



INTERNATIONAL  
BEARDED VULTURE  
MONITORING

Annual report 2018

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## International Bearded Vulture Monitoring- IBM



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# Imprint

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# 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 2018 the IBM comprised 14 IBM-partners and 4 associated organisations. The lead partner was the Vulture Conservation Foundation (VCF) and the IBM-database was managed by Mirco Lauper, while additional administrative work was carried out by Franziska Lörcher and José Tavares. All hours together sum up to be almost 2/3 of a fulltime job. These costs, as well as the costs for rings, database hosting etc. were covered by a budget of 42'000 Euros. The budget was financed by the fee of each IBM-partner and additional funds from MAVA, which for the time being allowed to reduce the partner fee substantially, from 3'000 Euros to currently 1'600 Euro for partners which are releasing birds and 800 Euros for the other partners. Further LIFE GypHelp funded the import of data from the ornitho/visionnature platform, which costed additional 15'000 Euros.

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 2018. During the steering committee meetings by phone in April and September 2018, as well as a physical SC-meeting in Cazorla (ESP) in November 2018, important topics were discussed, and major decisions were taken jointly.

## 2 Summary

In the Alpine range, 29 Bearded Vultures fledged from 52 occupied territories in the breeding season 2018 (11 in France, 9 in Switzerland, 7 in Italy and 2 in Austria). For 5 out of these 52 territories, it was the first year with a breeding attempt and for Malaval (FRA) and Pralognan (FRA) even with a successful result. 44 breeding pairs successfully produced a clutch and hatchlings have been reported in 33 nests (75% hatch rate). The productivity of 63% was considerably lower than in 2016 (-5%) and 2017 (-4%) and varied by region, with lower productivity in the north-western parts of the Alps (58%).

On Corsica, 2 clutches were reported from 5 territories. In both territories a chick hatched, but only 1 chick fledged (Bonifatu2018).

In the Massif Central, nesting behaviour from two released male birds (Layrou and Adonis) has been observed – the occupation of the first territory in this region.

A total of 13 birds from the captive breeding programme (EEP) have been released in the Alps and Pre-Alps (N=7), in Andalusia (N=4) and in Maestrazgo (N=2) in Spain. All of the released birds have been individually marked with country-specific rings, bleached feathers and GPS-tags in order to follow their life history and spatial behaviour. Furthermore, it was possible to mark three wild-hatched birds (Bonifatu2018, Kruml5 and Lapie) with solar powered GPS/GSM tags and rings and the wild-hatched bird Albula2018 with two aluminium rings only. Such ringing actions are becoming more and more important, as the major part of the actual Bearded Vulture population has hatched in the wild. Marked wild-hatched birds can be visually identified during an observation and thus deliver important information on their life history, which forms the basis of future population modelling.

For 37% out of 1'729 verified observations that were registered in the IBM-database in 2018, it was possible to identify the individual birds. In combination with the information of around 700 observations reported by over 1'000 observers during the IOD 2018, reproduction- and telemetry data, 139 individuals were identified over the year.

Several times in 2018, Bearded Vultures were reported outside IBM monitoring area (e.g. Turkey, Netherlands, Slovakia, Greece, Portugal etc.). The successful import of 14'170 reported observations of Bearded Vultures from ornitho.ch is therefore a first step in the planned cooperation with other common reporting platforms in order to improve the European monitoring.

The mortalities of 5 birds (1 in Switzerland and 4 in France), the recapture of Marty McFly (France, genetic feather problem) and the successful recovery and rerelease of Kruml5 (Austria, calcium deficiency) demonstrate that thorough monitoring can identify mortality risks, reveal causes of death and even rescue individual animals. Such information is communicated through the IBM-network and is of great importance for the restoration of the Bearded Vulture populations in Europe.

# Key facts

## Releases in Europe

- 7 Bearded Vultures released in the Alpine mountain-range
  - 2 birds in Melchsee-Frutt (CHE), 2 in Hohe Tauern NP (AUT) and 3 in Baronnies (FRA)
- 6 Bearded Vultures released in Spain
  - 2 birds in Maestrazgo and 4 in Parque Natural de Cazorla

## Reproduction

- Alpine range: 52 occupied territories, 44 clutches, 29 fledglings
  - Productivity varied between 58% (North-western Alps) and 68% (Central Alps)
- Massif Central: first territory established by two male nesting birds (Layrou & Adonis)
- Corsica: 5 occupied territories, 2 clutches, 1 fledgling (Bonifatu2018)

## Monitoring and the IBM-database 2018

- 1'729 observations from 11 countries
  - 37% of the observed birds could be identified on individual level
  - 63 individuals could be identified (13 of them are wild-hatched birds)
- 2'081 ornitho.ch observations were imported to the IBM-database in 2018 (14'170 since 1991)
- 139 individuals with known origin in the Alps (N=109), the Massif Central & French Pyrenees (N=8), Corsica (N=14) and Spain (N=8) were identified on individual level
- 1'040 observers occupied 640 sites and reported 701 Bearded Vulture observations during the International Bearded Vulture Observation Days (IOD 2018)
- Population size estimates based on IOD 2018 data: 208-284 in the Alpine range, 3 in the Massif Central (FRA), 5-9 in Aude (Pyrenees FRA) and 28-40 in Spain (without Pyrenees)

## Markings & telemetry

- All 13 released birds have been marked with a solar powered GPS-tag
- 5 wild hatchlings were ringed and equipped with GPS-tag: Bonifatu2019 (FRA), Kruml5 (AUT), Lapie (FRA), Gea (ESP) and Cano (ESP). Alblua2018 (CHE) was only ringed.
- 45 GPS-tracks of 38 released and 7 wild-hatched birds were stored in the WildlifeMonitor

## Dropouts

- 5 mortalities: 4 released birds (Alois (CHE), Durzon (FRA), Viaduc (FRA), Palanfré (ITA)) and 1 wild-hatched bird (GT021) in FRA
- 1 capture: Marty McFly (Bargy BIS territory, FRA) is unable to fly (feather problem)
- 1 rerelease: Kruml5 (Gastein/Rauris territory, AUT) recovered because it was not flying well. A calcium deficiency was diagnosed and treated.



## 3 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).

### 3.1 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)		Life history event
		Jan-Feb	Mar-Dec	
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 ( $\geq 6$ . cy)	6	4	5	potential breeding
adult ( $\geq 6$ . cy)	$\geq 7$	5	$\geq 6$	potential breeding

### 3.2 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

### 3.3 Reproduction<sup>1</sup>

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 <sup>2</sup>	Pair <sup>2</sup> occupying a territory with at least one nest → territories with nest or egg-lay date entered in the IBM-database
Checked pair <sup>2</sup>	Pair <sup>2</sup> 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 <sup>2</sup>	Cases of verified egg-laying → date of egg-laying entered in the IBM-database
Breeding success	$\frac{\textit{fledglings}}{\textit{breeding pairs}}$
Productivity	$\frac{\textit{fledglings}}{\textit{checked pairs}}$

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

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

## 4 Releases

In 2018, a total of 13 Bearded Vultures that have been reared in 3 different captive breeding centres of the EEP (European Endangered Species Programme) were released in the eastern, central and south-western Alps, as well as in two projects in Spain.

Within the Alpine range, 2 birds were released in the Hohe Tauern National Park (AUT) and in a federal hunting ban area in Melchsee-Frutt (CHE) as part of the Alpine reintroduction project, while another 3 birds were released in Baronnie (FRA) in the most western periphery of the Alps. In Spain, 4 Bearded Vultures have been released at two sites in Andalusia in the natural park Sierra de Cazorla, Segura y las Villas and another 2 birds in Maestrazgo.

The project in Baronnie is part of the LIFE GypConnect program with the aim to serve as a steppingstone (population) between the two Bearded Vulture populations in the Alps and the Pyrenees, such that in the long-term genetic exchange may be established and maintained. The release of 2 animals in Maestrazgo has a similar objective and should serve as a steppingstone between the two populations in the Pyrenees and the mountainous areas of Andalusia. It is the first time that Bearded Vultures have been released in this area and it is a great success to extend the IBM-monitoring network with this new partner.

All 13 released birds took off for their first flight (Table 3). The average age at the first flight was 120 days with a minimum of 109 (Drumana, BG0980) and a maximum of 125 days (Suerte Somera, BG0990 and Finja, BG1003).

## 4.1 Release sites 2018

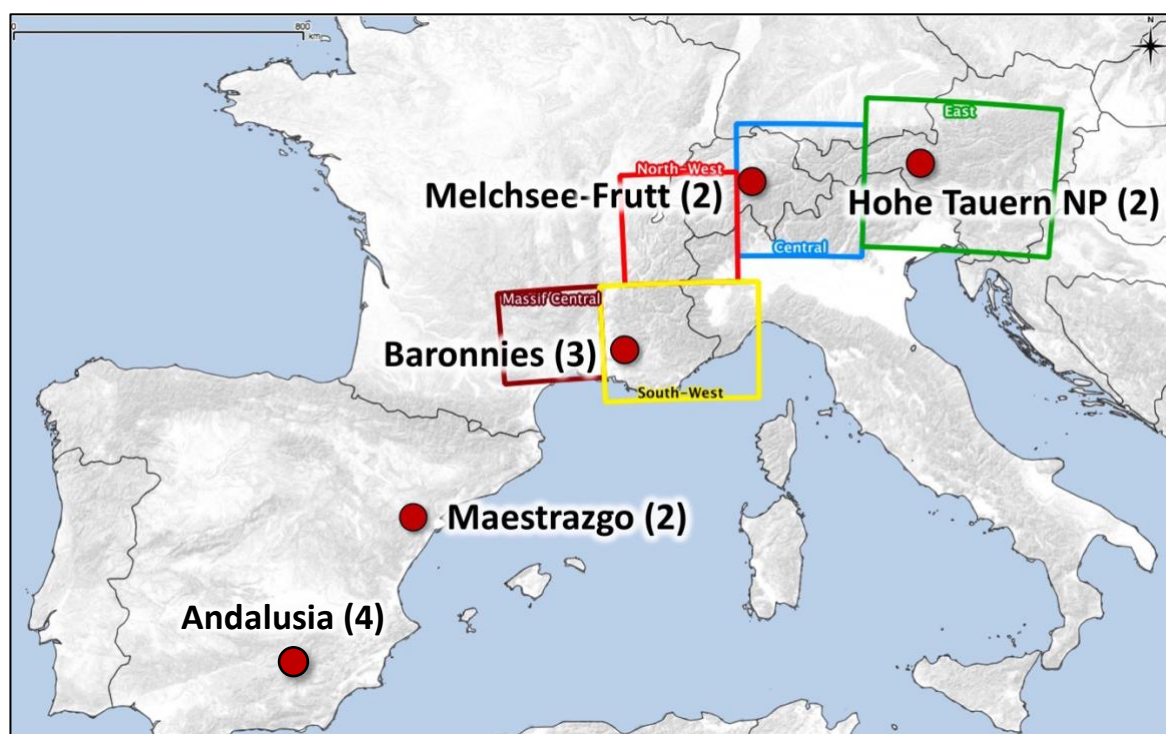


Figure 1: Overview of the release sites of the 9 Bearded Vultures that were released within the eastern (2 birds), central (2 birds) and south-western Alpine range (3 birds) and for the first time in Maestrazgo in north-eastern Spain (2 birds) within the IBM monitoring area. This area should serve as a stepping-stone between the Bearded Vulture populations in the Pyrenees and Andalusia, where four birds were release in 2018.

Table 3: Details about 13 Bearded Vultures that have been released within the IBM monitoring area and Andalusia. The release site of the Maestrazgo project is called Sierra de la creu.

Place release	BirdID	Name	Sex	Hatch	Fledge	Age at first flight	Place hatch	Date release
Baronnies, Léoux Valley (FRA)	BG975	Clapas	m	25/01	25/05	120	RFZ Haringsee	06/05
Baronnies, Léoux Valley (FRA)	BG980	Drumana	m	05/02	25/05	109	CVF (Asters)	06/05
Baronnies, Léoux Valley (FRA)	BG983	Simay	m	09/02	08/06	119	CC Guadalentín	06/05
Hohe Tauern, Seebachtal (AUT)	BG991	Kasimir	m	23/02	23/06	120	RFZ Haringsee	08/06
Hohe Tauern, Seebachtal (AUT)	BG998	Caeli	m	05/03	05/07	122	CC Guadalentín	08/06
Melchsee-Frutt (CHE)	BG1001	Fredueli	m	14/03	07/07	115	CF Vallcalent	17/06
Melchsee-Frutt (CHE)	BG1003	Finja	f	22/03	25/07	125	CF Vallcalent	17/06
Sierra de la creu (ESP)	BG992	Alos	m	24/02	27/06	123	CC Guadalentín	29/05
Sierra de la creu (ESP)	BG995	Amic	m	28/02	01/07	123	CC Guadalentín	29/05
Tornillos de Gualay, Cazorla (ESP)	BG985	Biosfera	f	16/02	17/06	121	CCQ. Cazorla, Jaén	14/05
Tornillos de Gualay, Cazorla (ESP)	BG984	Iruela	m	16/02	18/06	122	RFZ Haringsee	22/05
Los Picones, Castril (ESP)	BG990	Suerte Somera	f	22/02	27/06	125	CCQ. Cazorla, Jaén	25/05
Los Picones, Castril (ESP)	BG988	Lápiz	m	22/02	24/06	122	Green Balkans	25/05

# 5 Reproduction in the wild

## 5.1 Breeding season 2017/2018

During the breeding season 2017/2018 the IBM partners reported 54 territorial pairs and 4 trios that showed breeding or nesting behaviour. In the Alpine range 44 of 52 breeding units produced a clutch with a total of 33 birds hatching from these eggs (75% hatch rate). In 10 of the occupied territories no clutch had been reported in previous years and for Pralognan (FRA) and Malaval (FRA) their first reproduction in 2018 was already successful (Figure 2). Finally, 29 young Bearded Vultures fledged by the end of the summer: 11 in France, 9 in Switzerland, 7 in Italy and 2 in Austria.

On Corsica, 2 clutches were reported from 5 territories. In both territories a chick hatched, but only 1 chick (Bonifatu2018) fledged (Table 5).

For the first time ever, nesting birds have been observed in the Massif Central (FRA). However, the territorial birds are two released males, Layrou (BG761) and Adonis (BG794).

