INTERNATIONAL
BEARDED VULTURE
MONITORING

# 5th Alpine Bearded Vulture Observation Days

## October 9th – October 17th 2010

A co-operation within the International Bearded vulture Monitoring (IBM)

Dr. Richard Zink & David Izquierdo Acebes

Nationalpark Hohe Tauern

EGS Eulen und Greifvogel Schutz Österreich

**Hohe Tauern National Park / Owl- and Raptor Centre Haringsee**
c/o Research Institute of Wildlife Ecology
University of Veterinary Medicine Vienna

&

**The project partner:**

Parc Nationale du Mercantour
Parco Naturale Alpi Marittime
Parc National les Ecrins
Parc National de la Vanoise
Regione Autonoma Valle d'Aosta & Parco Nazionale Gran Paradiso
A.S.T.E.R.S.
Parco Nazionale dello Stelvio/NP Stilfserjoch
Stiftung Pro Bartgeier
Vulture Conservation Foundation

Scientifically and technically managed by the

**Vulture Conservation Foundation (VCF)**

and supervised by

**ALPARC**

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# 1. Introduction

In October of 2010 the already traditional 5th "Alpine Observation Days" took part. They have become an important part of the international monitoring not only for the valuable information about the population status and bird territories they provide but also, which might be even more important for the future of the project, for the positive impact they have for public awareness. Thanks to the coordination of local administrators the synchronous counts throughout the Alps was planned in detail on the local/regional level.

The period for the observation days, 9th-17th of October (focal time on the 16th), was selected by mutual agreement of the partners considering former years' results and that this and the next months are the best period of the year to observe the courtship of birds e.g. behaviours like nest building, copulations, synchronous flights etc. 2008 (10th- 18th of October) was the most suitable year in terms of weather conditions during the Observation Days, so the date was selected accordingly. Unluckily once more this year the adverse weather conditions in most of the Alpine range impeded the optimum work of collaborators and volunteers. Despite the fog, rain and snow, the number of participants on the whole period was higher than 580 this year, out of which almost 2/3 (over 350 participants) collaborated in the focus day (16th). The total number of bird observations this year was quite high in the period between 9th and 17th, with more than 300 observations reported, although in this case the number of observations in the focus day (16th) was relatively low when compared to the whole amount, with an estimation of "only" 94 observations. Due to the bad weather conditions, some of the partners decided to change the date to more suitable days. In order to avoid double counting, only the sightings done in the 16th of October have been considered for the general results, although there is an appendix summarizing results of the other days. Although not part of the Alpine Observation Day as such, some observations have been made independently in the selected period. They have been added to this report.

As it has been pointed out in previous years, there are some observation gaps (e.g. central Switzerland, north-eastern Italy and some parts of Austria) to be closed in order to cover the whole Alpine range, but once again it proved unfeasible to do so. It is remarkable that this year most of the data received was given in accordance with the format suggested, but nonetheless there are still some partners sending data in alternative formats, which should be avoided in the future. For this reason, there is a short explanatory note in the *Materials and Methods* section giving some advice on how to send the coordinates.

# 2. Methods and Data

The "Alpine Bearded Vulture Observation Days" was first conceived as a tool to achieve an overall count of birds throughout the Alps. However, it seems unfeasible to mobilise enough people to cover the whole Alpine range (~188.000 $Km^2$) simultaneously, so the main aim has shifted from the total census of animals to the relative census (density index). This means that instead of assessing the total number of Bearded vultures in the whole range, the aim is to check how the population changes on the regional level; for scientific reasons it would be necessary to use more or less the same observation points, as well as sampling effort, year after year, in order to see the development of the population. Likewise, it is necessary to provide information of the observation sites (coordinates) even if the counting result was 0 birds observed, so that it is possible to establish the area covered by the observers and therefore an index for abundance of vultures e.g. per $km^2$. Finally, it is important to point out once again the importance of sending data in a standardized format, both to facilitate the work of coordinating all data and also to avoid mistakes which in the vast majority of the cases are caused by a mere misunderstanding.

In the IBM Webpage, www.gyp-monitoring.com, it is possible, and strongly recommended, to download the provided file (downloads→ Registration forms→ Alpine Observation Days) in excel format with an example of how to fill in the data obtained.

| | | | local position | | observation period | | bird presence | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Team** | **Person** | **date** | **latitude (decimal)** | **longitute (decimal)** | **from** | **to** | **Bird/s** | **Age** | **ID/Hypothesis** | **from** | **to** |
| IBM | R.Zink | 11/10/2008 | 46,3242164 | 8,1254532 | 8:00 | 18:30 | 1 | juv. | mysterybird1 | 12:30 | 12:35 |

**Figure 1: Example of how to fill in the table with the data obtained in the Observation Days**

On the same section of the Home page it is also possible to download an identification booklet (produced by the Natural History Museum of Crete / University of Crete and the Hellenic Ornithological Society) to harmonise age determination. This booklet can be found in German, French and Italian. Likewise, it is also available the .pdf file of the updated marking pattern used for juvenile vultures in the Alps.

**→ NOTE: How to send coordinates to the IBM Administration:**

When working with coordinates, the IBM has been using the **World Geodesic System, 1984** (**WGS84**, see http://es.wikipedia.org/wiki/WGS84 for information). Although most of the partners provide the geographic references in this suggested format, we are still receiving data in different unknown systems. The conversion from these various formats (for instance ED50, UTM or French Geodesic System NTF, among others) into WGS84 is always problematic and often insurmountable, leading to an important loss of time for both the partner and the administration in crossed mailing, and eventually loss of information when the harmonising is not possible. But another problem that has been found occasionally is that there have been mistakes done by the partners when converting the coordinates into WGS84, which have not been detected beforehand by them and neither by the administration when received, but later on, so it was necessary to redo all figures and calculations, with the resulting extra investment of time and effort. In order to avoid these situations in the future, it would be strongly recommended that the partners check the coordinates they are about to send **in advance**, by verifying that they actually mark the point they are supposed to by testing in Google Earth®.

For those who have never used this program, it is a *freeware* that can be directly downloaded from the website of Google® http://www.google.com/intl/es/earth/download/ge/. Once Google Earth® has been installed in the computer, it is possible to visualize some points in the map simply by uploading an excel file (.xls) with their coordinates in the page http://www.earthpoint.us/ExcelToKml.aspx. The excel file must follow a certain format (see http://www.earthpoint.us/Downloads/ExcelToKmlDemo.zip). The minimum file consist of a sheet with 2 columns with the titles **Latitude** and **Longitude**, but it is possible to add other columns for more specific treatment, such as **name** (it will be seen directly in the map), **description** (it appears in a short note that spreads when placing the cursor on the selected point) and **icon** (there is a list with all the different icons that can be used in the map that can be found at the lower part of the Excel-to-KML site). The coordinates must be provided in **WGS84**. When the excel file is finished, it can be directly imported by clicking in the "browse" button and select the file from its directory in your computer, and then saving the file in .kml format (Google Earth® file). Further information can be looked up in the Excel-to-KML website. The website allows the import of up to 200 rows for free; in case the file to be uploaded contains more than that, it is recommended to simply divide the file in consecutive files no longer than 200 rows each.

