



INTERNATIONAL
BEARDED VULTURE
MONITORING

IOD 2019

14th International Bearded Vulture Observation Days

Focal day - October 12th 2019

IOD Period - October 12th-20th 2019



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Mirco Lauper

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Contact

ibm@4vultures.org

The IOD 2019 were organised by the following
IBM-members¹ and associated organisations²:

ASTERS¹

ENVERGURES ALPINES¹

LPO GRANDS CAUSSES¹

LANDESBUND VOGELSCHUTZ BAYERN – LBV¹

NATIONALPARK HOHE TAUERN¹

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JUNTA DE ANDALUSIA¹

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ASSOCIATION MAROCAINE POUR LA FAUCONNERIE ET LA CONSERVATION DES RAPACES AND IUCN²

REGIONE AUTONOMA VALLE D'AOSTA & PARCO NAZIONALE GRAN PARADISO²



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The International Observation Days (IOD) are an annual monitoring event for Bearded Vultures organised by the International Bearded Vulture Monitoring network (IBM). The monitoring action takes place in the first two weeks of October with a synchronous and coordinated survey on the focal day and covers large parts of the Alpine arc (since 2006), parts of the Massif Central (since 2012), the eastern part of the French Pyrenees (since 2016), several regions in Spain (since 2017), some selected sites in Bulgaria (since 2018) and the High Atlas (since 2019). 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 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. Furthermore, the number of participants during the IOD increases every year and thus the IOD represents a big public event that helps to increase awareness for the conservation of the Bearded Vulture as a flagship species.

1 Abstract

With a favourable weather situation at 91% of the 696 occupied observation sites, more than 1'146 participants joined the IOD 2019 and reported 832 Bearded Vulture observations. Monitoring a mobile species such as the Bearded Vulture on a European wide scale, is challenging and would not be possible without the effort and expertise of the regional coordinators of 14 IBM-partners and several associated organisations. Furthermore, experts that are familiar with the local situation, form a key function in order to give an estimate about the population size in their region and also identifying individual birds. Thanks to this international collaboration, it was possible to compile, evaluate and summarise the observations and estimates over the 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)¹.

The Alpine population was estimated to vary between 256 and 344 individuals respectively - on average slightly lower than the model estimate of 320 individuals. However, similar as in the previous years, the estimated age class distribution is fairly well in line with the predicted values of the demographic model¹ with a slight underestimate of the number of subadult birds, which are difficult to identify correctly in the field (53% adults, 9% subadults, 19% immature, 14% juveniles). The population estimate, as well as the age class distribution are based on observation data collected during the focal day (12.10.19) combined with the estimated number of individuals that have not been observed but are supposed to be present in the specific region (territorial birds, in some exceptional cases also their fledglings, GPS-tagged birds (N = 34 in 2019) etc.).

The small population of the Massif Central is estimated to vary between 4-5 individuals, and at least 5, possibly 7, individuals have been observed in the Aude region of the French Pyrenees. The Spanish IBM-partners estimated the Bearded Vulture population in Andalusia and Castilla y León with a minimal and maximal number of 32 and 40 Bearded Vultures, respectively. Same as in 2018, no Bearded Vultures have been observed in Bulgaria where the species has been considered extinct since 1972. For the first time, the IOD was conducted in the High Atlas in Morocco with an estimated number of 6-11 Bearded Vultures.

71 Bearded Vultures could be identified on an individual level, while another 17 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. Such individual based information on an international scale is unique and allows to estimate survival rates and to follow the bird's life-history - important key elements in order to monitor the development of the Bearded Vulture project.

¹ Schaub, M., Zink, R., Beissmann, H., Sarrazin, F., & Arlettaz, R. (2009). When to end releases in reintroduction programmes: demographic rates and population viability analysis of Bearded Vultures in the Alps. *Journal of Applied Ecology*, 46(1), 92-100.

2 Key facts

Monitoring organisation

- 14 IBM-partners and several associated organisations coordinated the IOD 2019
- 1'046 observers participated in Austria, Bulgaria, France, Germany, Italy, Morocco, Spain and Switzerland
- 677 sites were occupied during the focal day (12.10.2019) another 19 during the IOD period
- weather situation at the observation sites: 91% good, 8% mediocre and 1% unfavourable

Observation results

- 832 Bearded Vulture observations during the IOD period, 806 of them on the focal day 12.10.2019
- Bearded Vultures observed at 263 out of 696 sites (38%)
- observed age class distribution (number of observations)
 - adult (N = 411)
 - subadult (N = 29)
 - immature (N = 127)
 - juvenile (N = 99)
 - unknown (N = 84)

Age class distribution & populations estimates

- estimated age class distribution in the alps (individuals)
 - adult (N = 161; 53%)
 - subadult (N = 27; 9%)
 - immature (N = 59; 19%)
 - juvenile (N = 41; 14%)
 - unknown (N = 15; 5%)
- estimated number of Bearded Vulture individuals
 - Alps: 256-344
 - Massif Central: 4-5
 - Pre-Pyrenees (FRA): 5-7
 - Spain²: 32-40
 - Bulgaria: 0
 - Morocco: 6-11

Individual based data

- 52 (Alps), 5 (Massif Central) and 14 (Spain) individuals were identified
- 13 (Alps) and 4 (Spain) individuals were probably identified
- 5 (Alps) resident and territorial individuals could not be observed
- GPS-data is available for 48 individuals during the IOD period 2019
- in the Alps 12 (~35%) of the 34 GPS-tagged individuals were identified by the observers

² Only for monitored parts (e.g. no survey in Spanish Pyrenees and other mountain massives)

3 Methods

3.1 Organisation

The monitoring is coordinated and executed simultaneously over the four Alpine zones (eastern, central, north-western and southern Alps), in the Massif Central, in parts of the French Pyrenees, Spain and Bulgaria by local IBM-partners and associated organisations (**Figure 1**). This ultimately allows to gain information about Bearded Vulture presence thus avoiding/reducing the chance of double counts and allowing us to get the big picture of Bearded Vulture distribution.

In the previous years, monitoring was expanded towards the Pyrenees (department Aude in France) in order to reveal exchanges between the separated populations from the Alps and the Pyrenees. Since 2017, our Spanish colleagues (and new IBM-partner since 2019) organise the IOD within parts of Andalusia and Castilla y León and share their results with the IBM-network in order to contribute to get a wider picture about the Bearded Vulture population in western Europe. A new observer network is also establishing in the eastern parts of Europe in Bulgaria, where the *Green Balkans* participate at the IOD for the second time and thus raise awareness for the regionally extinct species.

For the first time, several sites in Morocco were occupied during the focal day 2019. The observations and data collection were coordinated by the Association Marocaine pour la Fauconnerie et la Conservation des Rapaces and IUCN and the VCF. This first IOD in Morocco is a further step towards an international collaboration and monitoring and was the first IOD on the continent Africa.

No IOD was organised on Corsica and the region around Maestrazgo in Spain in 2019.

3.2 Time Period

The 2019's international survey was held between the 12th and the 20th October with the focal day on Saturday 12th of October. The buffer period of one week is chosen to allow more flexibility for areas where the weather conditions are not suitable on the focal day.

All dates are decided on mutual agreement among the IBM partners and take into account partner's availability, other ornithological appointments and the birds' reproductive behaviour (see [future dates](#)). The fact, that Bearded Vultures are active in nest building during October, makes this a suitable period to observe the birds and record possible new territories and breeding pairs.

3.3 Monitoring Area

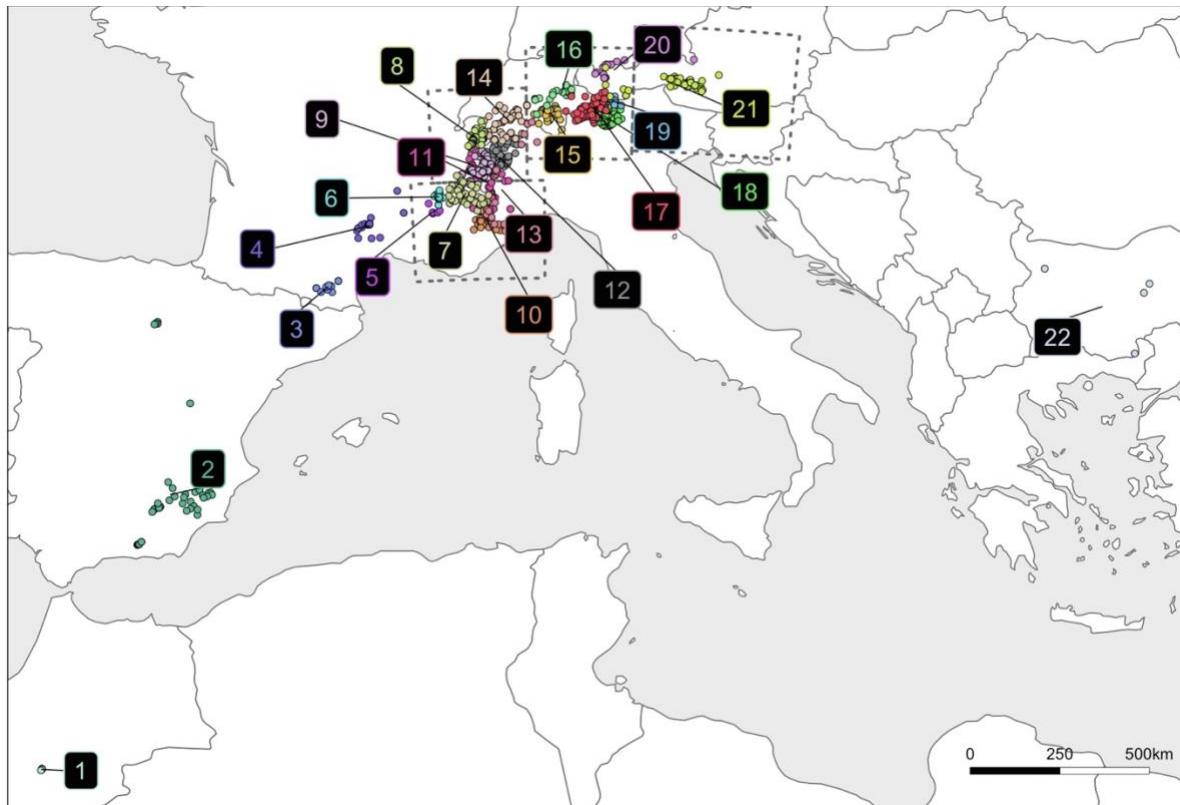


Figure 1. The IOD-monitoring area is regionally coordinated by IBM-partners and associated organisations (Table 1).

Table 1. Regional responsibilities (IBM-partners & associated organisations) coordinating the IOD (Figure 1).

Nr	Regional Coordinator / Organisation	Country	IBM-Partner
1	Association Marocaine pour la Fauconnerie et la Conservation des Rapaces and IUCN	MAR	no
2	Junta de Andalusia	ESP	yes
3	LPO Aude	FRA	no
4	LPO Grands Causses	FRA	yes
5	Vatours en Baronnies	FRA	yes
6	Parc Naturel Regional du Vercors	FRA	yes
7	Envergures Alpines	FRA	yes
8	Asters	FRA	yes
9	Parc National de la Vanoise	FRA	yes
10	Parc National du Mercantour	FRA	yes
11	Parco Alpi Cozie	ITA	yes
12	Regione autonoma Valle d'Aosta & Parco Nazionale Gran Paradiso	ITA	no
13	Parco Naturale Alpi Marittime - WAON	ITA	yes
14	Stiftung Pro Bartgeier - West	CHE	yes
15	Stiftung Pro Bartgeier - South	CHE	yes
16	Stiftung Pro Bartgeier - Central	CHE	yes
17	Stiftung Pro Bartgeier - East	CHE	yes
18	Parco Nazionale Dello Stelvio	ITA	yes
19	Forstinspektorat, Jagd und Fischereiverwaltung Südtirol	AUT	no
20	Landesbund Vogelschutz Bayern – LBV	GER	yes
21	Natinalpark Hohe Tauern	AUT	yes
22	Green Balkans	BGR	no

3.4 Data collection and observation protocol

The survey took place between 10:00 am and at least 15:00 pm. The teams are composed of one or more observers, at least one of them being experienced, equipped with binoculars and, depending on availability, telescope and camera. For each observation site and Bearded Vulture sighting the following information was recorded:

Observation site:

- Date and site occupancy (time)
- team/partner and observer names
- site name, address and coordinates
- weather conditions
- total number of observed Bearded Vultures
- presence/observation of other species

Bird observation:

- date
- time and duration of the observation
- age of the bird³
- bird name / hypothesis
- picture if possible

3.5 Data Analysis

All data is collected at the end of the day by the local administrators who will review the reported observations. The local administrators work in close cooperation with field assistants/observers and other nearby local administrators responsible for the surrounding monitoring areas. Based on for example individual markings, temporal overlap of the sightings, knowledge about known territorial birds and their juveniles that still remain in the area, they are able to critically assess the number of observations and judge to how many individual Bearded Vultures the IOD observations refer to. GPS-tagged birds that were not observed, are added to the estimate and also serve as a measure for detection probability.

The population estimate should only base on data from the focal day in order to avoid that individuals are observed and thus counted twice in two different regions. Individual identification is challenging and since it is not always possible to assess whether several observations have been made of the same individual, the final estimate includes a minimal and a maximal count number, namely accounting for a stricter versus a less conservative analysis.

After a critical assessment of possible double counting, these results are summarised over the whole monitoring area in order to get an overview of the estimated Bearded Vulture populations. Finally, the resulting population estimates of the IOD are compared with the estimate that can be deduced from the demographic model of Schaub et al. (2009).

³ *In age classes: juvenile (1.cy), immature (2.-3.cy), subadult (4.-5.cy) adult (≥6.cy)*

4 Results and Discussion

4.1 Weather conditions

The overall weather situation was good in 2019 with 91% good, 8% mediocre and 1% unfavourable weather situations at the observation sites (**Figure 2**). Compared to 2018, with 40% good, 24% mediocre and 35% unfavourable conditions, the conditions for a survey were considerably better. The weather situation at the three observation sites in Morocco was good (not on map in Figure 2). Favourable weather conditions increase the detection probability of the individuals - better vision and more bird activity - and should therefore be considered for the interpretation of the population estimates.

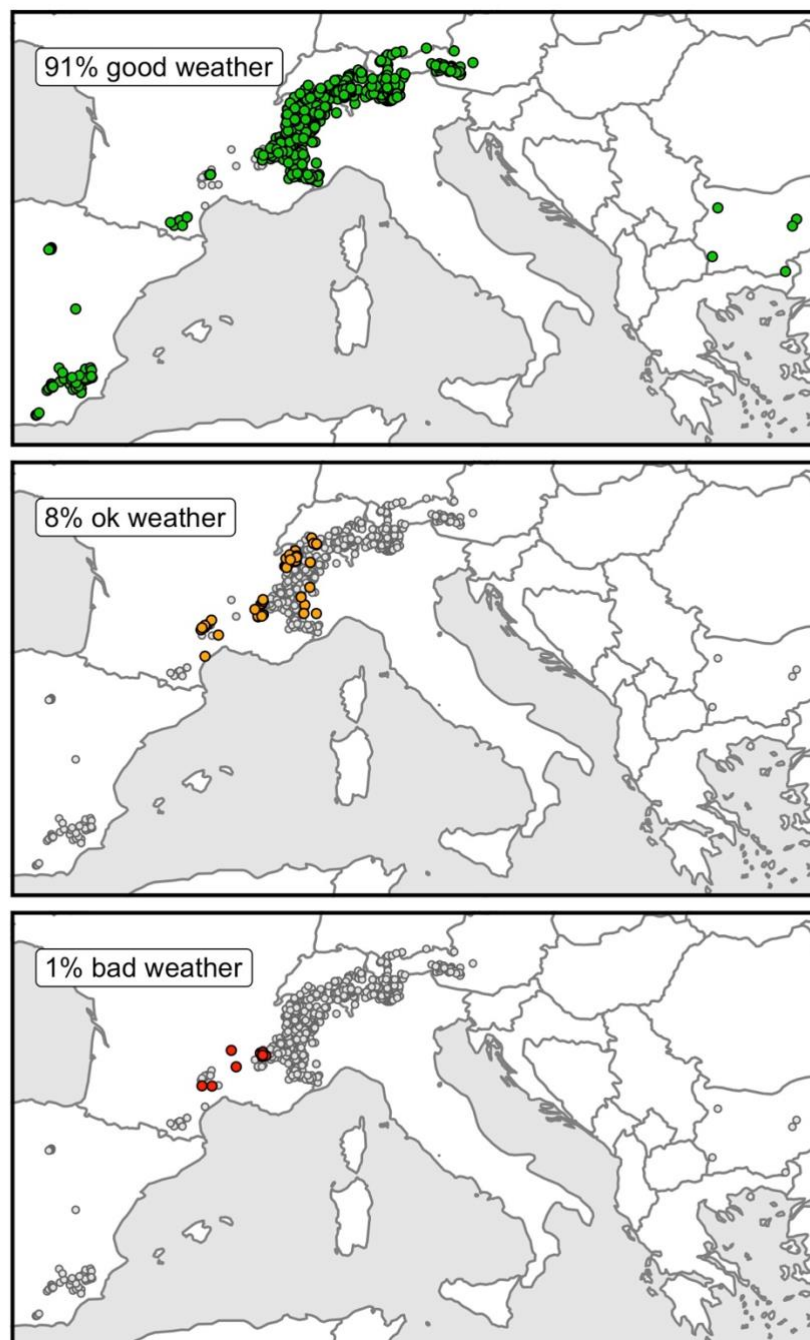


Figure 2. Weather conditions at the observations sites reported by the observers in the field during the IOD 2019. Most of the observers (91%) profited from good weather conditions, this was also the case in Morocco (not displayed on map).

