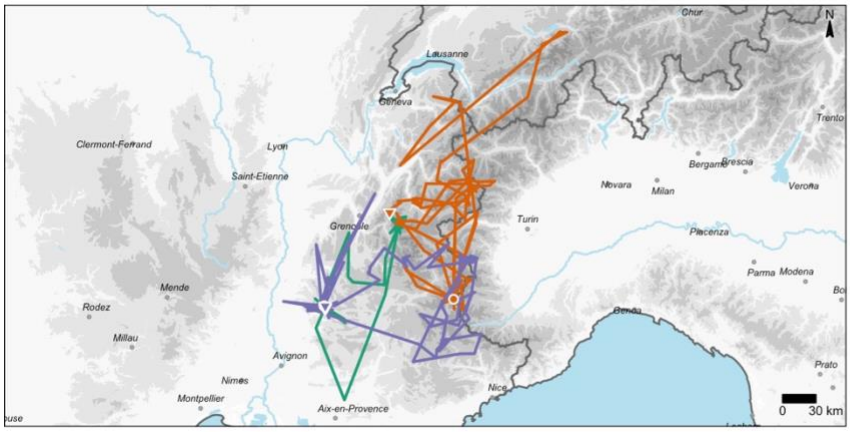


North-western Alps

GPS-data 2022

— Daille (wild - 2022)
— Dome (wild - 2022)
— Elfie (wild - 2022)

▼end
● start



South-western Alps

GPS-data 2022

— Canteperdrix (released - 2022)
— Mojo (wild - 2022)
— Riglos (released - 2022)