On the basis of the experience of the organising committee and results obtained in previous years, the selected date for the focus day of the "Alpine Observation Days" was the 16th of October, but unfortunately the weather was not as good as expected. At this period of the year, it is possible to observe the birds in a confined area and therefore locate new territories and pairs, since it's in this time when birds are more active in nest building, copulation, synchronous flights, etc. Bearded vultures, especially immatures and juveniles, are able to cover long distances in a short period of time, and thus it is necessary to select a short time window in order to avoid double counting. In former years the Observation Days took place within a period of about a week, differentiating between the focal time of 1-2 days, and the buffer time, that lasted for some days before and after the focal time. However, this year the time-span of the focal time was restricted to just a single day, and the buffer time was not concerted, ranging from the 9th of October to the 30th of October both in the Central-Alps. Nevertheless, for this report it has been considered as buffer time from the 9th till the 17th of October. In any case, the only data that has been used to evaluate the number of birds is that collected on the 16th, although the rest can be used in terms of people involved and efforts. Besides, this data can be used to complete the picture of bird distribution. During the focal time a total of 94 birds could be observed, while in the whole week, the number increases up to 248 (318 if we count also the observations made on the 23rd and 30th of October respectively in PN Alpi Marittime and PN Stelvio)

As pointed out before, the weather conditions made the task of the observers very difficult, even impossible in some areas. Despite the fog, rain and snow, the number of observation posts on the 16th of October was higher than 350, and there was an astonishing amount of more than 480 posts if we count all the work carried out in the whole week (more than 580 if we count also the observations made on the 23rd and 30th of October). Nevertheless, the result of the counting strongly correlates with the weather conditions, so the low number of observations we obtained this year in the focus day (94 observations) is not surprising. Some partners also counted other birds of prey such as Golden Eagles (*Aquila Chrysaetos*), what is recommended to use as a reference in the identification of suitable places for Bearded vultures, as well as differentiate between areas without Bearded vultures and those with monitoring deficiency.

On average 480 observers (in reality there were more, but not every partner sent the information about the number of participants) covered during the observation period (9th to 17th October) an area of ~188.000km² (considering the whole Alpine area). This means approximately one observation site per 392 km² which is equivalent to the approximate home range size of Bearded Vulture couples in the Alps.

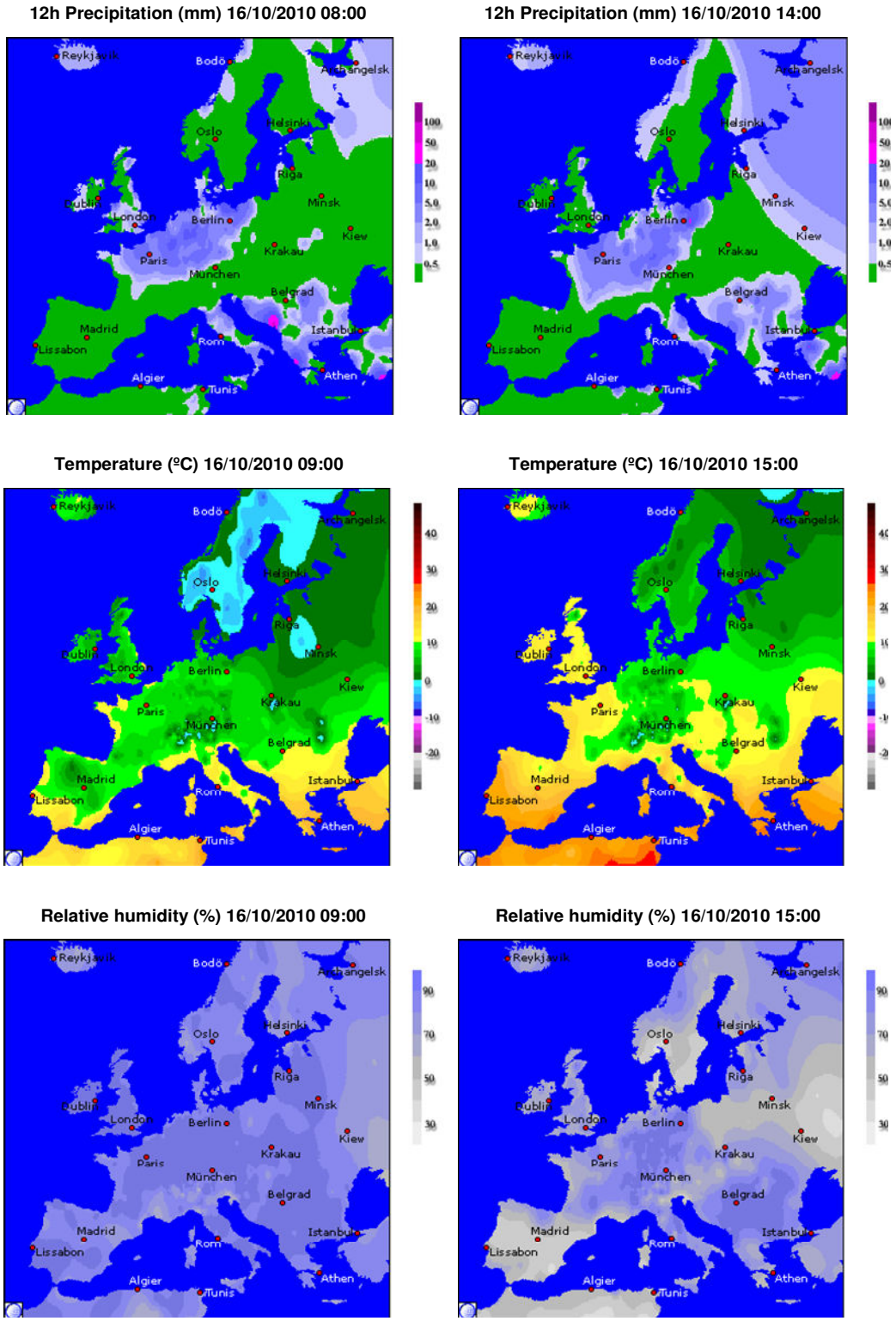


**Figure 2: Changes in weather conditions (Precipitation, Temperature and Humidity) in the Alpine range from the morning to the afternoon of the 16th October 2010.**

## 2.1 Outlook for 2011

During the Annual IBM Steering Committee held in Vercors (France) in November 2010, it was discussed whether the date for the Alpines Observation Days should be changed considering the difficulties found during 2010's event. There were 3 main alternatives to the actual date suggested: End of May, end of September and November. For weather reasons, the end of May would be suitable, but the proximity of the release events in some of the parks makes it less valuable when considering public awareness, since it would be better to separate such events to achieve a higher impact. The beginning of September was also dismissed for being a period of the year when birds (including territorial adults) tend to fly huge distances, which would hinder the accomplishment of the census. Finally it was fairly agreed to change the current date to the end of September/beginning of October. Nevertheless, it was also suggested to do the Observation Days twice, being the dates separated by a week; the second date would take place depending on the weather conditions, according to the decision of the IBM Administration.

→ **NOTE**: For the current year 2011 the **Alpine Observation Day will be hold on the 25th of September 2011**. The focal time for the count starts at 11 AM (11:00) and lasts at least 4 hours until 3 PM (15:00). Only if weather conditions are extremely bad the IBM community might decide to repeat the count on the alternative date 2nd of October 2011 (which is the same date of the EuroBirdWatch Day).

# 3. Results

All the observations collected by the local administrators during the focal time on the local and regional level were sent by email to the IBM office to be fuse on the entire Alpine scale. This information, plus additional data stored in the IBM data base collected in the same period, has been the basis for this report.

## 3.1 Monitoring effort

The figure 4 shows the distribution of observation sites in the whole Alpine range during the 16th of October of 2010. This year, a total of 351 observation posts have been used in this day, whereas the total number of sites when considering the whole week suggested for the event (9th-17th October) on the local level exceeded 480, which is, by far, the highest number of observation sites (!) registered for the event this far. When focusing on the focal time and speaking about regions, the area more thoroughly surveyed was, one more year, the Western part of the Alps (N-Western and S-Western regions). This is a consequence of a great coordination effort between several partners and the involvement of a significant number of trained observers, which has created a very effective and active monitoring network in this area. Besides, the South-western part of the Alps was the only area where there have been good weather (see figure 3) on the focus day, at least for some hours in the morning. The presence of observers in the Central Alps has decreased in relation to former years, although this is unfaithful to reality since these numbers refer only to the focus day and the buffer period, whereas there were several observers in following days, with a significant effort in the regions of Lombardia and Trentino, that postponed the event until the 30th of October, and gathered more than 100 observers to collaborate in the counting; nevertheless, despite the significant increase in monitoring effort in these regions, the Western side of the Central-Alps has traditionally had a very low density of observation sites, which has been pointed out in previous years, but it seems that it is rather difficult to close this gap. Finally, it is highly remarkable that the Eastern region has sensibly increased the number of observers in relation to former years' events, which shows a positive trend for future actions.