4.2 Observation data

In 2019, a total of 1'146 observers have occupied 696 observation sites in the Alps, the Massif Central, spanning to the Pyrenees to the department “Aude”, parts of Andalusia and Castilla y León, Bulgaria as well as Morocco (**Figure 3 and Table 2**). The area covered by the observers during the IOD has increased over the years. However, it has not been possible to cover the complete Alpine range (~188'000 km²) simultaneously.

As in the previous years, the western regions of the Alps remain the most thoroughly surveyed areas together with the area of the Stelvio National Park in the North of Italy. With additional observation sites close to the Spanish border near the Pyrenees the IBM monitoring network plans to cover regions that might serve as a connection between the Bearded Vulture populations from the Alps and the Pyrenees. As it is known, that Bearded Vultures in Spain move between the mountainous areas in the South and the region of Castilla y León, Castilla-La Mancha and La Rioja in the North, the observer network has been expanded in these areas.

In the eastern part of Europe, in Bulgaria several observations sites were also occupied for the first time in 2018, even though so far, no Bearded Vultures are known to be present in this region. However, in the future this region could serve as a stepping-stone area between the Alpine and Greek Bearded Vulture population and to establish an observer network in this area thus makes sense in the long-term perspective. A first attempt to include data about the small and critically endangered population in the High Atlas of Morocco, has been started with several sites in 2019.

IOD 2019: Bearded Vulture observation: ● no (433) ▲ yes (263)

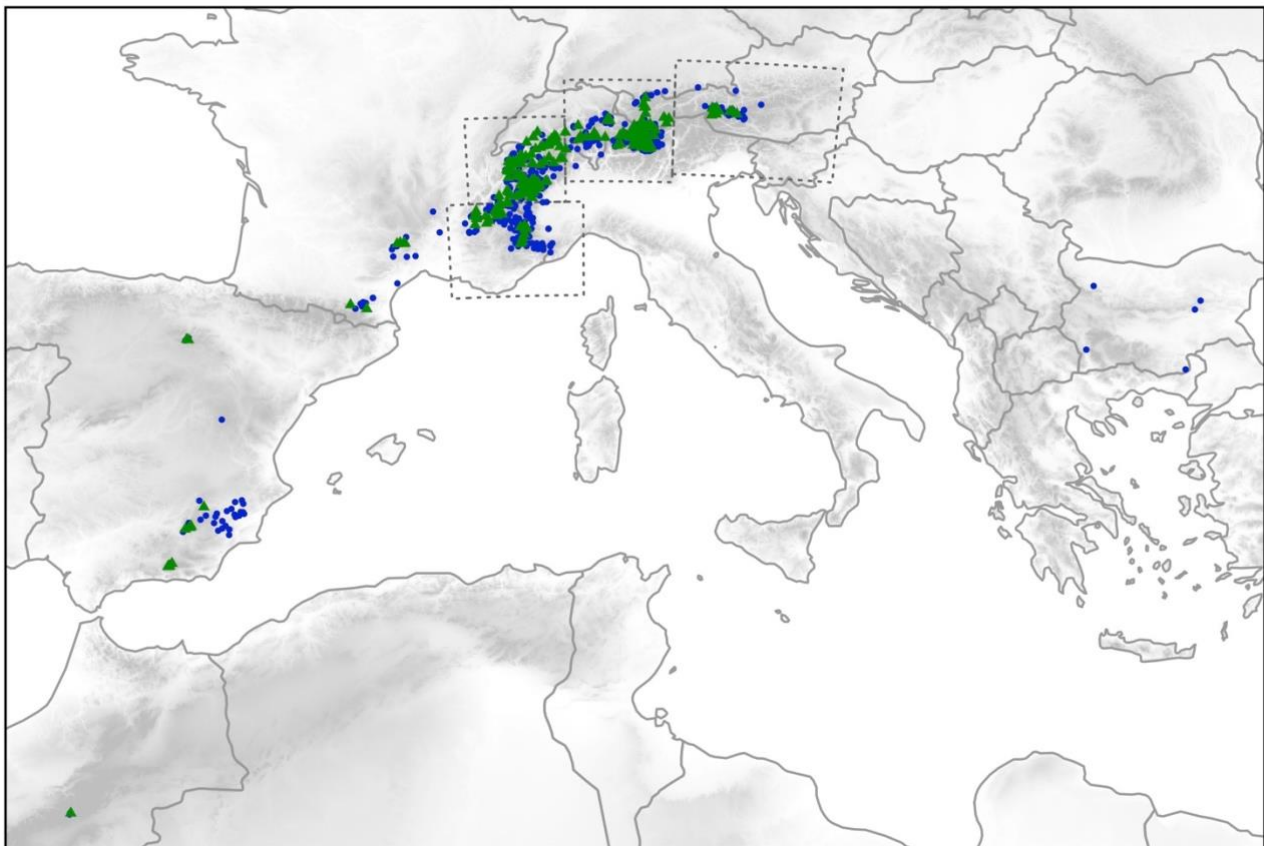


Figure 3. Distribution of all 696 observation sites during the IOD 2019 in Europe. Green triangles depict those sites where Bearded Vultures have been observed at least once during the IOD period 12th-20th of October 2019 (N=263) while no observations have been reported from sites marked with a blue dot (N=433). The area of the Alpine range is geographically divided into the eastern, central, north-western and south-western Alps (dashed rectangles from right to left).

Table 2. Number of observation sites and observers per region during the IOD 2019 (focal day 12.10.2019). In the bottom lines the results of the six previous years that highlight a continuous increase of monitoring effort.

Zone	Country	Region	Occupied sites in October 2019						Total	Observers	
			12.	13.	14.	15	17.	19.			20.
Alpine range			603	7	4	1	3	3	1	622	1'038
East	AUT	Kärnten	8							8	60
	AUT	Salzburg	18		1		1	3		23	
	AUT	Steiermark	1							1	
	AUT	East Tyrol	2		1		1			4	
	DEU	Bayern	2							2	
Central	AUT	North Tyrol	5	2	2				1	10	390
	AUT	Vorarlberg				1	1			2	
	CHE	Central Switzerland	20							20	
	CHE	Eastern Switzerland	67							67	
	CHE	Ticino	31	3						34	
	CHE	Western Switzerland	4	1						5	
	DEU	Bayern	4							4	
	ITA	Lombardia	75							75	
	ITA	Piemonte	2							2	
ITA	Trentino-Alto Adige	37	1						38		
North-West	CHE	Western Switzerland	36							36	312
	FRA	Auvergne-Rhones Alpes	85							85	
	ITA	Piemonte	29							29	
	ITA	Valle d'Aosta	39							39	
South-West	FRA	Provence-Alpes-Côte d'Azur	78							78	276
	FRA	Auvergne-Rhones Alpes	35							35	
	ITA	Liguria	1							1	
	ITA	Piemonte	24							24	
Massif Central			16							16	26
	FRA	Occitanie	14							14	
	FRA	Auvergne-Rhones Alpes	2							2	
Pre-Pyrenees	FRA	Languedoc-Roussillon	10							10	23
Spain			40							40	49
	ESP	Andalucía	11							11	
	ESP	Castilla-La Mancha	5							5	
	ESP	La Rioja	4							4	
	ESP	Región de Murcia	20							20	
Bulgaria			5							5	5
	BGR	Blagoevgrad	1							1	
	BGR	Haskovo	1							1	
	BGR	Montana	1							1	
	BGR	Sliven	2							2	
Morocco	MAR	Tinghir	3							3	5
Sites IOD 2019 total			677	7	4	1	3	3	1	696	1'146
IOD 2018										640	1'044
IOD 2017										573	923
IOD 2016										528	774
IOD 2015										496	708
IOD 2014										415	634
IOD 2013										437	596

Table 3. Number of Bearded Vulture sightings for each region during the whole IOD period 2019 (focal day 12.10.19). 0 values indicate dates where sites were occupied but no Bearded Vulture have been observed.

Zone	Region	Country	Bearded Vulture observations in October 2019						Total	
			12.	13.	14.	15.	17.	19.		20.
Alps			749	7	7	0	4	5	2	774
East	Kärnten	AUT	0							0
	Salzburg	AUT	7		2		3	5		17
	Steiermark	AUT	0							0
	East Tyrol	AUT	5		2		1			8
	Bayern	DEU	0							0
Central	North Tyrol	AUT	7	3	3				2	15
	Vorarlberg	AUT				0	0			0
	Central Switzerland	CHE	18							18
	Eastern Switzerland	CHE	81							81
	Ticino	CHE	8	1						9
	Western Switzerland	CHE	7	0						7
	Bayern	DEU	3							3
	Lombardia	ITA	157							157
	Piemonte	ITA	0							0
	Trentino-Alto Adige	ITA	11	3						14
North-West	Western Switzerland	CHE	52							52
	Auvergne-Rhones Alpes	FRA	297							297
	Piemonte	ITA	22							22
	Valle d'Aosta	ITA	21							21
South-West	Provence-Alpes-Côte d'Azur	FRA	15							15
	Auvergne-Rhones Alpes	FRA	31							31
	Liguria	ITA	0							0
	Piemonte	ITA	7							7
Massif Central		22		1						23
	Occitanie	FRA	22		1					23
	Auvergne-Rhones Alpes	FRA	0							0
Pre-Pyrenees	Languedoc-Roussillon	FRA	5							5
Spain			29							29
	Andalucía	ESP	26							26
	Castilla-La Mancha	ESP	1							1
	La Rioja	ESP	2							2
	Región de Murcia	ESP	0							0
Bulgaria			0							0
	Blagoevgrad	BGR	0							0
	Haskovo	BGR	0							0
	Montana	BGR	0							0
	Sliven	BGR	0							0
Morocco	Tinghir	MAR	1							1
Observations IOD 2019 total			806	7	8	0	4	5	2	832

4.3 Telemetry data

4.3.1 IBM-monitoring area

During the IOD-period GPS-data of 48 out of 49 Bearded Vultures with satellite tags have been retrieved in the Alpine range, the Massif Central, the Pyrenees, north-eastern Spain and Corsica⁴ (**Figure 4**), while Arcana's (BG954) tag did not send GPS-data during this period. Although this data is not part of the IOD, this information is collected as representative of their positions and to detect areas of monitoring deficiencies. Some of these birds still show their individual marking patterns (bleached feathers) and can therefore be identified by observers. Exceptions are the wild-born birds which have been GPS-tagged but not marked by bleaching their feathers.

GPS-data can serve as an indicator to assess the risk of double counting of individuals. The wide range movement patterns of some birds (**Figure 4**) underline the importance of using only observational data from a narrow period (focal day) for population estimation to avoid double counting.

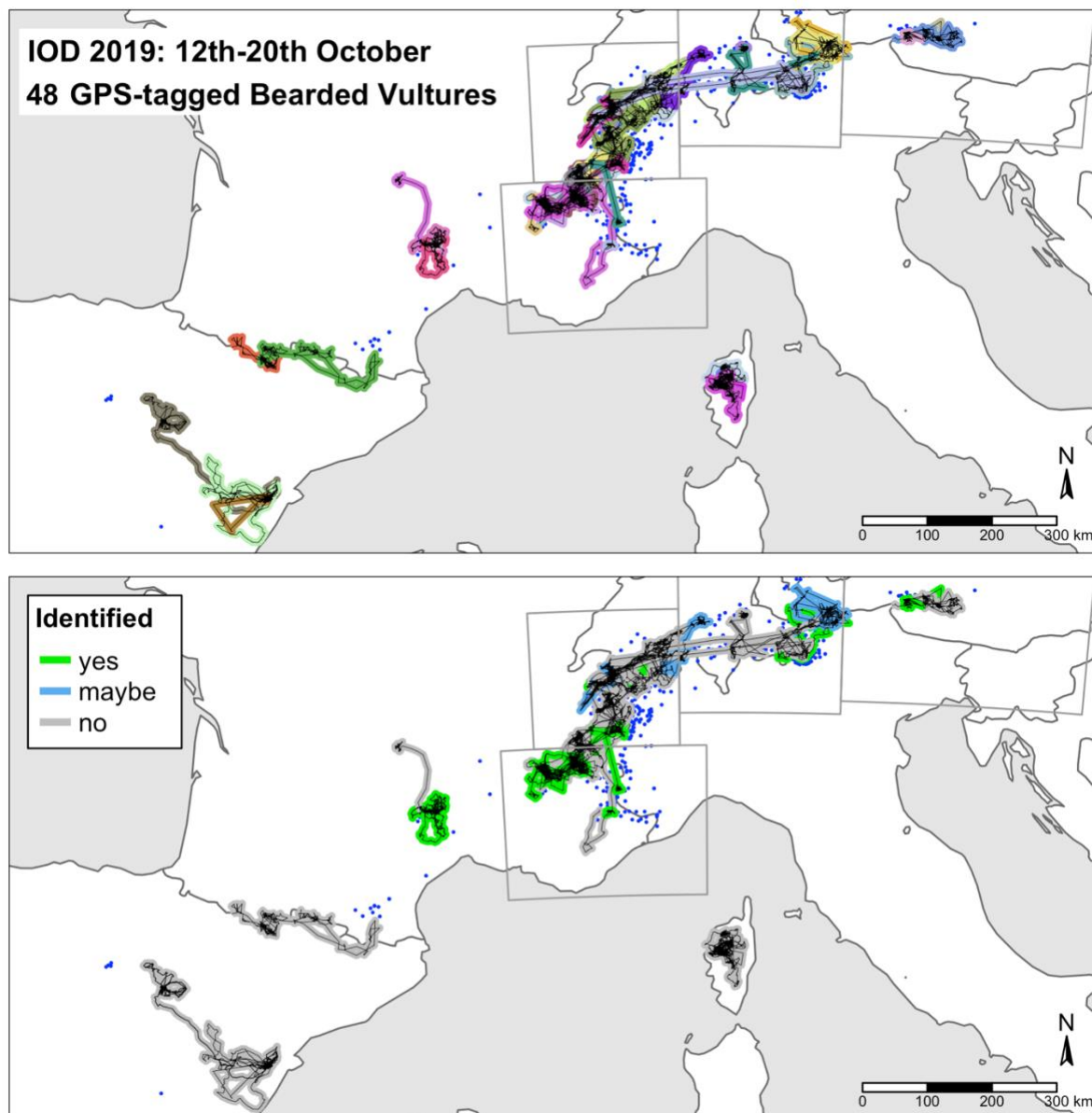


Figure 4. 48 GPS-tagged Bearded Vultures during the IOD periode. Blue dots = occupied observation sites.

⁴ No IOD was organized on Corsica in 2019.

4.3.2 Alpine range

During this year's IOD, GPS-data in the Alpine range was available from 34 birds during the IOD period and on the focal day (12.10.2019). Out of the 34 GPS-tagged birds 12 individuals could be sighted and identified, while 4 birds were identified with some uncertainty by observers.

Compared to the year 2018, where only around 20% of all GPS-tagged birds have been sighted and identified, around 35% of all GPS-tagged birds could be identified in the Alps in 2019. The overall more favourable weather conditions in 2019 could be a reason for this increase of identified GPS-tagged birds. However, the high number of GPS-tagged birds that were not identified despite they were probably observed and thus included in the estimate could lead to an overestimate of the actual number of birds present in the region.