In the Alpine range, both breeding success and the absolute number of fledglings was lower compared to 2017. Although more clutches (breeding pairs) have been reported, fewer birds fledged (29 in 2018 vs. 31 in 2017). This leads to a lower overall productivity of 63% in the Alps, which is still considerably higher than the productivity of 20% on Corsica (Table 4). However, within the Alpine range, the differences in breeding success and productivity are less pronounced compared to previous years (Figure 3). The lowest productivity was observed in the north-western Alps (58%), the highest in the central Alps (68%). When comparing the different zones, however, it should be noted that the number of territories per zone has a large influence on the respective productivity. Therefore, it is important to note, that for regions with low numbers of breeding pairs, pair performance has a strong influence on the breeding statistics (e.g. only 3 breeding pairs in the eastern Alps).

*Table 4: Breeding statistics for the season 2017/2018. See Table 2 for further details about the IBM-standards for breeding statistics. The failure rate is calculated by the number of breeding failures divided by the number of reported clutches.*

Region	Potential territories	Territorial pairs	Checked pairs	Breeding pairs	Hatches	Fledglings	Failures	Breedings success	Productivity
<b>2018</b>	<b>52</b>	<b>47</b>	<b>46</b>	<b>44</b>	<b>33</b>	<b>29</b>	<b>15</b>	<b>66%</b>	<b>63%</b>
East	3	3	3	3	3	2	1	67%	67%
Central	22	19	19	19	13	13	6	68%	68%
North-West	22	20	19	17	14	11	6	65%	58%
South-West	5	5	5	5	3	3	2	60%	60%
<b>2017</b>	<b>52</b>	<b>46</b>	<b>46</b>	<b>42</b>	<b>32</b>	<b>31</b>	<b>11</b>	<b>74%</b>	<b>67%</b>
East	3	3	3	3	1	1	2	33%	33%
Central	21	19	19	18	15	14	4	78%	74%
North-West	22	19	19	17	13	13	4	76%	68%
South-West	6	5	5	4	3	3	1	75%	60%
<b>2016</b>	<b>44</b>	<b>38</b>	<b>37</b>	<b>34</b>	<b>29</b>	<b>25</b>	<b>9</b>	<b>74%</b>	<b>68%</b>
East	4	2	2	2	2	2	0	100%	100%
Central	16	15	15	15	14	12	3	80%	80%
North-West	19	17	17	15	12	10	5	67%	59%
South-West	5	4	3	2	1	1	1	50%	33%
<b>Corsica 2018</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>50%</b>	<b>20%</b>
<b>Massif Central 2018</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0%</b>	<b>0%</b>

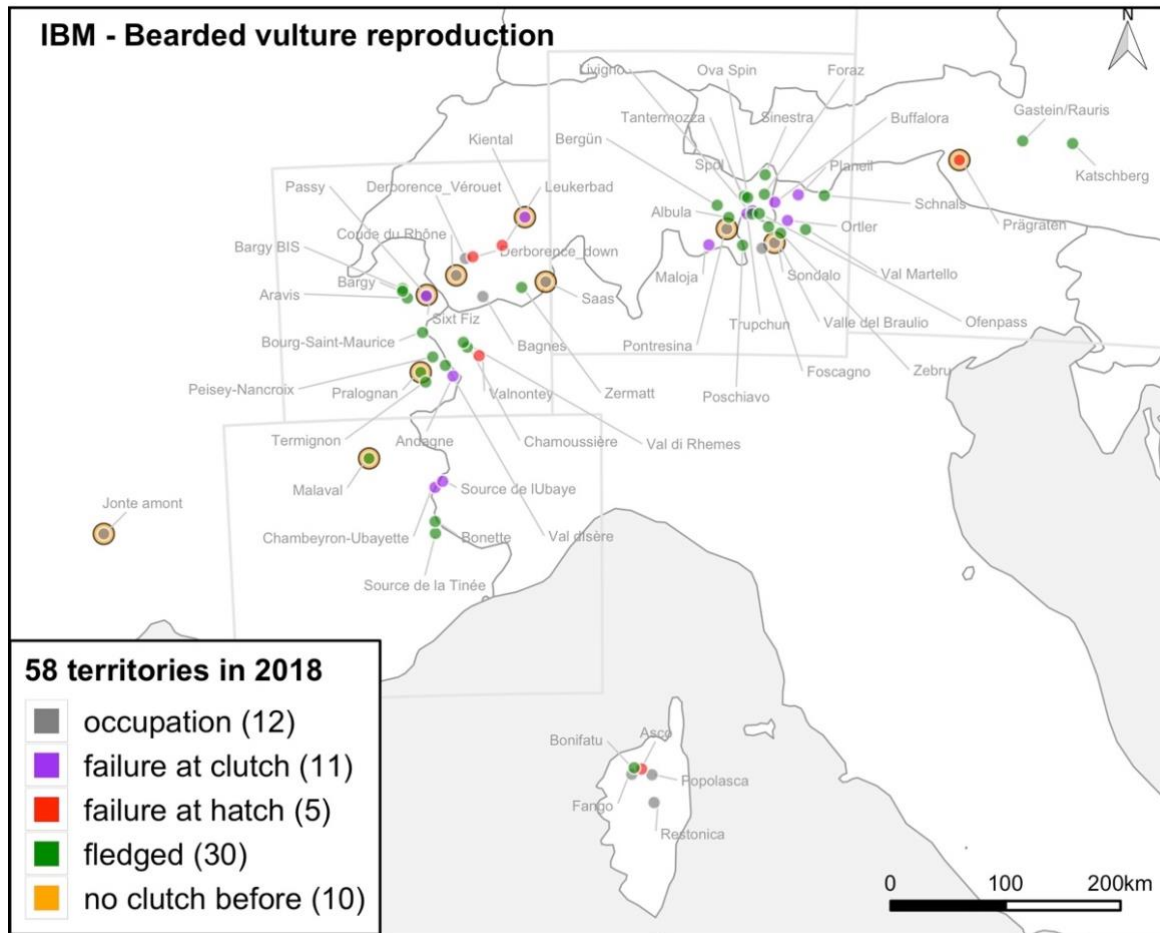


Figure 2: Reproduction status in 58 occupied territories in the Alpine range, Corsica and the Massif Central. For the first time, the nesting of Bearded Vultures was observed in the Massif Central (Jonte amont). However, the territorial birds are two released males, Layrou and Adonis. Territories where no clutch has been observed in - previous years (mostly new territories with young territorial birds) are marked with an orange outline. The rectangles represent the 4 monitoring zones: south-western Alps, north-western Alps, central Alps and eastern Alps, from left to right.

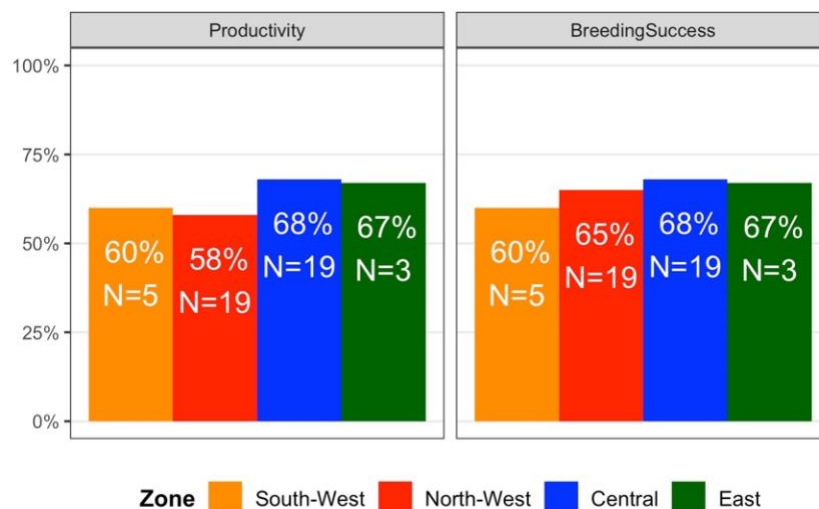


Figure 3: Productivity and breeding success vary in range of 58 to 68% within the different alpine zones with the highest productivity and breeding success in the central Alpine range and the lowest productivity in the north-western Alps. However, sample size (breeding territories) N varies considerably among regions.

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

Region	Territory	Nest	Parent1	Parent2	Parent3	Clutch	Hatch	Fledge	Failure	Chick	First fledgling	First clutch	Total fledglings	Total clutches	
<b>Alps total</b>	<b>52</b>	<b>47</b>	<b>52</b>	<b>52</b>	<b>4</b>	<b>44</b>	<b>33</b>	<b>29</b>	<b>15</b>	<b>33</b>	<b>1997</b>	<b>1996</b>	<b>233</b>	<b>249</b>	
<b>Eastern Alps</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>2010</b>	<b>2001</b>	<b>11</b>	<b>29</b>	
<b>AUT</b>	Gastein/Rauris	Kruml Quelle	Andreas Hofer	GT015	-	03/01 (±3)	28/02 (±3)	02/07	-	Kruml5 (W245)	2010	2003	5	16	
	Katschberg	Katschberg 6	Hubertus 2	Romariss	-	10/01 (±2)	05/03 (±2)	20/06 (±6)	-	Katschberg2018 (W254)	2012	2010	6	9	
	Prägraten *	Prägraten 1	-	adult	-	20/01 (±5)	01/05 (±1)	-	03/05 (±1)	Prägraten2018 (W263)	-	-	-	-	
<b>Central Alps</b>	<b>22</b>	<b>19</b>	<b>22</b>	<b>22</b>	<b>0</b>	<b>19</b>	<b>13</b>	<b>13</b>	<b>6</b>	<b>13</b>	<b>1998</b>	<b>1998</b>	<b>104</b>	<b>143</b>	
<b>CHE</b>	<b>13</b>	<b>12</b>	<b>13</b>	<b>13</b>	<b>0</b>	<b>12</b>	<b>8</b>	<b>8</b>	<b>4</b>	<b>8</b>	<b>2007</b>	<b>2007</b>	<b>52</b>	<b>71</b>	
	Albula	Albula 3	Tantermozza	Diana-Stelvio	-	31/12 (±2)	23/02 (±3)	03/06	-	Albula2018 (W248)	2008	2008	8	11	
	Bergün	Tuors1	adult	adult	-	23/01 (±4)	19/03 (±2)	11/07	-	Bergün2018 (W260)	2016	2016	3	3	
	Buffalora	Buffalora1	Ingenius	Retia	-	05/01 (±8)	-	-	19/03 (±2)	-	2017	2017	1	2	
	Foraz	Foraz 1	adult	GT031	-	13/01 (±15)	08/03 (±10)	01/07 (±8)	-	Foraz2018 (W272)	2014	2012	5	7	
	Maloja	Albigna1	Rurese	Folio	-	30/12	-	-	20/03	-	2016	2015	1	4	
	Ofenpass	Serraglio 1	Livigno	Ortler	-	15/01 (±10)	10/03 (±10)	17/07	-	Ofenpass2018 (W262)	2007	2007	8	9	
	Ova Spin	Ova Spin1	adult	adult	-	26/01 (±2)	21/03 (±2)	10/07 (±3)	-	Spin2018 (W261)	2018	2015	1	3	
	Pontresina *	-	wild-hatched (≥6.cy)	wild-hatched (≥6.cy)	-	-	-	-	-	-	-	-	-	-	-
	Poschiavo	Poschiavo2	GT057	GT038	-	13/01 (±1)	08/03 (±2)	28/06 (±3)	-	Poschiavo2018 (W259)	2013	2013	6	6	
	Sinestra	Sinestra 2	Samuel	Moische-Livigno	-	10/01 (±8)	05/03 (±8)	10/07 (±5)	-	Sinestra2018 (W270)	2013	2012	6	7	
	Spöl	-	adult	adult	-	15/02 (±6)	-	-	25/02	-	2014	2014	4	5	
	Tantermozza	Tantermozza 4	Zebru	adult	-	01/01 (±15)	05/03 (±10)	01/07 (±10)	-	Tantermozza2018 (W268)	2007	2007	9	12	
	Trupchun	Trupchun1	adult	adult	-	01/02 (±10)	-	-	09/03 (±25)	-	-	2017	-	0	2
<b>ITA</b>	<b>9</b>	<b>7</b>	<b>9</b>	<b>9</b>	<b>0</b>	<b>7</b>	<b>5</b>	<b>5</b>	<b>2</b>	<b>5</b>	<b>1998</b>	<b>1998</b>	<b>52</b>	<b>72</b>	
Foscagno	-	adult	adult	-	-	-	-	-	-	-	2011	2011	1	1	
Livigno	Livigno 2	Cic	Moische	-	19/01 (±4)	14/03 (±4)	28/07 (±1)	-	Ubario-Livigno (W273)	2000	1999	16	20		
Ortler	Ortler 1	adult	Jo	-	25/12 (±2)	-	-	15/01 (±5)	-	2017	2016	1	3		
Planeil	Planeil 1	Blick	adult	-	30/12 (±1)	-	-	28/03	-	-	2013	0	5		
Schnals	Tschöschwand 1	subadult (5/6.cy)	adult	-	29/01 (±3)	23/03 (±3)	16/07 (±1)	-	Reimut-Nassereith (W256)	2018	2013	1	2		
Sondalo *	-	adult	adult	-	-	-	-	-	-	-	-	-	-	-	
Val Martello	Martello 2013	adult	Temperatio	-	03/01 (±1)	26/02 (±1)	07/07	-	Zufritt (W274)	2015	2015	4	4		
Valle del Braulio	Braulio Palone	Tell	Stift	-	26/11 (±1)	19/01 (±1)	06/06 (±1)	-	Ginger-Braulio (W243)	1998	1998	15	21		
Zebru	Zebru 3	Heinz-Serraglio	Felice	-	19/12 (±2)	11/02 (±2)	12/06 (±2)	-	Beppe-Zebru (W275)	2002	2002	14	16		
<b>NW-Alps</b>	<b>22</b>	<b>20</b>	<b>22</b>	<b>22</b>	<b>3</b>	<b>17</b>	<b>14</b>	<b>11</b>	<b>6</b>	<b>14</b>	<b>1997</b>	<b>1996</b>	<b>104</b>	<b>156</b>	
<b>CHE</b>	<b>8</b>	<b>6</b>	<b>8</b>	<b>8</b>	<b>1</b>	<b>4</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>3</b>	<b>2007</b>	<b>2007</b>	<b>19</b>	<b>26</b>	
	Bagnes	-	adult	adult	-	-	-	-	-	-	2016	2016	2	2	
	Coude du Rhône *	Dorénaz_1	adult	adult	-	-	-	-	-	-	-	-	-	-	
	Derborence_down	Derborence 6/ Grand Dzeu	Swaro	Gilbert	-	15/01 (±15)	15/03 (±15)	-	11/04 (±2)	Derborence_down2018 (W249)	2012	2012	6	7	
	Derborence_Vérouet	-	Pablo	Guillaume	Gildo	-	-	-	-	-	2007	2007	6	9	
	Kiental *	Lauchereflue_01	LF1	LF02	-	24/01 (±15)	-	-	10/03 (±40)	-	-	-	-	-	
	Leukerbad	Leukerbad1	Diana-Valais	wild-hatched (≥6.cy)	-	21/01 (±15)	03/03 (±5)	-	01/05 (±10)	Leukerbad2018 (W247)	2015	2012	2	4	
	Saas *	Saas-Almagell_1	immature (3.cy)	adult	-	-	-	-	-	-	-	-	-	-	
	Zermatt	Zermatt Riffelhorn	Smaragd	adult	-	15/02 (±30)	24/04 (±30)	20/06 (±10)	-	Urs-Zermatt (W255)	2016	2016	3	3	
<b>FRA</b>	<b>11</b>	<b>11</b>	<b>11</b>	<b>11</b>	<b>1</b>	<b>10</b>	<b>8</b>	<b>8</b>	<b>2</b>	<b>8</b>	<b>1997</b>	<b>1996</b>	<b>70</b>	<b>109</b>	
Andagne	Andagne1	adult	adult	-	16/01	-	-	24/01	-	2014	2011	1	5		
Aravis	Sallaz	wild-hatched (≥6.cy)	wild-hatched (≥6.cy)	-	26/12 (±12)	23/02 (±2)	23/06	-	Electron (W244)	2009	2006	7	13		
Bargy	H51BA1 Bargy 1	Phenix Alp Action	GT089	wild-hatched (≥6.cy)	25/01 (±2)	20/03 (±2)	29/07	-	Lapie (W251)	1997	1996	17	22		
Bargy BIS	H53BA3 Bargy 3	GT099	Zufal	-	27/01 (±2)	28/03 (±2)	23/07	-	Marty Mclfy (W269)	2017	2016	2	3		
Bourg-Saint-Maurice	Bourg-Saint-Maurice 3	adult	adult	-	10/01	05/03	05/07	-	Cécile-Maurice (W267)	2017	2016	2	3		
Passy *	H55F11 Rochers des Fiz-Pointe	adult	adult	-	-	-	-	-	-	-	-	-	-	-	
Peisey-Nancroix	Peisey-Nancroix 2	GT021	adult	-	08/01	25/02	02/07	-	Perceval-Nancroix (W264)	2005	2005	11	14		
Pralognan *	Balme noire	adult	adult	-	24/02	21/04	16/08	-	Pralognan2018 (W278)	-	-	-	-		
Sixt Fiz	Pointe des Places	adult	adult	-	03/01 (±2)	-	-	06/02	-	2009	2007	7	12		
Termignon	Termignon 4	adult	adult	-	15/01	04/03	26/06	-	Termignon2018 (W266)	2002	2002	12	17		
Val dière	Gorge de la daïlle	adult	Jausiers	-	14/02 (±15)	01/03	25/07	-	Super Puma-Iserè (W265)	2002	1999	10	19		
<b>ITA</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>2012</b>	<b>2010</b>	<b>15</b>	<b>21</b>	
Chamoussière	Chamoussière 2	Michegabri	adult	-	19/01	23/03	13/07 (±1)	-	Chamoussière2018 (W252)	2012	2011	6	8		
Val di Rhemes	Rhemes 2	adult	wild-hatched (≥6.cy)	wild-hatched (≥6.cy)	27/01	07/04 (±1)	01/08 (±1)	-	Rhemes2018 (W279)	2012	2010	6	8		
Valnontey	Valnontey	adult	adult	-	30/12	28/02	-	25/04	Valnontey2018 (W246)	2015	2015	3	4		
<b>SW-Alps</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>1</b>	<b>5</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>2008</b>	<b>2008</b>	<b>14</b>	<b>21</b>	
<b>FRA</b>	Bonette	Rocher du Prêtre 2	adult	Bellemotte	-	15/01 (±1)	16/03 (±3)	17/07	-	Guy (W250)	2017	2017	2	2	
	Chambrayon-Ubayette	Chauvet-1	Stephan	Cuneobirding	-	05/02 (±3)	-	-	20/04 (±3)	-	2016	-	0	3	
	Malaval *	Sarduc 1	Basalte	adult	subadult (5/6.cy)	10/02	06/04	04/08	-	Muzelle (W258)	-	-	-	-	
	Source de la Tinée	Demandols 1	Rocca	Girasole	-	29/01 (±1)	24/03 (±1)	20/07 (±1)	-	Orion (W253)	2015	2013	4	5	
	Source de l'Ubaye	Pelvat Ubaye 1 PNM	Sereno	GT036	-	11/01 (±11)	-	-	21/02 (±30)	-	2008	2008	7	9	

