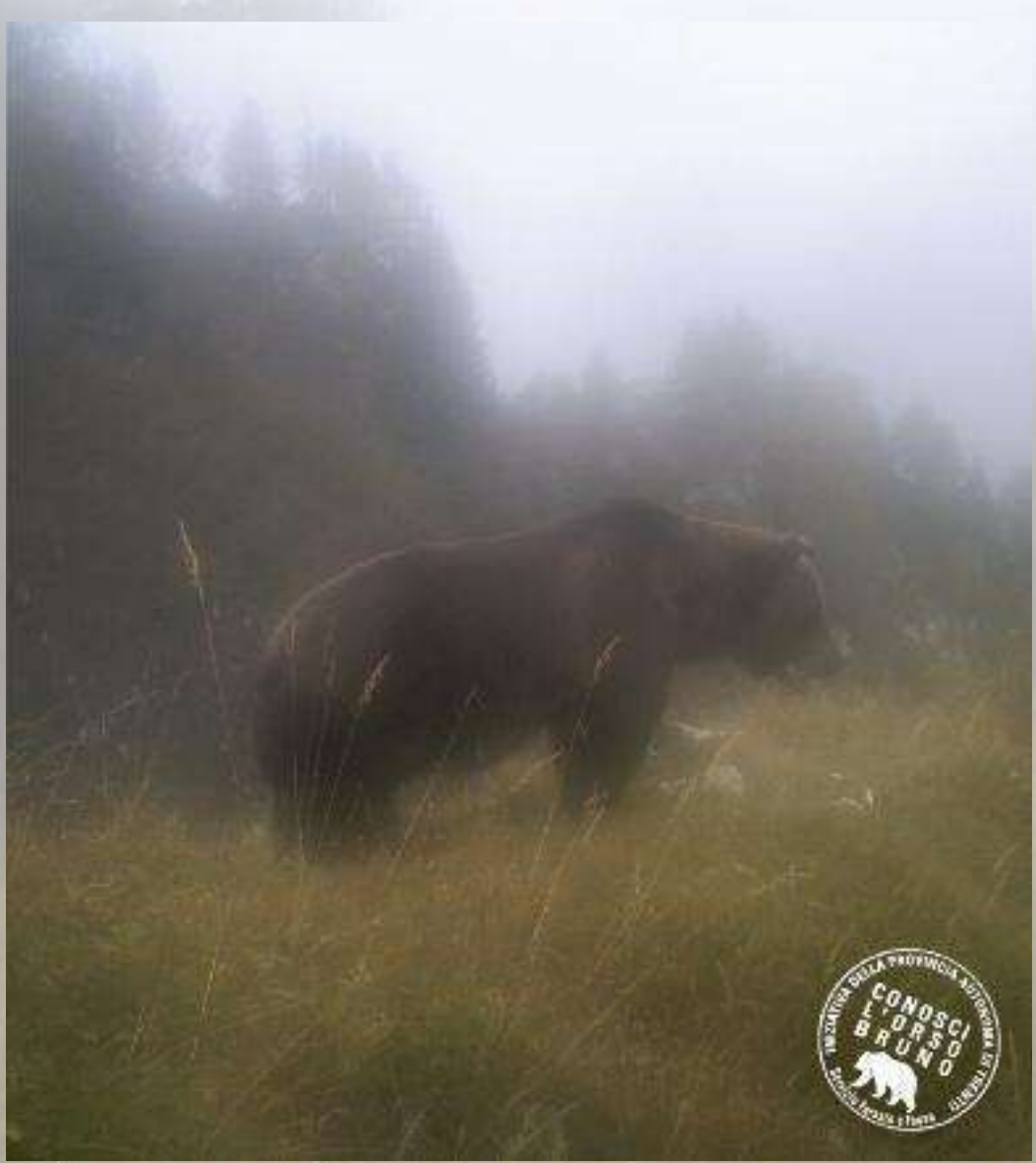
PROVINCIA AUTONOMA DI TRENTO

TRENTINO

2014 BEAR REPORT

WITH APPENDICES ON THE LYNX AND WOLF



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PROVINCIA AUTONOMA
DI TRENTO

SERVIZIO FORESTE E FAUNA
UFFICIO FAUNISTICO

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2014
BEAR REPORT

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Photo by Massimo Papi (with camera trap) - APT Forestry and Wildlife Department Archives

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"Spider's web in the fog"
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Presentation

2014, the year to which this report refers, was undoubtedly distinguished by the Daniza case, which gave rise to sensationalist media coverage and increased interest in the Trentino bear project.

It is therefore necessary to dedicate some preliminary considerations to the matter.

In the light of the situation that developed, there is no doubt that the management strategies adopted to date must be re-evaluated, and this is precisely the process begun by our organisation during the season when operations are at a standstill; it is likely that this will lead shortly to the adjustment of certain procedures.

It is however equally certain that the position taken by many in relation to the events was not the result of an objective and responsible approach, and led to categorical condemnation of the whole provincial administration and the staff who work there, without taking into any consideration the commitment demonstrated over the course of the years to supporting the project and dealing with the difficulties resulting from it.

It has not been easy to operate in a similar context, while attempting to maintain an overall perspective. It has required a great deal of conviction and enthusiasm, despite the substantial and at times ferocious criticism arriving from several quarters.

First of all we must therefore express our genuine appreciation for the work of the Wildlife Office and the staff of the Trentino Forestry Service, who dealt with the essence of the matter throughout the whole period, while others preferred to pay attention to appearances.

Equally sincere thanks must also go to the technical staff at the Ministry of the Environment and ISPRA, who have demonstrated a clear-cut vision and authoritative and constant support, and to the international experts who have worked alongside us in this process, sharing their experience and showing their willingness to collaborate.

Presentation of this new report must therefore be seen as an opportunity to note the importance of continuing a process interrupted in 2014, designed to overcome the biggest obstacle in the bear project, namely the lack of a popular consensus in the Trentino area.

This was not talked about last year, because the media uproar excited by the Daniza case ended up by overshadowing all other aspects. The data regarding the evolution of the bear population, once again shown to be at a standstill, nevertheless demonstrates the urgency of the need to provide suitable answers to problems that have already been reported several times.

All of us working on this particularly demanding project with such enthusiasm hope that 2015 will represent a real opportunity to take up the subject once again and to regain a sense of proportion.

DOTT. MAURIZIO ZANIN

Manager of the Autonomous Province of Trento's Forestry and Wildlife Department

Introduction

The brown bear has never completely disappeared from Trentino, which is thus the only area in the Alps that can proudly affirm the continuous presence of bears.

However, protection of bears, which began in 1939, has not eliminated the risk of their becoming extinct. Direct persecution by man and, to a lesser extent, environmental changes taking place in the last two centuries, reduced the original population, bringing it to the threshold of extinction. At the end of the 1990s there were probably no more than three or four bears remaining, confined to the north-eastern Brenta area, the last bears in the Alps. However, just when all seemed lost, there was a reversal of fortune, originating in the action taken by ABNP, which started up the *Life Ursus* project together with APT and ISPRA, co-funded by the European Union. Between 1999 and 2002 this led to the release of 10 bears (3 males and 7 females), giving rise to the current population. The release of the bears was preceded by a detailed feasibility study supervised by ISPRA, which ascertained the environmental suitability of a sufficiently large area to play host to a viable bear population (40-60 bears), which is the minimum aim of the project. This area extends well beyond the confines of the province of Trento, also involving neighbouring regions and countries.

Following the conclusion of the phase involving the release of the animals, the phase dedicated to the conservation and ordinary management of the bear population, perhaps even more demanding, began in 2002. For this purpose the provincial government set out the operational guidelines on which these management activities should be based in resolutions no. 1428 of 26 June 2002 and no. 1988 of 9 August 2002. Specifically, six programmes of action were identified (Monitoring, Damage Management, Management of Emergencies, Staff Training, Communication and National and International Links), which represent the underlying structure followed in this report.

Acknowledgements

The information coming from **genetic monitoring** presented in this report is available thanks to the large number of organic samples collected during the year by the people listed below, to whom our most sincere thanks must go, and as a result of the work of Francesca Davoli and Patrizia Giangregorio, from ISPRA, who materially carried out the genetic testing:

Albertini Ivan, Angeli Fabio, Bagatoli Tiziano, Baggia Mauro, Baldessari Michele, Benvenuti Mauro, Bonapace Elio, Borghetti Tommaso, Caliari Angelo, Calvetti Roberto, Calvetti Valter, Collini Gelindo, Dallabetta Luca, Debarba Marta, Degiampietro Giugliano, Dorigatti Enrico, Dorna Riccardo, Gentilini Jessica, Ghezzi Gianni, Ghezzo Alessandro, Groff Claudio, Luzzani Massimiliano, Menghini Giorgio, Michelon Giuseppe, Moncher Erwin, Monte Roberto, Mosconi Giordano, Penasa Gianni, Peterlana Egidio, Piazzi Luciano, Pincelli Giuliana, Pincigher Lorenzo, Piva Paolo, Radoani Alessio, Rizzoli Renato, Rossi Domenico, Stoffella Alberto, Stringari Adriano, Todeschini Bruno, Tolotti Maurizio, Verones Andrea, Vettorazzi Massimo, Vettori Gabriele, Volcan Gilberto, Zanghellini Paolo, Zeni Matteo, Zeni Michele..

1. Monitoring

Monitoring of the bear has been carried out continuously by APT for 40 years. Over time, traditional survey techniques in the field have been supplemented by radiotelemetry (a method first used in Eurasia, in the second half of the 1970s), automatic video controls by remote stations, camera traps and finally, since 2002, by **genetic monitoring**.

The latter technique is based on the collection of organic samples (hairs and excrement) and takes place using two methods commonly described as **systematic monitoring**, based on the use of traps with scent bait, designed to "capture" hairs using barbed wire, and on **opportunistic monitoring**, which is based on the collection of organic samples found in the area during routine activities. In the last few years, genetic monitoring has represented the most crucial technique for collecting information regarding the bear population present in the province. This was carried out for the **thirteenth consecutive year**, coordinated by APT's Forestry and Wildlife Department, with the collaboration of ISPRA, ABNP, MuSe and volunteers. The data is collected and processed on an annual basis, with reference to the **solar year** (1/1 - 31/12), which effectively coincides with the bear's "biological year", making it possible to take stock of the situation just before new births and during the period of the year in which the species is least active. The wolf is a different case, and the need to exploit the winter season for monitoring and take stock before new litters are born leads most researchers to define its "biological year" as going from 1/5 to 30/4.