**Figure 3: Fast change in weather conditions in South-Western France (10:00 – 14:00)** © French monitoring report

Since the “Observation Days” have become one of the main tools at our disposal to raise public awareness, a big part of the work has been focused on the monitoring event to motivate participation. There have also been other areas involved in the event on a more local level which have participated but haven’t sent coordinates of the observation sites; in any case in none of these cases there have been observations of birds due to the bad weather conditions. This year most of the partners have followed the advice to send coordinates of every observation site regardless of their success, which has contributed to get a more general impression of the area covered by observers.

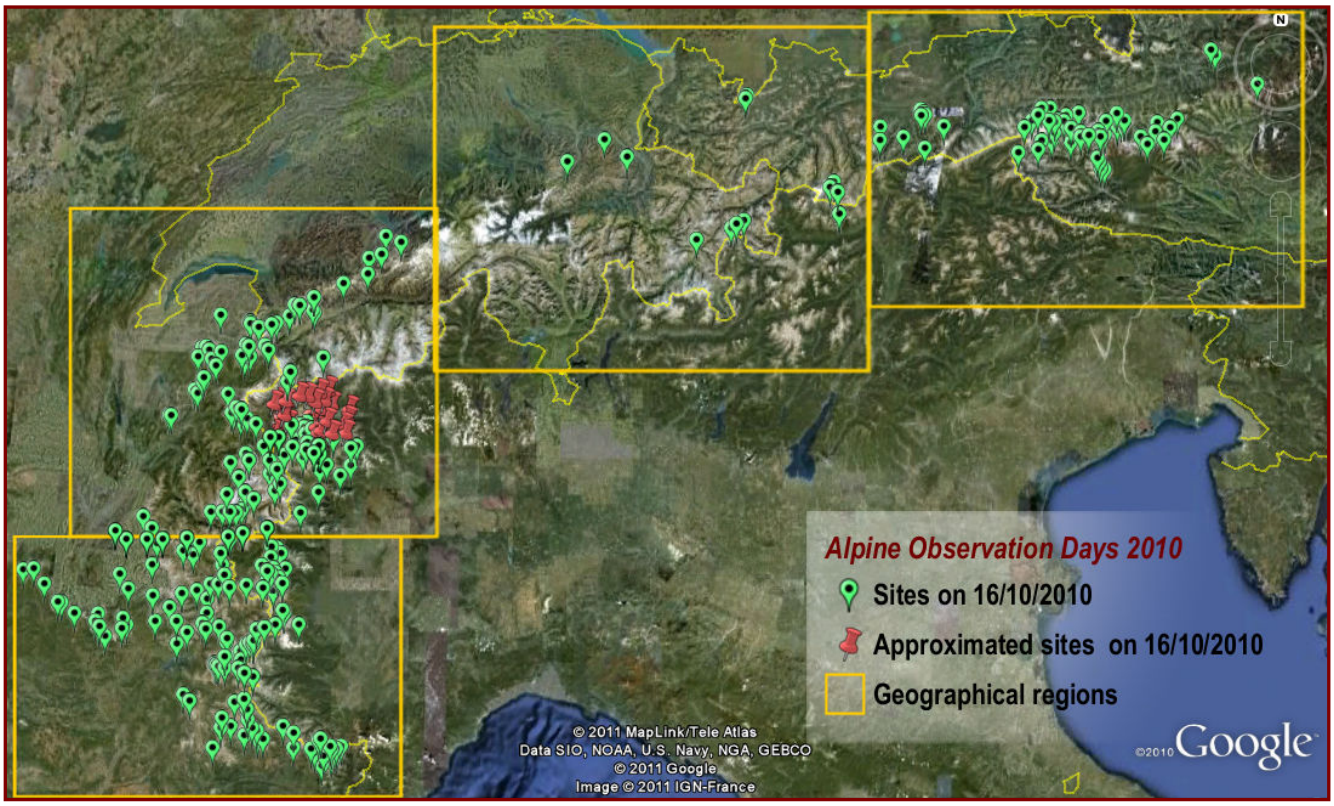


**Figure 4: Observation sites on the focus day of the Alpine Observation Days (16th October 2010). The red pins indicate the approximate position of the observation points in Valle d’Aosta and PN Mont Avic**

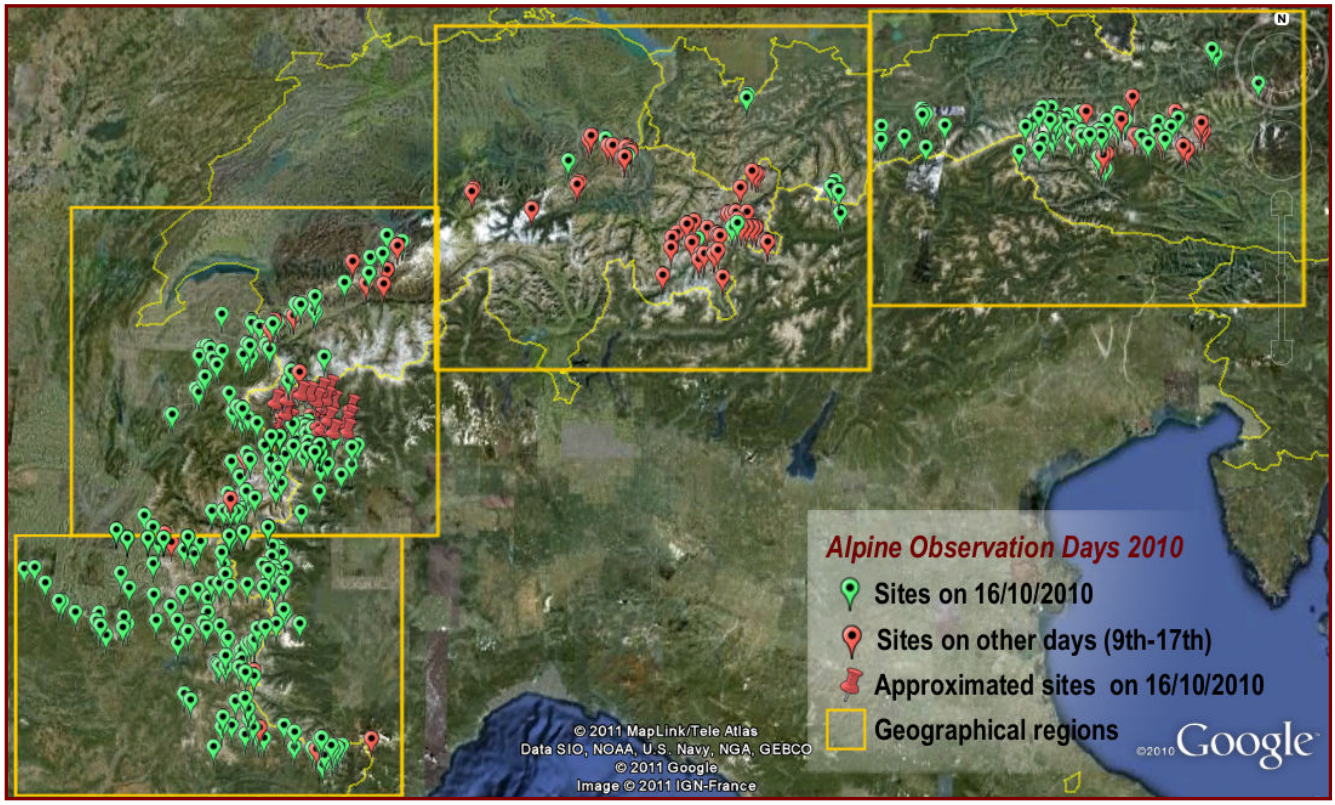


**Figure 5: Observation sites in the whole period of the Alpine Observation Days (9th – 17th October 2010)**

## 3.2 Distribution of birds

This year there were 94 bird observations in the focal time (16th of October), which is not a specially high number, whereas the total amount goes up to 248, including double counts, when considering the whole period (9th to 17th October). These total results exceed in more than 32% those obtained in the previous year (2009) for the same period of time. The relatively low number of observations obtained the 16th can be easily understood when considering that the weather conditions this year have been one of the most unsuitable ones in the 5 years of history of the event. The flying conditions for the birds were far from optimal. However, the elevated number in the whole period is owed to the increase in effort and people involved in the monitoring of the species in the Alps.