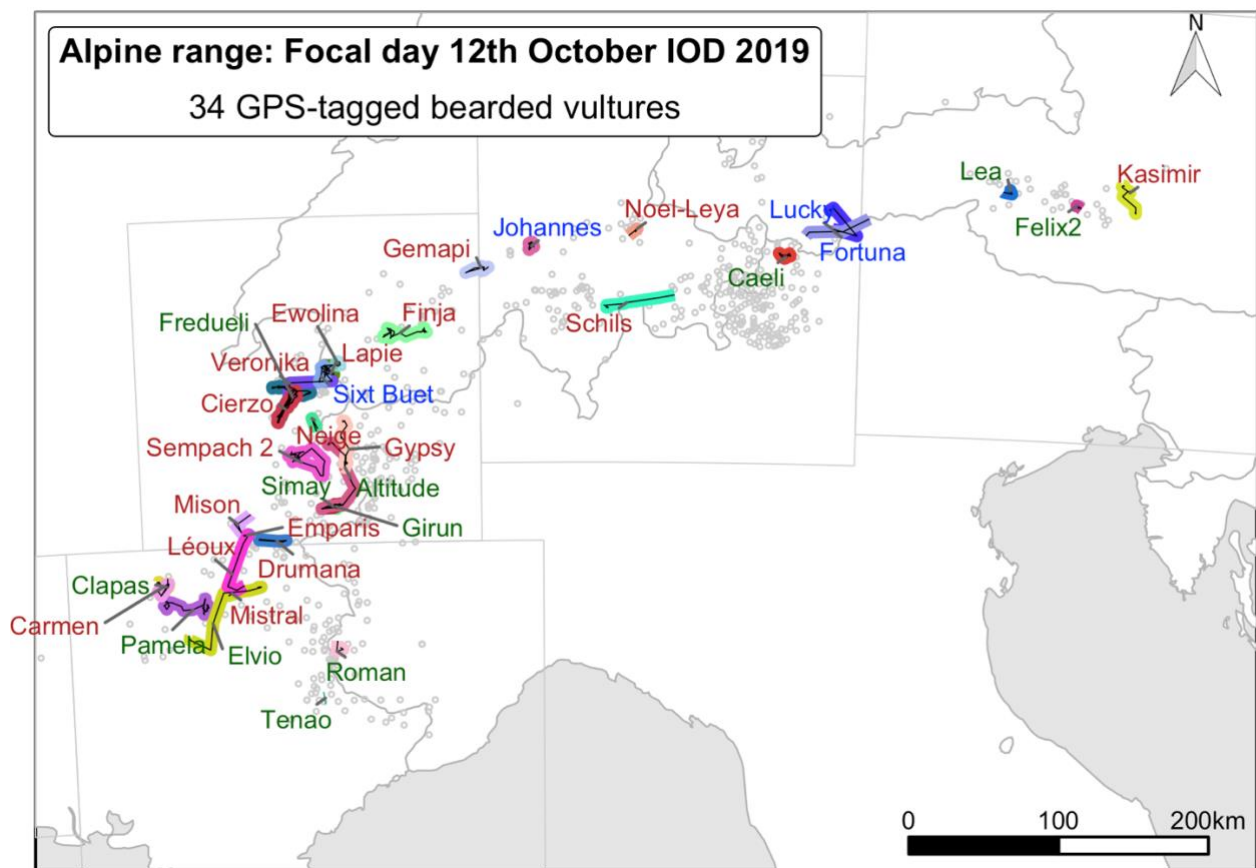


Figure 5. Positions of 34 Bearded Vultures tagged with GPS transmitters that were present in the Alpine range during the focal day (12.10.2019). Observation sites that were occupied during the IOD-period are marked with grey circles. During the IOD-period 12 birds have been identified (green labels), 4 birds have been identified with high probability (blue labels) and 18 birds couldn't be identified (red labels).

Table 4. 49 birds, twice as many males than females, with active GPS-tag during the IOD periode 2019. No GPS-data is available from Arcana (BG954) during the IOD. No IOD was organised in Corsica in 2019.

Animal	BirdID	Sex (m/f)	Age class	Days with pos.	Pos. on focal day	Observed (yes/probably/no)
Alps	34	21/10				12/4/18
Felix2	793	m	adult	8	3	yes
Tenao	755	m	adult	8	2	yes
Noel-Leya	797	m	adult	8	3	no
Schils	802	m	adult	9	11	no
Veronika	321	f	adult	7	4	no
Girun	904	f	subadult	8	11	yes
Lea	840	m	subadult	7	6	yes
Roman	854	m	subadult	4	4	yes
Cierzo	899	m	subadult	9	110	no
Ewolina	838	f	subadult	7	1	no
Gemapi	W196	f	subadult	8	23	no
Neige	W198	m	subadult	1	3	no
Sempach 2	841	f	subadult	9	43	no
Fortuna	843	m	subadult	8	7	probably
Lucky	909	m	subadult	8	6	probably
Caeli	998	m	immature	8	35	yes
Clapas	975	m	immature	8	13	yes
Freduei	1001	m	immature	8	84	yes
Simay	983	m	immature	9	32	yes
Drumana	980	m	immature	9	9	no
Finja	1003	f	immature	8	73	no
Gypsy	W209	m	immature	8	37	no
Kasimir	991	m	immature	8	25	no
Lapie	W251	m	immature	8	14	no
Léoux	950	f	immature	8	12	no
Mison	W230	f	immature	8	6	no
Johannes	964	m	immature	8	73	probably
Altitude	W313	u	juvenile	8	21	yes
Elvio	1026	m	juvenile	8	12	yes
Pamela	1031	f	juvenile	8	45	yes
Carmen	1027	f	juvenile	8	24	no
Emparis	W284	u	juvenile	8	49	no
Mistral	1022	m	juvenile	8	13	no
Sixt Buet	W285	u	juvenile	8	13	probably
Massif Central	5	3/2				5/0/0
Adonis	794	m	adult	6	3	yes
Layrou	761	m	adult	9	16	yes
Arcana	954	f	subadult	0	0	yes
Cévennes	1032	m	juvenile	9	74	yes
Lausa	1015	f	juvenile	9	243	yes
Pyrenees	2	2/0				0/0/2
Roc Genèse	-	m	subadult	8	2	no
Alos	992	m	immature	9	15	no
Corsica	5	2/2				0/0/5
Muntagnolu	890	m	subadult	8	5	no
Bonifatu2018	W271	u	immature	9	168	no
Luna	959	f	immature	8	8	no
Cintu	1042	m	juvenile	9	355	no
Orba	1041	f	juvenile	8	15	no
Maestrazgo	3	2/1				0/0/3
Amic	995	m	immature	9	95	no
Bassi	1033	m	juvenile	9	93	no
Boira	1040	f	juvenile	9	5	no
Total	49	30/15				17/4/28

4.4 Individual based data

During the IOD 2019 period 52 individuals have been identified with high probability in the Alpine range. 6 of them in the eastern Alps, 21 in the central Alps, 10 in the north-western Alps, 13 in the south-western Alps, 5 in the Massif Central and 18 in Spain. Another 13 birds were identified with uncertainty and these "potentially" identified birds are marked as "maybe identified" in **Table 5** & **Table 6**.

For the Alpine range, the 52 identified birds account for about 16% of the total estimated population size predicted by the demographic model by Schaub et al. 2009 (320 individuals), similar as in the previous year. The identified birds are mostly territorial birds and their chicks or recently released birds that can be identified by means of bleached feathers or GPS-locations. The identification of Bearded Vultures on individual level forms the basis for long-term life history data, the core element for demographic modelling, that allows to predict the development of the reintroduced Bearded Vulture population.

Such individual based monitoring is only possible due to the international collaboration, information exchange and the coordination of marking patterns within the international Bearded Vulture monitoring network.

Table 5. Bearded Vultures that were identified in the Massif Central and Spain during the IOD 2019. * GPS-tags are still on the animal but are not sending GPS-data.

Zone	Bird	Observed (yes/maybe)	BirdID	Sex (m/f)	Age (cy)	Tag	Territory	Region
Massif Central		5/0		3/2		4		
	Layrou	yes	761	m	7	GPS	Jonte Amont	
	Adonis	yes	794	m	6	GPS	Jonte Amont	
	Arcana	yes	954	f	3	GPS*		GrandsCausses (FRA)
	Lausa	yes	1015	f	1	GPS		
Cévennes	yes	1032	m	1				
Spain (without Pyrenees)		18		14/4		9/9		15
	Vera	yes	752	f	7		Castril	
	Guadalquivir	yes	751	m	7		Castril	
	Kika	yes	1018	f	1	GPS		
	Huesitos	yes	1036	f	1	GPS		
	Siles	yes	1037	f	1	GPS		
	Arroyo Frío	yes	1047	m	1	GPS		
	Cleo	yes	967	f	3	GPS*		
	Tono	yes	486	m	14		Guadalestín	
	Hans	yes	W302	m	1	GPS		Andalusia (ESP)
	Suerte Somera	yes	990	f	2	GPS*		
	Pozo Alcón	yes	888	m	4	GPS		
	Miguel	yes	800	m	6	GPS		
	Cenarbe	yes	-	m	-	VHF		
	Iruela	yes	984	m	2	GPS*		
Heli	maybe	955	m	3	GPS			
Tormenta	maybe	963	f	3	GPS			
Huesa	maybe	858	f	5	GPS*			
Quesada	maybe	861	f	5	GPS*			

Table 6. 65 Bearded Vultures that were identified (13 of them with some uncertainty = maybe identified) in the Alpine range during the IOD 2019 grouped by the region where they have been observed. * GPS-tags are still on animal but are not sending GPS-data.

Zone	Bird	Observed (yes/maybe)	BirdID	Sex (m/f)	Age (cy)	Tag	Territory	Region	
Alpine range	65	52/13	30/19			15		Alpine range	
	Eastern	Felix2	yes	793	m	6	GPS		
		Charlie	yes	910	f	4			
		Alexa	yes	100	f	32		Gastein/Rauris	Hohe Tauern NP (AUT)
		Andreas Hofer	yes	260	m	24		Gastein/Rauris	
		Lea	yes	840	m	5	GPS	Gschlöß	
		Kruml6	yes	W291	u	1			
	Central	Lechtal2019	yes	W324	u	1		Lechtal	
		Lucky	maybe	909	m	4	GPS		Tyrol (AUT)
		Fortuna	maybe	843	m	5	GPS		
		Madagaskar	maybe	665	m	9			
		Diana-Stelvio	yes	W07	f	20		Albula	
		GT116	yes	-	-	-		Bergün	
		GT117	yes	-	-	-		Bergün	
		Ingenius	yes	621	m	10		Buffalora	
Retia		yes	357	f	20		Buffalora		
Ortler		yes	439	f	16		Ofenpass		
Livigno		yes	W08	m	20		Ofenpass		
GT038		yes	-	f	-		Poschiavo	South-eastern Grison (CHE)	
GT057		yes	-	m	-		Poschiavo		
Samuel		yes	526	m	13		Sinestra		
Zeburu		yes	W12	m	18		Tantermozza		
GT048		yes	-	f	11		Tantermozza		
Rurese		maybe	559	m	12		Maloja		
Folio		maybe	463	f	15		Maloja		
Fleck		maybe	W296	u	1		Ortler		
Moische-Livigno	maybe	W11	f	18		Sinestra			
GT100	maybe	-	m	-					
North-western	Sardona	yes	624	m	10			Central Switzerland (CHE)	
	Johannes	maybe	964	m	3	GPS			
	Cic	yes	186	m	27		Livigno		
	Moische	yes	146	f	29		Livigno		
	Tell	yes	283	m	23		Valle del Braulio	Stelvio NP, Trentino & Sondrio (ITA)	
	Stift	yes	393	f	18		Valle del Braulio		
	Heinz-Serraglio	yes	W45	u	13		Zeburu		
	Felice	yes	375	f	19		Zeburu		
	Jo	maybe	169	f	28		Ortler		
	Caeli	yes	998	m	2	GPS		Vinschgau (AUT)	
	Smaragd	yes	675	m	9		Zermatt	Wallis & Berner Oberland (CHE)	
	Norbert	yes	W318	u	1				
	South-westerh	Fredueli	yes	1001	m	2	GPS		Haute Savoie (FRA)
Sixt Buett		maybe	W285	u	1		Sixt Fiz		
Nonno Bob		yes	548	m	12		Andagne		
Altitude		yes	W313	u	1	GPS	Peisey-Nancroix		
Stelvio		yes	W02	u	22		Termignon	Savoie (FRA)	
Gelas		yes	279	f	23		Termignon		
Désiré		yes	W325	u	1				
Simay		yes	983	m	2	GPS			
Girun		yes	904	f	4	GPS			
Basalte		yes	716	m	8		Malaval	Haut-Dauphiné (FRA)	
Elvio	yes	1026	m	1	GPS				
Roman	yes	854	m	5	GPS	Maira	Alpi Marittime (ITA)		
Belavri	yes	W288	u	1		Usseglio			
South-westerh	Bellemotte	yes	708	f	8		Bonette		
	Cuneobirding	yes	491	f	14		Chambeyron-Ubayette		
	Stephan	yes	616	m	10		Chambeyron-Ubayette		
	Sereno	yes	348	m	20		Source de l'Ubaye	Mercantour (FRA)	
	GT036	yes	-	f	-		Source de l'Ubaye		
	Tenao	yes	755	m	7	GPS	Val d'Entraunes		
	Gypse	maybe	W299	u	1		Source de la Tinée		
	Altaïr	maybe	W292	u	1				
	Kirsi	yes	764	m	7		Archiane		
Clapas	yes	975	m	2	GPS		Vercors (FRA)		
Pamela	yes	1031	f	1	GPS				

4.5 Estimated number of Bearded Vultures

E_{foc} - Based on observations (focal day):

Although the total amount of observations gathered during the IOD can be used as an indicative of the presence of Bearded Vultures, it is not possible to use data from the whole week (IOD-Period) due to the high mobility of the species (**Figure 4**). In order to omit the possibility of double counting birds and to create a more accurate picture of the Bearded Vulture distribution, only observations from the focal day were used to determine the approximate number of birds (*E_{foc}* = estimate based on observations (focal day) **Table 7**). Furthermore, regional coordinators were requested to communicate with nearby partners to avoid double counting of bird individuals.

E_{hyp} - Hypothetically present birds:

During the focal day it is not possible to observe and identify every single bird that is known to be present in a specific region. A second estimate (*E_{hyp}* = hypothetically present birds) composed of the estimate based on observations (focal day) *E_{foc}* and the number of individuals that were missed during the survey but that should be present in the region (e.g. territorial breeding pairs) should therefore give a picture of the expected number of Bearded Vulture individuals on the regional level (**Table 7**).

However, as the number of counted birds during the IOD depends on multiple external factors (weather conditions, observer etc.), these estimates are best used as a proxy for population trends and to be compared between years rather than directly and solely as a population size estimation.

E_{GPS} – GPS-tagged non-territorial floater birds:

Most of the GPS-tagged birds are non-adult floater birds, which do not necessarily stay in a certain area for a longer time period. Therefore, GPS-tagged individuals, which have not been observed during the IOD should be added to the subtotal of hypothetically present birds in order estimate the overall Alpine Bearded Vulture population.

Final estimate:

We estimate the number of Bearded Vultures observed on the focal day in the Alpine range to vary between 215 and 257 individuals (*E_{foc}*). Together with the birds that are known to be present in the region (mainly territorial birds from the breeding pairs) the estimate sums up to 238 and 322 individuals (*E_{hyp}*). Based on GPS-data we know, that 34 tagged birds were present in the Alpine range during this year's IOD. However, 18-22 of these individuals (*E_{GPS}*) were not identified by observers and should therefore be added to the estimate (*E_{hyp}*). Through the combination of estimates based on observation data, expert knowledge about territorial birds and GPS-data results it can be assumed that the number of Bearded Vultures in the Alpine population varies between **256** and **344** individuals.

These numbers are considerably higher compared to the results obtained during the last year's IOD, where the weather conditions were much less favourable (**Table 8**). The estimates of hypothetically present birds *E_{hyp}* represent 80% (conservative) or 108% (optimistic) of the total population that is predicted by the demographic model from Schaub et al. 2009 (predicted population size = 320, **Figure 7 and Table 10**) with a higher variance than the estimates from the last year (conservative = 208 (71%), optimistic = 284 (97%) with less favourable weather conditions). However, looking at the estimates based on observations only, it was possible to observe 67% or 80% respectively of the birds predicted by the model – considerably more than in 2018. In good weather conditions (thermals) the activity and flight distance of the birds increases, which can lead to double counting. In addition, more observations can generally be expected in good visibility.

Table 7. Estimates of minimal (conservative) and the maximal (optimistic) number of Bearded Vulture individuals observed during the focal day (E_{foc}) and hypothetically present (E_{hyp} = observed and known not-observed birds) in each region during the IOD 2019.

	Country	Region	E_{foc} - Estimate based on		E_{hyp} - Estimated number	
			min	max	min	max
	East subtotal		9	12	11	22
	AUT	Hohe Tauern NP	9	12	11	22
	Central subtotal		86	104	95	136
	GER	Bavarian Alps	0	0	0	0
	AUT	North Tyrol	7	7	7	7
	CHE	Central Switzerland	2	3	2	3
	CHE	Grison	51	59	54	81
	CHE	Ticino	3	5	3	5
	ITA	Vinschgau	2	4	5	9
	ITA	Stelvio NP, Sondrio, Brescia & Trentino Alto Adige	21	26	24	31
Alpine range	North-west subtotal		83	97	93	118
	CHE	Wallis & Berner Oberland	24	30	24	35
	FRA	Haute Savoie	12	17	15	23
	FRA	Savoie	36	37	39	42
	ITA	Valle d'Aosta & Gran Paradiso NP	11	13	15	18
	South-west subtotal		38	44	40	46
	FRA	Baronnies	0	0	0	0
	FRA	Haute Dauphiné	9	11	9	11
	FRA	Mercantour	10	10	12	12
	FRA	Vercors NP	5	6	5	6
ITA	Alpi Cozie	3	4	3	4	
ITA	Alpi Marittime - WAON	11	13	11	13	
Subtotal Alpine range			216	257	239	322
+ GPS-tagged birds that have not been observed during the IOD					18	22
Total Alpine range					257	344
Massif Central	FRA	Grands Causses & Cevennes NP	4	5	4	5
French Pyrenees	FRA	Aude	4	5	5	7
Spain (without Pyrenees)	ESP	Andalusia, La Rioja & Maestrazgo	16	16	29	37
+ GPS-tagged birds that have not been observed during the IOD					3	3
Total Spain					32	40
Bulgaria	BRG		0	0	0	0
Morocco	MAR		1	1	6	11

Table 8. Comparison of the estimated number of Bearded Vultures in the Alpine range based on the survey during the IOD 2019 in comparison to the estimates from the last six years.