It is nevertheless implicit that the monitoring techniques cited do not guarantee that **all the bears present** in the area will be detected, so the data in this report must be interpreted bearing in mind this **intrinsic limitation**.

In 2014 **genetic testing** was again carried out by technicians from the conservation genetics laboratory at **ISPRA**. The samples collected (hairs, faeces, tissue or other) are sent to the laboratory for genetic tests, carried out using standard protocols; the data is validated using population genetics software. The methods developed, in accordance with the provisions of PACOBACE, provide for amplification of ten different genomic regions (DNA microsatellites) and molecular sexing of all the hair and faeces samples collected by staff and sent to the institute's laboratory. The high risk of error associated with analysis of samples collected using non-invasive techniques demands optimisation of laboratory procedures, designed to minimise the risk of genotyping errors. With this scope the multiple amplification approach has been adopted, involving repeating a series of tests until a genotype considered to be reliable is obtained. Reliability was established using statistical evaluation, carried out using the *Reliotype* programme. This calculates the likelihood of the particular genotype observed effectively belonging to the population, based on the allele frequency observed in the population of reference and on the number of repeat tests providing concordant results. If the reliability of the genotype arrives at or exceeds 95% it is accepted and the sample identified is added to the database. Following processing of the initial results of genetic tests, the combination of genotypes identified is subjected to careful quality control carried out subsequently, through comparison of genetic data, sampling and data coming from other activities in the field (telemetry, sightings etc.) designed to identify samples potentially subject to error. Further tests are used for these samples in order to clarify any uncertainty. Finally, **blind tests** are carried out regularly by the authority (with checks designed to reveal any possible errors in the system of analysis).

As regards the **level of heterozygosity** of the bear population, **ISPRA** underlines that "heterozygosis, estimated through the panel of microsatellite loci in the population genotyped in 2014, is **H = 0.72**. This figure shows a **good level of heterozygosis**, comparable

with the values observed in other European brown bear populations. Currently the brown bear population in Trentino tends to maintain the heterozygosis transferred following their relocation. The heterozygosis of the source bear population (Slovenia) is high, thus allowing the population reintroduced to maintain a high level of genetic diversity".

Estimation of the population using the CMR *(capture, mark, recapture)* system

As already mentioned in the 2013 Bear Report (on page 5), for the first time last year an overall estimate of the size of the bear population was prepared, in the context of collaboration with MUSE, Trento Science Museum, the main content of which is summarised in Box 1.

BOX 1 - Estimate of the size and density of the brown bear population in 2013

In 2014 collaboration between APT and the Vertebrate Zoology Department of MUSE, the Science Museum, was started up in order to take a closer look at certain aspects linked to the ecology and dynamics of the brown bear population. The assignment provided for (i) exploration of the different datasets available, (ii) estimation of the extent and density of the brown bear population in 2013, and (iii) exploration of the potential of using existing data to obtain reliable estimates of demographic parameters regulating changes in the size of the population (namely the number of individuals) over time.

Data coming from systematic sampling via the network of ***hair snares*** *was used to obtain identification of individual bears through DNA testing. The data was gathered over the course of 5 sessions, from 28 May to 31July 2013, using a total of 100 hair traps (50 x 2 sessions) with an average space of 1701 m between them (see Figure A). The sample included a total of 24 individual adults, 14 females and 10 males. The tests did not include cubs (bears less than one year old in 2013) in order not to violate the assumption of independent contact between different individuals, although recent research suggests that the violation of this assumption has little influence on the estimation of parameters (Reich et al. 2014). To estimate the density of the bear population, spatially explicit capture-recapture models were used (Borchers et al. 2006, Royle et al. 2014). The models considered can include a gender effect on density (different density of males and females), the basic probability of contacting individuals and the use of space. In addition to gender, the effect of altitude on the density of individual bears was also considered. In order to extend the models, a resolution of 500m was used, with a buffer zone of 20 km around the network of traps (prior to verification of a buffer zone of 10 and 30 km).*

The models best supported by the data include differentiated density for the sexes and no substantial effect of altitude on the density of individuals. An estimate based on the parameters led to an ***average density of 1.31 females / 100 km² (0.61-2.81, 95% CI) and of 0.28 males / 100 km² (0.12-0.66)****. It should be underlined the density estimates refer to the sampling period (around two months) and to the area effectively sampled by the traps, the latter not being directly measurable but only possible to estimate using a spatial capture-recapture model. At the moment the best models do not include non-ho-*

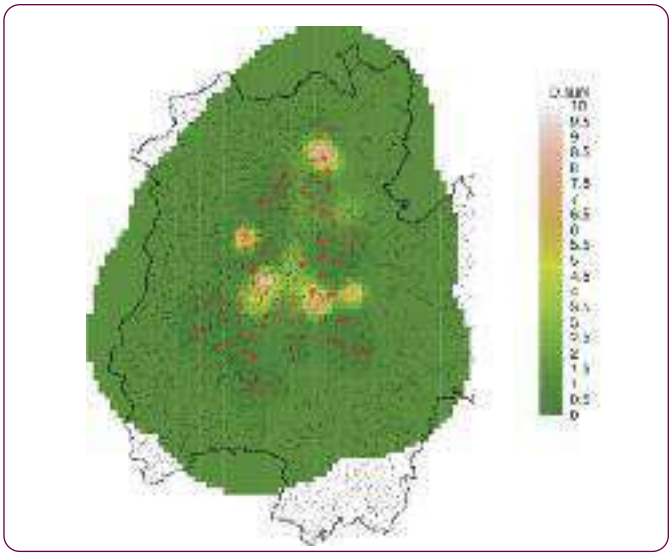
mogeneous density in the space and for this reason density maps will not be presented. Future studies will be able to investigate the environmental characteristics leading to spatial changes in the density of individuals in more detail, including anthropogenic constraints that limit the use of space by bears.

For ***females*** *an average range of movement of 7.433 m from the centre of their activities is estimated, from which one can deduce an* ***average home range of 173.5 km²****. This conclusion is however conditioned by certain assumptions, such as for example the lack of influence of the traps on the ways in which individuals used the space. The estimated average range of movement around the centre of activity for males is less precise, probably in relation to the low density of individuals with a much more extensive home range as compared to the females. In this case the extension of the network of traps would not be able to provide representative information on the use of space by the males. This could explain the estimate of* ***2072.7 km² for the average home range of males****. It is pointed out that there is no single and specific definition of the centre of an individual's activity. In the literature it is identified as the centroid of the individual's home range, or the centroid of the activities of an individual during the period of sampling (Royle et al. 2014). In general, this point is unknown for each individual, but can be estimated through repeated sightings of the individuals in the space.*

Graphic representation of the outline of the home range for females is shown in Figure A, which essentially shows the confidence intervals in 2D for the different home ranges, given the best model used. By adding these confidence intervals together, a cumulative probability surface area is obtained for the centres of activity for observed and non observed individuals (estimated). It is underlined that this does not correspond with the surface area of the density of individuals and that the graph in Figure A can erroneously suggest pattern interpretations that have not been included in models.

The graph indeed only regards one output for the model applied, emphasising information relating to the individuals observed, and the surface area shown is influenced by the intensity of the sampling procedures, tending to change shape gradually as new data is added.

Figure A



For further details see Borchers & Efford 2008.

Sum of the probable density for the centres of activity of the females' home ranges. The surface area has a resolution of 1145 m and is delimited by the buffer zone of 20 km established around the traps (red crosses). The contour lines are 500 m apart. With

the limitations explained, it can be interpreted as a representation of the superimposed home ranges of the females. The greater the figure shown in the key by "D.sum", the greater is the number of home ranges superimposed in a certain cell.

Population dynamics

Integrated analysis of the different datasets available for the brown bear population in Trentino from 2002 to 2013 is currently underway. Individual datasets can indeed be ineffective for estimating demographic parameters and the size of the population with sufficient precision for understanding increases or decreases in this population (see, for example Schaub et al. 2007). The use of integrated population models has recently become an important tool in the biology of conservation and management of wildlife, making it possible to maximise the scarce information available for a species in order to study population dynamics and threats (Schaub et al. 2010, Tenan et al. 2012). In addition to estimating ***demographic parameters****, the scope of the study is to obtain* ***age-dependent estimates of anthropogenic and natural mortality rates****. Furthermore, analysis of disturbance will be carried out starting from the integrated model, to understand how some demographic parameters (e.g. number of cubs) can compensate for theoretical decreases in survival rates. The study provides for mathematical integration of the following types of data, available on an annual basis: (i) counting of the total number of individuals (on a genetic basis), (ii) number of cubs, (iii) systematic capture-recapture (on a genetic basis), (iv) individuals found dead for different reasons, (v) size of the harem, (vi) pedigree. The research takes place in collaboration with the Population Ecology Group of IMEDEA (CSIC-UIB, Spain). From this analysis we anticipate that the overall* ***estimate of the size of the population in 2013*** *with 95% probability, was* ***between 34 and 51 individuals (median 42)****. In contrast with the estimate of the density of individuals given above, this last estimate does not refer to any specific area and includes all individuals that can potentially be sampled using the methods adopted (so also outside Trentino).*

Further details will be provided in the article currently being written.

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Tenan, S., Adrover, J., Navarro, A.M., Sergio, F. & Tavecchia, G. (2012) Demographic consequences of poison-related mortality in a threatened bird of prey. PloS ONE, 7, e49187.

Edited by Simone Tenan and Paolo Pedrini (MUSE-Science Museum)

Collection of organic samples

A total of **688** organic samples from large carnivores were collected in the province of Trento in **2014. 531** of these were sent for genetic testing (526 using the standard system and 5 with the rapid system). Some of the samples collected (157) were not sent for testing, as they were duplicates (or further repeats) of samples which had already been successfully analysed. It was possible to attribute **494** samples (393 hair, 99 faeces and 2 tissue samples) to the **bear**, **35** to the **wolf** and **2** to **dogs**. The organic samples related to bears were collected from rub trees (226), damage sites (85), a bear carcass (2) and elsewhere (181). The 494 samples analysed in 2014 brought the total number of organic samples related to the bear collected and subjected to genetic testing **since 2002** to **6,165**.