The results obtained are shown in the figures 6 and 7 displaying the sites where birds were observed just in the focus day and in the whole period respectively, differentiating the birds accordingly to their potential capacity to establish a breeding unit; thus, the birds have been considered separately in 3 groups: adults and subadults (older than 5 years) in one group, birds younger than 5 years in a second and finally undetermined birds in the third.

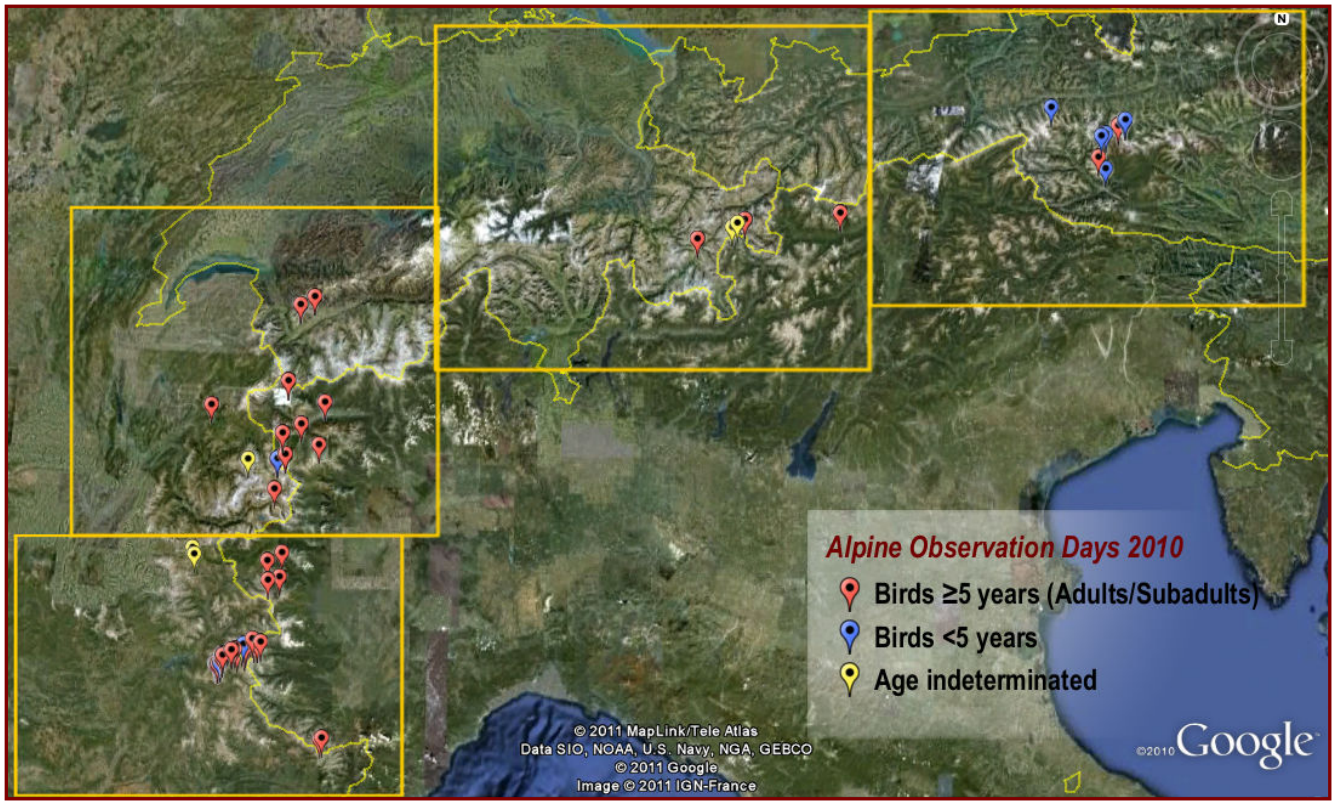


**Figure 6: Bird Observations on the focus day of the Alpine Observation Days (16th October 2010) separated by their potential capacity to establish a breeding unit**

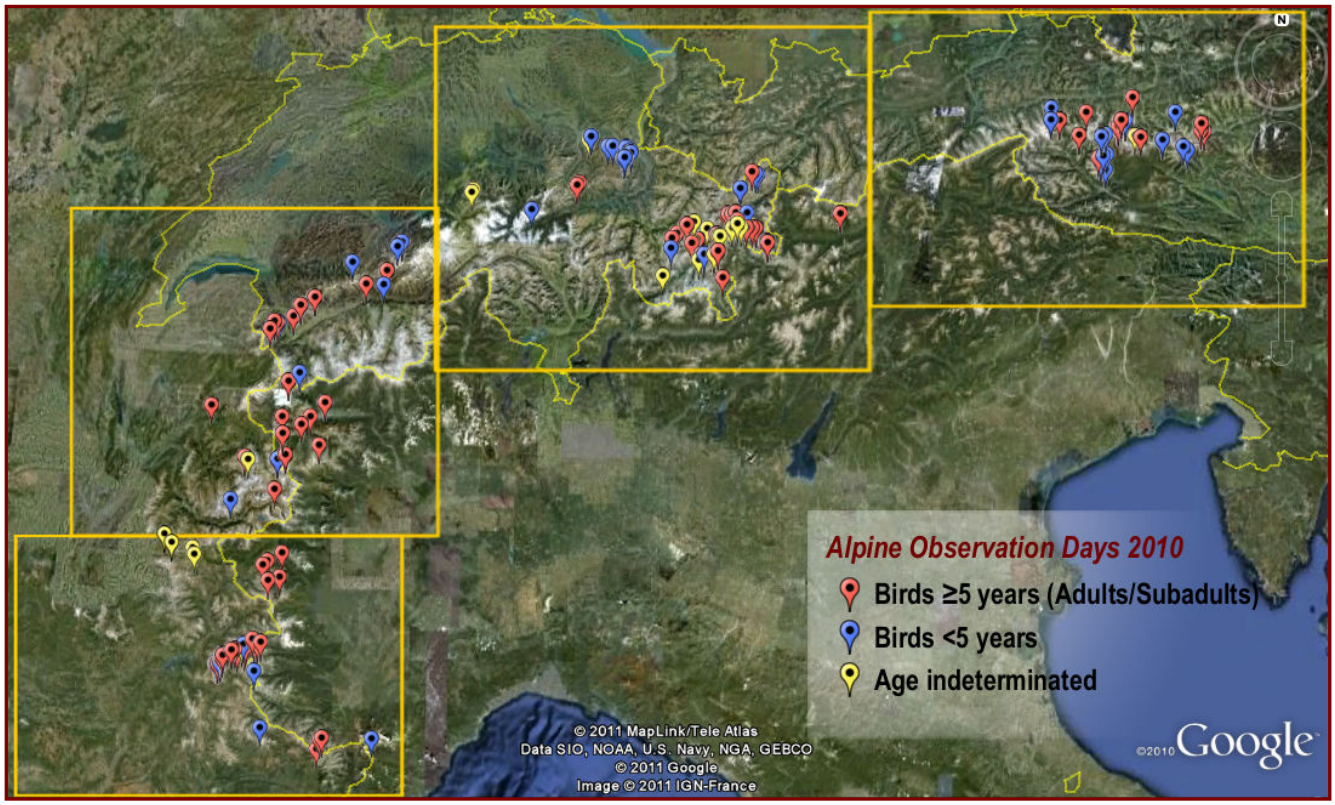


**Figure 7: Bird Observations in the whole period of the Alpine Observation Days (9th – 17th October 2010) separated by their potential capacity to establish a breeding unit**

## 3.3 Proportion of age classes

As observed in previous years, the proportion of observed birds older than 4 years (potentially in reproductive age) encompasses more than half (~60%) of the total observations. These data cover all observations made in the whole period of the Observation days (9th – 17th October, n= 248). The rest of age classes, ranging from juveniles to immature, encompass a proportion of approximately 28% of the total number of observed birds. The remaining 12% is the percentage of birds that could not be identified due to unfavourable observation conditions (bad visibility, long distance, back light, etc.).