	E_{foc} - Estimate based on observations (focal day only)		E_{hyp} - Estimated number of hypothetically present birds	
	min	max	min	max
IOD 2019	215	257	256	344
IOD 2018	153	177	208	284
IOD 2017	152	182	208	251
IOD 2016	149	178	172	218
IOD 2015	120	153	166	199
IOD 2014	87	95	112	130
IOD 2013	87	98	117	128

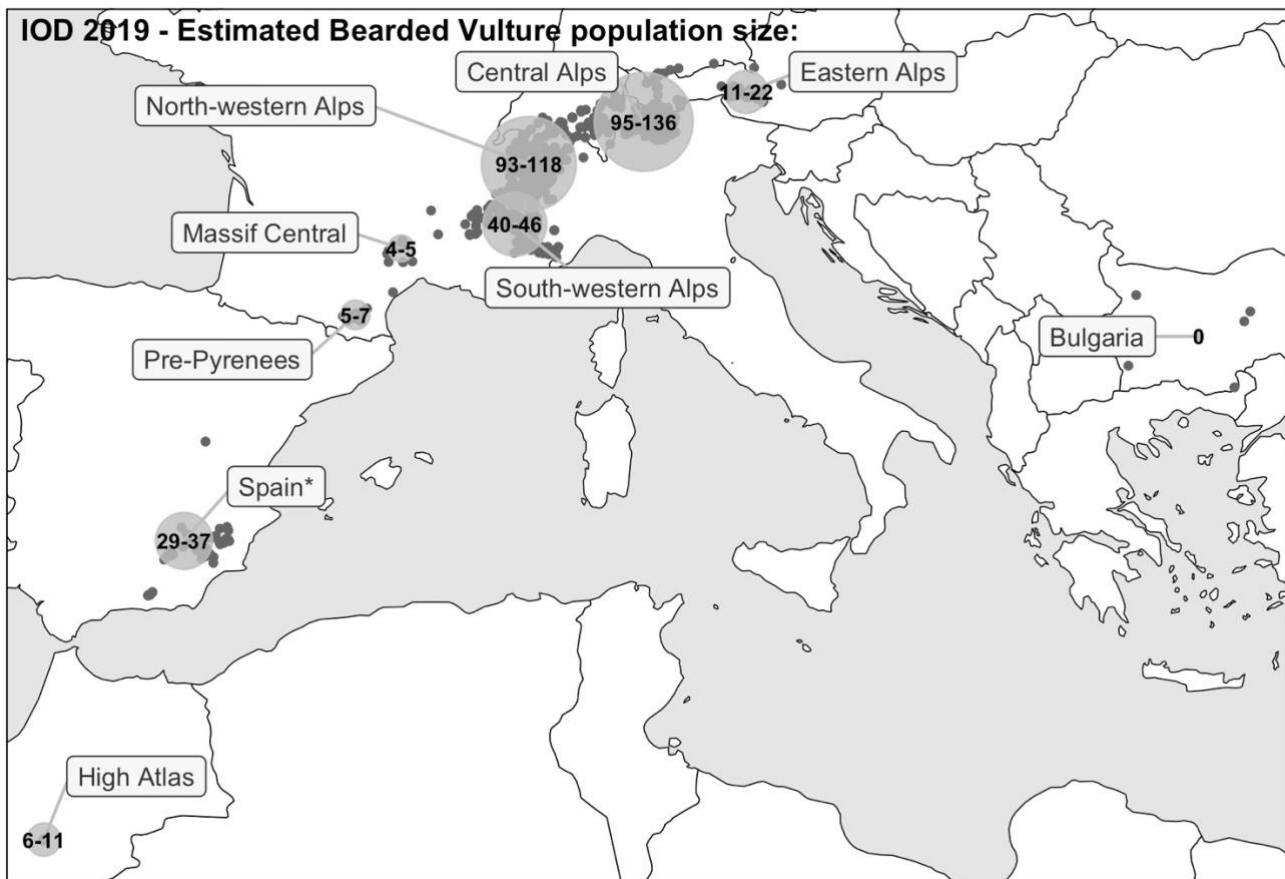


Figure 6. Overview of the estimated Bearded Vulture population size E_{hyp} on the regional level within the monitoring area of the IOD 2019. Estimates of the populations size are based on estimates derived from observations during the focal day of the IOD 2019 E_{foc} and an estimated number of birds that were not observed but should be present in the region (mostly territorial birds). *The estimate for Spain is based on observation data from the occupied observation sites (grey dots) without taking the Bearded Vulture population of the Spanish Pyrenees into account. In Spain Bearded Vultures roam between mountainous areas in the south and in central and northern Spain. The next southern population of the populations in southern Spain, is the critically endangered population of the High Atlas (MAR). No IOD was organised in Corsica (FRA) where a small population of 4 breeding pairs survived. Since 2016 a restocking program is ongoing on Corsica to support this small island populatin. Since their extinction in 1972 no Bearded Vultures are present in Bulgaria.

4.6 Proportional distribution of age classes in the Alpine range

By looking at the total number of observations during the IOD it is possible to get an overview of age class distribution, which should be representative of the general Alpine Bearded Vulture population. Per definition the IBM always uses calendar years (cy) for age specifications (**Table 9**).

Table 9. IBM-standard age classification.

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

Comparing the results from the absolute numbers of observations with the estimated number of individuals per age class indicates that, even though there is some variation, observation data can be used as an estimate for the age class distribution. The estimate of the age class distribution based on the data collected during the IOD 2019 is similar as in the last year's estimate. Most of the birds observed on the focal day were adults (52%), followed by immatures (20%), juveniles (15%) and subadults (7%). In fact, similarly to last year's results, the proportion of sighted birds aged in their 5th calendar year or older (subadults & adults - potentially in age to establish a territory) almost reaches 2/3 of the total number of observations (**Table 10**).

Finally, the results were compared to the expected number of living individuals per age class derived by the demographic model designed by Schaub et al. (2009) (**Table 10, Figure 7**). The results from **Figure 7** indicate that the percentage of juveniles, immatures and adults coincide quite well with the model predictions, while similar as in the previous years the proportion of subadults is underestimated by the observations from the IOD. This is also the case for the absolute numbers (E_{hyp}), where the estimated and predicted numbers overlapp quite well, except for the subadults.

There are multiple and additive explanations for the observed discrepancies in the age class distribution (A) and total estimate of the population size (B):

- A. More stable birds (adults) might be easier to recognise, detect and monitor as they settle into a region and are territorial. In addition, many observation sites were situated in the core area of known breeding units.
- A. Juveniles are also easier to detect as they are easier to discern from the other age classes and often the parents have already been detected and the territory is therefore regularly visited. Additionally, released birds up to 2 to 3 years can be identified individually thanks to the bleached feathers. Therefore, it is easier to identify birds of this age class.
- A. In general it is considered difficult for non professional ornitologist to determine the age of young vultures (especially subadult) and could therefore represent the number of observations under the category "unknown".
- B. The model of Schaub et al. (2009) is based on survival rates over the whole Alpine area and does not take differences in regions into account.
- B. The model of Schaub et al. (2009) is based on only two survival rates. One for juveniles (1.cy) and one for all older birds.

Table 10. Proportion of Bearded Vultures per age class based on observations reported during the focal day during the IOD 2019. Based on these observations the regional coordinators estimated a minimal and maximal number of Bearded Vultures per age class (estimated from observations E_{foc}). The estimate of the birds that are hypothetically present also includes territorial birds, the birds that are known to be present in the region as well as the GPS-tagged birds that have not been identified during the IOD-period (estimated hypothetically present E_{hyp}).

Age class	Observed focal day only absolut	Estimated				Predicted	
		E _{foc}		E _{hyp}		Model Schaub et al. 2009	
		mean(min,max)	%	mean(min,max)	%	absolut	%
adult	411	126	52%	161	53%	168	53%
subadult	29	18	7%	27	9%	46	14%
immature	127	48	20%	59	19%	63	20%
juvenile	99	36	15%	41	14%	43	13%
unknown	83	15	6%	15	5%	-	-
Total	749	243	100%	303	100%	320	100%

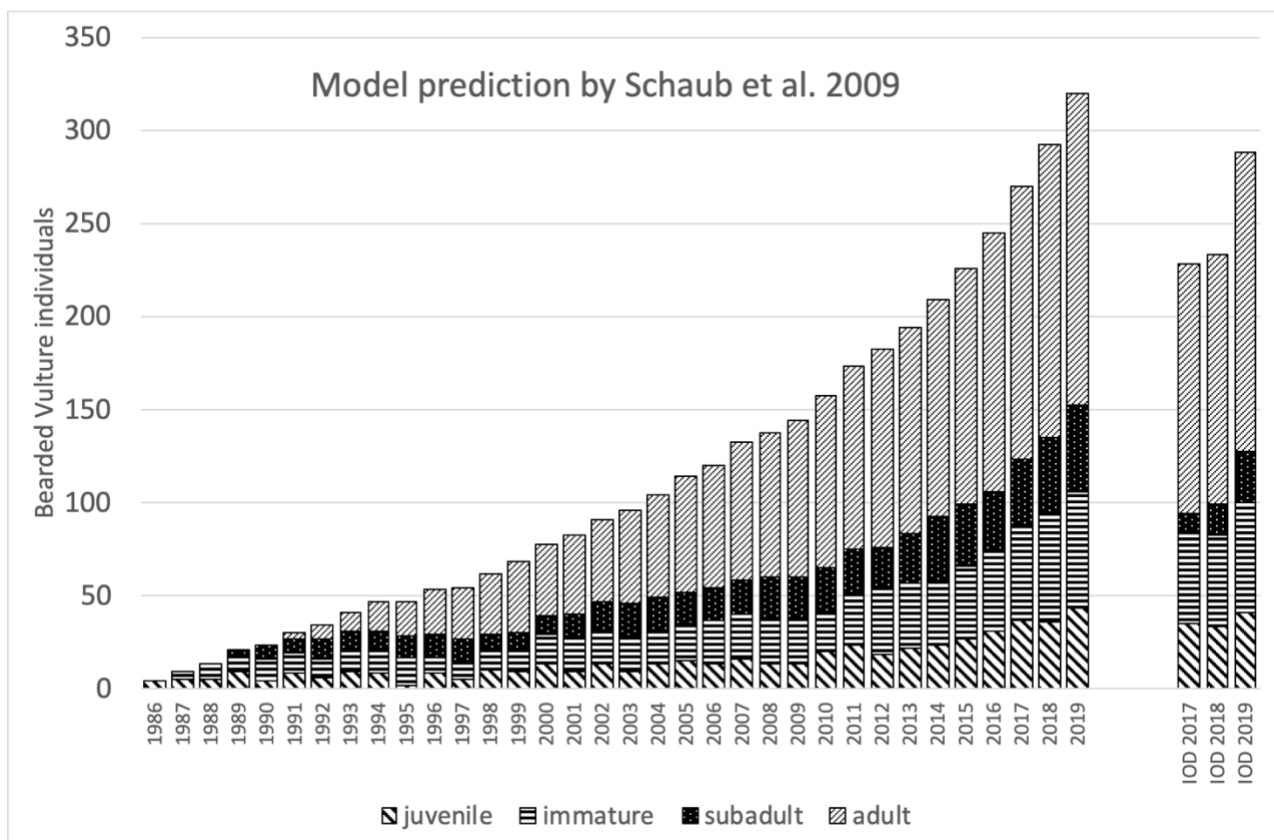


Figure 7. Predicted number of Bearded Vultures per age class according to the demographic model by Schaub et al. 2009^a in comparison to the estimated number of birds that should hypothetically be present based on observation data (IOD 2019) and expert knowledge from regional coordinators. (*mean of minimal = 257 and maximal = 344 estimated number of hypothetically present Bearded Vultures and the GPS-tagged birds that have not been identified during the IOD 2019; birds with unknown age are not included).

4.7 Spatial distribution of age groups

From 677 sites 832 Bearded Vulture sightings have been recorded during the whole period, 806 during the focal day (**Table 3**).

In terms of reintroduction and resettlement of a species like the Bearded Vulture, it is of interest to gain a picture of the spatial distribution of different age classes. In particular, the presence of sexually mature adult birds can be an indicator for the formation of new reproductive units in the periphery of the species' distribution.

The following figures (**Figure 8 - Figure 14**) show the presence of Bearded Vultures subdivided in the two age groups adult and non-adult (juvenile, immature, subadult) at the regional level and give a more detailed overview on the Bearded Vulture distribution during the whole observation period. Each symbol on the map represents the position of an observation site (except Figure 15).

For Morocco, a distribution of the Bearded Vulture distribution was provided by F. Cuzin (Figure 15).

4.7.1 Alpine range

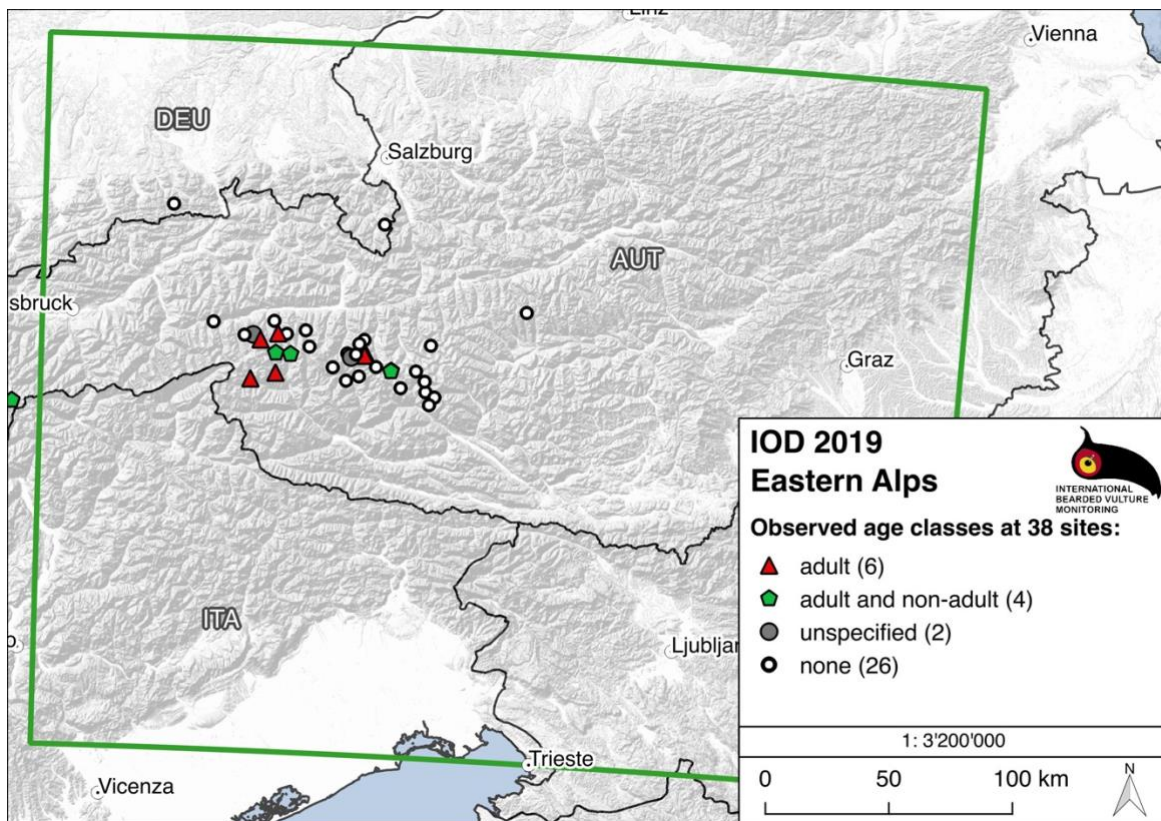


Figure 8. Age class distribution observed at 38 sites in the Eastern Alps during the IOD 2019. Estimated number of Bearded Vulture individuals in this sector: 9-13 adult, 3-6 subadult, ≤3 immature, ≤1 juvenile and 3 unspecified birds. Total 11 – 22 Bearded Vultures (GPS-tagged floaters not included).