▼end
● start

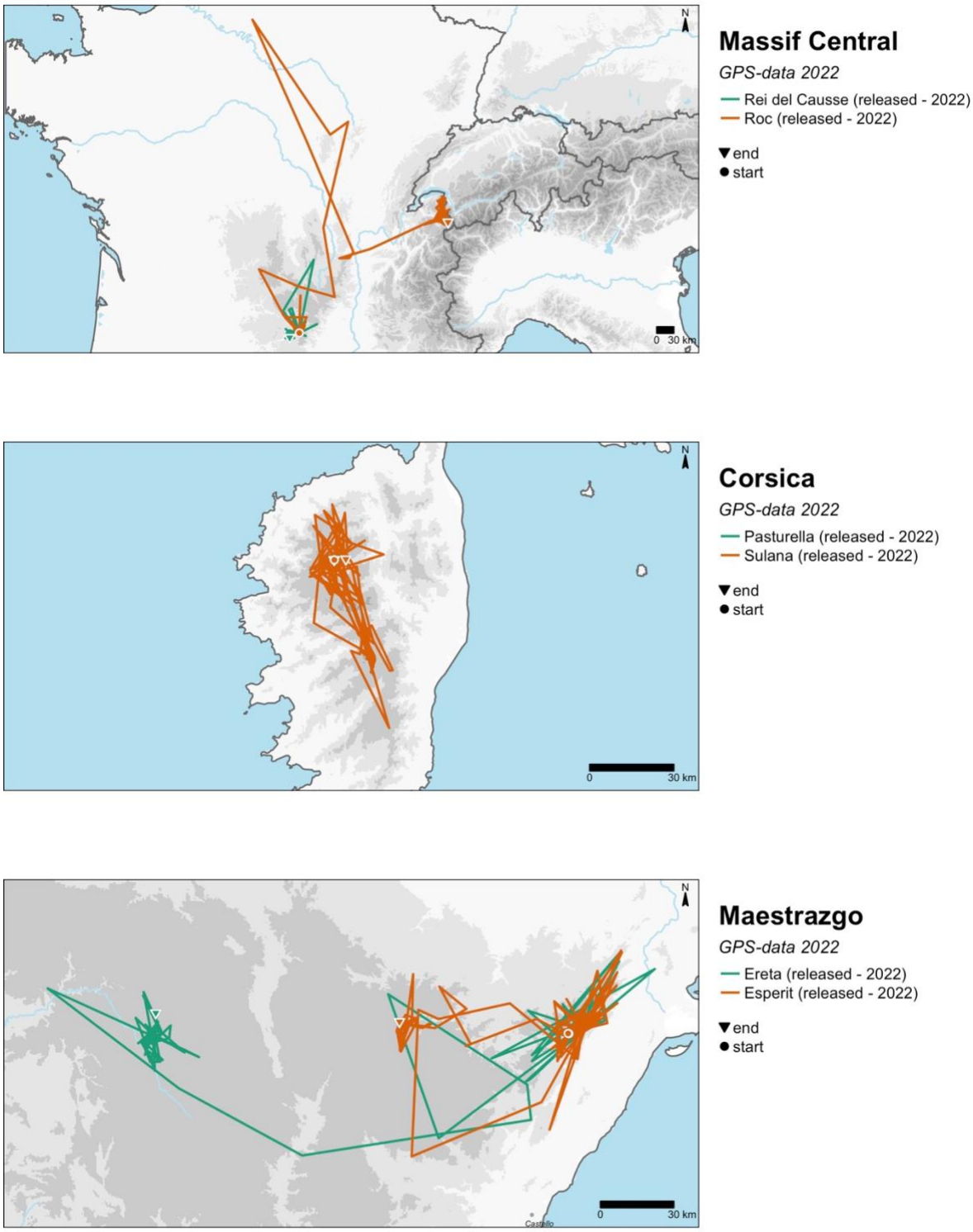


Figure 13. GPS-trajectories of 15 birds that have been marked with GPS in 2022.

Table 15: 79 birds from different age classes could be followed by GPS during 2022 thanks to the support by partner organisations. MinDT and maxDT represent the day of the first and last location in 2022 respectively. The number of obtained localisations varies considerably among individuals (114 – 827'208 positions) and mainly depends on tag type used, age of the tag and battery charge level.