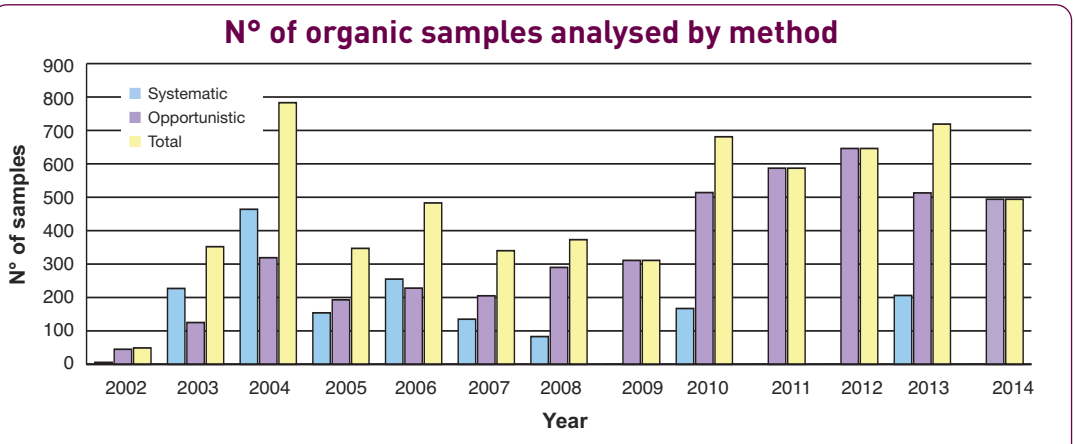
The fact that **genetic monitoring** has now been carried out for **thirteen consecutive years** makes it particularly interesting, as the medium-long term timescale for these activities (generally difficult to keep up and hence rare, perhaps without precedent), makes certain types of analysis possible which would be unthinkable with more fragmentary monitoring.

The 531 organic samples analysed were collected by the staff of the Autonomous Province of Trento (328; 62%), ABNP (185; 35%) and by volunteers (18; 3%).

Further samples were collected outside the province, contributing towards determining the total number of bears from this population identified; the data was kindly provided by the **Autonomous Province of Bolzano**, the **Lombardia Region**, the **Veneto Region** and the **Autonomous Region of Friuli Venezia Giulia**.

The trend in relation to the number of samples collected in Trentino over the last thirteen seasons can be seen below (Graph 1).

Graph 1



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	TOT.
Opport.	45	125	319	193	228	205	290	311	514	587	646	513	494	4470
System.	4	227	464	154	255	135*	83	-	167	-	-	206	-	1695
TOTAL	49	352	783	347	483	340	373	311	681	587	646	719	494	6165
N° of traps	4	39	41	42	47	17*	57	-	57	-	-	50	-	

*within the ABNP alone

Monitoring of *"rub trees"*

During 2014, (for the fifth consecutive year) the Forestry and Wildlife Department, with the collaboration of MuSe and ABNP, again carried out **monitoring of rub trees**, namely plants on which bears leave signs of their presence by leaving their smell and hair on the bark. For the second year running, this monitoring activity took place in a **standardised manner**, as described below and with the results given.

Overall, 156 **trees** equipped with barbed wire were monitored, with the scope of collecting organic samples, assessing the possible significance of the use of these trees by bears and consequently understanding how useful they may be in monitoring the population (photo 1). The checks, carried out **every three weeks** from **April** until **November**, with a total of **10 sessions**, provided for the collection of samples of organic material from each positive rub tree (collected exclusively from the barbs of the barbed wire). In order to avoid changing the habits of bears, no lures were used. Identification and monitoring of the sites was possible thanks to the local knowledge of staff from the Wildlife Office, the park wardens of ABNP, the staff of the Trentino Forestry Service, forest wardens and volunteers.

Photo 1 - Bear checking a rub tree (APT Wildlife Office - Adamello Brenta Nature Park Archives)

During the season **276 hair samples** were collected. A total of **11 bears** were genotyped; **9 males and 2 females** (representing 39% of males and 12% of females known to be present in the area studied in 2014, also considering all the cubs). Of these **9** were **adults** and **2 youngs**. In the five years of monitoring **(2010-2014)**, a total of 25 bears actively frequented the rub trees.

For the third and final year, **photographic monitoring** of rub trees was also carried out (box 2).

BOX 2 - Photographic monitoring of "rub trees"

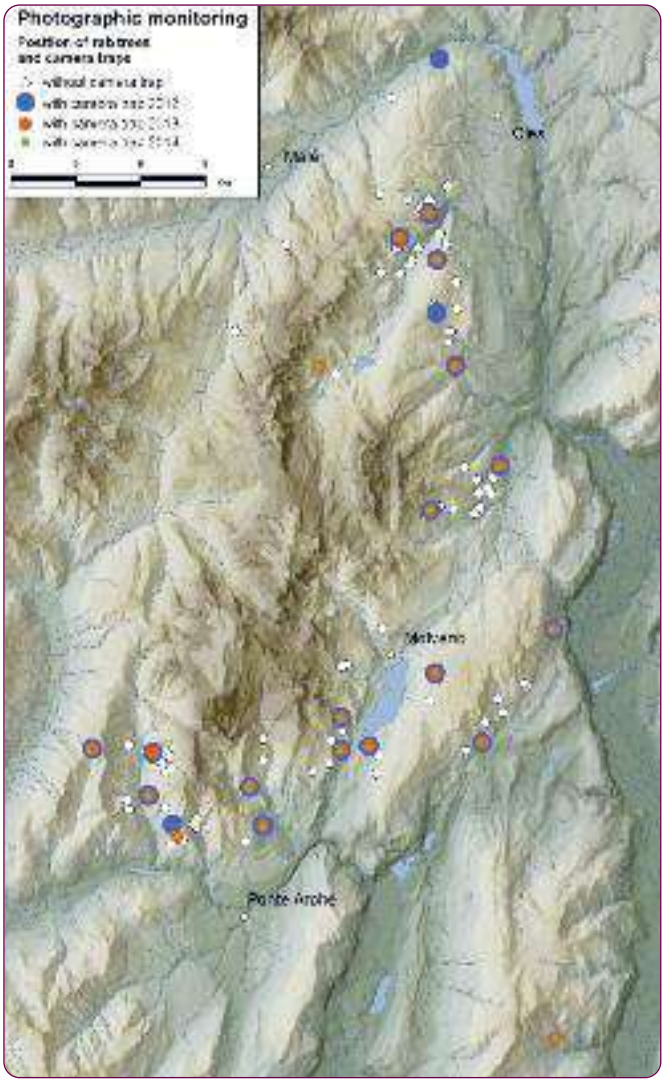
The results of rub tree monitoring using camera traps are presented here for 2014, the last year in a three-year study carried out through renewal of the agreement signed by APT and MuSe - the Science Museum, and in collaboration with ABNP. The main scope of the study was to obtain quantitative and qualitative data on the use of rub trees by bears, in relation to the frequency and ways in which they are used by the different sexes and age groups and during different seasons. Secondly, the camera traps made it possible to obtain important information on seasonal variations and the activities of bears in general, along with information about numerous other species.

*Repeating the data collection system adopted in previous years, **20** "IR-plus" **camera traps** were used.*

The cameras were attached to trees opposite the chosen rub tree, at a height of around 2 metres and an average distance of around 4 metres. They were set to video mode, with continuous filming (20 second sequences) and the date and time of the footage impressed on the image. They were equipped with a 4 GB memory card, making it possible to record hundreds of videos, also thanks to the extensive operational autonomy guaranteed by an external battery, in addition to the internal batteries. The camera traps were ***checked every 3 weeks*** *by APT/ABNP staff, in order to download the data and control the batteries.*

In order to guarantee comparability of the results in different years, the rub trees chosen for monitoring in 2014 were the same as those used in previous years, with the exception of 2 sites which were changed because the cameras had previously been stolen or because the rub trees were not visited in 2013. Overall, the 20 sites (of the 156 rub trees recorded in 2014) represent a sample uniformly distributed in the area used most regularly by bears (Figure A). The 25 sites covered by camera traps in the 2012-2014 period were positioned at an altitude ranging between 750 and 1560 metres a.s.l. (average altitude 1192 m). 15 rub trees were monitored using camera traps in all three years of the study; this consistency over time for most of the sites monitored made it possible to compare data obtained in different years.

Figure A - Location of photo traps positioned on rub trees



Photographic sampling was carried out during the period of activity of the species, specifically from 13 March to 17 November 2014, with a total of ***3,318 camera days*** *in terms of effective operation (an average of 175 days per camera). The sampling was not quite as extensive as expected (3655 days), due to reduced operation by some of the cameras be-*

cause of full memory cards or problems with batteries, and to the theft of one camera. The extent of the sampling was consistent with sampling in 2013, both in terms of the number of days and seasonal coverage, whereas in 2012 the sampling was less extensive as it was started up in May.

Population dynamics

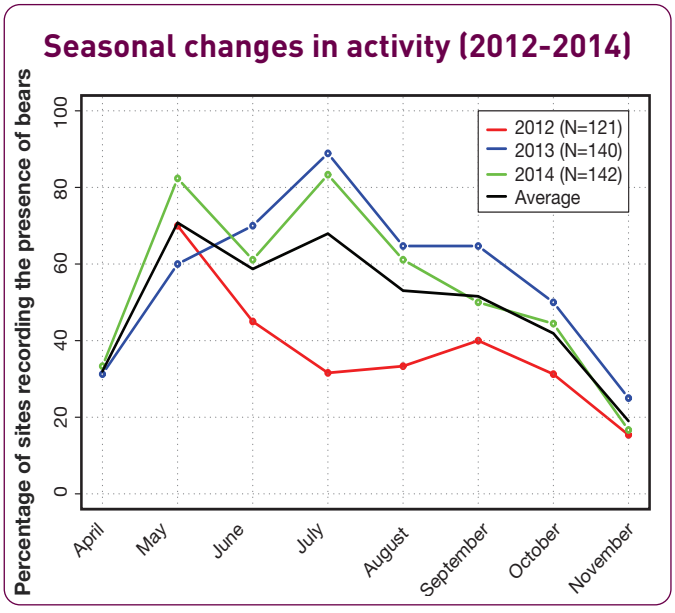
*The cameras recorded a total of **5,449 videos of animals** and men, of which **286 of bears**. The results were similar to those obtained in 2013 (4962 videos, of which 285 of bears) and in 2012 (4736 videos of which 128 of bears). "Individual events" relating to the passage of bears (or other species) were counted, joining together sequential videos because they referred to a single event (such as a bear checking and using a rub tree for example), or in the event that the same animal spent a long time in front of the camera, leading to several videos within a standard time interval (established as 1 hour).*

*In this way **215 "individual events"** (or separate events independent of each other) resulted for bears **(as compared to 213 in 2013 and 110 in 2012)**, with an average of 10.8 per camera (from a minimum of 1 to a maximum of 61).*

Graph 1 shows that there was slightly more activity in 2013 and 2014 as compared to 2012, particularly during the June-September period.