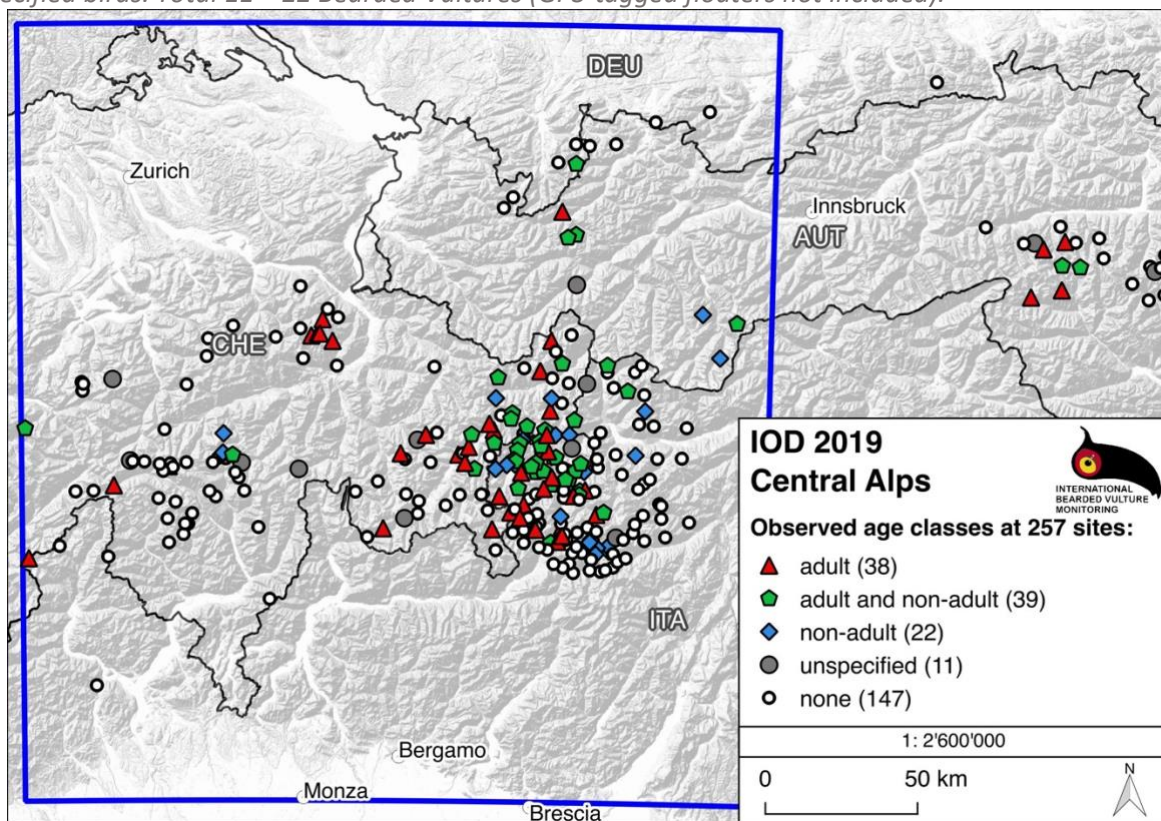


Figure 9. Age class distribution observed at 257 sites in the Central Alps during the IOD 2019. Estimated number of Bearded Vulture individuals in this sector: 52-67 adult, 5-11 subadult, 19-29 immature, 11-18 juvenile and 4-7 unspecified birds. Total 95 – 136 Bearded Vultures (GPS-tagged floaters not included).

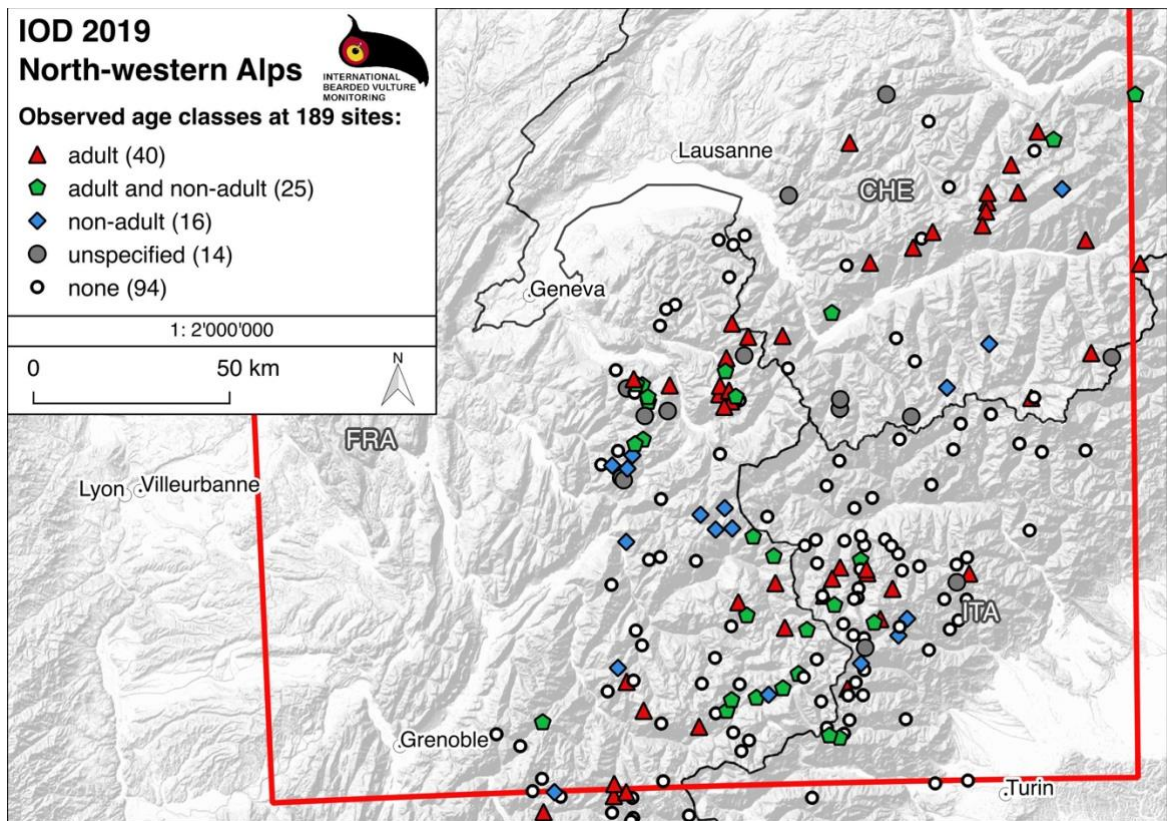


Figure 10. Age class distribution observed at 189 sites in the north-western Alps during the IOD 2019. Estimated number of Bearded Vulture individuals in this sector: 57-75 adult, 5- 6 subadult, 19-21 immature, 12-15 juvenile and ≤1 unspecified birds. Total 93 – 118 Bearded Vultures (GPS-tagged floaters not included).

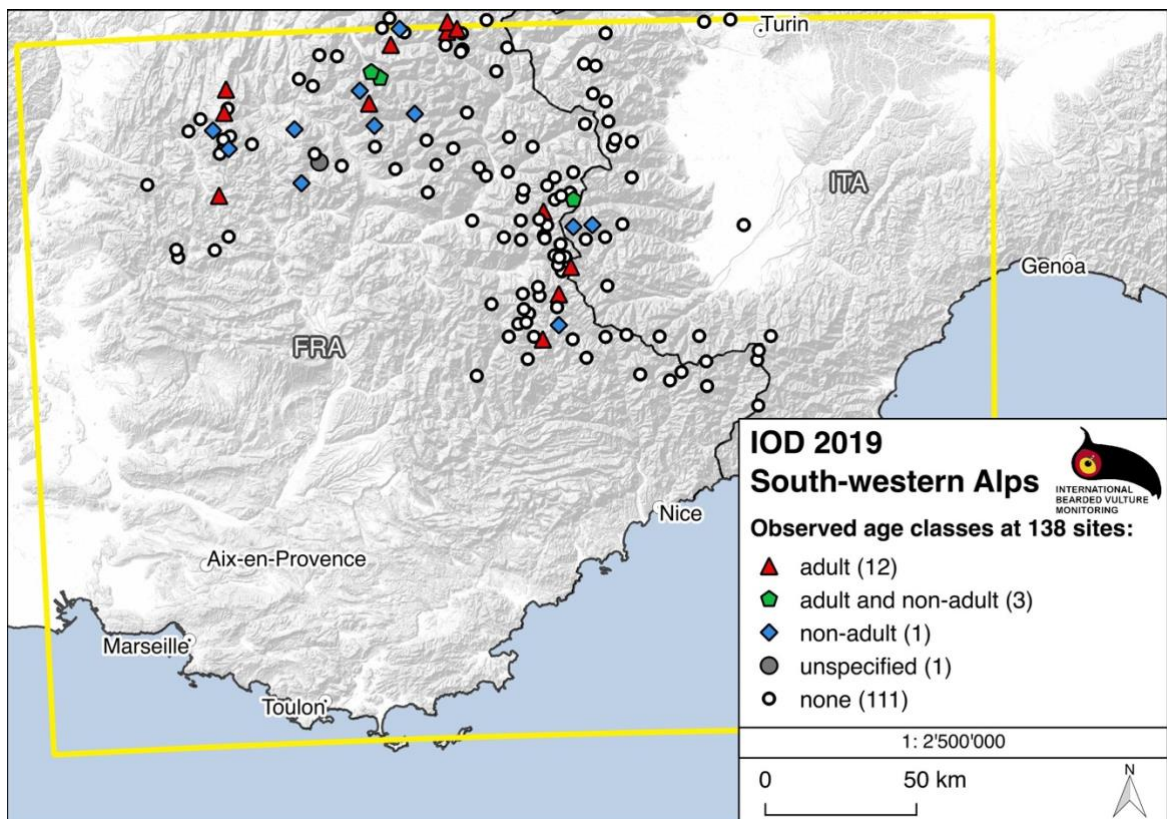


Figure 11. Age class distribution observed at 138 sites in the north-western Alps during the IOD 2019. Estimated number of Bearded Vulture individuals in this sector: 20-22 adult, 3-4 subadult, 5 immature, 8-9 juvenile and 4-6 unspecified birds. Total 40-46 Bearded Vulture (GPS-tagged floaters not included).

4.7.2 Massif Central & French Pyrenees

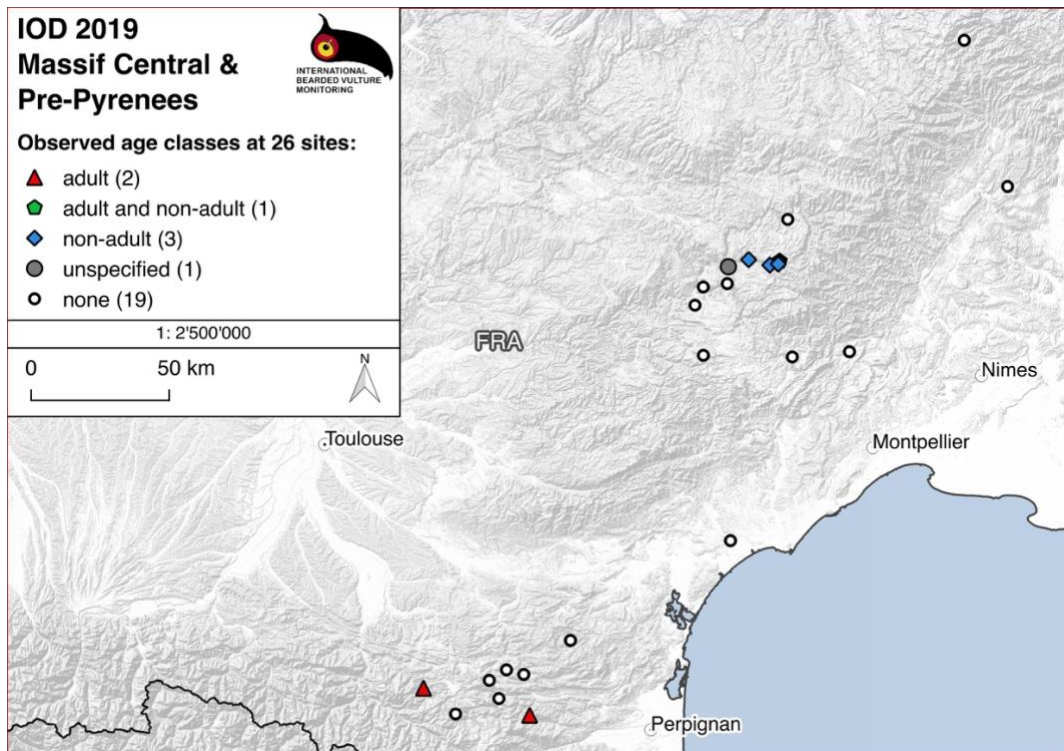


Figure 12. Age class distribution observed at 26 sites in the region between the Massif Central and the french Pyrenees during the IOD 2019. Estimated number of Bearded Vulture individuals in this sector: 6-8 adult, ≤1 subadult, 1 immature and 2 juvenile birds. Total 9 - 12 Bearded Vultures (GPS-tagged floaters not included).

4.7.3 Spain

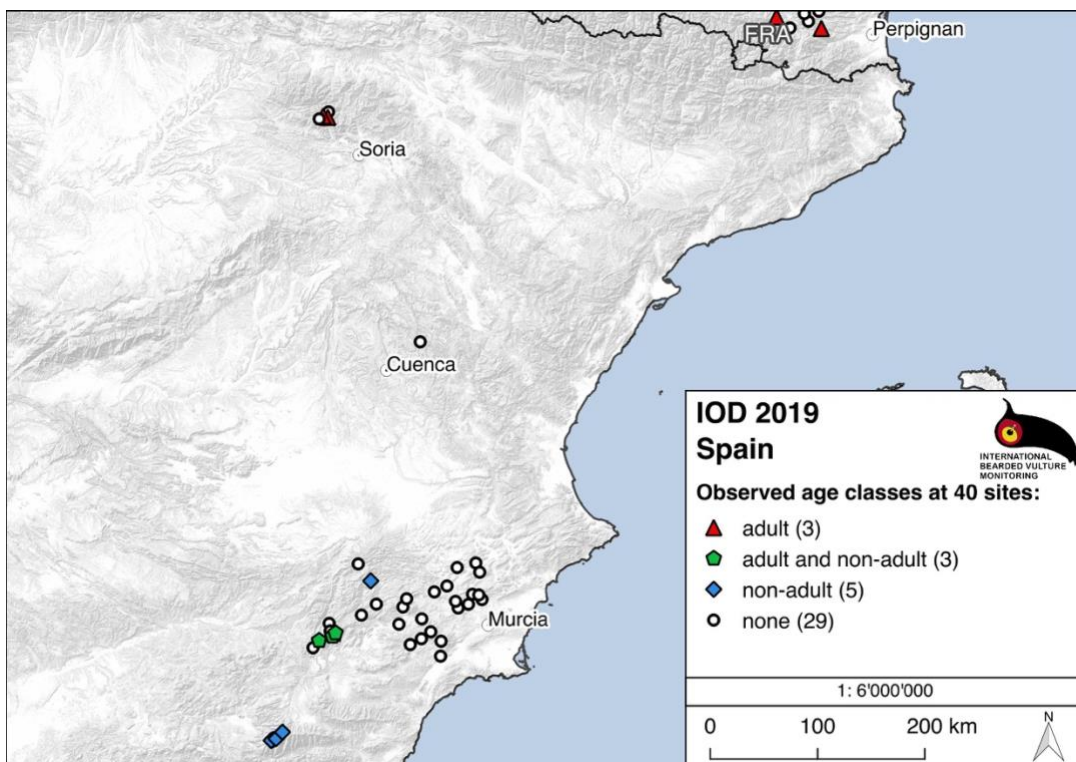


Figure 13. Age class distribution observed at 40 sites in Spain during the IOD 2019. Estimated number of Bearded Vulture individuals: 13-18 adult, 7 subadult, 4-7 immature and 5 juvenile birds. Total around 29-37 Bearded Vultures.

4.7.4 Bulgaria

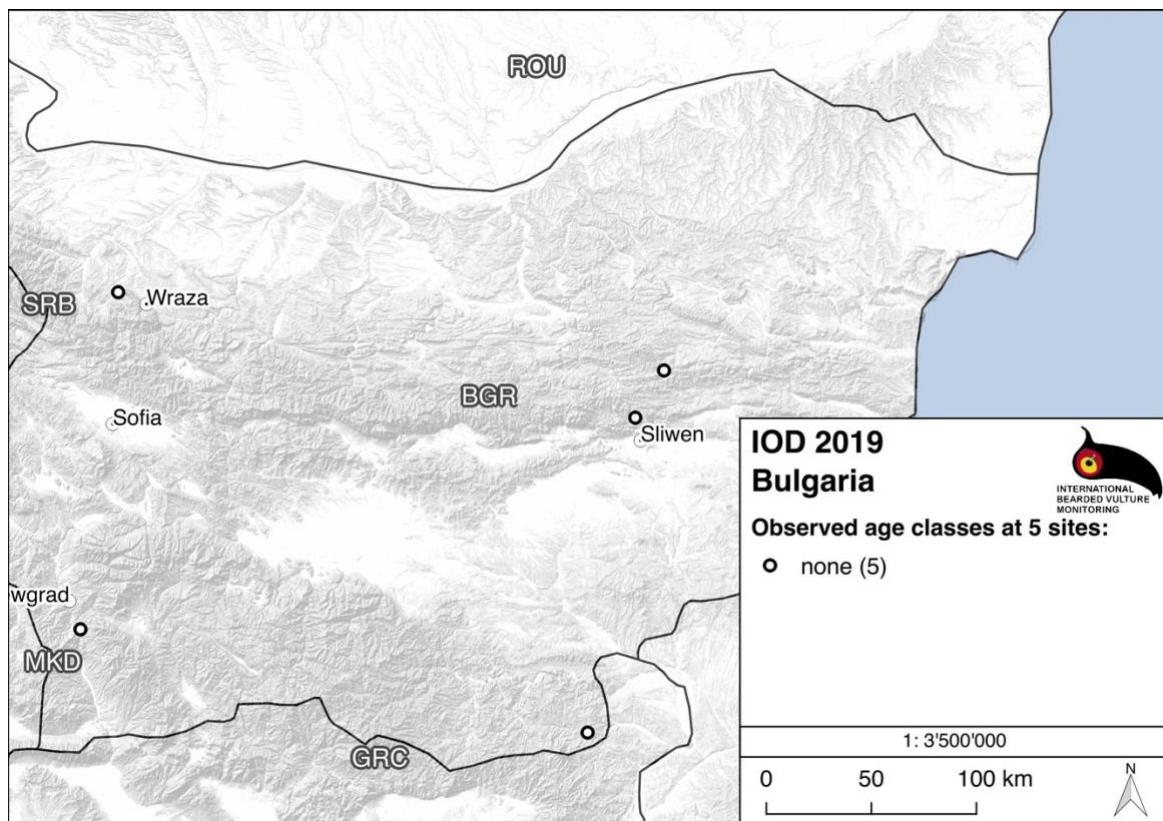


Figure 14. Age class distribution observed at 5 sites in Bulgaria during the IOD 2019. At the moment no Bearded Vultures are present in Bulgaria, since their extinction in 1972.