Animal	BirdID	Sex	Hatch	Place release	minDT	maxDT	Days with locations	Tag info	Locations total
Canteperdrix	BG1136	f		Baronnies, Léoux Valley (FRA)	26.06.22	31.12.22	186		99'570
Dagmar	BG1145	f		Berchtesgaden, Halsgrube (GER)	02.07.22	31.12.22	183		2'974
Daille	W0480	u		wild-hatched	06.07.22	31.12.22	179		39'292
Dome	W0478	u		wild-hatched	16.07.22	31.12.22	155		12'776
Elfie	W0437	u		wild-hatched	30.06.22	31.12.22	185		36'850
Ereta	BG1132	f		Tinença de Benifassà (ESP)	01.07.22	31.12.22	184		87'732
Esperit	BG1135	m		Tinença de Benifassà (ESP)	30.06.22	31.12.22	185		80'231
Mojo	W0440	u	2022	wild-hatched	10.07.22	31.12.22	175		2'787
Pasturella	BG1146	m		Corsica, Niolo Valley (FRA)	29.06.22	24.07.22	26	died on the 26.07.22	747
Recka	BG1147	f		Berchtesgaden, Halsgrube (GER)	10.07.22	31.12.22	175		3'866
Rei del Causse	BG1128	m		Grands Causses, Trévezel (FRA)	12.06.22	31.12.22	203		27'920
Ricky-Rico_Livigno	W0466	m		wild-hatched	01.07.22	31.12.22	184		4'183
Riglos	BG1138	m		Baronnies, Léoux Valley (FRA)	26.06.22	31.12.22	189		9'217
Roc	BG1127	m		Grands Causses, Trévezel (FRA)	11.06.22	31.12.22	204		27'739
Sulana	BG1144	m		Corsica, Niolo Valley (FRA)	01.07.22	31.12.22	184		90'506
Bavaria	BG1112	f		Berchtesgaden, Halsgrube (GER)	19.01.22	31.12.22	345		69'200
BelArosa	BG1119	m		Melchsee-Frutt (CHE)	01.01.22	04.04.22	94	tag loss	94'670
Dalila	BG1109	f		Tinença de Benifassà (ESP)	01.01.22	31.12.22	365		47'019
Dena	BG1104	f		Tinença de Benifassà (ESP)	01.01.22	31.12.22	364		17'605
Donna Elvira	BG1117	f		Melchsee-Frutt (CHE)	01.01.22	31.12.22	200		8'984
Friday For Flying - Livigno	W0396	m		wild-hatched	01.01.22	31.12.22	361		532'615
Novo	BG1098	m		PNR Vercors, Trechenu-Creyers (FRA)	01.01.22	31.12.22	365		827'208
Peyre	BG1116	m		Grands Causses, Trévezel (FRA)	01.01.22	31.12.22	365		313'622
Pradines	BG1122	f		Grands Causses, Trévezel (FRA)	01.01.22	31.12.22	365		187'592
Pyrenees	BG1094	f		Grands Causses, Trévezel (FRA)	01.01.22	31.12.22	365		353'467
Severino-Zebru	W0372	m		wild-hatched	01.01.22	31.12.22	365		818'828
Sunny	W0397	m		wild-hatched	01.01.22	31.12.22	365		777'110
Telemark	BG1101	m	2021	PNR Vercors, Trechenu-Creyers (FRA)	01.01.22	10.03.22	69	tag loss	52'406
Wally	BG1113	f		Berchtesgaden, Halsgrube (GER)	01.01.22	23.04.22	97	died on the 15.04.22	1'764
Aven	BG1067	f		Grands Causses,Frépestel (FRA)	01.01.22	31.12.22	364		40'113
Bellecote	W0361	u		wild-hatched	01.01.22	30.04.22	23	fate unknown (tag loss or mortality)	114
Celest	BG1073	f		Tinença de Benifassà (ESP)	01.01.22	31.12.22	364		20'047
Eglazine	BG1069	f		Grands Causses, Trévezel (FRA)	01.01.22	31.12.22	361		97'108
Fario	BG1079	f		Grands Causses, Trévezel (FRA)	01.01.22	31.12.22	365		82'228
Fortunat	BG1068	m		Melchsee-Frutt (CHE)	16.01.22	08.11.22	289	low performance tag during winter months	292'669
Kobalann	BG1063	f		PNR Vercors, Trechenu-Creyers (FRA)	01.01.22	31.12.22	365		21'799
Luzerna	BG1071	f		Melchsee-Frutt (CHE)	01.01.22	31.12.22	365		281'559
Ophrys	BG1078	f		Grands Causses, Trévezel (FRA)	01.01.22	31.12.22	364		80'282
Penti2020	W0349	f		wild-hatched	01.01.22	08.03.22	67	tag loss	56'562
Prazon-sixt-fer-a-cheval	W0346	u		wild-hatched	01.01.22	31.12.22	365		730'045
Vidoc	W0356	u		wild-hatched	01.01.22	28.12.22	351		68'079
Altitude	W0313	f		wild-hatched	01.01.22	31.12.22	365		6'865
Bassi	BG1033	m		Tinença de Benifassà (ESP)	01.01.22	31.12.22	346		22'333
Boira	BG1040	f		Tinença de Benifassà (ESP)	01.01.22	30.04.22	120	tag loss	4'027
Cévennes	BG1032	m		Grands Causses,Frépestel (FRA)	01.01.22	31.12.22	364		68'836
Cintu	BG1042	m		Corsica, Niolo Valley (FRA)	01.01.22	31.12.22	364		47'750
Elvio	BG1026	m	2019	PNR Vercors, Trechenu-Creyers (FRA)	01.01.22	31.12.22	365		67'015
Emparis	W0284	f		wild-hatched	01.01.22	31.12.22	365		6'399
Mistral	BG1022	m		PNR Vercors, Trechenu-Creyers (FRA)	01.01.22	31.12.22	365		167'724
Orba	BG1041	f		Corsica, Niolo Valley (FRA)	01.01.22	12.12.22	342	tag loss	54'520
Pamela	BG1031	f		Baronnies, Léoux Valley (FRA)	01.01.22	31.12.22	365		14'256
Pierro	W0301	m		wild-hatched	01.01.22	31.12.22	365		15'076
Sixt Buet	W0285	f		wild-hatched	01.01.22	30.12.22	352		4'242
Alos	BG992	m		Tinença de Benifassà (ESP)	01.01.22	31.12.22	365		9'757
Amic	BG995	m		Tinença de Benifassà (ESP)	01.01.22	31.12.22	365		18'281
Caeli	BG998	m		NP Hohe Tauern, Mallnitz (AUT)	01.01.22	31.12.22	365		40'253
Finja	BG1003	f	2018	Melchsee-Frutt (CHE)	01.01.22	31.12.22	363		153'502
Fredueli	BG1001	m		Melchsee-Frutt (CHE)	01.01.22	31.12.22	357		248'446
Lapie	W0251	m		wild-hatched	01.01.22	31.12.22	365		6'530
Simay	BG983	m		Baronnies, Léoux Valley (FRA)	01.01.22	31.12.22	362		211'245
Gypsy	W0209	m		wild-hatched	01.01.22	31.12.22	358		7'814
Léoux	BG950	f	2017	Baronnies, Léoux Valley (FRA)	01.01.22	31.12.22	359		3'366
Luna	BG959	f		Corsica, Niolo Valley (FRA)	01.01.22	07.12.22	317	unknown	1'826
Mison	W0230	f		wild-hatched	01.01.22	31.12.22	360		1'889
Cierzo	BG899	m		Melchsee-Frutt (CHE)	01.01.22	31.12.22	333		38'109
Gemapi	W0196	f		wild-hatched	01.01.22	31.12.22	365		6'045
Girun	BG904	f	2016	Baronnies, Léoux Valley (FRA)	25.01.22	30.12.22	250		948
Muntagnolu	BG890	m		Corsica, Niolo Valley (FRA)	01.01.22	31.12.22	355		1'750
Neige	W0198	m		wild-hatched	24.01.22	17.10.22	263	low performance tag during winter months	1'197
Roc Genèse	BG	m		wild-hatched	01.01.22	05.11.22	304	recaptured on the 05.11.22	2'948
Ewolina	BG838	f		Melchsee-Frutt (CHE)	11.01.22	28.12.22	233		278
Fortuna	BG843	m	2015	NP Hohe Tauern, Dorfertal (AUT)	01.01.22	06.10.22	263	low performance tag during winter months	2'471
Roman	BG854	m		PN Alpi Marittime, Argentera (ITA)	01.01.22	31.12.22	289		969
Felix2	BG793	m		NP Hohe Tauern, Debantal (AUT)	31.05.22	29.11.22	77		221
Noel-Leya	BG797	m	2014	Calfeisen, Vaettis (CHE)	12.02.22	11.11.22	200	low performance tag during winter months	2'759
Schils	BG802	m		Calfeisen, Vaettis (CHE)	01.01.22	31.12.22	319	low performance tag during winter months	15'619
Layrou	BG761	m	2013	Grands Causses, Trévezel (FRA)	01.01.22	31.12.22	348		11'679
Tenao	BG755	m		PN du Mercantour, Vignols (FRA)	01.01.22	14.12.22	332	low performance tag during winter months	943
Veronika	BG321	f	1999	NP Engadin, Zernez (CHE)	01.01.22	31.12.22	347		1'765