Table 6: Reproduction in Corsica and the Massif Central. The IBM does not include reproduction data for Corsica before 2018. For the first time a Bearded Vulture territory was reported from the Massif Central. However, both territorial birds are males. Territories with no clutch in previous years are marked with an asterisk (\*).

Region	Territory	Nest	Parent1	Parent2	Parent3	Clutch	Hatch	Fledge	Failure	Chick	First fledgling	First clutch	Total fledglings	Total clutches
Corsica since :	5	5	5	5	0	2	2	1	1	2	2018	2018	1	2
FRA	Asco	ASCO 1	Asco 1	Asco 2	-	18/01 (±5)	13/03 (±3)	-	16/04 (±3)	Asco2018 (W257)	-	2018	0	1
	Bonifatu	Bonifatu Falaise	Bonifatu 1	Bonifatu 2	-	08/02 (±7)	05/04 (±10)	02/08 (±3)	-	Bonifatu2018 (W271)	2018	2018	1	1
	Fango	Fango 1	Fango 1	Fango 2	-	-	-	-	-	-	-	-	0	0
	Popolasca	Popolasca 1	Popolasca 1	Popolasca 2	-	-	-	-	-	-	-	-	0	0
	Restonica	Restonica 1	Restonica 1	Restonica 2	-	-	-	-	-	-	-	-	0	0
Massif Centra	1	1	1	1	0	0	0	0	0	0	-	-	0	0
FRA	Jonte amont *	Capelan 1	Layrou (m)	Adonis (m, 5./6.cy)	-	-	-	-	-	-	-	-	-	-



## 6 Observations

### 6.1 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 7) are responsible for a certain area (18 areas in 2018, see Figure 4), where the professionals collect and validate reported Bearded Vulture observations that are later stored in the IBM-database.

With two new IBM-partners, the IBM-network is intensifying the monitoring activities in the Piemont in the western Italian Alps (Natural Park Alpi Cozie) and is expanding the network to the region of Aragon in the north of Spain.

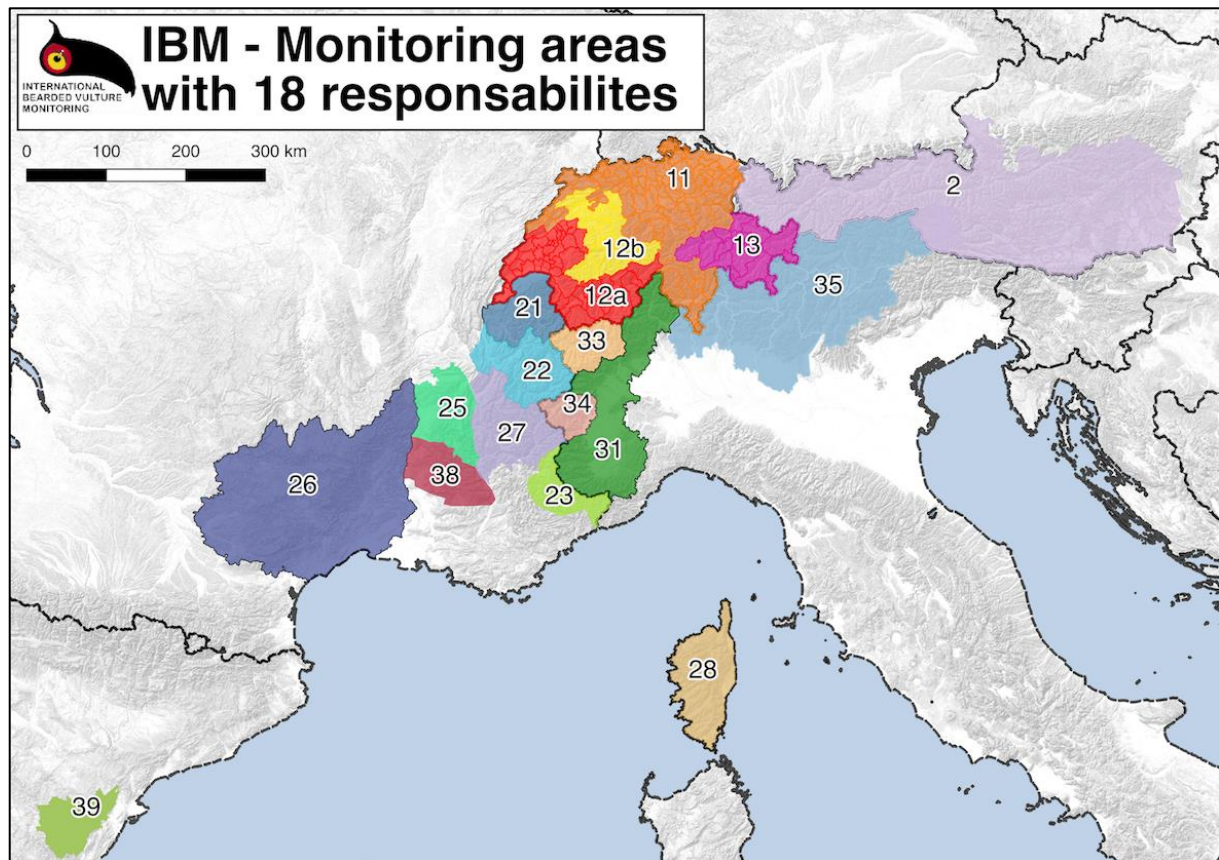


Figure 4: 18 Areas of responsibility that form the International Bearded Vulture Monitoring Network. Maestrazgo (39) and Natural park Alpi Cozie (34) both became IBM-partners in 2018.

Table 7: IBM-partners and associated organisations (\*) that collect data within their area of responsibility.

Collecting centre ID	Responsible organisation	Country
2	<i>Hohe Tauern National Park</i>	AUT
11	<i>Stiftung Pro Bartgeier Central</i>	CHE
12a	<i>Stiftung Pro Bartgeier north-west</i>	CHE
12b	<i>Stiftung Pro Bartgeier south-west</i>	CHE
13	<i>Stiftung Pro Bartgeier east</i>	CHE
21	<i>ASTERS</i>	FRA
22	<i>Parc National de la Vanoise</i>	FRA
23	<i>Parc National du Mercantour</i>	FRA
25	<i>Parc Naturel Régional des Vercors</i>	FRA
26	<i>LPO Grands Causses</i>	FRA
26	<i>National Park of Cevennes *</i>	FRA
28	<i>PNR de Corse</i>	FRA
38	<i>Association Vautours en Baronnies</i>	FRA
39	<i>Envergures Alpines *</i>	FRA
31	<i>Parco Naturale Alpi Marittime</i>	ITA
33	<i>Regione Autonoma Valle d'Aosta *</i>	ITA
34	<i>Aree protette delle Alpi Cozie</i>	ITA
35	<i>Parco Nazionale dello Stelvio</i>	ITA
39	<i>Maestrazgo - Els Ports</i>	ESP

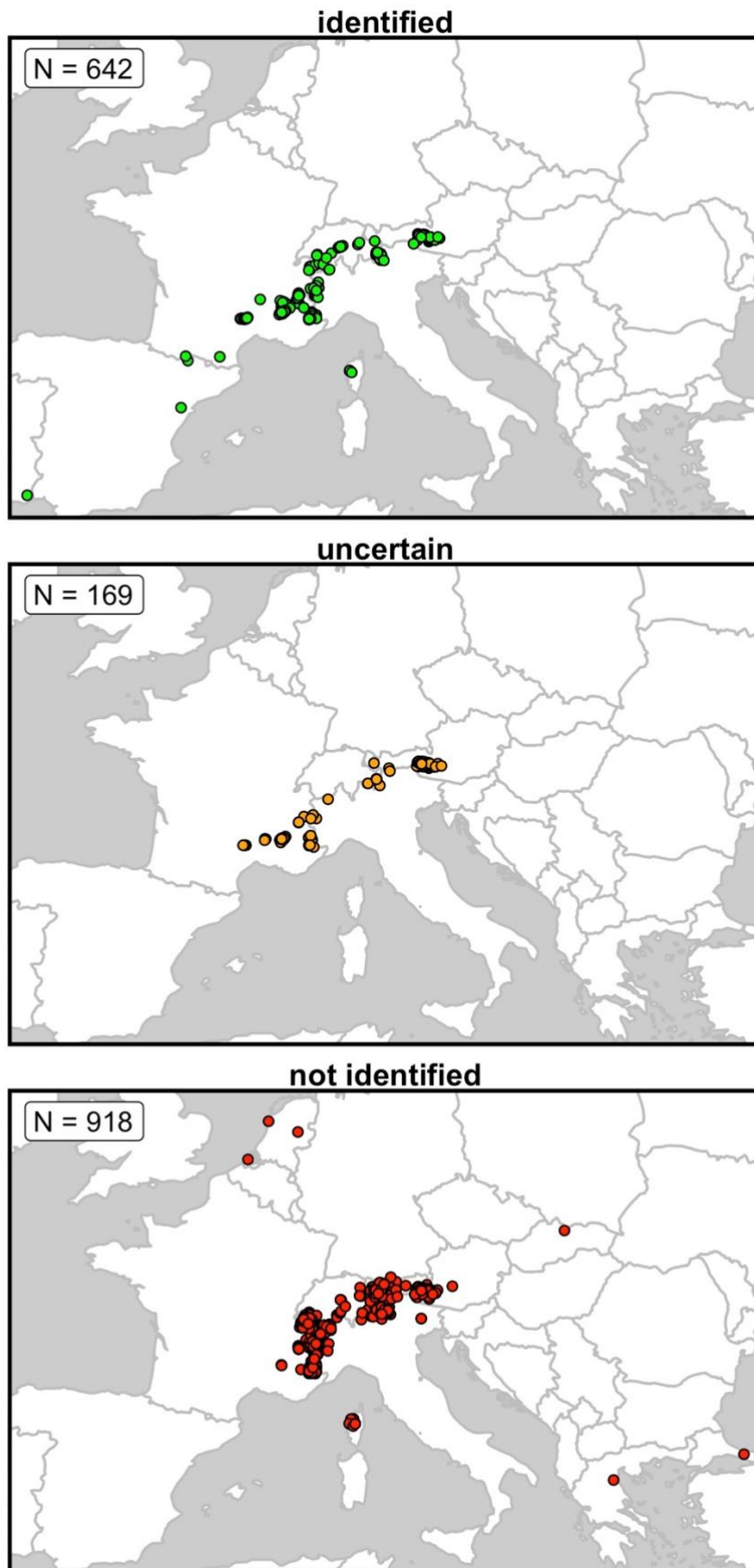
## 6.2 Visual observations

In 2018, 1'729 Bearded Vulture observations from 11 different countries in Europe have been registered in the IBM-database. For 642 (37%) observations it was possible to identify the observed individual, for 169 (~10%) cases there are hypotheses about the bird's identity, while it was not possible to identify the individuals in 918 (53%) observations. Outside of the IBM monitoring area, young wild-hatched and released Bearded Vultures have been observed in Slovakia, Germany, the French Pyrenees, Portugal, the Netherlands, Greece and Turkey (Figure 5).