This year a minimum of 25 individuals could be recognized, out of which at least 13 birds belong to known pairs. The average age of the mature individuals (adults and subadults) was of 11.21 years (4093 days) with the oldest bird, Colleen (if GT015 is Colleen?), being 22 years old. The average age of non mature birds (< 5 years old) reaches 1.16 years (424 days).

**Table 1: Age classes of the birds observed on the focus day of the Alpine Observation Days (16th October 2010)**

| Age | Observations | % |
|---|---|---|
| **≥ 5 years** | 67 | 71,28 |
| **< 5 years** | 19 | 20,21 |
| **Indetermined** | 8 | 8,51 |
| | 94 | 100,00 |

**Table 2: Age classes of the birds observed in whole period of the Alpine Observation Days (9th – 17th October 2010)**

| Age | Observations | % |
|---|---|---|
| **≥ 5 years** | 148 | 59,68 |
| **< 5 years** | 69 | 27,82 |
| **Indetermined** | 31 | 12,50 |
| | 248 | 100,00 |

## 3.4 Counted birds

In order to avoid double counting, only data collected in the 16th of October has been used to determine the number of birds observed in this period, setting aside known territorial birds and couples that have not been observed in the focus day, in contrast to what was done in former years. Due to the lack of information in some areas, shift of the Observation Day in some other and the erroneous coordinates in one case, it became unfeasible to establish a sound population size only with the data collected in the focus day. Figure 8 shows the results obtained per geographical region, and the approximate situation of known couples to get a better idea of the real distribution of birds regardless of the information gathered on the 16th.

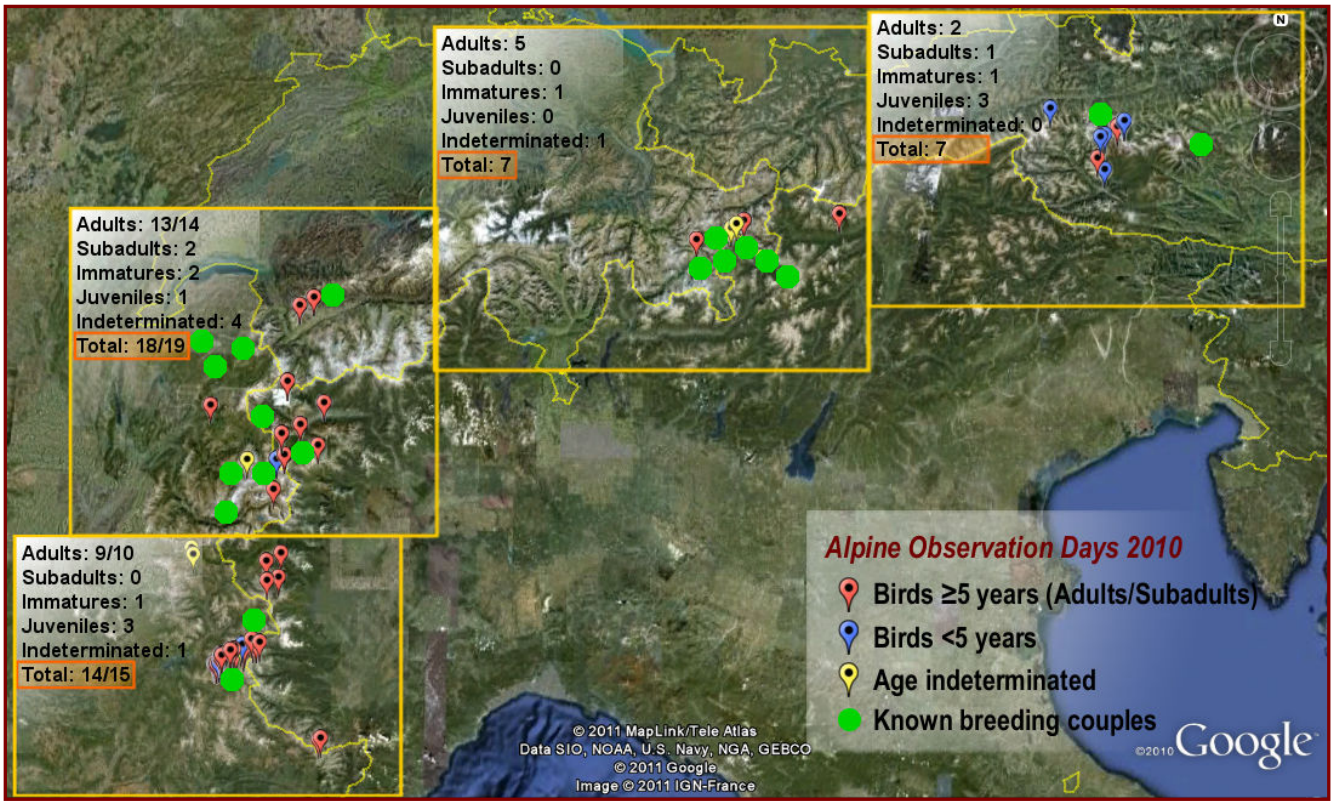


**Figure 8: Bird Observations on the focus day of the Alpine Observation Days (16th October 2010) giving the number of observed birds (separated by age classes) per geographical region as well as the position of known breeding couples (not counted if not observed on the 16th).**

The results are also summarized in the next tables, displaying the results per geographical region (table 3) and per country (table 4)

**Table 3: Results of the number of birds (separated by age classes) estimated per geographical region**

| | > 5 years | subadult | immature | juvenile | unknown | total |
|---|---|---|---|---|---|---|
| **SW Alps** | 9 to 10 | | 1 | 3 | 1 | 14 to 15 |
| **NW Alps** | 13 to 14 | 2 | 2 | 1 | 1 | 18 to 19 |
| **C Alps** | 5 | | 1 | | 1 | 7 |
| **E Alps** | 2 | 1 | 1 | 3 | 0 | 7 |
| | 33-35 | 2 | 6 to 7 | 7 | 4 | 47 to 49 |

**Table 4: Results of the number of birds (separated by age classes) estimated per country**

| | > 5 years | subadult | immature | juvenile | unknown | total |
|---|---|---|---|---|---|---|
| **Austria** | 2 | 1 | 1 | 3 | 0 | 7 |
| **France** | 9 | 0 | 1 | 4 | 2 | 16 |
| **Italy** | 13 to 15 | 2 | 1 | 0 | 0 | 16 to 18 |
| **Switzerland** | 5 | | 2 | 0 | 1 | 8 |
| | 33-35 | 2 | 6 to 7 | 7 | 4 | 47 to 49 |

When focusing on the results per region, it can be appreciated that the higher numbers correspond to the more intensively surveyed areas (North- and South-Western regions), which gives an idea of the need to improve the surveying in areas with lower success.

It is obvious, then, that the total number of birds in the whole Alpine range is not well represented by these results, so an estimation of the population based on the figures would prove unreliable and of little precision. This assumption is supported by all the data collected in the database and personal observations, and also by the numbers calculated according to the model of Schaub et al. (2009) which predicts a total of more than 140 birds by the end of the year 2010.

# 3.5 Identified birds

As pointed out before, this year at least 25 different birds (~51-53% of the total of differentiated individuals) could be identified during the Alpine Observation Days (9th-17th October), 13 birds when focusing on the 16th of October. Although this number is slightly bigger than the results of 2009 (23 identified birds), the relative percentage respect the total number of observed birds shows that it is actually much lower than 2009's results, since the amount of observations in that year was significantly smaller.