9 Dropouts

Dropouts include all incidents where individuals have been removed from the population (mortality, recapture). This also applies to birds that have been recaptured and could be released again. A recapture is in any case the last solution, which is why it must be assumed that these birds would not have survived without human intervention and would have died under natural conditions. However, if a hatchling dies at less than 80 days of age, this loss is referred to as breeding failure and it is therefore not included in the dropout statistics (see IBM-standard, chapter 4.2).

Mortalities of 3 Bearded Vultures have been reported in 2022: in Germany (1), France (1) and in Italy (1) (Figure 14).

Although much effort is invested in the search for, and investigation of dead animals, the reason of dropout remains unclear in the case of Pasturella (FRA, Corsica) and an unknown juvenile found in Italy (see Figure 14).

However, thanks to the close monitoring by GPS-tracking and quick intervention of the IBM partners and the regional coordinators, it was possible to save the released juveniles Donna Elvira (BG1117) and Canteperdrix (BG1136), as well as the wild-hatched Volta (W485) and release them after recovery. Due to the complicated injuries of Roc Genèse it was so far not possible to release the bird again. For further details concerning the individual dropout cases see chapters 9.1, 9.2, 9.3 and Table 16.

Table 16: List of all 7 reported dropouts from 2022.

Name	BirdID	Bird type	Age [cy]	Dropout	Date	Country	Reason	Classification
Wally	1113	released	2	mortality	15.04.22	DEU	rockfall	natural
Pasturella	1146	released	1	mortality	26.07.22	FRA	unknown	unknown
unknown		unknown		mortality	01.09.22 (±90)	ITA	unknown	unknown
Roc Genèse		wild hatched	7	recapture	05.11.22	FRA	shoulder dislocation	unknown
Donna Elvira	1117	released	1	rerelease	05.01.22	CHE	collision with cable	anthropogenic
Volta	W485	wild hatched	1	recovery	02.07.22	CHE	unknown	natural
Canteperdrix	1136	released	1	rerelease	03.07.22	FRA	unsuccessful release	unknown

9.1 Mortalities

9.1.1 Wally (BG1113)

On the 15.04.2022 the GPS-data of the juvenile Bearded Vulture Wally indicated, that the bird was not moving anymore on a slope in Schachen and Reintal (DEU). As the terrain was very difficult to access, the dead bird could only be recovered days later. Toxicological examinations were carried out and finally investigations by necropsy revealed that the bird was injured by falling rocks and died at the accident site. Bones of a young stag near the site suggest that the bird was killed while feeding.

9.1.2 Pasturella (BG1146)

On the 26.07.2022 Pasturella (BG 1146), released this year in Corsica, was found dead near the release site after the local team was alerted suspicious movement patterns of the GPS data. Despite investigations and necropsy, the cause of death remains unknown.