63 individuals (at least 13 of them wild-hatched) were identified by at least one visual observation, while some birds have been observed several times in 2018. Two birds have even been observed over 50 times in 2018: Mison (W230) with 118, Tenao (BG755) with 53 and Volcaire (BG905) with 52 observations (Table 8).

Another 2'081 Bearded Vulture observations have been reported on the swiss ornithologist reporting platform *ornitho.ch*. Even though these observations were not validated by professional observers such as the regional IBM-coordinators, these observations could deliver information about Bearded Vulture hotspots and future focal areas (Figure 7 Figure 8).

# 1729 observations in 2018



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Figure 5: Overview of 1'729 Bearded Vulture observations that have been reported in 2018. In 37% of all observations the observed bird could be identified on the individual level (642 identifications).

Table 8: Overview of all 1'729 observations from 11 different countries reported in the IBM-database for the year 2018. The older a bird is and the more often it has been observed, the darker it is highlighted in green. Birds that have not been observed for some time before 2018 are gradually marked in red. Another 2'081 Bearded Vulture observations have been reported on ornitho.ch.

Nr	Bird	Sex	Age (cy)	Observed before 2018	Observed total	AUT	CHE	DEU	ESP	FRA	ITA	GRC	PRT	SVK	NDL	TUR	Observed in 2018	Ornitho.ch	
1	Adonis (794)	m	5	12.09.17	222	-	-	-	-	28	-	-	-	-	-	-	28	-	
2	Albula2018 (W248)	u	1	-	1	-	1	-	-	-	-	-	-	-	-	-	1	-	
3	Alexa (100)	f	31	04.08.90	89	7	-	-	-	-	-	-	-	-	-	-	7	-	
4	Amic (995)	m	1	-	1	-	-	-	1	-	-	-	-	-	-	-	1	-	
5	Andreas Hofer (260)	m	23	19.10.17	64	7	-	-	-	-	-	-	-	-	-	-	7	-	
6	Arcana (954)	f	2	05.10.17	39	-	-	-	-	35	-	-	-	-	-	-	35	-	
7	Aschka (749)	f	6	03.07.17	24	-	1	-	-	-	-	-	-	-	-	-	1	-	
8	Auron (W220)	u	2	24.08.17	6	-	-	-	-	3	-	-	-	-	-	-	3	-	
9	Basalte (716)	m	7	12.03.15	108	-	-	-	-	1	-	-	-	-	-	-	1	-	
10	Bellemotte (708)	f	7	15.07.16	35	-	-	-	-	1	-	-	-	-	-	-	1	-	
11	Caeli (998)	m	1	-	2	1	-	-	-	-	1	-	-	-	-	-	2	-	
12	Calandreto (948)	m	2	30.12.17	13	-	-	-	1	8	-	-	-	-	-	-	9	-	
13	Charlie (910)	f	3	27.12.17	51	3	-	-	-	-	-	-	-	-	-	-	3	-	
14	Cic (186)	m	26	17.12.17	153	-	-	-	-	-	1	-	-	-	-	-	1	-	
15	Cierzo (899)	m	3	17.09.17	19	-	1	-	-	2	2	-	-	-	-	-	5	-	
16	Clapas (975)	m	1	-	20	-	-	-	-	20	-	-	-	-	-	-	20	-	
17	Cuneobirding (491)	f	13	21.01.08	15	-	-	-	-	2	-	-	-	-	-	-	2	-	
18	Drumana (980)	m	1	-	34	-	-	-	-	34	-	-	-	-	-	-	34	-	
19	Durzon (945)	m	2	24.10.17	13	-	-	-	-	5	-	-	-	-	-	-	5	-	
20	Ercu (958)	m	2	-	1	-	-	-	-	1	-	-	-	-	-	-	1	-	
21	Felice (375)	f	18	05.10.17	62	-	-	-	-	-	3	-	-	-	-	-	3	-	
22	Felix2 (793)	m	5	04.12.17	37	6	-	-	-	-	-	-	-	-	-	-	6	-	
23	Finja (1003)	f	1	-	6	-	6	-	-	-	-	-	-	-	-	-	6	-	
24	Fortuna (843)	m	4	22.11.17	30	2	-	-	-	-	-	-	-	-	-	-	2	-	
25	Freduei (1001)	m	1	-	6	-	6	-	-	-	-	-	-	-	-	-	6	-	
26	Gemapi (W196)	f	3	14.08.17	12	-	-	-	-	3	-	-	-	-	-	-	3	-	
27	Gerlinde (759)	f	6	28.12.17	180	-	-	-	-	27	-	-	-	-	-	-	27	-	
28	Gilbert (440)	f	15	06.03.16	27	-	1	-	-	-	-	-	-	-	-	-	1	-	
29	Ginger-Braulio (W243)	u	1	-	1	-	-	-	-	1	-	-	-	-	-	-	1	-	
30	Girun (904)	f	3	01.08.17	93	-	-	-	-	31	-	-	-	-	-	-	31	-	
31	Gypsy (W209)	m	2	-	3	-	-	-	-	1	2	-	-	-	-	-	3	-	
32	Heinz-Serraglio (W45)	u	12	25.09.17	4	-	-	-	-	1	-	-	-	-	-	-	1	-	
33	Herculis (849)	m	4	11.11.17	47	-	-	-	-	1	-	-	-	-	-	-	1	-	
34	Johannes (964)	m	2	03.12.17	13	-	3	-	-	-	2	-	-	-	-	-	5	-	
35	Kasimir (991)	m	1	-	3	3	-	-	-	-	-	-	-	-	-	-	3	-	
36	Katschberg2018 (W254)	u	1	-	1	1	-	-	-	-	-	-	-	-	-	-	1	-	
37	Kirsi (764)	m	6	22.11.17	58	-	-	-	-	11	-	-	-	-	-	-	11	-	
38	Kruml5 (W245)	u	1	-	10	9	-	-	-	-	1	-	-	-	-	-	10	-	
39	Layrou (761)	m	6	19.10.17	236	-	-	-	-	24	-	-	-	-	-	-	24	-	
40	Lea (840)	m	4	12.12.17	38	16	-	-	-	-	-	-	-	-	-	-	16	-	
41	Léoux (950)	f	2	26.11.17	15	-	-	-	-	1	-	-	-	-	-	-	1	-	
42	Linky (W130)	m	6	17.07.17	18	-	3	-	-	1	-	-	-	-	-	-	4	-	
43	Livigno (W08)	m	19	29.07.13	5	-	-	-	-	-	3	-	-	-	-	-	3	-	
44	Lucky (909)	m	3	27.12.17	59	8	-	-	-	-	-	-	-	-	-	-	8	-	
45	Luna (959)	f	2	-	4	-	-	-	-	4	-	-	-	-	-	-	4	-	
46	Mison (W230)	f	2	28.12.17	148	-	-	-	-	118	-	-	-	-	-	-	118	-	
47	Moische (146)	f	28	17.12.17	192	-	-	-	-	-	2	-	-	-	-	-	2	-	
48	Muzelle (W258)	u	1	-	3	-	-	-	-	3	-	-	-	-	-	-	3	-	
49	Neige (W198)	m	3	27.11.17	10	-	-	-	-	1	-	-	-	-	-	-	1	-	
50	Ortler (439)	f	15	28.02.06	15	-	-	-	-	-	3	-	-	-	-	-	3	-	
51	Palanfre (435)	f	15	31.12.17	115	-	-	-	-	-	6	-	-	-	-	-	6	-	
52	Rayo (799)	m	5	-	1	-	-	-	-	-	-	1	-	-	-	-	1	-	
53	Sardona (624)	m	9	01.06.17	111	-	1	-	-	-	-	-	-	-	-	-	1	-	
54	Sempach 2 (841)	f	4	07.02.17	38	-	1	-	-	-	-	-	-	-	-	-	1	-	
55	Simay (983)	m	1	-	38	-	-	-	-	38	-	-	-	-	-	-	38	-	
56	Smaragd (675)	m	8	08.10.16	55	-	2	-	-	-	-	-	-	-	-	-	2	-	
57	Stephan (616)	m	9	01.03.15	73	-	-	-	-	1	-	-	-	-	-	-	1	-	
58	Stift (393)	f	17	23.11.17	24	-	-	-	-	-	1	-	-	-	-	-	1	-	
59	Tenao (755)	m	6	30.12.17	80	-	-	-	-	51	2	-	-	-	-	-	53	-	
60	Trudi (842)	f	4	07.10.17	49	-	2	-	-	1	-	-	-	-	-	-	3	-	
61	Veronika (321)	f	20	19.12.17	87	-	1	-	-	-	-	-	-	-	-	-	1	-	
62	Viaduc (946)	m	2	13.09.17	10	-	-	-	-	7	-	-	-	-	-	-	7	-	
63	Volcaire (905)	m	3	13.12.17	108	-	-	-	-	52	-	-	-	-	-	-	52	-	
unknown						323	21	5	-	332	395	1	-	-	-	-	-	1'077	2'081
wild hatched						4	1	-	-	-	-	-	-	1	3	1	10	-	
						390	51	5	2	847	427	1	1	1	3	1	1'729	2'081	

### 6.3 Ornitho.ch data

Ornitho.ch is the official birding exchange platform from the Swiss Ornithological Institute and is dedicated to all birdwatchers of Switzerland and the neighbouring regions. Thus, a large community of bird watchers spends a lot of time outside in the field collecting valuable observations. For Bearded Vultures, the number of observations increased significantly since 2013 (Figure 6). As the Bearded Vulture population in the Alps is growing, more observations are reported and the effort to validate each and every observation increased immensely and thus became impossible to handle.

The network of ornithologist reports hundreds of observations per year. With the support of the LIFE GypHelp project it was possible to develop an automatic transfer of observations from the ornitho platform into the IBM database. Since November 2018 all observations from ornitho.ch are successfully imported into the IBM. In a first step data from Switzerland were included and other countries will follow soon, upon agreement of the ornitho management.

Since 1991 more than 14'000 Bearded Vulture observations have been collected and are now stored in the IBM-database (Figure 7, Figure 8). However, it is important to note that *ornitho.ch* observations are not validated from regional IBM-coordinators and should therefore be interpreted with caution. Nevertheless, this information shows whether the observed distribution coincides with the IBM monitoring in Switzerland, or whether any gaps should be addressed.

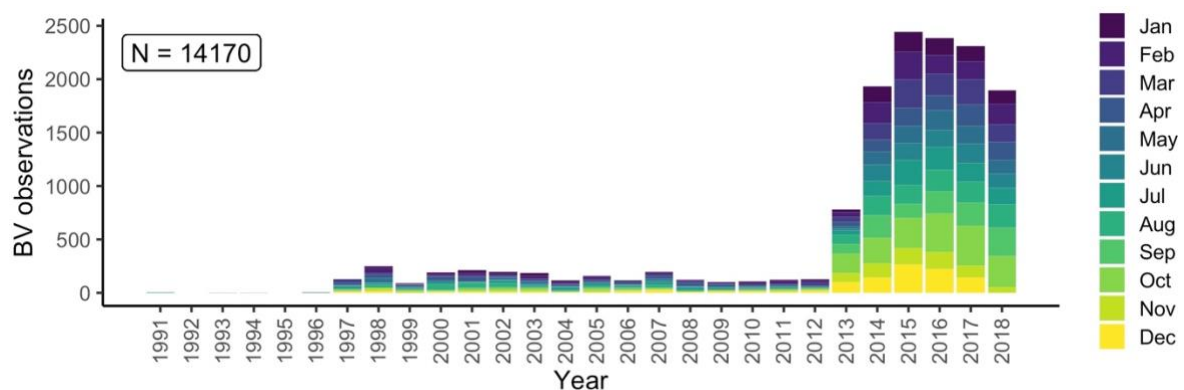


Figure 6: Temporal development of Bearded Vultures observations reported on ornitho.ch. In total, 14'170 observations were recorded until December 2018. There has been an increase in the number of reports, especially in the last 6 years.