**Table 5: Non Mature birds identified within the whole period of the Alpine Observation Days 2010 (9th -17th October)**

| | n1 | n2 | Name | ID | Birth date | Age(days) | Age (years) |
|---|---|---|---|---|---|---|---|
| **Birds < 5 years** | 1 | 1 | Tschadin | 629 | 19.03.2010 | 211 | 0,58 |
| | 2 | 2 | **Kira** | 626 | 11.03.2010 | 213 | 0,58 |
| | 3 | 3 | **Figol** | 628 | 16.03.2010 | 214 | 0,59 |
| | 4 | 4 | **Kruml** | W77 | 15.03.2010 | 215 | 0,59 |
| | 5 | 5 | **Sardona** | 624 | 01.03.2010 | 228 | 0,62 |
| | 6 | 6 | **Spelugue** | 615 | 24.02.2010 | 232 | 0,64 |
| | 7 | 7 | **Elena** | 613 | 17.02.2010 | 241 | 0,66 |
| | 8 | 8 | **Maseta** | 585 | 28.02.2009 | 594 | 1,63 |
| | 9 | 9 | **Condamine** | 586 | 28.02.2009 | 595 | 1,63 |
| | 10 | 10 | **Pinzgarus** | 558 | 05.03.2008 | 953 | 2,61 |
| | 11 | 11 | **Girasole** | 549 | 16.02.2008 | 971 | 2,66 |
| | | **11** | | | **Average** | **424** | **1,16** |

**Table 6: Mature birds (adults/subadults) identified within the whole period of the Alpine Observation Days 2010 (9th -17th October)**

| | n1 | n2 | Name | ID | Birth date | Age(days) | Age (years) |
|---|---|---|---|---|---|---|---|
| **Birds ≥ 5 years** | 12 | 1 | **Doraja** | 465 | 13.03.2005 | 2041 | 5,59 |
| | 13 | 2 | **Hubertus 2** | 446 | 02.07.2004 | 2296 | 6,29 |
| | 14 | 3 | **Ambo** | 392 | 27.02.2002 | 3152 | 8,64 |
| | 15 | 4 | **Roure** | 370 | 16.02.2001 | 3529 | 9,67 |
| | 16 | 5 | **Louis** | 364 | 09.04.2000 | 3842 | 10,53 |
| | 17 | 6 | **Diana Stelvio** | W07 | 16.03.2000 | 3867 | 10,59 |
| | 18 | 7 | **Pablo** | 359 | 04.03.2000 | 3878 | 10,62 |
| | 19 | 8 | **Paolo Peila** | 388 | 21.02.2000 | 3888 | 10,65 |
| | 20 | 9 | **Sereno** | 348 | 03.02.2000 | 3908 | 10,71 |
| | 21 | 10 | **Gildo** | 299 | 23.02.1998 | 4618 | 12,65 |
| | 22 | 11 | **Phenix Alp action** | W01 | 11.04.1997 | 4937 | 13,53 |
| | 23 | 12 | **Andreas Hofer** | 260 | 26.02.1996 | 5346 | 14,65 |
| | 24 | 13 | **GT015 (Colleen?)** | 112 | 19.02.1989 | 7908 | 21,67 |
| | 25 | 14 | **GT027 (Peisey-Nancroix?)** | - | ? | ? | ? |
| | | **14** | | | **Average** | **4093** | **11,21** |

When comparing these results with those obtained in the previous year, 1 bird <5 years (Girasole) and 8 mature birds (adults/subadults) (Andreas Hofer, Sereno, Roure, Paolo Peila, Ambo, Hubertus 2, Doraja, Phenix Alp Action) were not present then and have though been re-identified in the year 2010.

**Table 7: Comparison of identified birds during the Alpine Oberservation Days 2009 and 2010. Birds marked with an "x" have not been identified in 2009 even though they must have been alive (identification 2010!).**

| Name | ID | 2009 | 2010 |
|---|---|---|---|
| Balthazar | 99 | 1 | |
| Assignat | 111 | 1 | |
| Andreas Hofer | 260 | x | 1 |
| Republic 11 | 288 | 1 | |
| Gilde | 299 | 1 | 1 |
| Veronika | 321 | 1 | |
| Sereno | 348 | x | 1 |
| Pablo | 359 | 1 | 1 |
| Haute Savoie Mont Blanc | 361 | 1 | |
| Louis | 364 | 1 | 1 |
| Roure | 370 | x | 1 |
| Paolo Peila | 388 | x | 1 |
| Ambo | 392 | x | 1 |
| Martell | 395 | 1 | |
| Hubertus 2 | 446 | x | 1 |
| Doraja | 465 | x | 1 |
| Blick | 524 | 1 | |
| Romaris | 528 | 1 | |
| Nonno Bob | 548 | 1 | |
| Girasole | 549 | x | 1 |
| Ikarus | 557 | 1 | |

| | | | |
|---|---|---|---|
| Pinzgarus | 558 | 1 | 1 |
| Maseta | 585 | 1 | 1 |
| Condamine | 586 | 1 | 1 |
| Eustachius | 587 | 1 | |
| Elena | 613 | | 1 |
| Spelugue | 615 | | 1 |
| Sardona | 624 | | 1 |
| Kira | 626 | | 1 |
| Figol | 628 | | 1 |
| Tschadin | 629 | | 1 |
| GT015 (Colleen?) | GT015 | | 1 |
| GT027 (female Peisey-Nancroix?) | GT027 | | 1 |
| GT028 (male Aravis?) | GT028 | 1 | |
| Phenix Alp Action | W01 | x | 1 |
| Diana Stelvio | W07 | 1 | 1 |
| Zebru | W12 | 1 | |
| Zebrusius | W65 | 1 | |
| Sixt | W67 | 1 | |
| Darwin | W69 | 1 | |
| Kruml | W77 | | 1 |
| | | **23** | **25** |

# 4. Acknowledgements

Special thanks go to the IBM members for their cooperation and for the organisation of the Alpine census on the regional level. From the south-west to the north-east of the Alps special thanks shall go to the following people and institutions:

- Mercantour National Park (Alain Morand, Monique Perfus and François Breton)
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- Ecrins National Park, Dauphiné observer network (Richard Bonet & Christian Couloumy)
- Regione Valle d'Aosta (Christian Chioso)
- Natural Park Mont Avic (Massimo Bocca)
- The Gran Paradiso National Park (Achaz von Hardenberg & Martino Nicolino)
- The Vanoise National Park (Jean Pierre Martinot, Henri Suret & Mylène Herrmann)
- ASTERS (Marie Zimmermann and Etienne Marlé)
- The western Swiss Observer Network (Francois Biollaz & Michael Schaad)
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- The Stiftung Pro Bartgeier (Daniel Hegglin & David Jenny-Mettler, Franziska Lörcher)
- The Hohe Tauern National Park (Ferdinand Lainer, Gunther Gressmann & Michael Knollseisen)

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Numerous people participated and supported the Alpine Bearded vulture monitoring event in the year 2010. Some of them could not be mentioned or remained unknown to the IBM office. They should be acknowledged just as much as those observers mentioned in the long list which follows.