4.7.5 Morocco

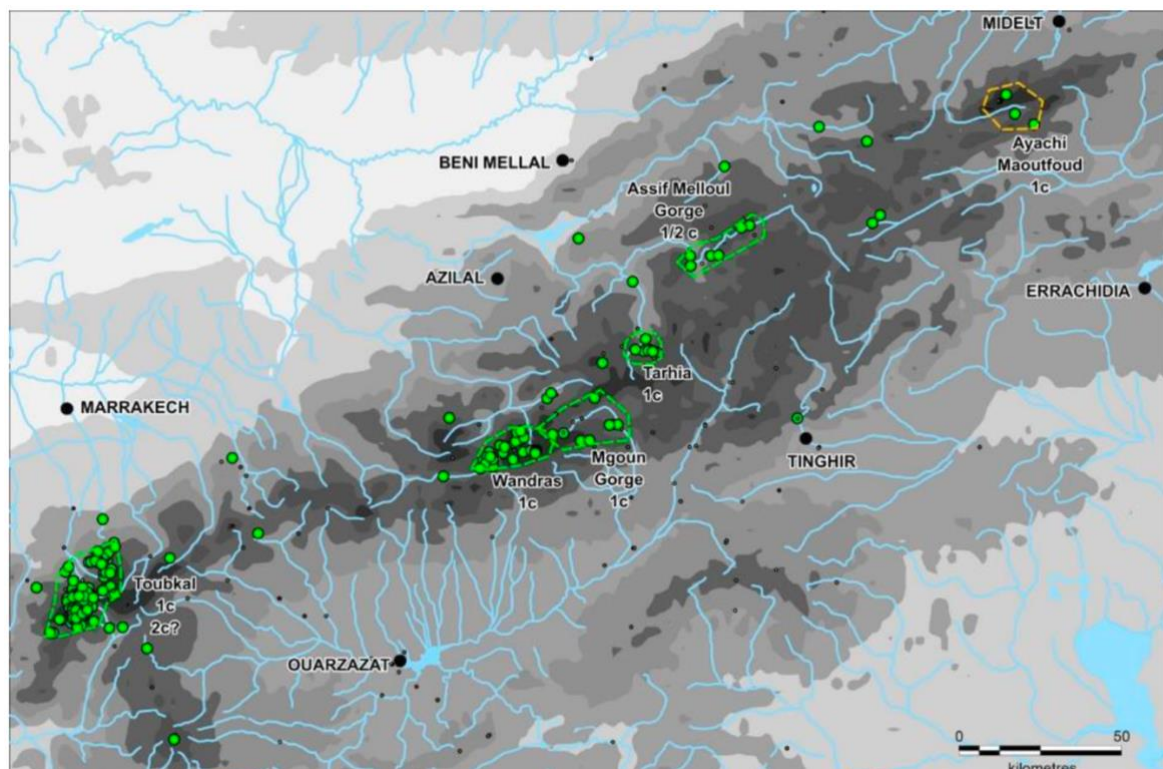


Figure 15. Known distribution area of the Bearded Vulture in the High Atlas of Morocco - BD F.CUZIN. The population in the area monitored during the IOD is estimated to vary between 6 – 11 birds.

5 Outlook 2020

The IBM steering committee fixed the date for the next International Observation Day:

Period 3rd - 10th of October 2020

Focal day is the 3rd of October 2020.

Even though a period of one week was chosen for public communication, we would like to stress the importance of focused observation intensity. Observations can be cumulated only within the core period. Therefore, **the count by specialists and volunteers on observation posts shall be carried out only during the focal day.**

The focal time for the count starts at 10 am to at least 3 pm.

6 Acknowledgements

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- ◆ *Azienda Faunistica- venatoria Albergian*
- ◆ *Carabinieri Forestali di Bardonecchia*
- ◆ *Carabinieri Forestali di Pragelato*
- ◆ *Carabinieri Forestali di Torre Pellice*
- ◆ *Ente di gestione Alpi Cozie rangers, colleagues and volunteers*
- ◆ *Gruppo Piemontese Studi Ornitologici*
- ◆ *Servizio Aree protette Coo. Gev Area Metropolitana Torino*
- ◆ *Servizio Tutela della Fauna e della Flora - Città Metropolitana di Torino*
- ◆ *Unione Montana del Pinerolese*
- ◆ *Castilla La Mancha, provincia de Albacete (JA López Donate, Miguel Fajardo, Antonio Catalán, Amas y Voluntarios)*
- ◆ *Castilla La Mancha, provincia de Cuenca (Enrique Montero y Amas)*
- ◆ *Junta de Andalucía, Consejería de Agricultura, Ganadería, Pesca y Desarrollo Sostenible (Iñigo Fajardo)*
- ◆ *La Rioja (Luis Lopo, Juan Ignacio Ibáñez, David Martín y Amas)*
- ◆ *Murcia (Mario León, Emilio Aledo, Nestor Yelo y Amas)*
- ◆ *Parque Nacional de Sierra Nevada (Blanca Ramos, JM Barea, Pablo Galdo, Gonzalo Muñoz y familia, Amas y voluntarios)*
- ◆ *Parque Natural de Cazorla, Segura y Las Villas (Amas y voluntarios)*
- ◆ *Plan de Recuperación y Conservación de Aves Necrófagas Enrique Ávila, Luis Cardente, Pepe Bueno). Estrategia Lucha Contra el Veneno (Jesús Olivares).*
- ◆ *Parco Nazionale Gran Paradiso: Martino Nicolino, Stefano Borney, Alberto Peracino, Stefano Cerise, Bruno Bassano, Antonio Mingozi ed Enrico Bassi*
- ◆ *Regione Autonoma Valle d'Aosta (Christian Chioso) with the rangers of Corpo forestale della Valle d'Aosta, including the Parco Naturale del Mont Avic*
- ◆ *Asters, Conservatoire d'espaces naturels Haute-Savoie with the observer network of Asters, LPO 74 in the Haute-Savoie region, CCPEVA and GRIFEM.*
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- ◆ *LPO Drôme*
- ◆ *Vautours en Baronnie*
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- ◆ *Fund for Wild Flora and Fauna (Emilyan Stoinov, Hristo Peshev)*
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- ◆ *400 hunters from the eastern Tyrol*
- ◆ *Gebietsbetreuung Mangfallgebirge*
- ◆ *Landesbund für Vogelschutz (Henning Werth) with observer network Allgäu/Tannheimer Tal/Lechtal*
- ◆ *Nationalpark Berchtesgaden*
- ◆ *Alpi Marittime Natural Park (Fabiano Sartirana & Giuseppe Canavese)*
- ◆ *Comunità Montana della Val Pellice (Robi Janavel)*
- ◆ *Ente di Gestione delle Aree Protette dell'Ossola (Radames Bionda)*
- ◆ *Lipu Biella - Vercelli (Aldo Pietrobon)*
- ◆ *Monviso Natural Park (Daniele Garabello e Mara Calvini)*
- ◆ *Società di Scienze Naturali Verbano Cusio Ossola (Lucia Pompilio)*
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- ◆ *Association Le Rougegorge (Kerstin & Pierre Karbe-Lauener)*
- ◆ *Réseau Gypaète Suisse occidentale (François Biollaz, Michael Schaad, Marco Hammel & Julia Wildi)*
- ◆ *Vogelwarte Sempach*
- ◆ *CTA Bormio (Riccardo Ghilotti and Carabinieri Forestali)*
- ◆ *Guardie Ecologiche Volontarie Valle Camonica (Mauro Speziari)*
- ◆ *MUSE di Trento (Paolo Pedrini)*
- ◆ *Parco Nazionale dello Stelvio/Stilfserjoch (Enrico Bassi, Christian Pentori, Franco Rizzolli, Alberto Pastorino, Andrea Roverselli, Alessandro Nardo and Hans Peter Gunsch)*
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- ◆ *Stazioni Forestali del settore trentino e altoatesino del Parco Nazionale dello Stelvio (wardens)*
- ◆ *Ufficio Distrettuale Forestale di Malè (Fabio Angeli and wardens)*
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Participants / Observers

<i>Adèle Opolka</i>	<i>Andi Kofler</i>	<i>Annik Juen</i>	<i>Benoit Tomczack</i>
<i>Adrian Aebischer</i>	<i>Andrè Bortolameo</i>	<i>Anouk Boistard</i>	<i>Benyoub Abdelbaki</i>
<i>Adriana Veronesi</i>	<i>André Foulu</i>	<i>Anouk Taucher</i>	<i>Bernadette Maltese</i>
<i>Adriano Caldera</i>	<i>André Pichard</i>	<i>Anrrondeau Gaétan</i>	<i>Bernard Drillat</i>
<i>Adrien Petot</i>	<i>André Weiss</i>	<i>Anthony Turpaud</i>	<i>Bernard Michellod</i>
<i>Agnès Delorme</i>	<i>André Zapun</i>	<i>Antoine Marnat</i>	<i>Bernard Moniez</i>
<i>Agnès Fossey</i>	<i>Andrea Ferrari</i>	<i>Antoine Masclet</i>	<i>Bernard Thomas</i>
<i>Agostino Parisi</i>	<i>Andrea Gorreri</i>	<i>Anton Pegoraro</i>	<i>Bernhard Permoser</i>
<i>Alain Bernini</i>	<i>Andrea Leccese</i>	<i>Anton Stecher</i>	<i>Blanca Kleiber</i>
<i>Alain Bloc</i>	<i>Andrea Maurici</i>	<i>Antonin Dalibor</i>	<i>Boris Mittermeier</i>
<i>Alain Chastin</i>	<i>Andrea Millhäuser</i>	<i>Antonio Angulo</i>	<i>Brice Palhec</i>
<i>Alain Giraud</i>	<i>Andrea Nicoli</i>	<i>Antonio Gonzalo Muñoz</i>	<i>Brice Redon</i>
<i>Alain Girodon</i>	<i>Andrea Ragazzoni</i>	<i>Antonio Lingua</i>	<i>Brigitte Kuhn</i>
<i>Alain Heyraud</i>	<i>Andrea Roverselli</i>	<i>Antonio Mingozzi</i>	<i>Brigitte Pierson</i>
<i>Alain Lefebvre</i>	<i>Andrea Stampanoni</i>	<i>Antonio Ronconi</i>	<i>Bruno Cuerva</i>
<i>Alberto Mocellini</i>	<i>Andrea Thom</i>	<i>Arcangelo Vita</i>	<i>Bruno Gruber</i>
<i>Alberto Palmarin</i>	<i>Andrea Vegetti</i>	<i>Armand Dussex</i>	<i>Bruno Mooser</i>
<i>Alberto Pastorino</i>	<i>Andrea Vignetta</i>	<i>Armando Janett</i>	<i>Bruno Siviero</i>
<i>Alberto Peracino</i>	<i>Andrea Zanolli</i>	<i>Arturo Gargioni</i>	C <i>Roberto</i>
<i>Alberto Rossotto</i>	<i>Andreas Angermann</i>	<i>Astrid Oehl</i>	<i>Camille Chevallier</i>
<i>Alberto Sancho</i>	<i>Andreas Gantenbein</i>	<i>Athos Conti</i>	<i>Camille Fahed</i>
<i>Aldo Fasoli</i>	<i>Andreas Gärber</i>	<i>Aude Etcheverry</i>	<i>Camille Laurin</i>
<i>Aldo Pietrobon</i>	<i>Andreas Weiss</i>	<i>Audrey Previtali</i>	<i>Camille Pinel</i>
<i>Aldo Rizzo</i>	<i>Andrew Hargreaves</i>	<i>Aurel Salamin</i>	<i>Camille Tournier</i>
<i>Alessandro Bergamo</i>	<i>Anette Dorn</i>	<i>Aurélien Dion</i>	<i>Carlo Artese</i>
<i>Alessandro Corgatelli</i>	<i>Angela Schenatti</i>	<i>Aurelio Lubini</i>	<i>Carlo Micheli</i>
<i>Alessandro Mercogliano</i>	<i>Angèle Macé</i>	<i>Authier Christophe</i>	<i>Carlos Herrera</i>
<i>Alessandro Mucciolo</i>	<i>Angélica Ruz</i>	Barbara <i>Jenny</i>	<i>Carola Reetz</i>
<i>Alessandro Perron</i>	<i>Angelo Battaglia</i>	<i>Barbara Li Sanli</i>	<i>Caroline Druesne</i>
<i>Alessandro Voulaz</i>	<i>Angelo Dan</i>	<i>Bassano Riboni</i>	<i>Caroline Huet</i>
<i>Alex Gruit</i>	<i>Angelo Pasqua</i>	<i>Bastien Pascal</i>	<i>Carolyn Nabholz</i>
<i>Alex Martin Vairetto</i>	<i>Anita Schweizer</i>	<i>Bastien Vallat</i>	<i>Catherine Beciu</i>
<i>Alexander Dettwiler</i>	<i>Anna Chan Tat Saw</i>	<i>Battista Silvestri</i>	<i>Catherine Maugendre</i>
<i>Alexis Genuy</i>	<i>Anna Foieri</i>	<i>Bea Stucki</i>	<i>Catherine Nombret</i>
<i>Alfonso Cirolo</i>	<i>Anna Funaro</i>	<i>Beat Egli</i>	<i>Catherine Ravary</i>
<i>Alicia Dupraz</i>	<i>Anna Pecile</i>	<i>Beat Landolf</i>	<i>Cathy Ribot</i>
<i>Alicia Mabillard</i>	<i>Anna Russ</i>	<i>Beat Wartmann</i>	<i>Cécile Laurencot</i>
<i>Aligon Anaïs</i>	<i>Annalisa Brucoli</i>	<i>Beatrice Pozzi</i>	<i>Cécile Valembois</i>
<i>Aline Guizzetti</i>	<i>Annalisa Rebecchi</i>	<i>Ben Chomel</i>	<i>Cecilia Tambone</i>
<i>Alix Guedou</i>	<i>Anne Zanolin</i>	<i>Bénédicte Elluin</i>	<i>Cédric Avignon</i>
<i>Almudena Vélez</i>	<i>Anne-Laure Bonato</i>	<i>Benjamin Griffoul</i>	<i>Cédric Cabrera</i>
<i>Ana Moreno</i>	<i>Anne-Laure Bouteyre</i>	<i>Benjamin Huet</i>	<i>Cédric Lardanchet</i>
<i>Anaïs Mas</i>	<i>Anne-Marie Trahin</i>	<i>Benjamin Plumecocq</i>	<i>Célestin Luisier</i>
<i>Anais Merdignac</i>	<i>Annick Obert</i>	<i>Benoit Cony</i>	<i>Céline Michaux</i>