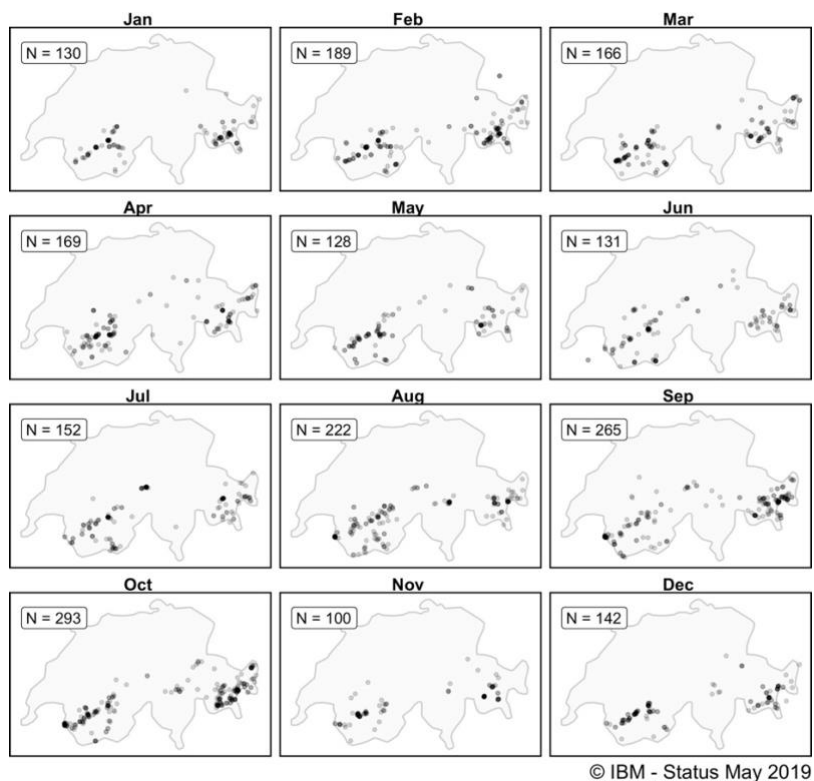


Figure 7: All Bearded Vulture observations (N=2'081) that were reported on Ornitho.ch in 2018 were imported into the IBM-database. The points are shown with 20% opacity in order to reveal hotspots of Bearded Vulture observations.

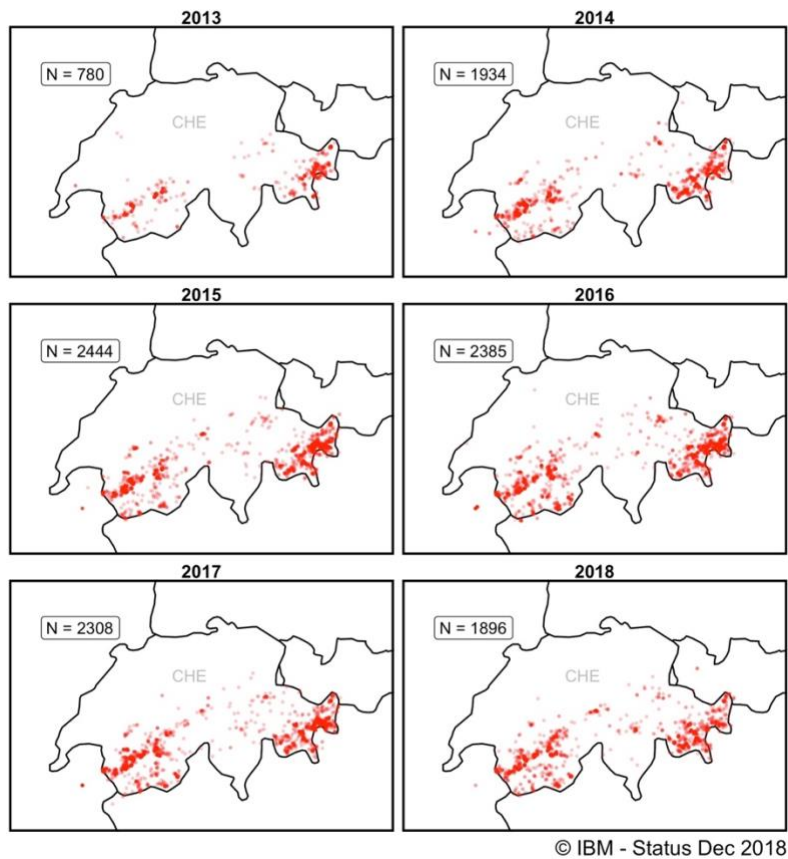


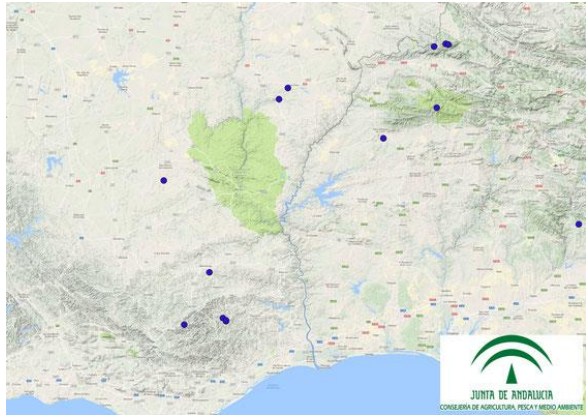
Figure 8: All Bearded Vulture observations that were reported on Ornitho.ch between 2013 and 2018. The points are shown with 20% opacity in order to reveal hotspots of Bearded Vulture observations (the darker the red, the more observations were reported).

## 6.4 Unusual observations

### 6.4.1 Identified observations

#### 6.4.1.1 Rayo (BG799)

On the 6.5 and 7.5.2018 the subadult Bearded Vulture Rayo was observed by a German birdwatcher in Portugal. Rayo was released in 2014 in Andalusia (500 km east of the observation spot) and could be identified thanks to the silver rings. Before this observation, at least 3 Bearded Vultures from the Andalusia reintroduction project have passed quickly through Portugal, but to our knowledge they had not been observed, photographed or reported.



### 6.4.2 Non-identified observations

#### 6.4.2.1 Immature in the Netherlands

A young Bearded Vulture, estimated to be around two years old (3. cy = immature), was observed near the city of Middleburg (NDL) on the 27.5.2018. It is the 17<sup>th</sup> time a Bearded Vulture was observed in the Netherlands, and as far as we know the 7<sup>th</sup> wild-hatched bird, that visits the country. The same bird (moulting gap) was observed again 160km north in the dunes of northern Holland, the Schoorlse Duinen on the 1.6.2018 and one day later in the Olst-Wijhe region of the eastern Netherlands. After this, no more observations of this bird were reported.



#### 6.4.2.2 Adult in Greece

An adult Bearded Vulture has been seen and photographed on the 6.4.2018 in Mount Olympus (Thessaly-C. Macedonia (GRC) by Thomas Nikolopoulos (on the picture together with a golden eagle). This is the first observation of an adult Bearded Vulture in the area since 1994. In the 70-80s between 2 and 4 pairs were reported to breed, but Bearded Vultures went extinct in Mt. Olympus and mainland Greece in the 90s. The bird seen recently does not seem to be ringed or bear any markings.



### **6.4.2.3 Immature crossing the Bosphorus**

On the 29.9.2018 a young wild-hatched Bearded Vulture (2<sup>nd</sup> calendar year) was observed crossing the Bosphorus (TUR) separating Europe and Asia and heading into Anatolia. The photo on the right side was taken by the Turkish photographer Ihsan Eroglu and is the first recent evidence of a Bearded Vulture in this area. However, it remains unclear if the bird came from the Alps, Crete or the mountains of Anatolia.



## **6.5 Individual identification**

Thanks to the sophisticated marking system of the IBM, it was possible to identify 139 Bearded Vultures in 2018 (Table 12, Table 13 and Table 14). Data from observations, the reproduction monitoring, telemetry as well as the IOD 2018 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.



## 6.6 Population estimate based on IOD 2018

Between the 6<sup>th</sup> and 14<sup>th</sup> of October 2018, the International Observation Days (IOD), an annual monitoring event for Bearded Vultures, took place for the 13<sup>th</sup> time. This monitoring action is organised by the International Bearded Vulture Monitoring network (IBM) and covers large parts of the Alpine arc (since 2006), parts of the Massif Central (since 2012) and the eastern part of the French Pyrenees (since 2016), several regions in Spain (since 2017) and for the first time some selected regions in Bulgaria.

The aim of this expanding network is to establish a Europe-wide monitoring of the Bearded Vulture population where time-synchronised observations on the focal day, 6<sup>th</sup> of October in 2018, allow to make an approximate estimate of the population size and age class distribution. A monitoring action of this scale and the fact that birds are identified on an individual level whenever possible, is unique and generates baseline information for survival analyses and demographic modelling, which give valuable insight into the reintroduction progress. In addition, the number of participants during the IOD increases every year, which promotes the public awareness for the conservation of this flagship species.

Even though the weather conditions were less favourable compared to last year with 40% of the total 640 observation sites reporting good, 24% mediocre and 35% unfavourable weather, more than 1'040 observers occupied observation sites in the field and reported 701 Bearded Vulture observations. Once more, such a large-scale survey would not have been possible without the effort and expertise of the regional coordinators of the 14 IBM-partners and 4 associated organisations. Their background knowledge and their familiarity with the local situation enables them to evaluate the IOD-observation data and to give an estimate about the population size in their region. These estimates and the observations were compiled, evaluated and summarised over the entire monitoring area in order to get an overview of the age class distribution and to compare the estimates on the alpine scale with the predicted population size from demographic modelling (Schaub et al. 2009)<sup>1</sup>.

The population within the Alpine range was estimated to vary between 208 and 284 individuals respectively, slightly lower than the model estimate of 292 individuals. However, the estimated age class distribution is fairly well in line with the predicted values of the demographic model<sup>1</sup> with the exception of the subadult birds, which are difficult to identify correctly in the field (55% adults, 7% subadults, 20% immature, 13% juveniles, 5% unidentified). Both estimates are based on a combination of the observation data collected during the focal day and the knowledge about individuals that have not been observed but are supposed to be present in the region (territorial birds, in some exceptional cases also their fledglings, GPS-tagged birds (N = 38 in 2018) etc.).

In the Massive Central the estimated population size is three individuals, and at least five, possibly nine, individuals have been observed in the Aude region of the French Pyrenees. The IOD in Andalusia and Castilla y León revealed a minimal and maximal number of 28 and 40 Bearded Vultures, respectively. As expected, no Bearded Vultures have been observed in Bulgaria where the species has been considered extinct since 1972.

55 Bearded Vultures could be identified on an individual level, while another 13 birds were identified with high probability. Each of these identifications provides valuable information about the life history and survival rates of these birds and contributes to the unique data collection of the IBM, which is monitoring the development of the Bearded Vulture reintroduction project since 1999.

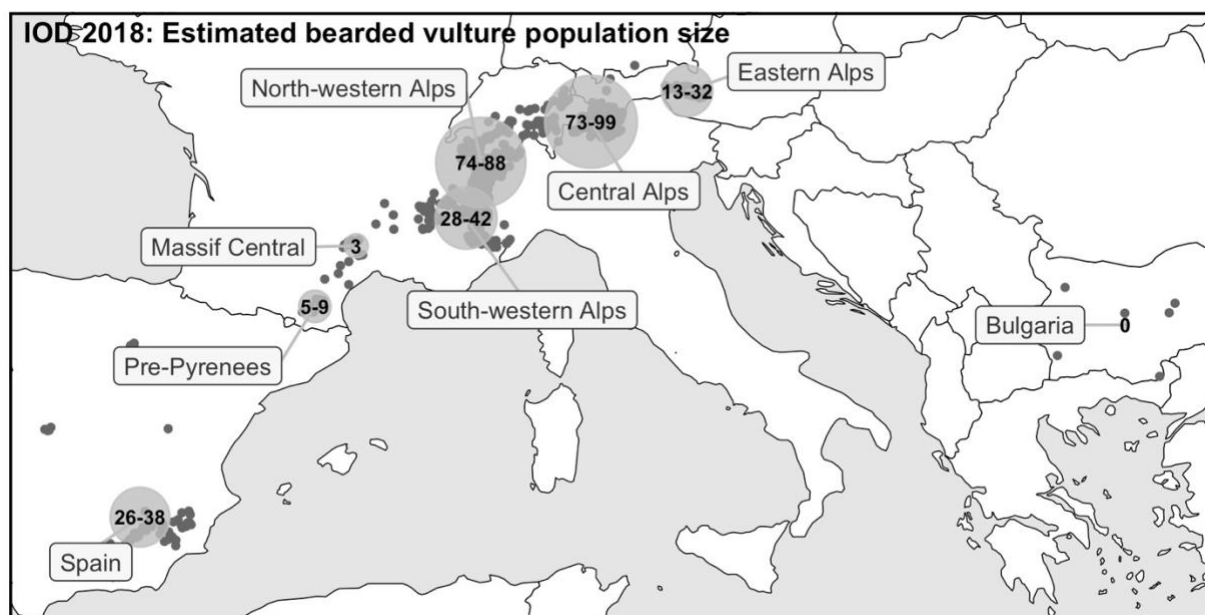


Figure 9: Estimated Bearded Vulture population size on a regional level for the Alpine range, the Massif Central, the French Pyrenees, Spain and Bulgaria. The estimate is based on data from the international Bearded Vulture observation days (6<sup>th</sup> -14<sup>th</sup> October) in 2018.

\*\* The complete IOD 2018 report can be found online on [www.gyp-monitoring.com](http://www.gyp-monitoring.com) \*\*

## 7 Markings

Individual based monitoring makes the International Bearded Vulture Monitoring unique among monitoring projects of this scale. By the end of 2018, more than 54'000 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 7.1), bleached feathers (chapter 7.2) as well as GPS-tags (chapter 7.3) before they are released into the wild (Figure 11, Figure 12).

### 7.1 Rings

Since 2015, one silver aluminium ring and a black plastic ring with white letters ("Darvic ring"), both with two-digit codes (bi-directional), were used to mark Bearded Vultures (Figure 10). Their large letters should ensure that the codes are easily readable with binoculars and also on pictures. Since uniqueness of the codes is important for clear identification, unique two-digit codes (unidirectional) were used from 2016 onwards. Two rings with inverted identical codes but different orientation improves legibility, as it is more likely to be able to read both characters of the code. After it has been observed that the Darvic rings of some birds fell off or slipped from their position, it was decided to use two aluminium from 2017 onwards (see annual report 2017 for more details). The right aluminium ring is marked with a country-specific code of the national ringing centre (Table 9), while the left IBM-ring is marked with the two-digit code and IBM-contact details.