## 4.1 Participants/Observers 2010

Abgottspon, B.
Adami
Adrion, Alain
Affany, Sylvain
Albert, Christophe
Alberti, Silvia
Althaus, S.
Amic, Monique
Andreola
Andrione, G.
Angerer
Angermann, Andreas
Angermann, Anton
Annycke, Xavier
Antelmann, Björn
Arlaud, Clara
Arlettaz, R.
Arlettaz, S.
Armanasco
Arsac, Thierry
Attanasio
Audisio, Piero
Avignon, Cédric
Barbieri
Barbini, A.
Barrel, Giustino
Bassi
Basso, N.
Battaglia
Baudin, Etienne
Bauer, Jean Baptiste
Bazzi, G.
Bazzi, L.
Beauchet, Didier
Becker, Philipp
Becquart, Isabelle
Belardi
Belfiore, Fabiano
Bell, Wolfgang

Bellagamba, Alain
Belleau, Eric
Belotti
Benassi, Chiaro
Bénévole
Bensa, Marion
Berger, Mathias
Bergese, Franco
Bernert, Kurt
Bertella
Bertelli, Marco
Berthillot, Emile
Bertoli
Bettini
Bevacqua
Bianchi, Franco
Biedermann, Renate
Bignotto, M.
Biollaz, F.
Blanchin, Hervé
Blanchin, Hervé
Bloino, David
Boczmac, Monique
Bompard
Bonafè, Diego
Bongiolatti
Bonnevie, Danièle
Bonsaquet, Lionel
Bonvoisin, Bastien
Borney, Valter
Bortolameolli
Boschi, M.
Bouchard, Michel
Bouche, Michel
Boukris, Marc
Boulanger, Isabelle
Bouquet, Matthieu
Bourdat, Fred
Bourlot, Marcello
Bouvier, Martial
Bragalanti
Brennwald, Annemarie
Bresesti
Bresson, Philippe
Breton, Arthur
Breton, François
Bridet, Vincent
Bridet, Yann
Brimmer, Didier
Brondex, Francine
Broquet, Claire
Brosi, Georg
Brosius, Hervé
Brueren, Erika
Bryner, Sonja
Bstieler, Ruth
Cachat, Dominique
Cachat, Jean-Claude
Cahenzli, Flavio
Calliero, Cristina
Callovi, Ivan
Cambensy, Jürg
Camerlenghi
Cao
Caratti, Gérard
Cardinali
Caroline
Carriat, Jacques
Carriat, Nina
Castellano, Giacomo
Castelli, Mauro
Cauquet, Martine
Cavagnino, Gabriella
Cellerino
Cevasco, Jean-Marie
Champ, Axelle
Charrière, Pascal
Chastin, Alain
Chesaux, M.
Chevalier, Françoise
Chevalier, Robert
Chiereghin, Maurizio
Chiola, Margherita
Chioso, Christian
Chochon, Lalie
Chomel, Bénédicte
Christian, Balais
Claudon, Sylvie
Cloutier, J.
Colato
Colin, Eric
Combrisson, Damien
Combrisson, Lucas
Conca
Conseil, Alfred
Corcatelli
Corno, Alberto
Corti
Cortot, Hervé
Costa, Livio
Cotting, S.
Couillard, Yann
Coulon, Mireille
Couloumy, Christian
Coursier, Cyril
Coursier, Cyril
Craddock, Stefany
Crippa
Dacko, Thierry
Daeye, Ollivier
Dalix,Jean-François
Dalla Torre
Dalla Valle
David, Franck
de Gasquet, Vincent
de Groot, Marion
De Martin
de Tann, Dario
de Thiersant, Érige
Deblevit, Véronique
Defrennes, Benoît
Delacour, Gilles
Dematteis, M.C.
Demontoux, Daniel
Dengg, Helmut
Denis, S.
Denoth, Guolf
Derivaz, Serge
Derungs, Gieri
Diana
Dogliotti, Marco
Dominique, Jacquemin
Dubranna, Anne-Sophie
Dumaine, Olivier
Dumas, Pierre
Dussans, Sylvain
Ebner, Günter
Egger, Emanuel
Eisank, Klaus
Emmery, Brigitte
Empereur, Osvaldo
Fabre, Rémi
Facoetti
Faifer
Fantini, Paolo
Fappani, Alessandro
Fasce, Laura
Fasce, Paolo
Fasoli
Faure, Aline
Faure-Gignoux, Germaine
Favaro, Sébastien
Favaron
Felizia, Bruno
Fellin
Ferchal, Alain
Ferloni
Ferrero, Giuseppe
Ferrier, Massimo
Ferry, Pierre
Fine, Vanessa
Fioletti
Fischbacher, Mathias
Fissore, Mauro
Floreani

Florineth, Curdin
Foglini
Folatti
Forlani
Fornero, Cinzia
Foulon, Hélène
Fournier, Jérôme and father
Frache, Bruno
Frachon,Julie
Fragiacomo, Nicolas
Framba
Franchini
Franck, Guigo
Frangi
Fredl, Reinhardt
Frei, P.
Freychet, Didier
Freychet, Julien
Friedli, Daniel
Frin, Bernard
Fritsc, Jeremy
Gabbud, B.
Gähwiler, Urs
Garcel, Geoffrey
Garçon, Noa
Gareau, Chantal
Garnier, Alexandre
Gatt, Armin
Gatti
Gavagnin, Patrizia
Gay, Maxime
Geneve, Sylvie
Gerber, M.
Gerecke, Steffi
Gfeller, Hans
Giandomenico
Gionta
Giordano, Remo
Giradon, Christophe
Girardi
Giraudo, Luca
Giuliano, Elio
Giumelli
Godli, Daniel
Gorini
Gouron, Claude
Gratz, Lois
Grenier, Cécile
Greßmann, Gunther
Griesser, Matthias
Gruber, Bruno
Gruber, Peter
Gualtiero, Sanmartino
Guigo, Franck
Haslacher, Erwin
Hegglin, Daniel
Hembert, Hélène
Henry, Brigitte
Henzelin, R.
Hölzl, Alex
Hörl, Sepp
Houot, Suzanne
Huppmann, Uli
Huppmann, Ulrike
Imstepf, R.
Inaudi, Simona
Issambert, Jérôme
Janavel, R.
Jardin, Jean-Luc
Jestin, Fabrice
Jordan, N.
Joss, Richard
Joubert, Amandine
Julien-François, Robert
Kaufmann, Toni
Kendlbacher, Robert
Kirchner, Maria
Klaunzer, Heinrich
Knollseisen, Michael
Knüsel, Dominique
Koch, Franz
Köll, Franz
Kronawetter, Hans
Küng, Christian
Kurskinski
Laas, Jens
Lackner, Markus
Lacosse, Pierre
Ladstätter, Peter
Lainer, Feri
Lambrucchi
Lancini
Lanteri-Minet, Alain
Lapia, Sergio
Laurençot, Cecile
Laurent, Delomez
Laurent, Elisabeth,
Laurent, Olivier
Leccia, Marie-France
Lelay, Mathieu
Lenk, Marcel
Lenogue, Serge
LeoGarzetti
Letévé, Alain
Lingua, Antonio
Lobascio
Loberbauer, Franz
Loitfellner, Sepp
Loitfellner, Steff
Lombard, Jean-François
Lombard, Jo
Lörcher, Franziska
Lörcher, Marianne
Lucas, Stéphane
Luccioni, Jérôme
Lussiana, Mauro
Maag, Regina
Maffei, Jacques
Maffei, Mme
Magnolo, Séverine
Mahaut, Aurélien
Malavasi
Malleways, Jacqueline
Malrat, Didier
Manini
Manzon, Louis
Manzoni
Marchesi
Marchionini, Laurence
Marcolli
Maricau, Christine
Maricau, Dominique
Marie, Blandine
Marietta, C.
Marlé, Etienne
Marsan, Greg
Martinaglia, Frau
Martin-Dhermont, Laurent
Martinelli
Martinolli
Massa, Serena
Massal, Bruno
Massara
Maure, Sophie
Mauro
Mauthner, Hermann
Mélanie
Mélé, Stéphane
Melot, Denise
Melot, Roger
Menusan, Gianni
Mermier, Martin
Michel, Samy
Michellod, B.
Michellod, D.
Michelotto, S.
Miletto, Marino
Miramand, Frank
Mitterdorfer, Alois
Mochen
Moine, Rémi
Moneta
Monitzer, Mathias
Monn, Gabriel