There seems to have been more activity by bears at the rub trees in the summer period from May to July, but preliminary analysis of qualitative correlation of activity with climatic parameters did not show any clear correlation either with rainfall (which if anything was lower in the summer months of 2013 as compared to 2012 and 2014) or with temperature, which was similar over the three years.

Graph 1 - Seasonal changes in the activity of bears in the three-year period, as recorded at rub trees monitored with camera traps, expressed as the % of sites recording the presence of bears in relation to the total number of sites monitored with camera traps. N indicates the overall commitment in terms of the total number of sites (cameras working for all months)

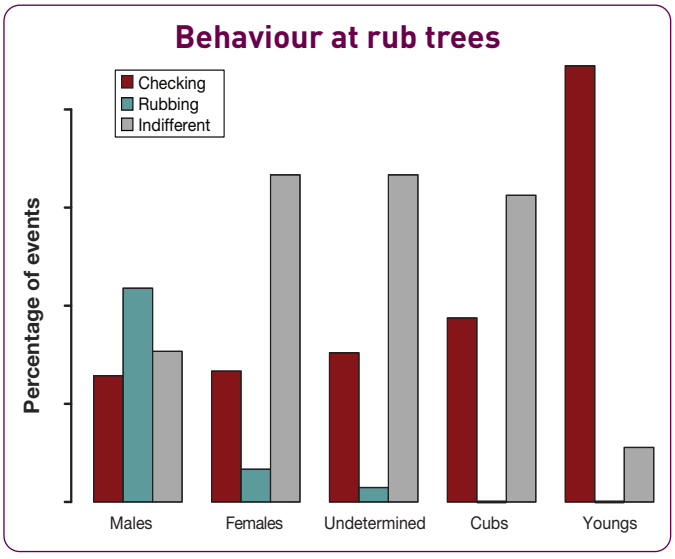


The bears' behaviour at rub trees was assigned to one of 3 categories: (1) indifferent (bear did not stop at tree), (2) checking of tree, (3) rubbing (photo A). Graph 2 shows the percentages for these different categories of behaviour for the 215 individual events recorded, overall and by age group and sex.

It is interesting to observe that the frequency of the behaviour by age group and sex showed a trend rel-

Photo A - Bear rubbing itself against a rub tree (C. Sartori - APT Forestry and Wildlife Department archives)

Graph 2 - % distribution of behaviour in terms of the use of rub trees (in relation to individual events recorded by camera traps) by different age groups. Males=101, Females=15, Undetermined: 204, Cubs:8, Youngs: 9

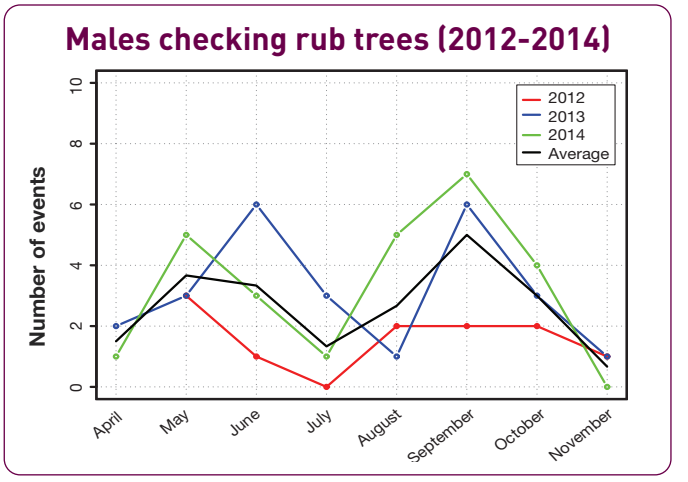


atively similar to that recorded in previous years, although in 2014 there were more cases of checking as compared to indifferent behaviour. To summarise, half of the bears were "indifferent", a third checked the rub tree (30%), while the remaining bears either checked and rubbed (13%) or just rubbed. It was confirmed that most of the bears rubbing themselves against the trees were adult males, but this year at least one female and two adults of unidentified gender were observed to show this behaviour, while no youngs were observed rubbing. As regards this it should be recalled that classification of individuals by age groups and gender was carried out in an extremely conservative manner, due to the difficulty in identifying the bears. Despite this intrinsic limitation, the consistency in terms of the frequency of behaviour at rub trees over the years confirms the role of rub trees in communication by adult males, as highlighted in the subsequent considerations.

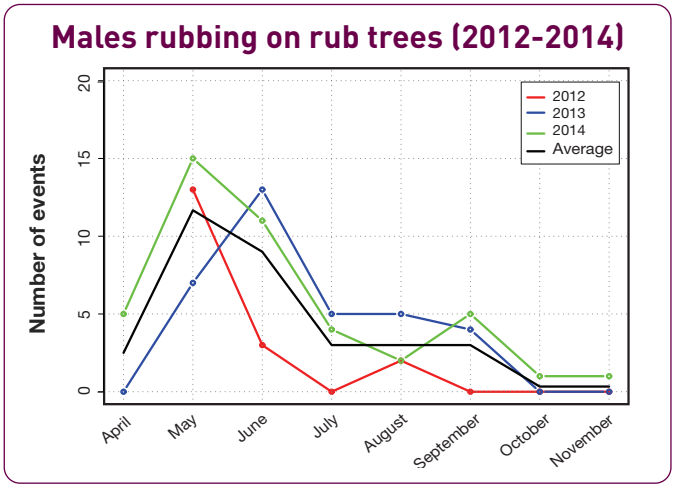
The behaviour of adult females was largely marked by indifference (in 10 out of 15 cases) or checking alone (4 out of 15), whereas only 30% of adult males were indifferent to the rub trees (31 out of 101). As regards differentiation according to age groups, it is interesting to observe that 80% of youngs passing checked the tree, a pattern similar to 2012. As regards cubs, the trend was again similar to 2012, when cases of cubs checking the trees were also recorded, whereas in 2013 no images of cubs were captured. This was certainly influenced by the low number of cubs present in 2013.

This data confirms that active behaviour (the 'checking and rubbing' and 'rubbing' category) mainly concerns adult males, confirming the information coming from genetic testing and the results of other studies. An analysis of seasonal changes in behaviour at rub trees shows a clear seasonal trend for adult male bears, with a clear peak in the use of rub trees for marking in May, June and part of July, as compared to subsequent months (see graphs 3a and 3b). Checking of trees instead shows two peaks, with one in June and one in September. This trend is also very consistent over the years. This result reinforces the theory that rub trees have a fundamental role in inter-specific communication linked to reproduction.

Graph 3a - Trend for male bears **checking** rub trees over the months. The data refers to individual events recording the passage of bears (2012: N°=11, 2013: N°=59, 2014: N°=26)

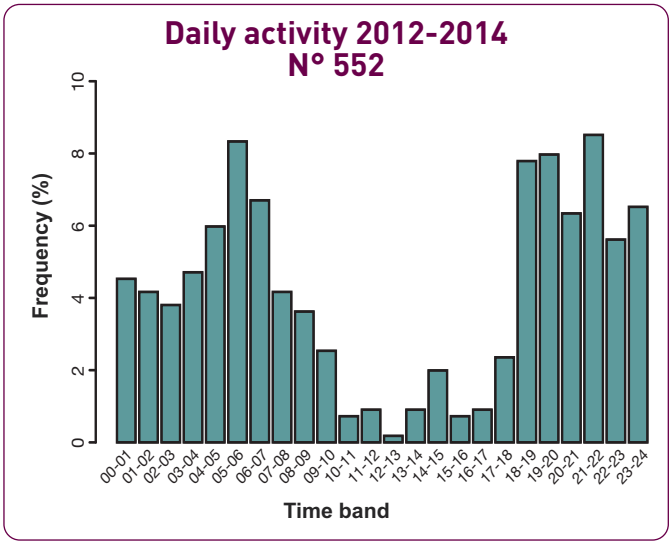


Graph 3b - Trend for male bears **rubbing** on rub trees over the months. The data refers to individual events recording the passage of bears (2012: N°=11, 2013: N°=59, 2014: N°=26)

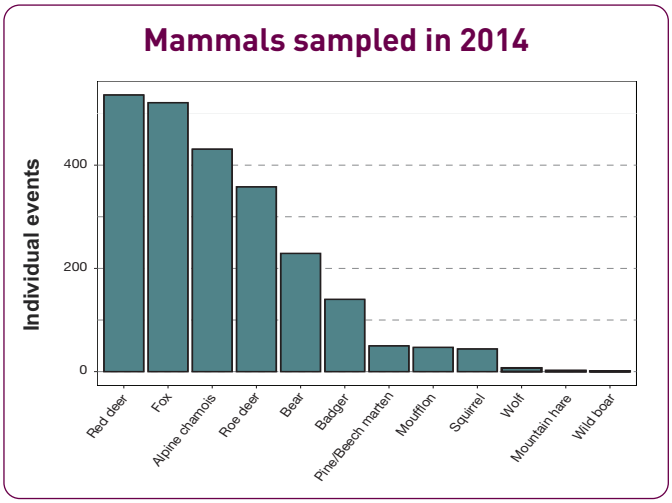


In addition to the use of rub trees, the results revealed other interesting aspects regarding the habits of bears, particularly in relation to their daily activities. The typical pattern for a nocturnal and crepuscular species was confirmed, but also with significant use in the hours of light in the early morning and late afternoon. Peaks in terms of passage (and hence activity) were recorded early in the morning (4:00-8:00) and in the evening (18:00-22:00). Graph 4 shows the cumulative data for the three years, given that the trend is almost identical in the different years.