9.1.3 Unknown juvenile Bearded Vulture

In September 2022, remains of a juvenile Bearded Vulture were found in the Schnalstal (Southtyrol, ITA). Neither the bird nor the exact cause of death or mortality date could be identified.

© Klaus Bliem

9.2 Recaptures

9.2.1 Roc Genèse (wild-hatched Pyrenees)

Due to reduced movement patterns of the GPS data, the emergency situation of Roc Genèse has been noticed. On the 5.11.22, the animal was recovered near Cabannes (FRA) by local colleagues. Since then, the animal has been in captivity where it is recovering from its dislocated shoulder. Unfortunately, it will not be possible to release the bird back to the wild. The wild-hatched bird was marked with a GPS-tag in 2016 in the nest in the Aude Region in the French Pyrenees in the framework of the LIFE project GypConnect.

9.3 Rerelease

9.3.1 Donna Elvira (BG1117)

The daily check of the GPS data from Donna Elvira alerted the team from the Stiftung Pro Bartgeier late in the afternoon of the 04.01.2022. Donna Elvira, which was released in Switzerland in 2021, was injured after a collision with a transport cable in Melchtal (CHE). She was unable to fly due to severe injuries (broken rips, clavicula and shoulder blade), but thanks to the quick reaction of the local team and game warden, she survived and could be released again on the 20.06.2022 after recovery in captivity at her original release site.

9.3.2 Canteperdrix (BG1136)

Only a few days after her first flight the bird had to be recaptured on the 03.07.2022 because the bird had landed in an inconvenient place near the release site and made a weakened impression. The bird that was released in Baronnies (FRA) could be released again only four days later at the release site.

9.4 Recovery

9.4.1 Volta (W458)

The wild-hatched young bird got stuck in a forested area after the first flight. The animal was captured on the 02.07.2022, ringed and released again the following day.

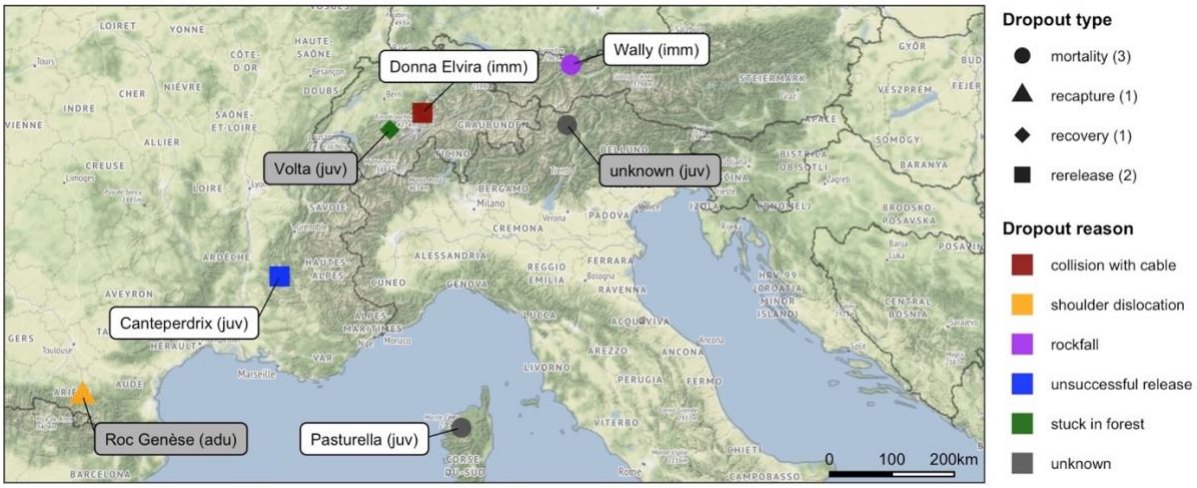


Figure 14. 3 mortalities, 1 recapture, 1 recovery and two rereleases of Bearded Vultures in 2022. Grey labels mark wild-hatched individuals (N=3).

10 Acknowledgements

Thanks to all the field workers, assistants, gamekeepers, hunters, ornithologists and non-professional observers who report Bearded Vulture sightings and valuable information during the reproduction monitoring. Furthermore, thanks to the regional coordinators of the IBM-network and associated organisations who enter the data in the IBM, coordinate the monitoring network within their area of responsibility and contribute to this report with their inputs. Also, thanks to the valuable inputs by Franziska Lörcher (VCF), Katja Rauchenstein (SWILD) during the review of this report.

Only thanks to the financial support of the IBM-partners and the funding organisations MAVA, LBV and LIFE GypConnect, LIFE GypRescue, the IBM-data collection could be summarised and published in this report.