<i>Cesare Dell'acqua</i>	<i>Claudio Crespi</i>	<i>Dario De Siena</i>	<i>Eduard Resinger</i>
<i>Chantal Faury</i>	<i>Claudio Foglini</i>	<i>Dario Favre</i>	<i>Eduardo Di Trapani</i>
<i>Chantal Mermier</i>	<i>Claudio Gilardi</i>	<i>Dauverné Lise</i>	<i>Elena Castagna</i>
<i>Chiara Andreola</i>	<i>Claudio Ibba</i>	<i>David Jenny</i>	<i>Elena Grasso</i>
<i>Chiara Caminada</i>	<i>Claudio Irniger</i>	<i>David Kaufmann</i>	<i>Eli Mordasini</i>
<i>Chiara Dragonetti</i>	<i>Claudio Pozzi</i>	<i>David Keheyen</i>	<i>Elio Polla</i>
<i>Chiara Gabrielli</i>	<i>Cléa Deyres</i>	<i>David Leroy</i>	<i>Elisa Reyne</i>
<i>Chiara Juri</i>	<i>Clément Barbeyrac</i>	<i>David Margerie</i>	<i>Elisa Ricci</i>
<i>Chiara Scandolara</i>	<i>Clément Beuret</i>	<i>David Ulrich</i>	<i>Elisabeth Bürkli</i>
<i>Chiara Solari</i>	<i>Coralie Theux</i>	<i>David Weiss</i>	<i>Elisabeth D'hauteville</i>
<i>Chiara Spadetti</i>	<i>Corinne Binet</i>	<i>Davide Facchetti</i>	<i>Elisabeth Kalbermatten</i>
<i>Christa Kronig</i>	<i>Corinne Meizenc</i>	<i>Davide Keller</i>	<i>Elisabeth Schmitt</i>
<i>Christian Brunet</i>	<i>Cornelia Huerzeler</i>	<i>Davide Sigaud</i>	<i>Elodie Bousiqueau</i>
<i>Christian Couloumy</i>	<i>Corsin Wetter</i>	<i>De Vathaire Anne</i>	<i>Emanuela Marzoli</i>
<i>Christian Haslinger</i>	<i>Cristian De Lorenzi</i>	<i>Debora Barolin</i>	<i>Emanuele Forlani</i>
<i>Christian Michel</i>	<i>Cristina Di Noia</i>	<i>Delphine Edel</i>	<i>Emanuele Manzi</i>
<i>Christian Moro</i>	<i>Cristina Movalli</i>	<i>Demis Massoni</i>	<i>Emil Kuen</i>
<i>Christian Pierson</i>	<i>Cristina Nencini</i>	<i>Denis Attinault</i>	<i>Emilie Mugnier-Merlin</i>
<i>Christian Roussel</i>	<i>Cristobal Muñoz</i>	<i>Denis Dezarnaud</i>	<i>Emilio Galipienso</i>
<i>Christian Steiner</i>	<i>Curdin Florineth</i>	<i>Didier Lethenet</i>	<i>Emilio López</i>
<i>Christian Tessier</i>	<i>Curdin Köhli</i>	<i>Didier Warnet</i>	<i>Emilyan Stoinov</i>
<i>Christiane Ceillé</i>	<i>Cynthia Auge</i>	<i>Diego Ebranati</i>	<i>Emmanuel Chaussard</i>
<i>Christine Barteï</i>	<i>Cyril Dommergue</i>	<i>Diego Franchini</i>	<i>Emmanuel Domet-De-Mont</i>
<i>Christine Buscat</i>	<i>Cyril Prevent</i>	<i>Dolores De Maria</i>	<i>Emmanuel, Cappe</i>
<i>Christine Geanty</i>	<i>Dada Oreiller</i>	<i>Domenic Godly</i>	<i>Emmanuelle Allamano</i>
<i>Christine Juliand</i>	<i>Damien Ibanez</i>	<i>Domenic Scharplatz</i>	<i>Emmanuelle Sana</i>
<i>Christine Petiteau</i>	<i>Daniel Buehlmann</i>	<i>Domenico Albano</i>	<i>Emmanuelle Voisin</i>
<i>Christophe Gerrer</i>	<i>Daniel Carde</i>	<i>Domenico Contratto</i>	<i>Endrich Silvestri</i>
<i>Christophe Goetz</i>	<i>Daniel Chiardola</i>	<i>Domenico Mirlocca</i>	<i>Enrico Bassi</i>
<i>Christophe Gotti</i>	<i>Daniel Godli</i>	<i>Domenico Pogna</i>	<i>Enrico Boetto</i>
<i>Christophe Pasini</i>	<i>Daniel Huerzeler</i>	<i>Domenico Rosselli</i>	<i>Enrico Caprio</i>
<i>Christophe Thomas</i>	<i>Daniel Kühler</i>	<i>Dominique Draperi</i>	<i>Enrico Ferrarini</i>
<i>Cinzia Fornero</i>	<i>Daniel Miolan</i>	<i>Dominique Fahed</i>	<i>Enrique Ávila</i>
<i>Claire Oddou</i>	<i>Daniel Thonon</i>	<i>Dominique Gauthier</i>	<i>Enrique Villa</i>
<i>Claire Wetzstein</i>	<i>Daniela Praolini</i>	<i>Dominique Michellod</i>	<i>Eraldo Vuillermoz</i>
<i>Clara Petazzi</i>	<i>Daniele Capello</i>	<i>Dominique Mouchené</i>	<i>Eric Baudin</i>
<i>Claude Chabrol</i>	<i>Daniele Cigana</i>	<i>Dominique Petitjean</i>	<i>Eric Frank</i>
<i>Claude Pfau</i>	<i>Daniele Feriozzi</i>	<i>Dominique Robin</i>	<i>Eric Ollieu</i>
<i>Claude Romain</i>	<i>Daniele Spigoli</i>	<i>Dominique Secondi</i>	<i>Eric Vimercati</i>
<i>Claudia Baumberger</i>	<i>Daniele Valfré</i>	<i>Dominique Vincent</i>	<i>Erich Joos</i>
<i>Claudia Linty</i>	<i>Daniele Vezzoli</i>	<i>Doris Schmid</i>	<i>Etienne Marle</i>
<i>Claudia Müller</i>	<i>Daniele Zonari</i>	<i>Durand Camille</i>	<i>Ettore Mozzetti</i>
<i>Claudia Pleickner</i>	<i>Dario Azzalin</i>	<i>Edi Busana</i>	<i>Eugen Jenal</i>
<i>Claudio Bazzell</i>	<i>Dario Cretier</i>	<i>Edith Carrel</i>	<i>Eugen Wallnofer</i>
<i>Claudio Calco</i>	<i>Dario Crinari</i>	<i>Edith Gentzik</i>	<i>Eugenio Osele</i>

<i>Eusebio Gil</i>	<i>Franck Parchoux</i>	<i>Gianpaolo Palladino</i>	<i>Hervé Cortot</i>
<i>Evelyne Debette</i>	<i>Franco Rizzolli</i>	<i>Gil Streichert</i>	<i>Hervé Picq</i>
<i>Evelyne Saint Dic</i>	<i>François Breton</i>	<i>Gilles Moisson</i>	<i>Hervé Tournier</i>
F Barile	<i>Francois Claude</i>	<i>Gino Delpero</i>	<i>Hristo Peshev</i>
<i>Fabiano Sartirana</i>	<i>Françoise Chaussard</i>	<i>Giorgia Gaibani</i>	<i>Hubert Alexia</i>
<i>Fabio Consolino</i>	<i>Françoise Chevalier</i>	<i>Giorgio Bonomi</i>	<i>Hubert Christian</i>
<i>Fabrizio Bertholin</i>	<i>Françoise Nolibois</i>	<i>Giorgio Mangili</i>	<i>Hubert Evelyne</i>
<i>Fabrizio Maestrani</i>	<i>Françoise Tabardel</i>	<i>Giovanni Bailo</i>	<i>Hubert Köllemann</i>
<i>Fadri Bott</i>	<i>Franz Pleickner</i>	<i>Giovanni Gandini</i>	<i>Hubert Stillebacher</i>
<i>Famille Challes</i>	<i>Franziska Buehlmann</i>	<i>Giovanni Sambinelli</i>	<i>Hugo Padilla</i>
<i>Fanny Routin</i>	<i>Franziska Lörcher</i>	<i>Giovanni Vairo</i>	<i>Ignacio Gámez</i>
<i>Fantino Marion</i>	<i>Fred Varlet</i>	<i>Giulia Zanetti</i>	<i>Ignacio Henares</i>
<i>Faustine Genin</i>	<i>Frédéric Bessonnet</i>	<i>Giulio De Carlo</i>	<i>Ilario Belotti</i>
<i>Fausto Gianera</i>	<i>Fulgencio Sanchez</i>	<i>Giulio Machet</i>	<i>Ilhoa Weiss</i>
<i>Fedele Aioldi</i>	<i>Fyodor Cheredeyeff</i>	<i>Giuseppe Bongiolatti</i>	<i>Ilyan Stoev</i>
<i>Federica Guidotti</i>	Gabriele Cristiani	<i>Giuseppe Camelliti</i>	<i>Ingrid Chapel</i>
<i>Federico Peretti</i>	<i>Gabriele Gianatti</i>	<i>Giuseppe Castelli</i>	<i>Iris Silviera</i>
<i>Federico Pino</i>	<i>Gabriele Pizzo</i>	<i>Giuseppe Dalla Torre</i>	<i>Irma Botta</i>
<i>Federico Tettamanti</i>	<i>Gabriele Romanenghi</i>	<i>Giuseppe Ferrero</i>	<i>Irmgard Jung</i>
<i>Félix Grosset</i>	<i>Gabriele Simonini</i>	<i>Giuseppe Marianini</i>	<i>Isabelle Battentier</i>
<i>Ferdinand Lainer</i>	<i>Gabriele Wolf</i>	<i>Giuseppe Mirlocca</i>	<i>Isabelle Epp-Nicolino</i>
<i>Filip Sroubek</i>	<i>Gaël Foilleret</i>	<i>Giuseppe Roux Poignant</i>	<i>Isabelle Joly</i>
<i>Filippo Bulloni</i>	<i>Gaëlle Filliol</i>	<i>Graziano Borello</i>	<i>Isabelle Lhommedet</i>
<i>Fiore Cao</i>	<i>Gaëtan Delaloye</i>	<i>Graziano Gerbelle</i>	<i>Italo Armanasco</i>
<i>Fiorenzo Dadò</i>	<i>Gaëtan Tisseron</i>	<i>Grégory Guillen</i>	<i>Iva Daliborova</i>
<i>Flavio Tunesi</i>	<i>Garcia Sarah</i>	<i>Gregory Morell</i>	<i>Jacqueline Chiardola</i>
<i>Florence Chantepie</i>	<i>Gauthier Ailloud</i>	<i>Guido De Monte</i>	<i>James Beauchamp</i>
<i>Florence Masiero</i>	<i>Geneviève Coupez</i>	<i>Guido Moreschini</i>	<i>Jean Draperi</i>
<i>Florian Bossert</i>	<i>Geni Ballat</i>	<i>Guido Teppa</i>	<i>Jean Laurent Jordaney</i>
<i>Florian Egger</i>	<i>Georg Steiner</i>	<i>Guillaume Laigle</i>	<i>Jean Luc Danis</i>
<i>Florian Gorfer</i>	<i>Georges Reychler</i>	<i>Guillaume Leport</i>	<i>Jean Queyron</i>
<i>Flurin Filli</i>	<i>Georgi Stoyanov</i>	<i>Günter Jakober</i>	<i>Jean Revolot</i>
<i>Flurin Schur</i>	<i>Gerald Lesacher</i>	<i>Gunther Gressmann</i>	<i>Jean Yves Ployer</i>
<i>Francesca Cozzi</i>	<i>Géraldine Leduc</i>	<i>Günther Kirstein</i>	<i>Jean-Baptiste Noguès</i>
<i>Francesca Michelin</i>	<i>Gérard Alric</i>	<i>Guolf Denoth</i>	<i>Jean-Baptiste Portier</i>
<i>Francesca Rastelli</i>	<i>Germano Balestrieri</i>	Hans Pohlmann	<i>Jean-Christian Piques</i>
<i>Francesco Bellini</i>	<i>Giacomo Regazzoni</i>	<i>Hansjakob Baumgartner</i>	<i>Jean-Christophe Peers</i>
<i>Francesco Campra</i>	<i>Giacomo Righettini</i>	<i>Hansruedi Weyrich</i>	<i>Jean-Claude Coupez</i>
<i>Francesco Cotroneo</i>	<i>Giampaolo Brignoli</i>	<i>Heidi Henzelin</i>	<i>Jean-François Deroussin</i>
<i>Francesco Panuello</i>	<i>Gian Fuemm</i>	<i>Heinz Jost</i>	<i>Jean-François Desmet</i>
<i>Francesco Sottile</i>	<i>Gianabele Bonicelli</i>	<i>Hélène Claveau</i>	<i>Jean-François Mossot</i>
<i>Francesco Vender</i>	<i>Gianfranco Careddu</i>	<i>Hélène Hembert</i>	<i>Jean-José Richard-Pomet</i>
<i>Francesco Veronesi</i>	<i>Gianni Lardgiader</i>	<i>Henning Werth</i>	<i>Jean-Louis Meytral</i>
<i>Francis Guichon</i>	<i>Gianni Oppi</i>	<i>Hervé Blanchin</i>	<i>Jean-Luc Debette</i>
<i>Francisco Peinado</i>	<i>Gianni Penasa</i>	<i>Hervé Brosius</i>	<i>Jean-Luc Duron</i>

<i>Jean-Luc Jardin</i>	<i>Julia Rieder</i>	<i>Lièvre Loula</i>	<i>Manfred Reinhardt</i>
<i>Jean-Luc Mokhtari</i>	<i>Julia Schmid</i>	<i>Lilian George</i>	<i>Manon Cassonnet</i>
<i>Jean-Luc Pinel</i>	<i>Julia Wildi</i>	<i>Linda Scalco</i>	<i>Manu Blanchet</i>
<i>Jean-Marc Fasmeyer</i>	<i>Julie Carlier</i>	<i>Lisa Pouzet</i>	<i>Manuel Piana</i>
<i>Jean-Marie Geffrin</i>	<i>Julie Régis</i>	<i>Lisa Seppecher</i>	<i>Manuela Marchesi</i>
<i>Jean-Marie Marslen</i>	<i>Julien Traversier</i>	<i>Livia Curti</i>	<i>Manuelita Perini</i>
<i>Jean-Michel Ciaccio</i>	<i>Julio José Valero</i>	<i>Livio Costa</i>	<i>Mara Calvini</i>
<i>Jean-Noël Loireau</i>	<i>Justin Mazouyer</i>	<i>Loïc Thurre</i>	<i>Marc Bethmont</i>
<i>Jean-Paul Coulomb</i>	<i>K Prinzio</i>	<i>Loredana Cicinelli</i>	<i>Marc Konareff</i>
<i>Jean-Paul Crisinel</i>	<i>Karine Renaud</i>	<i>Lorella Scarsi</i>	<i>Marcello Bourlot</i>
<i>Jean-Pierre Bergeon</i>	<i>Karine Sarnette</i>	<i>Lorena George</i>	<i>Marco Bagutti</i>
<i>Jean-Pierre Brovelli</i>	<i>Katia Lhoste-Ascensio</i>	<i>Lorenzo Petralia</i>	<i>Marco Bertelli</i>
<i>Jean-Pierre Choisy</i>	<i>Kemp Jonathan</i>	<i>Lorenzo Rapa</i>	<i>Marco Dallavalle</i>
<i>Jean-Pierre Richaud</i>	<i>Kerstin Karbe-Lauener</i>	<i>Louise Bonhomme</i>	<i>Marco Dalmazzone</i>
<i>Jens-Peter Kiel</i>	<i>Kevin Ceni</i>	<i>Louise Opolka</i>	<i>Marco Dellanoce</i>
<i>Jérémie Jourdan</i>	<i>Klaus Bliem</i>	<i>Luca Da Canal</i>	<i>Marco Ghisolfi</i>
<i>Jérémie Pin</i>	<i>Klaus Eisank</i>	<i>Luca Fornari</i>	<i>Marco Gobbini</i>
<i>Jérôme Gruit</i>	<i>Konstantin Dichev</i>	<i>Luca Fornasari</i>	<i>Marco Grosa</i>
<i>Jesus Ignacio Sánchez</i>	<i>Kurt Cadosch</i>	<i>Luca Lorenzetti</i>	<i>Marco Hammel</i>
<i>Jesus Miñano</i>	<i>Labatut Malika</i>	<i>Luca Martignoni</i>	<i>Marco Libretti</i>
<i>Jesús Olivares</i>	<i>Laetita Regnier</i>	<i>Luca Quaglia</i>	<i>Marco Lombardo</i>
<i>Jo Lombard</i>	<i>Laffont Rémy</i>	<i>Luca Reggiani</i>	<i>Marco Marconi</i>
<i>Joaquin Caballero</i>	<i>Lanchbury Steve</i>	<i>Lucas Wauters</i>	<i>Marco Meneguz</i>
<i>Joaquin Gamboa</i>	<i>Larissa Muff</i>	<i>Lucia Geiger</i>	<i>Marco Pavia</i>
<i>Johann Primisser</i>	<i>Laura Pommier</i>	<i>Lucia Pizzocaro</i>	<i>Marco Rapetti</i>
<i>Johannes Denking</i>	<i>Laurence Cohard</i>	<i>Lucia Pompilio</i>	<i>Marco Regge</i>
<i>Johannes Tomschett</i>	<i>Laurence Lecuyer</i>	<i>Lucia Stella</i>	<i>Marco Rossi</i>
<i>Jon Gross</i>	<i>Laurence Thibaut</i>	<i>Luciano Heidempergher</i>	<i>Marco Salsotto</i>
<i>José Alcalá</i>	<i>Laurent Flenet</i>	<i>Lucien Tron</i>	<i>Marco Salvioni</i>
<i>José Ángel Ruiz</i>	<i>Laurent Malthieux</i>	<i>Lucio Uber</i>	<i>Marco Sarale</i>
<i>José Antonio Andrada</i>	<i>Laurent Martin-Dhermont</i>	<i>Lucio Vianello</i>	<i>Marco Sozzi</i>
<i>José Carrillo Carrillo</i>	<i>Laurent Ripert</i>	<i>Ludivine Leite</i>	<i>Marco Tasin</i>
<i>José Mellado</i>	<i>Laurenz Krisch</i>	<i>Ludovic Klein</i>	<i>Margot Brunelliere</i>
<i>José Miguel Barea</i>	<i>Lazennec Yves</i>	<i>Luigi Damiani</i>	<i>Maria Benciolini</i>
<i>José Navarro</i>	<i>Léa Christianne</i>	<i>Luigi Giannangelo</i>	<i>Maria Romero</i>
<i>José Rico</i>	<i>Léa Roux</i>	<i>Luigi Pedri</i>	<i>Marianne Lörcher</i>
<i>José Vicente Gómez</i>	<i>Legros Danielle</i>	<i>Luis Galera</i>	<i>Mariarosa Mombelli</i>
<i>Juan Alfonso Lozano</i>	<i>Léo Brigaud</i>	<i>Luis García</i>	<i>Marie- Laure Uginet-Ulliel</i>
<i>Juan Cristobal Vázquez</i>	<i>Léo Denais</i>	M Cerrato	<i>Marie-Cécile Moisson</i>
<i>Juan José Bas</i>	<i>Léo Laborieux</i>	<i>M Hodoul</i>	<i>Marie-Claire Schmitt</i>
<i>Juán José Molina</i>	<i>Letizia Fortini</i>	<i>M Pra</i>	<i>Marie-France Fosanelli</i>
<i>Juan-Manuel Martinez-Soriano</i>	<i>Lia Condeminas</i>	<i>Madeleine Geiger</i>	<i>Marie-Françoise Aubert</i>
<i>Jules Heuret</i>	<i>Liana Nicoli</i>	<i>Magali Nuyts</i>	<i>Marina Nova</i>
<i>Julia Hatzl</i>	<i>Licia Calabrese</i>	<i>Magdalena Karan</i>	<i>Mario Gandini</i>
<i>Julia Paterno</i>	<i>Lidia Panada</i>	<i>Manfred Hohenegger</i>	<i>Mario Pedrelli</i>