Graph 4 - Daily activity of bears, in terms of events when passing bears were filmed by camera traps, summary over 3 years, N°=552



Graph 5 - ndividual events recorded for all species of mammals. 2 events were recorded for the mountain hare and 1 for the boar



Results (all species)

In addition to the bear, a further 11 species of "medium-large" mammals were captured on film, including man, with 1,748 individual events being related to passing humans (more than 45% of all events), very much in line with the results for 2012 (40% in 2013).

In Graph 5 the species, excluding man, are placed in order of the overall number of events recorded, allowing straightforward comparison of the results for different species, limited to these specific points. The variety of animals filmed shows the usefulness of camera traps in monitoring a wide range of mammals. As compared to 2013, the fox and the red deer were recorded more frequently and the roe deer and chamois less frequently. Documentation of the presence of the wolf for the first time in the area was interesting (7 events), along with the absence of the only lynx present in the area, photographed up to 2012 (and then migrating outside the sampling area, as shown by other evidence). The passage of a single boar was recorded by the camera traps, as compared to 3 in 2013. Subsequent analysis will be directed at identifying any link between the bear and other species, including man, in terms of avoidance or association.

The positioning of cameras on rub-trees during the active season in the 2012-2014 period made it possible to obtain important data on the way these trees are effectively used by bears, by age group and gender, allowing quantitative confirmation of the primary role of such trees in inter-specific communication and obtaining information that does not come from genetic testing of the hairs found on the rub trees. The study also

made it possible to identify daily and seasonal patterns of activity, providing some indications regarding the length of the mating season.

In some cases it was possible to verify consistency between genetic and morphological data, the match being nevertheless complex due both to the inevitable time lag between the image taken by the camera trap and the moment of sampling, and to the possibility (somewhat remote if the collection protocol is respected) that hairs from a previous passage may have remained on the tree.

By Francesco Rovero and Clara Tattoni (MuSe-Science Museum) and Elisa Santoni.

Status of the population in 2014

Definitions

- **"Cubs"**: bears aged between 0 and 1;
- **"Youngs"**: males between the ages of 1 and 4 and females between the ages of 1 and 3;
- **"Adults"**: males over the age of 4 and females over the age of 3;
- **"Detected bears"**: bears whose presence has been ascertained during the last year, either genetically or on the basis of unequivocal and repeated observations;
- **"Undetected bears"**: bears not detected in the last year alone;
- **"Missing bears"**: bears certainly or most likely no longer present within the population, as they have been found dead, killed, emigrated, taken into captivity or for which no genetic evidence has been found in the last two years;
- **"Rediscovered bears"**: bears detected genetically after two or more years during which their presence was not recorded;
- **"Roaming"**: movement outside western Trentino by bears born in this area, without them reaching the territory habitually frequented by bears belonging to the Dinaric-Balkan bear population;
- **"Emigration"**: the abandoning of the population present in the province by bears reaching the territory habitually frequented by bears belonging to the Dinaric-Balkan bear population;
- **"Immigration"**: the arrival of bears from the Dinaric-Balkan bear population in the province.

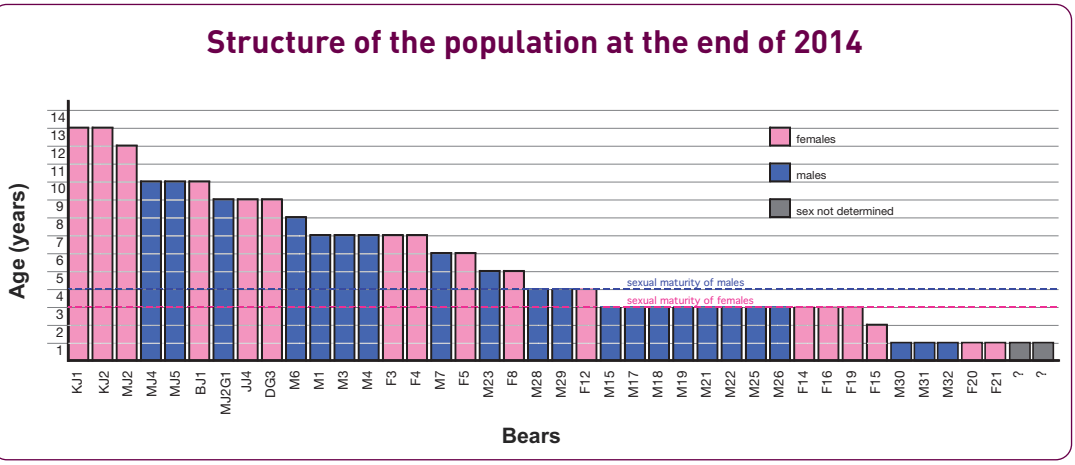
Processing of the data collected has provided the information given subsequently regarding the **identification of the bears** sampled, **estimation** of the **minimum population**, the number of **litters** during 2014, the **survival rate**, the **trends** in terms of population development and the **use of the area** by the animals.

It should be noted that the **graphs regarding demographic aspects** have been **updated** not only in relation to 2014, but also on the basis of data regarding **previous years** that monitoring in 2014 has made it possible to recover. This explains the differences which can sometimes be found between the graphs in previous reports and those in this year's report. The **updating of the data available** and the relative graphs is therefore ***"ongoing"*** and the current graphs must thus be considered to substitute previous ones, bearing in mind the greater reliability of the background information and hence the related analysis.

Results

The minimum number of animals considered to be present at the end of 2014 was 41, of which 22 males, 17 females and 2 of undetermined sex (see Graph 2) (M-F sex ratio 1:0.77 - N°=39).

Graph 2



Once again this year it is likely that the genetic monitoring carried out in the province did not detect all the bears making up the population. Considering the presence of individuals not detected in the last year alone (10) as possible, and excluding those missing for two or more years (19), **the estimated population in 2014** goes from **41 to 51 bears**.

It should be underlined that the minimum number represents the number of bears certainly present, whereas the maximum is exclusively an evaluation of probability, based on specific criteria shown to be essentially valid to date, but which have intrinsic limitations. The 41 bears therefore represent a **"minimum population estimate"**, which is different from a genuine **"population estimate"**, requiring the use of demographic models involving capture (genetic), marking and recapture **(CMR)**, on the basis of which an estimate was produced for the first time in Trentino precisely during 2014, thanks to the scientific support of the Science Museum in Trento (see Box 1).

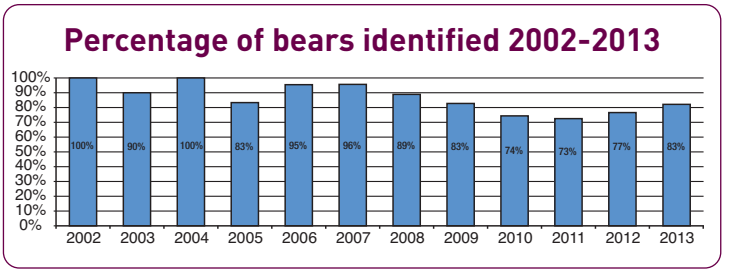
The estimated population in 2014 thus highlights an **essential stability** for the population in the last two years (if not a **slight fall**, although it is probably too early to establish this), in contrast with almost constant growth from 2002 to 2012 (average growth rate of 17.3% in the minimum certain population). As regards this some theories can be put forward:

- cases of illegal killing, potentially linked to the strong decline in levels of acceptance in relation to the presence of the bear, may have had an influence;
- the limitations of monitoring may be becoming clear, in relation to the larger number of bears present in the area in the last few years;
- a decrease in the productivity of the population may be manifesting itself.

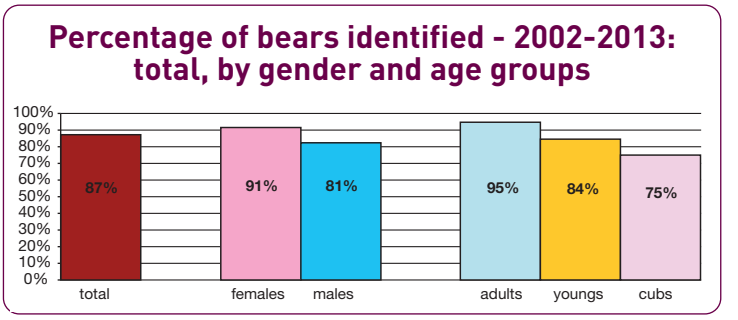
The good level of **heterozygosity** highlighted by ISPRA in the population genotyped in 2014 is though comforting.

The acquisition of consolidated demographic data over time also makes it possible to evaluate the **efficacy of genetic monitoring** in retrospect, comparing the number of individuals identified year by year with the individuals shown by monitoring in subsequent years to be

Graph 3



Graph 4



"actually" present in the same period (see Graph 3).

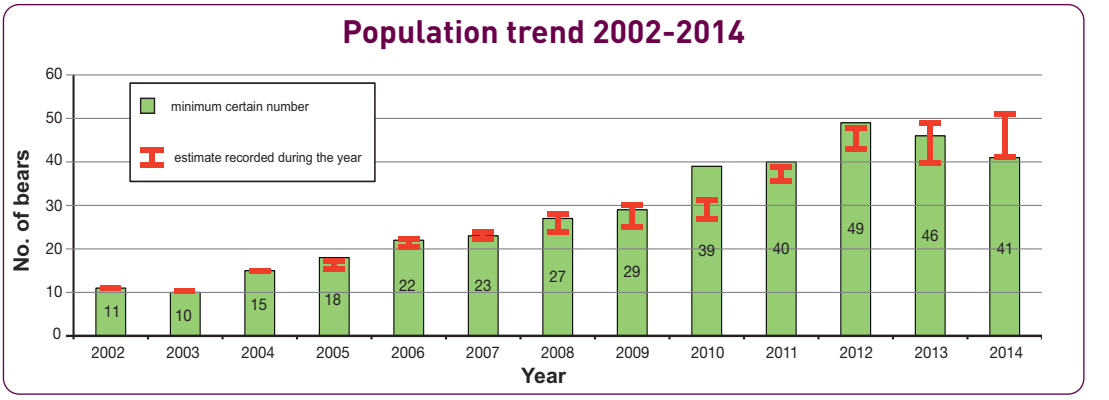
The **efficacy** of the monitoring was therefore shown to be relatively **good**, but **falling** substantially over time, in relation to the progressive increase in the number of bears present in the area.