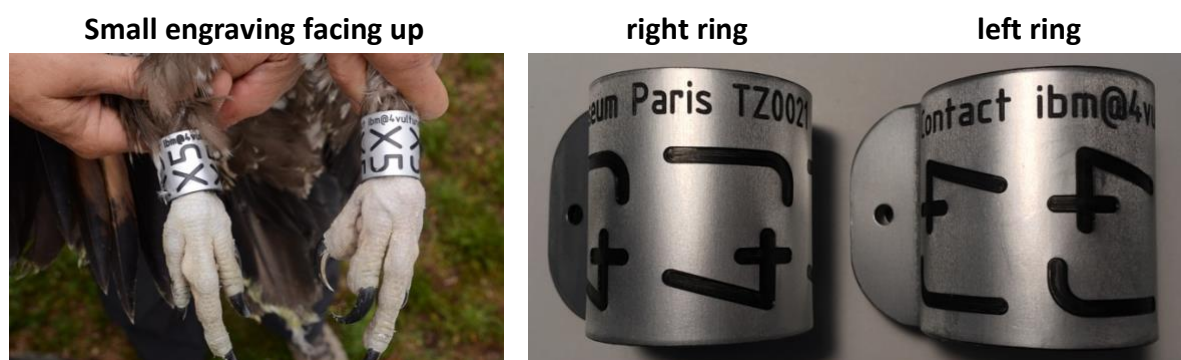


Figure 10: IBM-ringing system since 2017: 2 Aluminium rings with large two-digit code and a smaller engraving for the national code (right) and aluminium standard IBM-engraving (left) facing up.

Table 9: 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
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

## 7.2 Markings 2018

### Released birds<sup>3</sup>

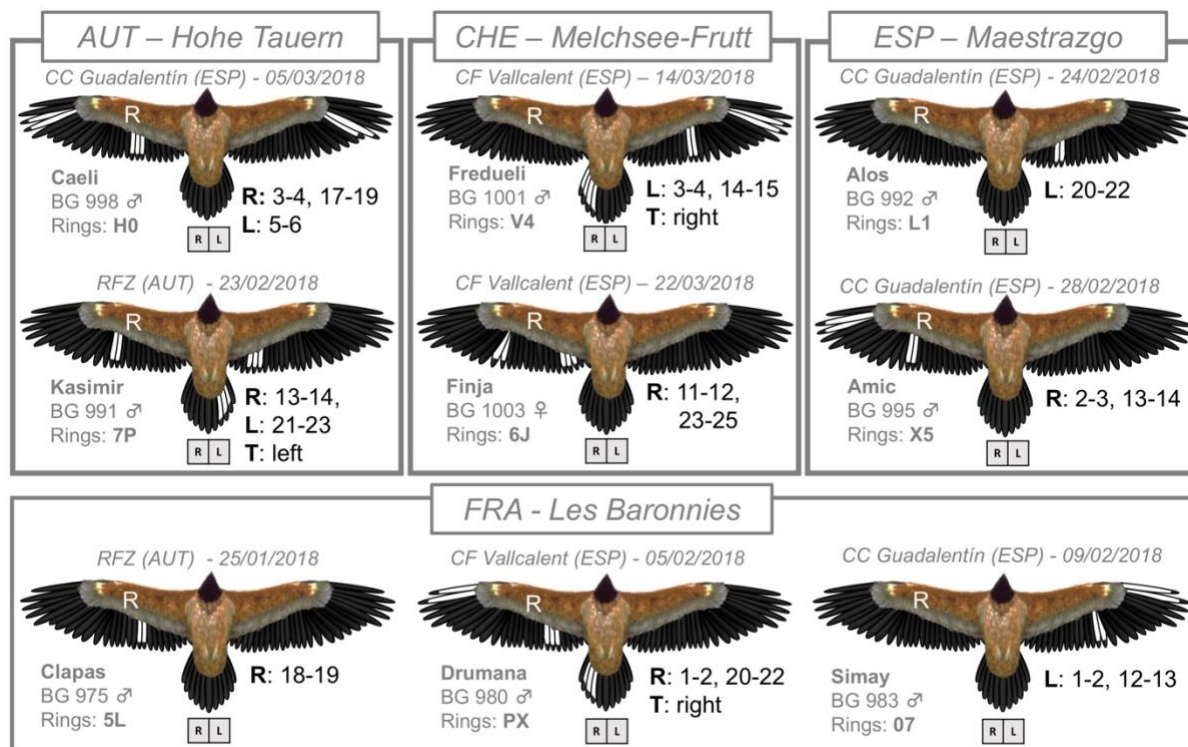


Figure 11: Marking patterns of the 9 Bearded Vultures released in 2018.

### Wild-hatched birds



Figure 12: Four wild-hatched birds have been marked in 2018. Some feathers of Kruml5 were bleached and the bird was marked with a golden ring (left), while Bonifatu2018, Lapie and Albula2018 were marked with two aluminium rings. All birds except Albula2018 were equipped with GPS/GSM tags.

<sup>3</sup> Download this file on: [www.gyp-monitoring.com](http://www.gyp-monitoring.com) --> Downloads --> Marking pattern

### 7.3 GPS-tagged birds

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 and another two juvenile, wild-hatched birds (Mison and Gypsy) in 2017.

In 2018, there was the possibility to tag three young Bearded Vultures: Kruml5 (W245) in Austria, Bonifatu2018 (W271) on Corsica, Lapie (W251) in France with GPS/GSM-tags. In total, movements of 45 Bearded Vultures (7 wild-hatched and 38 released birds) were followed by GPS-tracking and stored in the Wildlifemonitor in 2018 (Table 10). Besides three adult birds, Layrou (6<sup>th</sup> cy), Tenao (6<sup>th</sup> cy) and Veronika (20<sup>th</sup> cy), all tagged birds are non-adults.

In Andalusia Gea (W276) (chick from Hortelano (BG631) & Marchena (BG712)), as well as Cano (W277) (chick from Tono (BG486) & Blimunda (BG633)) were both tagged with Argos GPS-tags. Together with Ferguson (W242; 2017) and Esperanza (W179; 2015) four wild-hatched Bearded Vultures have been tagged in Andalusia so far.

#### 7.3.1 Released GPS-tagged birds

##### 7.3.1.1 Amic (BG995) and Alos (BG992)

The two Bearded Vultures released in the Maestrazgo project, are regularly seen together at the supplementary feeding station and mainly remain in the area around the release site. However, Alos made a round-tour further north-west to the mountainous area of la Rioja and back to Maestrazgo (Figure 13).

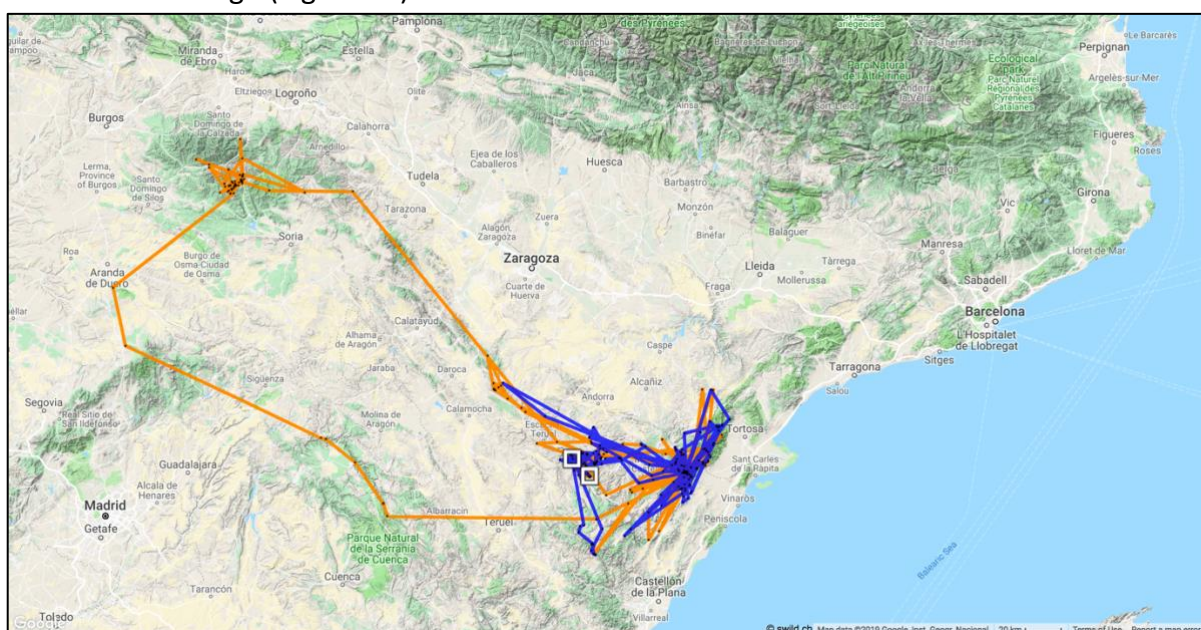


Figure 13: Alos (orange) und Amic (blue) were released in Maestrazgo and mainly remained in the area. 1 GPS-location per day between the 27.6.19 and 31.12.2018.

### 7.3.1.2 Calandreto (BG948)

Calandreto was one of four Bearded Vultures released equipped with a GPS-tag in the Grands Causses back in 2017 as part of the LIFE Gypconnect project. In May 2018 he started making more extensive journeys and at the beginning of June he started to head south, towards the Pyrenees. After reaching the Pyrenees he circulated far and wide, visited feeding sites in Aragon (ESP), and spent a lot of time in the French-Spanish border area around the core area of the “Parc National des Pyrénées”. Early November he began a journey eastwards and at the end of the month crossed Aude (FRA) and the mountain range of Caroux and was spotted on the 1<sup>st</sup> of December back in the Parc Naturel Régional des Grands Causses (Figure 14).

Calandreto is the second Bearded Vulture released in the Grands Causses that flew to the Pyrenees, following Cardabelle - released in 2012, and flying in the Pyrenees since May 2013. The Gypconnect project aims to re-establish the former range of the Bearded Vulture by connecting the growing population of the species in the Alps to the population in the Pyrenees by reintroducing individuals to the Grands Causses-Massif Central region of France.



Figure 14: Calandreto (BG948): All GPS locations between 1.1.2018 and 31.12.2018.

## 7.3.2 Wild-hatched GPS-tagged birds

### 7.3.2.1 *Kruml5 (W245)*

Kruml5 hatched in the breeding territory Gastein/Rauris fledged, but then did not fly for a very long time, most likely due to calcium deficiency (more details in chapter 8.1.1). After his recovery, the bird was marked (GSP tag, ring, bleach) and released again. GPS-data showed that it was able to successfully use its newly acquired flight capability afterwards (Figure 15).

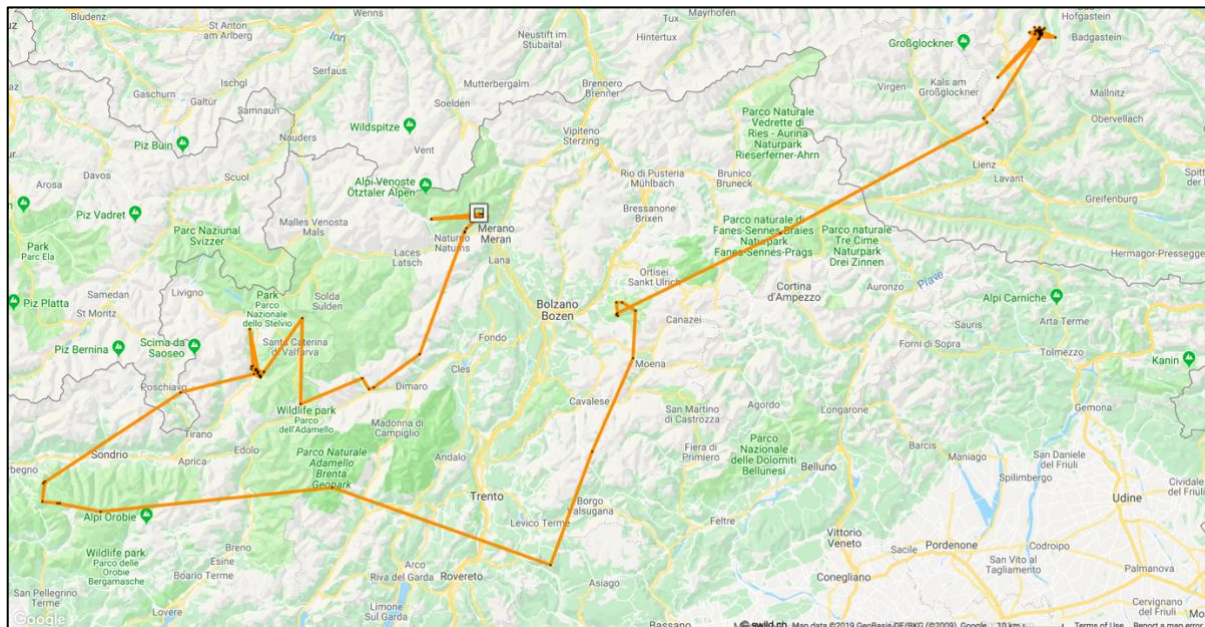


Figure 15: *Kruml5 (W245)*: 1 GPS location per day between 11.8.2018 and 31.12.2018.

### 7.3.2.2 *Bonifatu2018 (W271)*

Bonifatu2018 could be marked during a nest climbing action and remained in the surrounding area of the breeding territory Bonifatu on Corsica in 2018 (FRA) (Figure 16).