Montagnier, Isabelle
Montagnier, Odile
Montigny, Olivier
Moreschini
Mosconi
Mouchet, Alain
Moussiegt, Karine
Mozzetti
Mühlburger, Mathias
Muhr, Hannes
Muigg, Hermann
Naffzger, Laurence
Naffzger, Laurence
Naritelli, L.
Nauer, Willi
Nauer-Müller, Willi
Nicoli
Nobili, Vincent
Nofito, E.
Oberholzer, Karl
Oddou, Claire
Odelli
Oehl, A.
Oldebrandini
Oppi, Gianni
Orméa, Patrick
Ottonello,
Padredii, Tiziana
Palfrader
Panizza
Papet, Rodolphe
Pardi, Jean-Luc
Parisi
Parolini
Pascal, Susy
Pasini
Pasqua
Pedrelli
Pedri
Pedroli
Peer, Katharina
Pegolett
Pellet, Clarisse
Pellucchetti
Perfus, Monique
Perin
Perlotti
Pettavino, Massimo
Pham, Fabrice
Piazzani GF.
Piazzani, P.
Piazzi, L.
Piérini, Philippe
Pinel, Jean-Louis
Pinet, Valérie
Piques, Jean-Christian
Pisoni
Pizutto, Marie-France
Pizutto, Phillipe
Plozza, Arturo
Poirier, Frederick
Pomet, Jean
Pons, Enrico
Pons, Marco
Ponsard, Céline
Ponsard, Laurent
Poulet, Laetitia
Pozzi
Praolini
Preßlaber, Josef
Pucher, Walter
Puissant, Éric
Quellier, Hélène
Ramus
Ranieri, Rose
Rastelli
Rastelli, Marco
Ravicchio, O.
Rebattu, Guy
Reinhardt, Manfred
Remo, Giordano
Renaud, Karine
Renn, Fred
Reteuna, Daniele
Rezer, Antoine
Rezer,Julie
Ribetto, Gianfranco
Richard, José
Riepler, Christian
Rifflet, François
Rizzo, Aldo
Robert, Mathieu
Robin
Roche, Daniel
Roche, Joëlle
Rofner, Andreas
Ropars, Cédric
Rossetti
Rossion, Olivier
Roth-Kallis, Nina
Roux Poignant, G.
Roverselli
Sanetti
Santinelli
Sarasin, J.F.
Sartirana, Fabiano
Sarton, Dorothée
Sarton, Géraldine
Sautarel, Lisa
Scarafoni
Scargo, G.
Scarsi
Schaad, M.
Schär, Esther
Schmarada, Thomas
Schoop, J.
Sérié, George
Silvestri
Simmler, Monika
Soldano, Raffael
Soncina
Sozzi
Speranza
Speziari
Stefanelli
Steiner, Elisabeth
Steiner, Rosa
Steiner, Thomas
Suret, Henri
Susy, Pascal
Swab, Thierry
Tabardel, Françoise
Tambone
Tanga, Olivier
Tapparel, A.
Tasin
Tenoux, Mme
Tenoux, Nicolas
Thevenot, Benoit
Thiel, Dominik
Thomas
Thomas, Bernard
Tinguely, S.
Toferer, Gerhard
Tordella, Paolo
Tordjman, Patrice
Touret, Muriel
Trojer, Carola
Trompette, Olivier
Trotti, G.
Trotti, P.
Truc, Fabrizio
Turlais, Yannis
Unterweger, Bernhard
Urbani
Valentin, Daniel Gerfaud
Vallejo, Livia
Vannard, Éric
Varreau, Hervé
Vavruch, S.
Vincent, Alain
Vincent, Cathy
Von Harsteln, Edith
Vuillermoz, Eraldo
Wehrli, Thomas

| | | |
|---|---|---|
| Wettstein, M. | Wiedmaier, Andreas | Wiesenbauer, Peter |
| Wittwer, G. | Zoubof, Vadim | Zwanzleitner, Walter |
| X, Mathieu | Zuberbühler, Jürg | Zwicky, Christoph |
| Zanoli | Zubiani | |

# 5. Appendix A: Other Observation Days

- **Observations at PN dello Stelvio (30-10-2010)**

| Valley | Age | Time | E | N |
|---|---|---|---|---|
| Braulio | imm | 11.53-11.55 | 10,4 | 46,5 |
| Braulio | juv | 11.58-11.58 | 10,4 | 46,5 |
| Braulio | ad+juv | 13.03-13.07 | 10,4 | 46,5 |
| Braulio | imm | 9.10-9.12 | 10,4 | 46,5 |
| Braulio | imm | 9.13-9.13 | 10,4 | 46,5 |
| Braulio | imm | 11.27-11.29 | 10,4 | 46,5 |
| Braulio | imm | 11.58-12.04 | 10,4 | 46,5 |
| Braulio | juv | 10.54-11.00 | 10,4 | 46,5 |
| Braulio | juv+imm | 11.44-11.45 | 10,4 | 46,5 |
| Braulio | ad+juv | 12.41-12.45 | 10,4 | 46,5 |
| Braulio | ad+imm | 12.46-12.50 | 10,4 | 46,5 |
| Braulio | ad | 13.10-13.13 | 10,4 | 46,5 |
| Braulio | 2ad | 13.15-13.29 | 10,4 | 46,5 |
| Grosina | ad | 10.37-10.38 | 10,3 | 46,4 |
| Grosina | ad | 10.50-10.53 | 10,3 | 46,4 |
| Livigno | 2ad | 12.48-12.50 | 10,2 | 46,5 |
| Livigno | ad | 12.00-12.05 | 10,2 | 46,6 |
| Livigno | ad | 11.20-11.25 | 10,2 | 46,6 |
| Livigno | ad | 11.42-11.47 | 10,2 | 46,6 |
| Livigno | 2 unidentifyed | 12.25-12.38 | 10,2 | 46,6 |
| Livigno | ad | 13.25-13.26 | 10,2 | 46,6 |
| Livigno | 2ad | 8.45-9.15 | 10,2 | 46,6 |
| Viola | 2ad | 12.48-13.01 | 10,3 | 46,5 |
| Viola | ad | 12.42-12.46 | 10,3 | 46,5 |
| Viola | 1 unidentifyed | 11.10-11.14 | 10,3 | 46,5 |
| Plator | ad | 10.35-10.45 | 10,3 | 46,5 |
| Plator | 2 unidentifyed | 12.48-13.01 | 10,3 | 46,5 |
| Plator | 2 unidentifyed | 13.03 - 13.04 | 10,3 | 46,5 |
| Plator | 2 unidentifyed | 12.23-12.25 | 10,3 | 46,5 |
| Plator | 2ad | 13.07-13.07 | 10,3 | 46,5 |
| Plator | 2 unidentifyed | 11.45-11.57 | 10,3 | 46,5 |
| Plator | 2ad | 10.05-10.13 | 10,3 | 46,5 |
| Plator | ad | 9.22-9.35 | 10,3 | 46,5 |
| Plator | ad | 12.03-12.05 | 10,3 | 46,5 |
| Plator | ad | 10.51-10.51 | 10,3 | 46,5 |
| Plator | juv | 10.00-10.08 | 10,3 | 46,5 |
| Plator | ad | 10.47-10.48 | 10,3 | 46,5 |
| Zebrù | ad | 11.16-11.29 | 10,4 | 46,5 |
| Zebrù | imm | 12.09-12.14 | 10,4 | 46,5 |

| | | | | |
|---|---|---|---|---|
| Zebrù | unidentifyed | 12.25-12.25 | 10,4 | 46,5 |
| Zebrù | ad | 10.01-10.01 | 10,5 | 46,5 |
| Zebrù | juv | 11.41-13.15 | 10,5 | 46,5 |
| Zebrù | juv | 13.32-13.59 | 10,5 | 46,5 |
| Zebrù | ad | 14.20-14.30 | 10,5 | 46,5 |
| Zebrù | imm | 11.35-11.38 | 10,4 | 46,5 |
| Zebrù | ad+juv | 11.37-11.47 | 10,4 | 46,5 |
| Sondalo | unidentifyed | 13.00-13.00 | 10,3 | 46,3 |
| Sondalo | unidentifyed | 13.38-13.39 | 10,3 | 46,3 |
| Sondalo | ad | 13.10-13.11 | 10,3 | 46,4 |
| Sondalo | ad | 13.08-13.09 | 10,3 | 46,4 |
| Sondalo | imm | 15.08-15.10 | 10,3 | 46,4 |

**Observations by the Western Italian Observer Network (23-10-2010)**

| Valley | Age | Time | E | N |
|---|---|---|---|---|
| Stura | imm | - | 7,0 | 44,3 |
| Maira | imm | - | 6,9 | 44,4 |
| Varaita | ad | - | 6,9 | 44,5 |