Graph 4 shows the average percentage of genetically identified bears in comparison to the bears "actually" present in the 12 years in the 2002-2013 period **(contactability)**, with reference to the whole **population**, **females** and **males** and to the three **age groups (adults, youngs and cubs)**.

The population **trend** is highlighted in Graph 5. The figures for previous years no longer show the range which characterises 2014, as the relative **"minimum certain numbers"** have been updated and supplemented using data acquired in subsequent years. For example in 2013 we now know that there were (at least) 46 bears present, as compared to the estimate of between 40 and 49 made that year.

The graph also shows **historic data for the estimates recorded year by year on the basis of the criteria stated above (shown in red); the respective figures effectively show the "snapshots" resulting year by year**, unchanged by the adjustments made possible later due to subsequent monitoring. In some ways this graphic representation is more realistic, above all for the last 2-3 years, for which the figures are thus an expression of monitoring procedures assumed to be equal to those in previous years and not distorted by the lack of "updating" of latter years as compared to earlier ones.

Graph 5



Reproduction

In **2014** the presence of 5 litters during the year was ascertained, with a total of **11 cubs**, made up of three cubs in two cases, two cubs in a further two cases and a single cub in the remaining instance. Two were observed in the southern Brenta area, one in the Val Rendena, one in the Val di Sole and the final one in the Sporeggio area.

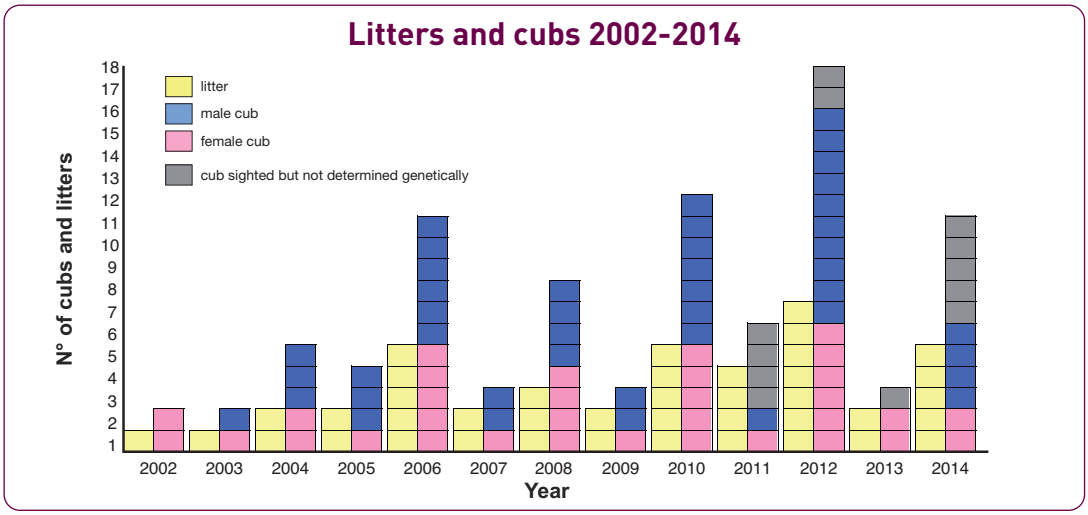
It is believed to be possible/likely that there were at least a further two litters (thus the sixth and seventh) in the Paganella-Gazza area in the upper Val dei Laghi and in the Tovel-Val di Non area, but it was not possible to obtain any objective evidence making it possible to distinguish them from the others. Consequently, as is the practice, they were not included in this report but will be taken into consideration in subsequent years should genetic evidence confirm their presence.

Of the 11 cubs observed at the beginning of spring, it is believed that **7** have **survived**, given that one was found dead and further three are presumed to have died, as they were not observed with their respective litters over the course of the year.

Genetic testing made it possible to identify 5 of the 7 surviving cubs (two females and three males).

41 litters have therefore been ascertained to date in Trentino (38 genetically, 2 only observed in 2011 and 1 in 2013) in the last **thirteen years**, and at least **88 cubs** have been born (45 males, 33 females and 10 of unknown gender) - (see Graph 6), **M-F sex ratio 1:0.73** (2002-2014, N°=78).

Graph 6



Reproductive animals

In 2014 reproduction by the following females was ascertained: **F8** accompanied by two cubs, M27 later found dead and a second cub not genetically identified, **DG3** (photo 2) with one cub (F21), **Daniza** accompanied at the beginning of spring by three cubs and later by only two (M31 and F20), **JJ4** (photo 3), she too initially accompanied by three cubs and later by two (M32 and an undetermined cub) and *F5*, initially accompanied by two cubs and later by only one (M30) - (photo 4).

The **fathers** of the five litters were **M2** (with Daniza and F5), who was killed by a poacher on 28 September 2013, however after having participated in the reproductive season (in total he was the father of four litters), **MJ5** (with DG3), reproducing for the second time, **MJ2G1** (with JJ4) and **M1** (with F8), both ascertained to have reproduced for the first time.

To date **17 females** and **9 males** have therefore reproduced (2002-2014).

There were **9 sexually mature males and 11 sexually mature females** present in 2014 (without considering the bears that died during the year).

The **average age of primiparous females** in the period 2006-2014 (N°=12) was **4.17**.

Photo 2 - L'orsa DG3 con un cucciolo ripresa da una fototrappola nei pressi di una trappola tubo (V. The female bear DG3 with a cub filmed by a camera trap near a tube trap (V. Calvetti - APT Forestry and Wildlife Department Archives)

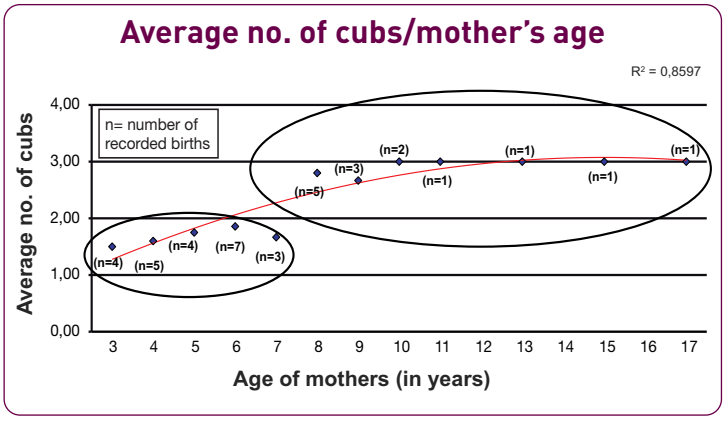
Photo 3 - The female bear JJ4 with three cubs filmed in May (F. Daprà - APT Forestry and Wildlife Department Archives)

Photo 4 - The female bear F5 with her cub filmed by a camera trap in July (APT Forestry and Wildlife Department archives – Adamello Brenta Nature Park Archives)

The **average gap between consecutive litters for the same female**, recorded in the period 2002-2014 (N°=21 gaps, referring to 10 females), is **2.10 years**.

The **average number of cubs per litter** is **2.15**. In general the **number of cubs per litter** to date has essentially been related to the age of the mother, with 2 or less cubs for females aged 3-7 and 3 for females aged 8 or over (see Graph 7). This data refers to 38 litters out of 41, not taking into consideration the two litters in 2011 and one in 2013 whose mothers are still not known. The link between the average number of cubs per litter and the age of the mother is represented with a certain degree of approximation by the red polynomial regression line in the graph, with a coefficient of determination of 0.8597.

Graph 7



"Rediscovered" bears

During 2014 **two bears** were "rediscovered" genetically (see definitions on page 19), both four- year-old males.

Bears undetected in 2014 alone

No less than **ten bears** present in 2013 **were undetected for the first year** in 2014 (seven youngs and three adults). They have not yet been classified as "missing" bears (see definitions on page 19), as there is a concrete possibility that they are still present.

Missing bears

In 2014 it was possible to confirm one of the **two** known cases of **"emigration"**, with reference to the male bear **KJ2G2**, who has been based in the area of the Dinaric-Balkan bear population (a frontier area between Italy, Austria and Slovenia) since 2011. **M8** was instead not detected in 2014, at least on the basis of the data available from the eastern Alps when this report was drawn up.

When calculating the number of "missing" bears in 2014 it is also necessary to consider **three** bears that **died** during the year.

- **M27**, a cub found dead in the Val Ambiez on 9 May 2014 (photo 5); the cub had a skull fracture compatible with a fall from a certain height.

Photo 5 - The cub M27 found dead in the Val Ambiez (A. Stoffella - APT Forestry and Wildlife Department archives)

Photo 6 - Remains of bear Gasper (C. Groff - APT Forestry and Wildlife Department archives)

Photo 7 - Point at which the carcass was found (C. Groff - APT Forestry and Wildlife Department archives

• **Gasper** whose carcass was found at Arca di Fraporte (Stenico) on 29 August 2014 (photo 6). The cause of death is unknown; the point where the body was found, in a gully subject to avalanches (photo 7) and the numerous fractures found, suggest that the bear fell from above the rocky cliffs indicated in the photo.
• **Daniza** died on 10 September 2014 in the Val di Borzago. As regards this see Box 3 on page 50.

In 2014 the last two "founding" Slovenian bears therefore died, 12 years after the last bears were released.

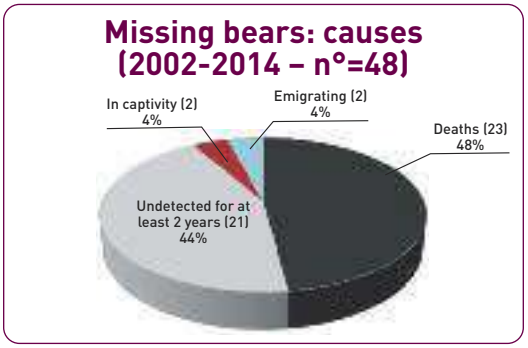
Three further bears (cubs born during the year) are instead **assumed to be dead** because they were only observed with their mothers in spring and not later in the year.