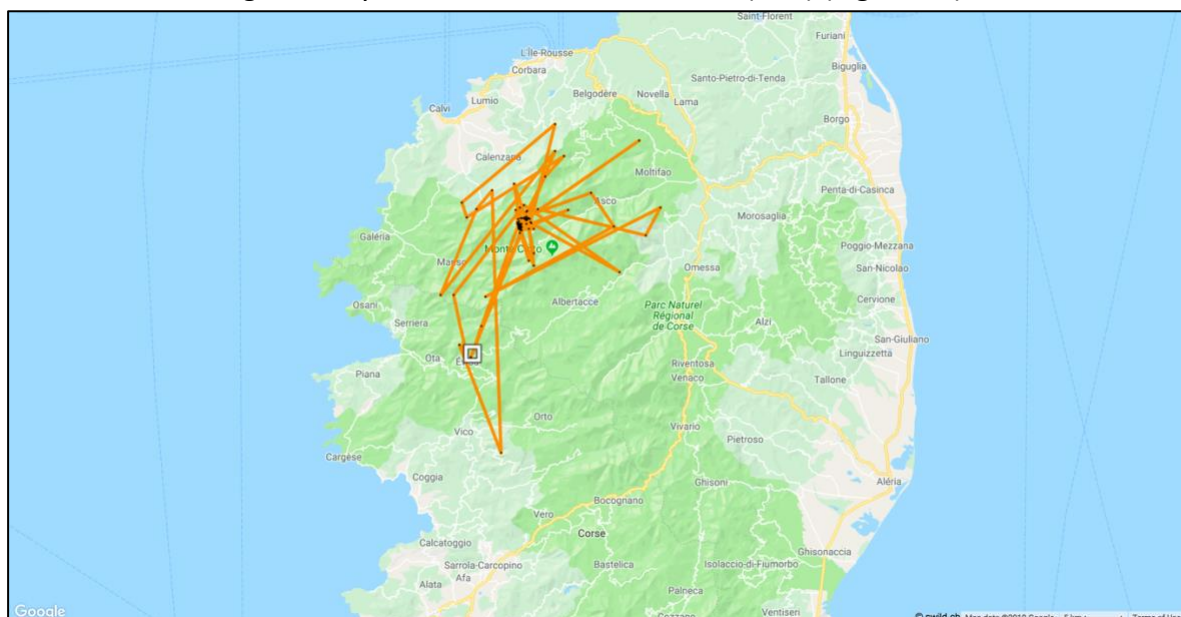


Figure 16: *Bonifatu (W271)*: 1 GPS location per day between 29.6.2017 and 31.12.2018.

Table 10: 45 birds from different age classes could be followed by GPS during 2018 thanks to the support by partner organisations. Wild-hatched birds are marked with a "W" in the BirdID. Roc Genèse hatched the wild in Aude in the French Pyrenees. Number of successful localisations (locs) varies considerably among individuals.

Animal	BirdID	Sex	Age (cy)	Mortality	Release site / Nesting site	First loc. (2018)	Last loc. (2018)	Days with loc.	Locs. total
Alos	992	m	1		Sierra de la creu (ESP)	27/06	31/12	188	8'268
Amic	995	m	1		Sierra de la creu (ESP)	01/07	31/12	184	24'255
Bonifatu2018	W271	u	1		wild-hatched	29/06	31/12	134	5'790
Caeli	998	m	1		Hohe Tauern, Seebachtal (AUT)	05/07	31/12	180	16'821
Clapas	975	m	1		Baronnies, Léoux Valley (FRA)	25/05	31/12	214	1'620
Drumana	980	m	1		Baronnies, Léoux Valley (FRA)	25/05	31/12	221	39'411
Finja	1003	f	1		Melchsee-Frutt (CHE)	25/07	31/12	160	199'367
Fredueli	1001	m	1		Melchsee-Frutt (CHE)	07/07	31/12	178	95'879
Kasimir	991	m	1		Hohe Tauern, Seebachtal (AUT)	23/06	31/12	192	20'605
Kruml5	W245	u	1		wild-hatched	11/08	31/12	143	11'266
Lapie	W251	m	1		wild-hatched	29/07	31/12	155	3'388
Simay	983	m	1		Baronnies, Léoux Valley (FRA)	08/06	31/12	207	135'863
Arcana	954	f	2		Grands Causses, Trévezel (FRA)	01/01	31/12	33	251
Calandreto	948	m	2		Grands Causses, Trévezel (FRA)	01/01	31/12	365	51'272
Durzon	945	m	2	09.02.18	Grands Causses, Trévezel (FRA)	01/01	09/02	40	3'052
Ercu	958	m	2		Corsica, Niolo Valley (FRA)	01/01	31/12	365	82'773
Gypsy	W209	m	2		wild-hatched	01/01	31/12	365	516'359
Johannes	964	m	2		Melchsee-Frutt (CHE)	01/01	31/12	365	1'056'960
Léoux	950	f	2		Baronnies, Léoux Valley (FRA)	05/01	31/12	355	2'975
Luna	959	f	2		Corsica, Niolo Valley (FRA)	01/01	31/12	364	2'478
Mison	W230	f	2		wild-hatched	01/01	15/12	323	144'902
Viaduc	946	m	2	01.03.18	Grands Causses, Trévezel (FRA)	01/01	01/03	56	4'304
Alois	900	m	3	17.01.18	Melchsee-Frutt (CHE)	01/01	18/01	18	220
Charlie	910	f	3		NP Hohe Tauern (AUT)	09/03	22/03	4	6
Cierzo	899	m	3		Melchsee-Frutt (CHE)	01/01	31/12	362	44'748
Gemapi	W196	f	3		wild-hatched	01/01	31/12	365	21'075
Girun	904	f	3		Baronnies, Léoux Valley (FRA)	01/01	20/12	238	1'604
Lucky	909	m	3		NP Hohe Tauern (AUT)	17/02	21/11	265	1'275
Muntagnolu	890	m	3		Corsica, Niolo Valley (FRA)	01/01	31/12	362	1'859
Neige	W198	m	3		wild-hatched	01/01	31/12	287	2'084
Roc Genèse		m	3		wild-hatched	01/01	31/12	365	4'056
Volcaire	905	m	3		Baronnies, Léoux Valley (FRA)	01/01	12/04	101	15'019
Ewolina	838	f	4		Melchsee-Frutt (CHE)	01/01	31/12	289	4'074
Fortuna	843	m	4		Dorfertal (AUT)	01/01	31/12	365	11'934
Lea	840	m	4		Dorfertal (AUT)	01/01	31/12	358	7'631
Roman	854	m	4		PN Alpi Marittime, Argentera (ITA)	03/01	31/12	312	1'397
Sempach 2	841	f	4		Melchsee-Frutt (CHE)	01/01	31/12	355	22'158
Trudi	842	f	4		Melchsee-Frutt (CHE)	06/01	30/12	258	967
Adonis	794	m	5		Grands Causses, Frépestel (FRA)	01/01	19/04	109	306
Felix2	793	m	5		NP Hohe Tauern (AUT)	01/01	06/12	340	967
Noel-Leya	797	m	5		Calfeisen, Vaettis (CHE)	01/01	31/12	283	3'433
Schils	802	m	5		Calfeisen, Vaettis (CHE)	01/01	31/12	347	20'300
Layrou	761	m	6		Grands Causses, Trévezel (FRA)	01/01	31/12	338	21'039
Tenao	755	m	6		PN du Mercantour, Vignols (FRA)	01/01	31/12	306	880
Veronika	321	f	20		NP Engadin, Zernez (CHE)	01/01	31/12	361	16'334



## 8 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 3.2).

In 2018, 7 dropout cases were reported to the IBM (2 juveniles, 3 immatures, 1 adult and 1 without age determination). 4 released and 1 wild-hatched bird were found dead, while two wild-hatched birds were recaptured (Marty McFly) and rereleased (KrumI5) respectively. Due to a feather anomaly (similar to GypHelp) Marty McFly is unable to fly and is now kept in captivity (Table 11).

*Table 11: List of all 7 reported dropouts from 2018. Five birds were found dead, KrumI5 could be released again while Marty McFly remained in captivity.*

Name	BirdID	Bird type	Age [cy]	Dropout	Date	Country	Reason	Classification
Alois	900	released	2	mortality	17.01.18 (±1)	CHE	collision with cable	anthropogenic
Durzon	945	released	2	mortality	09.02.18	FRA	poison	anthropogenic
Viaduc	946	released	2	mortality	01.03.18 (±1)	FRA	disease	natural
Palanfré	435	released	15	mortality	16.03.18 (±3)	ITA	collision / lead	anthropogenic
GT021	-	wild hatched	-	mortality	11.04.18	FRA	collision with powerline	anthropogenic
Marty Mcfly	W269	wild hatched	1	recapture	06.10.18	FRA	feather anomaly	natural
KrumI5	W245	wild hatched	1	released	20.07.18	AUT	disease	natural

### 8.1 Rereleases

#### 8.1.1 KrumI5 (W245)

Regular monitoring of the breeding pair Gastein/Rauris revealed that despite apparent good health, the juvenile bird KrumI5 was unable to fly even late in the season. Due to this misbehaviour it has been decided to capture the bird and blood examinations revealed a calcium deficiency. As the values stabilized after a therapy and KrumI5 made progress in flying, the bird could be ringed, its feathers bleached and GPS-tagged (Figure 12) before his release on the 11.8.2018.

## 8.2 Mortalities

### 8.2.1 Alois (BG900)

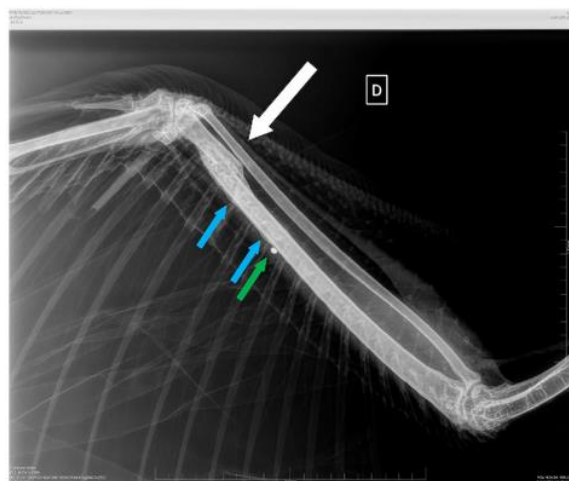
The GPS data alerted the monitoring team in Switzerland on the 17.01.2018, as Alois was not moving, and temperature of the GPS-tag dropped. However, due to heavy snow falls and avalanches in the area where the last GPS positions were reported, field inspections were possible only a few days later. However, the bird could not be found. Only after the snow had melted, the remains of the Alois could be recovered. The carcass was found with broken bones underneath a transport cable, so there is a strong suspicion that Alois died because of the collision with this cable and was buried by an avalanche after his death. Alois was found dead in the region, where he was released in Melchsee-Frutt (CHE) in 2016.

### 8.2.2 Viaduc (BG946)

Viaduc was found dead near Milau (FRA) on the 2.3.2018. During the necropsy many urate crystals were found, leading to the assumption that the bird died because of renal disease. Shotgun bullets in the wing indicate that the bird was shot in the past, but this did not lead to its death.

### 8.2.3 Palanfré (BG435)

Palanfré was found dead on the 16.3.2018 below a power-line in the municipality of Novalesa in Piemonte (ITA) and was transmitted to the University of Turin for investigations. Comprehensive post-mortem analysis revealed that multiple factors have led to her death. Bleeding in the lungs and body cavity were suspected as the primary cause of death due to the possible collision with the power line. Furthermore, an X-ray revealed that the bird had been shot by shotgun, probably from long distance, several months ago and that the resulting fractures had subsequently fused out of position. Additionally, the chemicals brodifacoum, bromadiolone and difenacoum, commonly used poisons to control rodent populations, were found in tissue samples from Palanfré. These poisons have an anticoagulant effect preventing the blood from clotting and when ingested by predators and scavengers often cause death through internal bleeding. The analysis done in Turin stated that it is possible that the ingestion of these toxins promoted the bleeding which led to Palanfré's death. Palanfré was released in the National Park Alpi Marittime (ITA) in 2004 and was also known as "Neve" (=snow) by our Italian partner, as this female did not colour herself and was almost pure white.



### 8.2.4 Durzon (BG945)

Due to irregularities in the GPS-data a field inspection found Durzon lying on its belly without any visible signs of electrocution or any other mark. It was located about 400 meters from a power line, which left the hypothesis of a collision, but a first X-ray revealed no fracture. After a post-mortem and toxicology tests, it became clear that Durzon was killed by illegal poisoning using Carbofuran (9.2.2018), a banned insecticide from the carbamate family. Photo by LPO Grands Causses.



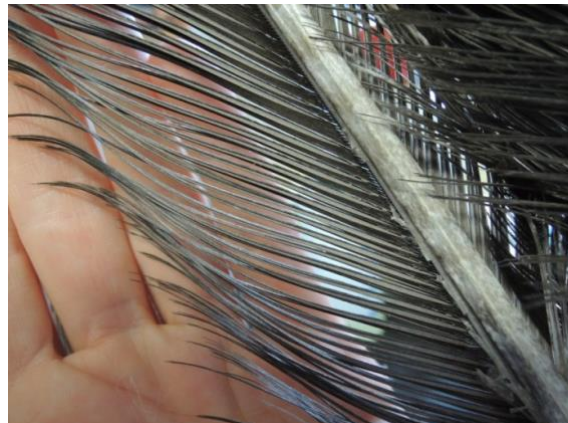
### 8.2.5 Male Peisey-Nancroix (GT021)

On the 11.4.2018 the male Bearded Vulture GT021 was found dying under a high-voltage line in Valezan (FRA), just outside the Parc National de la Vanoise (French Alps) from suspected collision. The bird was quickly transported to a nearby wildlife rehabilitation centre, but it did not survive. Examination revealed the presence of an incubating patch under the belly and that the bird was part of the breeding pair Peisey-Nancroix. It was decided by the team from the Vanoise National Park to not only monitor the chick but to intervene to ensure the survival of the young bird by providing food near the nest reduce the time the adult female was away from the chick.

## 8.3 Recaptures

### 8.3.1 Marty McFly (W269)

Marty McFly hatched in the Bargy BIS territory (FRA) and fledged around the 23.7.2018. From then on, he stayed on the ground and was fed by its parents. Due to this misbehaviour (not flying) he was caught on the 6.10.2018 with a bodyweight of only 4.3kg. It has been found that the young bird showed similar feather anomalies such as two birds that had to be recaptured in the past years: GypHelp (W215), the juvenile of Bargy BIS from 2017 and Leon-



Susanna (W068) which hatched in Aravis in 2009. Investigations of these three cases looked into nutritional deficiencies, thyroid gland problem and inherited malfunction. As feathers moulted and formed by GypHelp in its 2<sup>nd</sup> cy, nutritional deficiencies were excluded. Thyroid gland malfunction is still under investigation. "Silky chicken", a special breed of chicken, show the same phenotype and only one single point mutation is causing this phenotype. All three recovered Bearded Vultures share one common ancestor (BG0034) and it is still under investigation if founder specific inbreeding might have led to the abnormality in feather growth. If the hypothesis of genetic origin can be confirmed, it would reinforce the importance of genetic diversity in the Bearded Vulture reintroduction project.