<i>Mario Sertori</i>	<i>Mauro Belardi</i>	<i>Muraglia Monique</i>	<i>Paolo Bracco</i>
<i>Mario Taddei</i>	<i>Mauro Cerise</i>	N Basso	<i>Paolo Colombotto</i>
<i>Marion Bensa</i>	<i>Mauro Fissore</i>	<i>N Bianciotto</i>	<i>Paolo Faifer</i>
<i>Marion Michellod</i>	<i>Mauro Stella</i>	<i>Nadia Klemm</i>	<i>Paolo Fantini</i>
<i>Marion Rivollet</i>	<i>Maxime Clemenceau</i>	<i>Nadia Severgnini</i>	<i>Paolo Guglielmetti</i>
<i>Marisa Meschini</i>	<i>Michael Gähwiler</i>	<i>Nadir Signori</i>	<i>Paolo Massara</i>
<i>Marjolaine Chesnais</i>	<i>Michael Lagger</i>	<i>Nans Baïssat</i>	<i>Paolo Quinson</i>
<i>Markus Joerger</i>	<i>Michael Nussbaumer</i>	<i>Nathan Sautreuil</i>	<i>Paolo Valiati</i>
<i>Markus Lackner</i>	<i>Michael Schaad</i>	<i>Nele Striebel</i>	<i>Pascal Charriere</i>
<i>Markus Nindl</i>	<i>Michael Wenger</i>	<i>Nicola Ferrari</i>	<i>Pascal Labbé</i>
<i>Marlène Sauthier</i>	<i>Michel Bailly-Maitre</i>	<i>Nicola Mazzoni</i>	<i>Pascal Lhotte</i>
<i>Marlène Trepier</i>	<i>Michel Bouchard</i>	<i>Nicolas Fragiaco</i>	<i>Pascal Schneider</i>
<i>Marlies Taucher</i>	<i>Michel Bouche</i>	<i>Nicolas Gay</i>	<i>Pascal Sonnenwyl</i>
<i>Martial Bos</i>	<i>Michel Chesaux</i>	<i>Nicolas Gramatico</i>	<i>Patrice Bague</i>
<i>Martin Buisson</i>	<i>Michel Metayer</i>	<i>Nicolas Matteudi</i>	<i>Patrice Le Guilcher</i>
<i>Martin Gerber</i>	<i>Michel Morin</i>	<i>Nicolas Morisset</i>	<i>Patrick Beaujard</i>
<i>Martin Gorfer</i>	<i>Michel Zonino</i>	<i>Nicolas Peironnet</i>	<i>Patrick Damiano</i>
<i>Martin Hofer</i>	<i>Michela Marchetti</i>	<i>Nicolas Rausa</i>	<i>Patrick Fumagalli</i>
<i>Martin Mermier</i>	<i>Michelangelo Giordano</i>	<i>Nicolas Thevenod</i>	<i>Patrick Heitz</i>
<i>Martin Rickli</i>	<i>Michele Antonioli</i>	<i>Nicole Errard</i>	<i>Patrick Ormea</i>
<i>Martin Wettstein</i>	<i>Michele Arioni</i>	<i>Nicole Sellier</i>	<i>Patrick Scimè</i>
<i>Martine Dupont</i>	<i>Michele Barbieri</i>	<i>Nils Zimmermann</i>	<i>Patrizia Gavagnin</i>
<i>Martino Nicolino</i>	<i>Michele Battoraro</i>	<i>Noemi Spranzi</i>	<i>Paul Heisch</i>
<i>Massimiliano Pons</i>	<i>Michele Braghini</i>	<i>Nora Szijarto</i>	<i>Paul Sarlin</i>
<i>Massimo Benazzo</i>	<i>Michele Gorini</i>	<i>Norbert Jordan</i>	<i>Pauline Dislaire</i>
<i>Massimo Farcoz</i>	<i>Michèle Marslen</i>	<i>Not Pua</i>	<i>Pauline Foudabassery</i>
<i>Massimo Ferrier</i>	<i>Michele Minoretta</i>	<i>Numa Rondelli</i>	<i>Pavel Sroubek</i>
<i>Massimo Gaggetta</i>	<i>Michèle Moisson</i>	Odile Curchod	<i>Pépita Godelle</i>
<i>Massimo Rosso</i>	<i>Michele Sartori</i>	<i>Olivier Theillard</i>	<i>Peter Faerber</i>
<i>Mathias Lehnert</i>	<i>Michelle De Coster</i>	<i>Olivier Trompette</i>	<i>Peter Pfiffner</i>
<i>Mathieu Dubois</i>	<i>Miguel Artell</i>	<i>Omar Bonazzi</i>	<i>Peter Wimmer</i>
<i>Mathieu Jean</i>	<i>Miguel Canovas</i>	<i>Oriana Brandolese</i>	<i>Petra Siedler</i>
<i>Mathieu Krammer</i>	<i>Milena Béthaz</i>	<i>Orlando Ostinelli</i>	<i>Philipp Bertagnolli</i>
<i>Mathis Morion</i>	<i>Milica Krmar</i>	<i>Oswaldo Empereur</i>	<i>Philipp Brenner</i>
<i>Matteo Cuna</i>	<i>Milo Manica</i>	<i>Otto Zanetti</i>	<i>Philippe Archimbaud</i>
<i>Matteo Franchini</i>	<i>Mirco Lauper</i>	Pablo Galdo	<i>Philippe Ayrat</i>
<i>Matteo Ravelli</i>	<i>Mireille Giraud</i>	<i>Pablo Luís Villar</i>	<i>Philippe Badin</i>
<i>Matteo Saino Calabretta</i>	<i>Mirko Micheletti</i>	<i>Pamela Nicoli</i>	<i>Philippe Fortini</i>
<i>Mattia Colella</i>	<i>Mirko Muolo</i>	<i>Paola Antonelli</i>	<i>Philippe Malnoury</i>
<i>Mattia Colombo</i>	<i>Mollard Maxime</i>	<i>Paola Capra</i>	<i>Philippe Maret</i>
<i>Mattia Delpero</i>	<i>Monika Kraft</i>	<i>Paola Casale</i>	<i>Philippe Munier</i>
<i>Mattia Precazzini</i>	<i>Monika Mann</i>	<i>Paola Chiudinelli</i>	<i>Philippe Poiré</i>
<i>Maura Cattaneo</i>	<i>Monique Corneo</i>	<i>Paola Ricceri</i>	<i>Philippe Vallet</i>
<i>Maurilio Garbani-Nerini</i>	<i>Monique Tutundjian</i>	<i>Paola Rizzi</i>	<i>Phillippe Mulatier</i>
<i>Maurizio Chiereghin</i>	<i>Monthouel Melissa</i>	<i>Paolo Biscontini</i>	<i>Pierangelo Bolpagni</i>

<i>Piero Bonvicini</i>	<i>Renato Gonnet</i>	<i>Samy Michel</i>	<i>Stefano Allavena</i>
<i>Piero Borre</i>	<i>Renato Roganti</i>	<i>Sandie Bouvier-Garzon</i>	<i>Stefano Borney</i>
<i>Piero Chabod</i>	<i>Renato Scarafoni</i>	<i>Sandra Gloor</i>	<i>Stefano Marcolli</i>
<i>Pierre Bonneau</i>	<i>Renzo Vinzio</i>	<i>Sandra Sáenz</i>	<i>Stefano Martinolli</i>
<i>Pierre Bouvet</i>	<i>Reto Strimer</i>	<i>Santiago Estebarez</i>	<i>Stefano Zuccaro</i>
<i>Pierre Commenville</i>	<i>Ricardo Castillo</i>	<i>Sara Canclini</i>	<i>Stéphane Aubry</i>
<i>Pierre Delastre</i>	<i>Ricardo Moreno</i>	<i>Sarah Peno</i>	<i>Stéphane Bessart</i>
<i>Pierre Fery</i>	<i>Riccardo Nardelli</i>	<i>Sebastian Kraft</i>	<i>Stéphane Combeaud</i>
<i>Pierre Juliand</i>	<i>Richard Mazagg</i>	<i>Sébastien Brégeon</i>	<i>Stéphane Lucas</i>
<i>Pierre Lauener</i>	<i>Riols Christian</i>	<i>Sébastien Honore</i>	<i>Stéphane Mélé</i>
<i>Pierre Tardivel</i>	<i>Robert Joly</i>	<i>Sébastien Marie</i>	<i>Stéphane Thiebaud</i>
<i>Pierre Transon</i>	<i>Robert Straughan</i>	<i>Sepantona Bergamin</i>	<i>Stéphanie Brettnacher</i>
<i>Pierre-Henry Peyret</i>	<i>Robert Zegg</i>	<i>Serena Frau</i>	<i>Steve Pervier</i>
<i>Pierrick Touchet</i>	<i>Roberto Bertoli</i>	<i>Serge Lenogue</i>	<i>Susanna Rossi</i>
<i>Pietro Curcio</i>	<i>Roberto Bressanelli</i>	<i>Sergio Fasano</i>	<i>Susi Bähler</i>
<i>Pilar Rubio</i>	<i>Roberto Carlo</i>	<i>Sergio Perron</i>	<i>Suzanne Houot</i>
<i>Pne Florence</i>	<i>Roberto Chaulet</i>	<i>Séverine Haberer</i>	<i>Svenja Summermatter</i>
<i>Puech Marie-Pierre</i>	<i>Roberto Facoetti</i>	<i>Séverine Magnolon</i>	<i>Sylvain Combe</i>
<i>Purificación Galdo</i>	<i>Roberto Lardelli</i>	<i>Severino Moranduzzo</i>	<i>Sylvie Argoud-Puy</i>
<i>Radames Bionda</i>	<i>Roberto Maistri</i>	<i>Silvana Nembrini</i>	<i>Sylvie Barbichon</i>
<i>Radek Russ</i>	<i>Roberto Permunian</i>	<i>Silverio Manenti</i>	<i>Sylvie Geneve</i>
<i>Rafael Calvillo</i>	<i>Robi Janavel</i>	<i>Silvia Alberti</i>	<i>Tamara Emmenegger</i>
<i>Raffael Soldano</i>	<i>Robin Sechaud</i>	<i>Silvia Compagnoni</i>	<i>Teresa Spano'</i>
<i>Raffaele Spocci</i>	<i>Rocco Iacobuzio</i>	<i>Silvia Kaserer</i>	<i>Terrier Joe</i>
<i>Raffaella Miravalle</i>	<i>Rocco Leo</i>	<i>Silvia Salomoni</i>	<i>Theo Köhli</i>
<i>Raimondo Testoni</i>	<i>Rocco Umbescheidt</i>	<i>Simon Hohl</i>	<i>Théo Mazet</i>
<i>Ralf Vanscheidt</i>	<i>Rodolphe Papet</i>	<i>Simon Jaeger</i>	<i>Thibault Gebhard</i>
<i>Ralph Imstepf</i>	<i>Roland De Coster</i>	<i>Simona Danielli</i>	<i>Thiébaud Hélène</i>
<i>Ramón Morcillo</i>	<i>Roland Fricker</i>	<i>Simone Boca</i>	<i>Thierry Albert-Gondrand</i>
<i>Ramos Blanca</i>	<i>Romana Stepanova</i>	<i>Simone Liechti</i>	<i>Thierry Arzac</i>
<i>Rapez Christian</i>	<i>Romano Salis</i>	<i>Simone Minessi</i>	<i>Thierry Faivre</i>
<i>Rapez Paul</i>	<i>Rosa Sonnberger</i>	<i>Simonetta Cutini</i>	<i>Thierry Vincent</i>
<i>Raphaël Arlettaz</i>	<i>Rosanna Pedrini</i>	<i>Siro Gianella</i>	<i>Thomas Bredel</i>
<i>Raphaël Nussbaumer</i>	<i>Rose Ranieri</i>	<i>Sonia Giussani-Gotti</i>	<i>Thomas Cugnod</i>
<i>Raymond Meyer</i>	<i>Rosmarie Schwarz</i>	<i>Sonia Thevenod</i>	<i>Thomas Fankhauser</i>
<i>Rebecca Farmer</i>	<i>Rossana Daidone-Dassetto</i>	<i>Sophie Dohrer</i>	<i>Thomas Romanski</i>
<i>Régine Bague</i>	<i>Roullaud Yves</i>	<i>Sophie Rossi</i>	<i>Thomas Rosset</i>
<i>Régine Praile</i>	<i>Roux Franck</i>	<i>Sophie Roux</i>	<i>Thomas Roux</i>
<i>Régis Bertolotti</i>	<i>Rudy Valfiorito</i>	<i>Steeve Peyron</i>	<i>Thomas Salaun</i>
<i>Rémi Destre</i>	<i>Rudy Vallet</i>	<i>Stefan Folie</i>	<i>Thomas Wehrli</i>
<i>Rémi Fabre</i>	<i>Ruedi Ettlin</i>	<i>Stefan Seifert</i>	<i>Timia Sanchez</i>
<i>Rémi Henzelin</i>	<i>Ruth Pfiffner</i>	<i>Stefan Sprenger</i>	<i>Tiziana Favre</i>
<i>Remo Basso</i>	<i>Salvetat Lucas</i>	<i>Stefania Capelli</i>	<i>Tiziana Odelli</i>
<i>Rémy Roques</i>	<i>Samuel Talhoet</i>	<i>Stefania Marazia</i>	<i>Tiziano Quey</i>
<i>Renato Chevrere</i>	<i>Samy Jendoubi</i>	<i>Stefania Volani</i>	<i>Tommaso Campedelli</i>

<i>Tommaso Del Prete</i>	<i>Valérie Hagry</i>	<i>Vincenzo Ragaglia</i>	<i>Xavier Fribourg</i>
<i>Tommy Bulle</i>	<i>Valerio Bertoglio</i>	<i>Violetta Fontana</i>	<i>Xavier Pete</i>
<i>Tommy Epal</i>	<i>Valerio Donini</i>	<i>Vittorio Saccoletto</i>	<i>Yann Toutain</i>
<i>Toni Kronig</i>	<i>Van Der Streichel Philippe</i>	<i>Vladimir Wingate</i>	<i>Yoann Caillot</i>
<i>Toni Reinstadler</i>	<i>Vatin Tiffany</i>	<i>Walter Gfrerer</i>	<i>Yoé Chetboun</i>
<i>Tran Quynh Giao</i>	<i>Veau Florian</i>	<i>Walter Palfrader</i>	<i>Yolande Preteux</i>
<i>Ubaldo Ricci</i>	<i>Vedova Frank & Della</i>	<i>Walter Pucher</i>	<i>Yvan Schmidt</i>
<i>Ueli Rehsteiner</i>	<i>Verena Eichenberger</i>	<i>Walter Vallet</i>	<i>Yvan Sibourg</i>
<i>Ugo Parolini</i>	<i>Veronica Modena</i>	<i>Werner Rokitzky</i>	<i>Yves Jacquemoud</i>
<i>Ulrich Kreutzer</i>	<i>Veronika Hehl</i>	<i>Werner Ruinelli</i>	<i>Yves Zabardi</i>
<i>Ulrich Ruepp</i>	<i>Véronique Rémyot</i>	<i>Werner Schaer</i>	<i>Zdenek Sroubek</i>
<i>Valentin Pitsch</i>	<i>Victor Agloaté</i>	<i>Witka Cheredeyeff</i>	<i>Zoé Roussel</i>
<i>Valeria Moris</i>	<i>Victor Othenin-Girard</i>	<i>Wolfgang Fritz</i>	
<i>Valeria Wyler</i>	<i>Vincent Mugnier-Merlin</i>	<i>Wolfgang Wellinghausen-Striebel</i>	
<i>Valérie Arzur</i>	<i>Vincenzo Giumelli</i>	<i>X Allamano</i>	