Finally, **four** new bears must be considered **missing** as they have not been genetically recorded in the last two years.

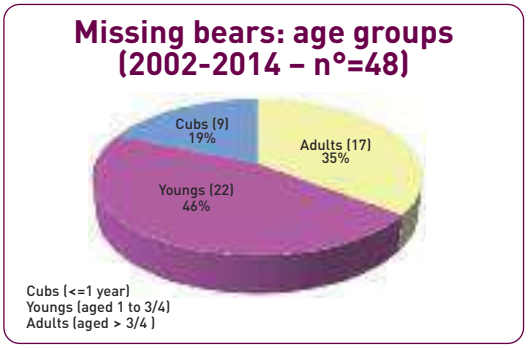
Thus, by the end of 2014 there have been **23 bears that have died, 21 bears undetected genetically for at least the last two years, 2 taken into captivity and 2 emigrating bears** (Graph 8).

In the year of their disappearance the were adults in 17 cases, youngs in 22 cases and cubs in 9 cases (Graph 9).

Graph 8

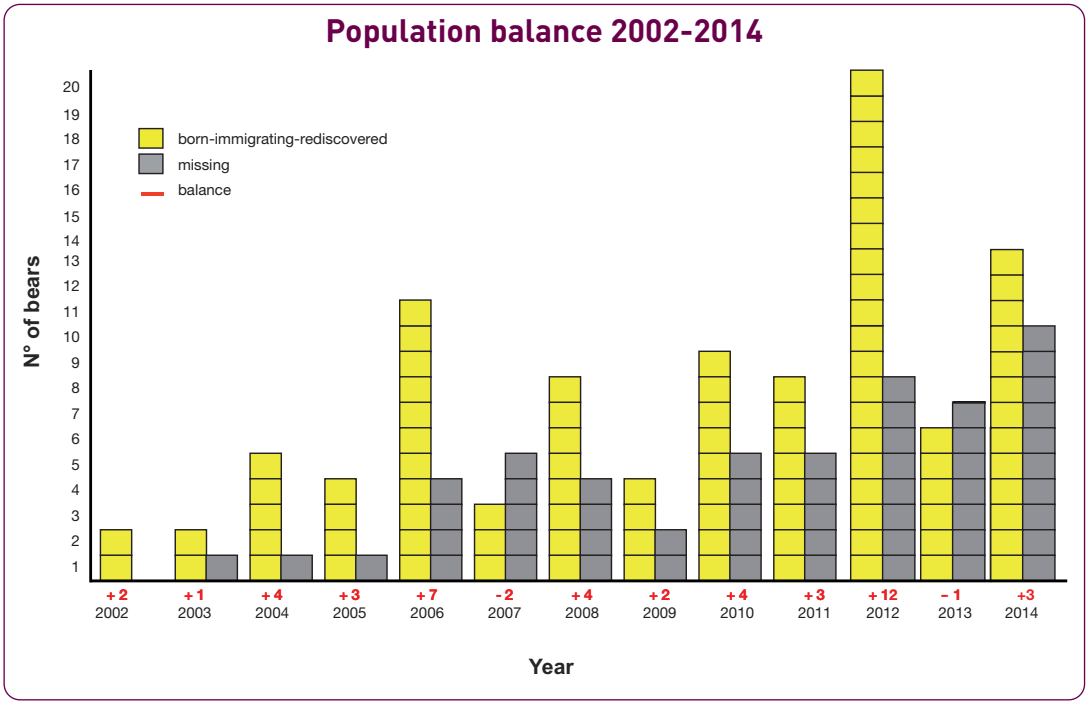


Graph 9



Graph 10 shows the **balance between births-immigrating-rediscovered/missing** bears year by year. In **2014** there was a **positive balance** of **+3**. This was the result of 11 births, 2 newly detected bears, 6 deaths and 4 new "missing" bears.

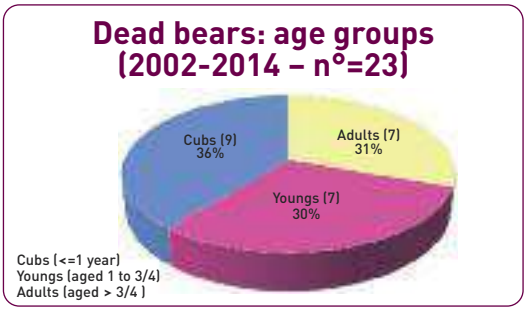
Graph 10



The **dead** bears belonged to the following categories: cubs (9), youngs (7) and adults (7), the percentages being shown in Graph 11.

The **deaths** were the result of natural causes in 5 cases, unknown in 8 cases and the result of action by man in the other 10 cases (Table 1 and Graph 12).

Graph 11



Graph 12

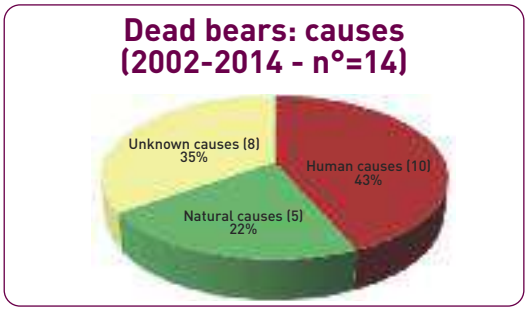


Table 1

Cause of death * in Germany ** in Switzerland, ad=adult, juv=young, cub=cub

Year	Natural causes	Poaching	Road accident	Shot down for management	Management accident	Unknown causes	Total deaths
2002							0
2003	1 cub						1
2004							0
2005							0
2006	1 cub, 1 ad			1 juv*			3
2007							0
2008			1 cub	1 juv**	1 juv		3
2009							0
2010						1 cub	1
2011						1 ad	1
2012	1 cub		2 juv		1 ad	1 juv, 1 ad	6
2013		1 ad		1 juv**			2
2014	1 cub				1 ad	3 cub 1 ad	6
TOTAL	5	1	3	3	3	8	23

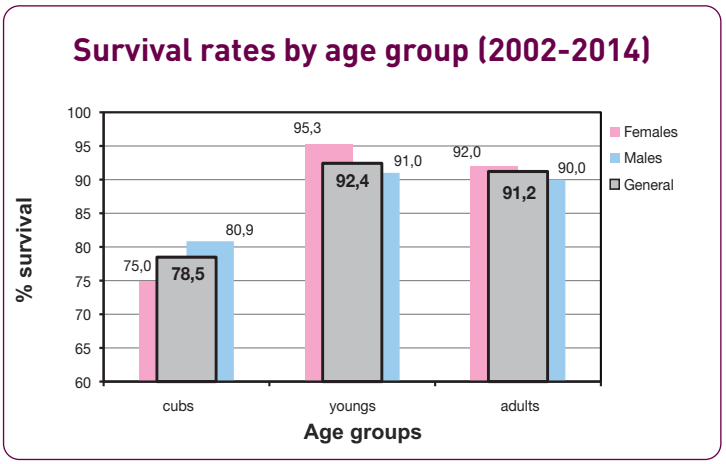
It should be highlighted that these figures probably do not reflect the real percentages for the various causes of death, given the different likelihood their being ascertained (for example, it is more likely that bears hit by cars will be found as compared to those dying of natural causes).

Survival rates

The new data available make it possible to update the survival rates for the three different age groups (cubs, youngs and adults, according to the definitions on page 19), differentiated for the two sexes (Graph 13).

The data refers to a period of **13 years** (2002-2014), during which it was possible to record the survival or death of **86** different **bears**, with 393 passages from one year to another **(393 bear-**

Graph 13



years). The "mortalities" category, considered in the broader sense, also includes bears undetected in the last two years or taken into captivity, confirming the criteria used for "missing" bears. The data regarding any emigrating bears is instead only considered up to the time that they leave their original population.

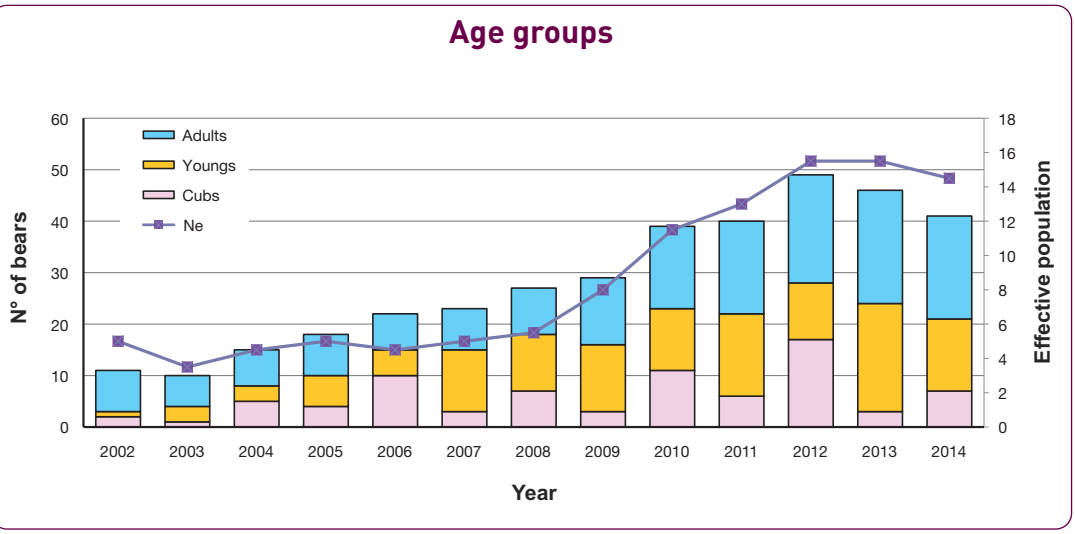
The **"natural" survival** rate, thus excluding any bears killed, removed or dying as a result of action by man, increased slightly, both for **youngs** (from 92.4% to **96.8**%) and for adults (from 91,2% to **93.8**%).