# 9 Annexe

## 9.1 List of all identified birds

Table 12: List of all birds that have been identified in 2018 in the eastern and central Alpine range. Wild-hatched birds are marked with a prefixed "W" or "GT" in the BirdID. "Source" 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 2018.

Name	BirdID	Sex	Hatch (year)	Death	Age (cy)	Origin (release site / territory / country)	Zone	Territory (2018)	Source
<b>Eastern and central Alpine range</b>									
Katschberg2018	W254	u	2018		1	Katschberg		Katschberg (AUT)*	r,o
Kruml5	W245	u	2018		1	Gastein/Rauris		Gastein/Rauris (AUT)*	r,o,i,t
Alexa	100	f	1988		31	NP Hohe Tauern, Rauris			o,i
Andreas Hofer	260	m	1996		23	NP Hohe Tauern, Rauris		Gastein/Rauris (AUT)	r,o,i
Hubertus 2	446	m	2004		15	NP Hohe Tauern, Kals		Katschberg (AUT)	r
Romaris	528	f	2007		12	NP Hohe Tauern, Kals		Katschberg (AUT)	r
Rurese	559	m	2008		11	NP Hohe Tauern, Rauris		Maloja (CHE)	r,i
Smaragd	675	m	2011		8	NP Hohe Tauern, Habachtal	AUT	Zermatt (CHE)	r,o
Felix2	793	m	2014		5	NP Hohe Tauern			o,t
Fortuna	843	m	2015		4	Dorfertal			o,t
Lea	840	m	2015		4	Dorfertal			o,i,t
Charlie	910	f	2016		3	NP Hohe Tauern			o,t
Lucky	909	m	2016		3	NP Hohe Tauern			o,t
Caeli	998	m	2018		1	Hohe Tauern, Seebachtal			o,t
Kasimir	991	m	2018		1	Hohe Tauern, Seebachtal			o,i,t
Retia	357	f	2000		19	NP Stilfserjoch, Martell		Buffalora (CHE)	r,i
Stift	393	f	2002		17	NP Stilfserjoch, Martell		Valle del Braulio (ITA)	r,o,i
Ortler	439	f	2004		15	NP Stilfserjoch, Martell	ITA	Ofenpass (CHE)	r,o,i
Temperatio	495	f	2006		13	NP Stilfserjoch, Martell		Val Martello (ITA)	r
Zufall	493	f	2006		13	NP Stilfserjoch, Martell		Bargy BIS (FRA)	r
Heinz-Serraglio	W45	u	2007		12	Ofenpass		Zebbru (ITA)	r,o,i
Tantermozza	W46	m	2007		12	Tantermozza		Albula (CHE)	r,i
Albula2018	W248	u	2018		1	Albula		Albula (CHE)*	r,o,i
Bergün2018	W260	u	2018		1	Bergün		Bergün (CHE)*	r
Foraz2018	W272	u	2018		1	Foraz		Foraz (CHE)*	r
Ofenpass2018	W262	u	2018		1	Ofenpass		Ofenpass (CHE)*	r,i
Poschiavo2018	W259	u	2018		1	Poschiavo		Poschiavo (CHE)*	r
Sinestra2018	W270	u	2018		1	Sinestra		Sinestra (CHE)*	r
Spin2018	W261	u	2018		1	Ova Spin		Ova Spin (CHE)*	r
Tantermozza2018	W268	u	2018		1	Tantermozza		Tantermozza (CHE)*	r
Moische	146	f	1991		28	NP Engadin, Zernez		Livigno (ITA)	r,o,i
Jo	169	f	1992		27	NP Engadin, Zernez		Ortler (ITA)	r
Cic	186	m	1993		26	NP Engadin, Zernez		Livigno (ITA)	r,o,i
Tell	283	m	1997		22	NP Engadin, Zernez		Valle del Braulio (ITA)	r,i
Diana-Valais	301	m	1998		21	NP Engadin, Zernez		Leukerbad (CHE)	r
Gildo	299	f	1998		21	NP Engadin, Zernez		Derborence_Vérouet (CHE)	r
Veronika	321	f	1999		20	NP Engadin, Zernez	CHE		o,t
Felice	375	f	2001		18	NP Engadin, Zernez		Zebbru (ITA)	r,o,i
Folio	463	f	2005		14	NP Engadin, Zernez		Maloja (CHE)	r,i
Blick	524	m	2007		12	NP Engadin, Zernez		Planeil (ITA)	r,i
Samuel	526	m	2007		12	NP Engadin, Zernez		Sinestra (CHE)	r,i
Ingenius	621	m	2010		9	Calfeisen, Vaettis		Buffalora (CHE)	r,i
Sardona	624	m	2010		9	Calfeisen, Vaettis			o
Aschka	749	f	2013		6	Calfeisen, Vaettis			o
Noel-Leya	797	m	2014		5	Calfeisen, Vaettis			t
Schils	802	m	2014		5	Calfeisen, Vaettis			t
Ewolina	838	f	2015		4	Melchsee-Frutt			t
Sempach 2	841	f	2015		4	Melchsee-Frutt			o,t
Trudi	842	f	2015		4	Melchsee-Frutt			o,t
Alois	900	m	2016	17.01.18	3	Melchsee-Frutt			t
Cierzo	899	m	2016		3	Melchsee-Frutt			o,t
Johannes	964	m	2017		2	Melchsee-Frutt			o,t
Finja	1003	f	2018		1	Melchsee-Frutt			o,t
Freduei	1001	m	2018		1	Melchsee-Frutt			o,i,t
Stelvio	W02	u	1998		21	Valle del Braulio			i
Diana-Stelvio	W07	f	2000		19	Valle del Braulio		Albula (CHE)	r,i
Livigno	W08	m	2000		19	Livigno		Ofenpass (CHE)	r,o,i
Moische-Livigno	W11	f	2002		17	Livigno		Sinestra (CHE)	r,i
Zebbru	W12	m	2002		17	Zebbru		Tantermozza (CHE)	r,i
Beppe-Zebrù	W275	u	2018		1	Zebbru	ITA	Zebbru (ITA)*	r
Ginger-Braulio	W243	u	2018		1	Valle del Braulio		Valle del Braulio (ITA)*	r,o
Reimut-Nassereith	W256	u	2018		1	Schnals		Schnals (ITA)*	r
Ubario-Livigno	W273	u	2018		1	Livigno		Livigno (ITA)*	r,i
Zufritt	W274	u	2018		1	Val Martello		Val Martello (ITA)*	r

Table 13: List of all birds that have been identified in 2018 in the north- and south-western Alpine range. Wild-hatched birds are marked with a prefixed "W" or "GT" in the BirdID. "Source" 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 2018.

Name	BirdID	Sex	Hatch (year)	Death	Age (cy)	Origin (release site / territory / country)	Zone	Territory (2018)	Source
<b>North-western and south-western Alpine range</b>									
Mison	W230	f	2017		2	Bagnes	CHE		o,t
Urs-Zermatt	W255	u	2018		1	Zermatt		Zermatt (CHE)*	r
Phenix Alp Action	W01	m	1997		22	Bargy		Bargy (FRA)	r,i
Linky	W130	m	2013		6	Sixt Fiz			o
Gemapi	W196	f	2016		3	Bargy			o,t
Neige	W198	m	2016		3	Aravis			o,t
Gypsy	W209	m	2017		2	Aravis			o,t
Cécile-Maurice	W267	u	2018		1	Bourg-Saint-Maurice		Bourg-Saint-Maurice (FRA)*	r
Electron	W244	u	2018		1	Aravis		Aravis (FRA)*	r
Lapie	W251	m	2018		1	Bargy		Bargy (FRA)*	r,t
Marty Mcfly	W269	f	2018		1	Bargy BIS	FRA	Bargy BIS (FRA)*	r
Perceval-Nancroix	W264	u	2018		1	Peisey-Nancroix		Peisey-Nancroix (FRA)*	r
Pralognan2018	W278	u	2018		1	Pralognan		Pralognan (FRA)*	r
Super Puma-Isere	W265	u	2018		1	Val dlsère		Val dlsère (FRA)*	r
Termignon2018	W266	u	2018		1	Termignon		Termignon (FRA)*	r
Pablo	359	m	2000		19	Haute-Savoie, Bargy		Derborence_Vérouet (CHE)	r
Gilbert	440	f	2004		15	Haute-Savoie, Doran		Derborence_down (CHE)	r,o
Swaro	459	m	2005		14	Haute-Savoie, Doran		Derborence_down (CHE)	r
Chamoussière2018	W252	u	2018		1	Chamoussière		Chamoussière (ITA)*	r
Rhemes2018	W279	u	2018		1	Val di Rhemes	ITA	Val di Rhemes (ITA)*	r
Auron	W220	u	2017		2	Source de la Tinée			o
Guy	W250	u	2018		1	Bonette		Bonette (FRA)*	r
Muzelle	W258	u	2018		1	Malaval		Malaval (FRA)*	r,o
Orion	W253	u	2018		1	Source de la Tinée		Source de la Tinée (FRA)*	r
Guillaumes	411	f	2003		16	PN du Mercantour, Vignols		Derborence_Vérouet (CHE)	r
Jausiers	413	f	2003		16	PN du Mercantour, Vignols		Val dlsère (FRA)	r,i
Rocca	516	m	2007		12	PN du Mercantour, Vignols		Source de la Tinée (FRA)	r,i
Stephan	616	m	2010		9	PNR Vercors, Trechenu-Creyers		Chambeyron-Ubayette (FRA)	r,o
Bellemotte	708	f	2012		7	PNR Vercors, Trechenu-Creyers	FRA	Bonette (FRA)	r,o
Gerlinde	759	f	2013		6	PNR Vercors, Trechenu-Creyers			o
Kirsi	764	m	2013		6	PNR Vercors, Trechenu-Creyers			o,i
Tenao	755	m	2013		6	PN du Mercantour, Vignols			o,t
Girun	904	f	2016		3	Baronnies, Léoux Valley			o,t
Volcaire	905	m	2016		3	Baronnies, Léoux Valley			o,i,t
Léoux	950	f	2017		2	Baronnies, Léoux Valley			o,t
Clapas	975	m	2018		1	Baronnies, Léoux Valley			o,t
Drumana	980	m	2018		1	Baronnies, Léoux Valley			o,i,t
Simay	983	m	2018		1	Baronnies, Léoux Valley			o,i,t
Sereno	348	m	2000		19	PN Alpi Marittime, Argentera		Source de IUbaye (FRA)	r
Palanfré	435	f	2004	16.03.18	15	PN Alpi Marittime, Argentera			o
Cuneobirding	491	f	2006		13	PN Alpi Marittime, Argentera		Chambeyron-Ubayette (FRA)	r,o,i
Michegabri	488	m	2006		13	PN Alpi Marittime, Argentera	ITA	Chamoussière (ITA)	r
Girasole	549	f	2008		11	PN Alpi Marittime, Argentera		Source de la Tinée (FRA)	r
Herculis	849	m	2015		4	PN Alpi Marittime, Argentera			o
Roman	854	m	2015		4	PN Alpi Marittime, Argentera			t

Table 14: List of all birds that have been identified in 2018 in the Massif Central, the French Pyrenees, Spain and Corsica. Wild-hatched birds are marked with a prefixed "W" or "GT" in the BirdID. "Source" 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 2018.

Name	BirdID	Sex	Hatch (year)	Death	Age (cy)	Origin (release site / territory / country)	Zone	Territory (2018)	Source		
<b>Massif Central &amp; French Pyrenees</b>											
Basalte	716	m	2012		7	Grands Causses,Frépestel	FRA	Malaval (FRA)	r,o		
Layrou	761	m	2013		6	Grands Causses, Trévezel		Massif Central	Jonte amont (FRA)	r,o,i,t	
Adonis	794	m	2014		5	Grands Causses,Frépestel		Jonte amont (FRA)	r,o,i,t		
Arcana	954	f	2017		2	Grands Causses, Trévezel				o,i,t	
Calandreto	948	m	2017		2	Grands Causses, Trévezel				o,t	
Durzon	945	m	2017	09.02.18	2	Grands Causses, Trévezel				o,t	
Viaduc	946	m	2017	01.03.18	2	Grands Causses, Trévezel			o,t		
Roc Genèse	GT086	m	2016		3		FRA	Pyrenees	t		
<b>Corsica</b>											
Bonifatu2018	W271	u	2018		1	Bonifatu		Bonifatu (FRA)*	r,t		
Muntagnolu	890	m	2016		3	Corsica, Niolo Valley			t		
Ercu	958	m	2017		2	Corsica, Niolo Valley			o,t		
Luna	959	f	2017		2	Corsica, Niolo Valley			o,t		
Popolasca 1		u				?	FRA	Popolasca (FRA)	r		
Popolasca 2		u				?		Corsica	Popolasca (FRA)	r	
Restonica 1		u				?			Restonica (FRA)	r	
Restonica 2		u				?			Restonica (FRA)	r	
Asco 1		u				?			Asco (FRA)	r	
Asco 2		u				?			Asco (FRA)	r	
Bonifatu 1		u				?			Bonifatu (FRA)	r	
Bonifatu 2		u				?			Bonifatu (FRA)	r	
Fango 1		u				?			Fango (FRA)	r	
Fango 2		u				?			Fango (FRA)	r	
<b>Andalusia &amp; Maestrazgo</b>											
Alos	992	m	2018		1	Sierra de la creu		ESP	Maestrazgo	t	
Amic	995	m	2018		1	Sierra de la creu				o,t	
Tono	486	m	2006		13	Centenares, Pontones		ESP		i	
Encina	713	f	2012		7	Centenares, Pontones			Andalusia		i
Guadalquivir	751	m	2013		6	Las Canalejas, Castril					i
Sansón	767	m	2013		6	Tornillos de Gualay, Cazorra				i	
Vera	752	f	2013		6	Las Canalejas, Castril				i	
Rayo	799	m	2014		5	Tornillos de Gualay, Cazorra				o	