Structure of the population

At the end of 2014 the ascertained population was made up of **20 adults** (9 males and 11 females), **14 youngs** (10 males and 4 females) and **7 cubs** (3 males, 2 females and 2 of undetermined sex).

Graph 14 shows the trend for the different age groups in the 2002-2014 period. It should be noted that the figures for each year again include data acquired thanks to monitoring in subsequent years; thus all data, even if relating to previous years, is constantly updated in relation to the new knowledge provided by continuing monitoring. Hence the data of thelast 2-3 years (above all the last year) may become a little higher with the data that will be acquired in the future. This graph also shows the **effective population (Ne)** recorded annually, understood in this case as the number of bears capable of reproducing in that year. In the case of the bear this means the adult males, plus half of the female bears recorded (given that they generally give birth every second year).

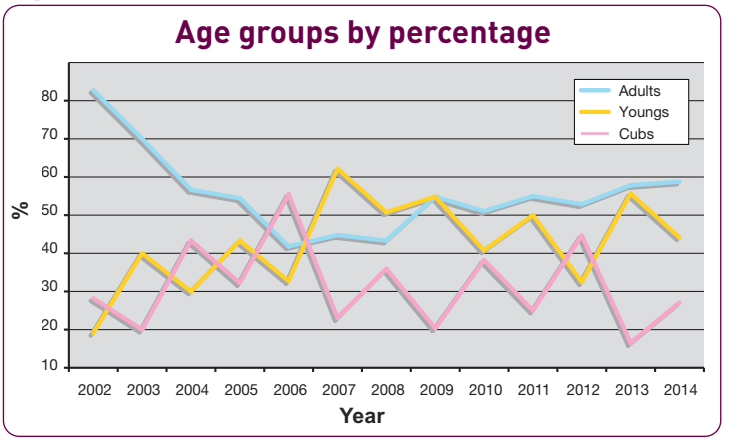
Graph 14



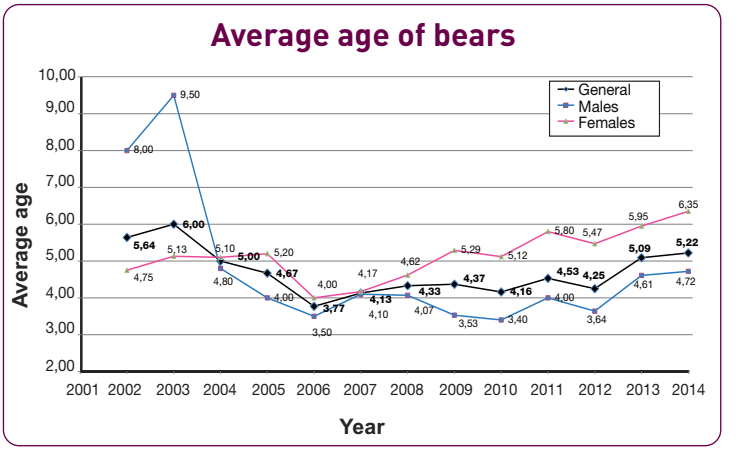
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Adults	8	6	7	8	7	8	9	13	16	18	21	22	20
Youngs	1	3	3	6	5	12	11	13	12	16	11	21	14
Cubs	2	1	5	4	10	3	7	3	11	6	17	3	7
Total	**11**	**10**	**15**	**18**	**22**	**23**	**27**	**29**	**39**	**40**	**49**	**46**	**41**
Effective population (Ne)	**5**	**3,5**	**4,5**	**5**	**4,5**	**5**	**5,5**	**8**	**11,5**	**13**	**15,5**	**15,5**	**14,5**


Foto A. Caliari

Graph 15



Graph 16



The **percentage of bears in the three age groups (adults 49%, youngs 34% and cubs 17%)** in the period 2002-2014 is shown in Graph 15.

It is also interesting to note the **evolution in the average age** of the bear population over the 13 year period examined (share of the population recognised with certainty - Graph 16). In 2014 there was a further slight increase in average age **(now 5.22)**, despite the disappearance of two older bears and a reasonable number of cubs recorded this year.

Finally, it may be noted that the **average age** of bears at the time of their disappearance (as a result of their death, disappearance or having been taken into captivity) was still significantly lower **(3.56 years - 32%)** as compared to the average age of the population (5.22 years). This confirms on the one hand the greater vulnerability of younger bears (see Graph 13) and on the other that the increase in average age recorded for some time is a positive factor in this phase.

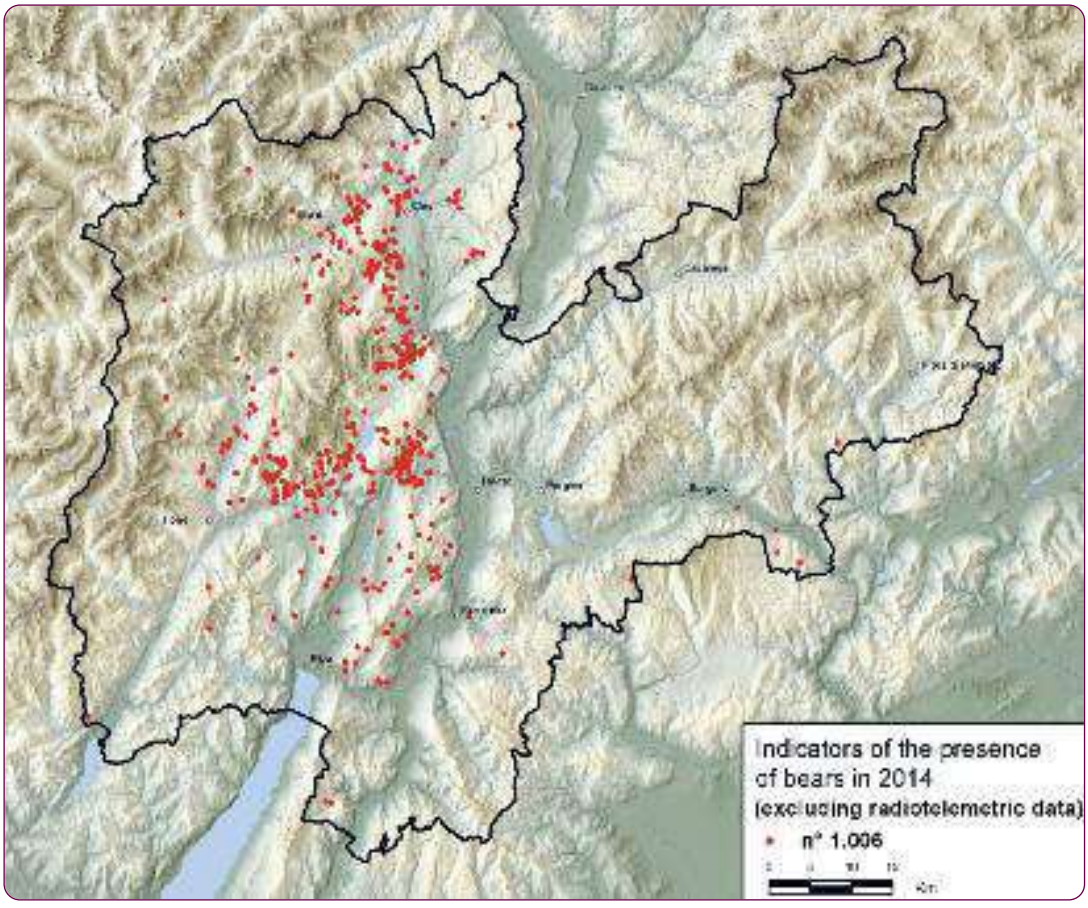
Use of the territory

39 of the **41** bears believed to be present at the end of 2014 were detected in the territory of Trentino (33 just in **Trentino**, 6 also neighbouring provinces/countries). Thus there were **2** bears living entirely outside the province: M29, recorded in the province of Brescia, and M28 in the province of Bolzano. All the 8 bears also or only detected outside the province in 2013 were males: 3 adults and 5 youngs.

5 bears also frequented the province of **Bolzano**, all being present on slopes going from the right-hand side of the Val d'Ultimo to the right-hand side of the Adige, up to the border with Trento (MJ4, MJ2G1, M22, M25 and M28), **2** bears were present in **Veneto** (M4 and M19) and **3** in **Lombardia** (MJ2G1, M29 and M25).

The **1,006 data** related to the presence of bears collected within the **province of Trento** during 2014 (all recorded data of presence, with the exception of those coming from satellite monitoring of three bears) are shown in Figure 1.

Figure 1 - Reports of bears in the province of Trento in 2014



In more detail as regards Trentino, Figure 2 shows the number of bears identified genetically in each **sector** of western Trentino. It should be underlined that each individual animal may have been present in several sectors and can thus have been identified in more than one of

Figure 2 - Number of bears identified genetically in each sector in western Trentino

them. It follows that the total minimum number ascertained in the province and surrounding areas in 2014 remains 39 bears, and it would therefore make no sense to cumulate the data for single sectors.

Area occupied by the population

Considering also the longest journeys made by young males during 2014, the **population** of brown bears roaming in the central Alps, which is mainly settled in and around western Trentino, **was distributed over a theoretical area of 13,567 km² in 2014** (Figure 3). The **area occupied by the females in a stable manner** is decidedly smaller **(958 km²)**, still entirely situated within the province. The areas occupied were estimated using the minimum convex polygon method, applied to 100% of the fixes available. This also leads to the inclusion of vast areas which are not suitable and/or not actually used, especially within the macro-area including the movements of young males.

Figure 3 - Area occupied by bears in the central Alps in 2014 (in light blue), highlighting the area within this occupied by the females (in pink).

Population density

The population **density** in the area frequented by the bears in a more stable manner in 2014 was **3.5 bears/100 km²** (34 bears, including cubs born during the year, within the area occupied by the females, namely 958 km²). This data should be considered bearing in mind the following:

- the density refers to a dataset collected over an extensive period of time (almost a solar year) and therefore the number of bears present in the area at a certain moment, which would represent a figure closer to the real average density, is likely to be lower;
- some bears (8 out of the 16 males that roamed around the area taken into consideration) also frequented areas outside this zone in the period of time considered.

Dispersion

In the period **2005-2014** it was possible to document dispersion (understood as movement outside western Trentino, see the definition on page 19) involving **26** bears (all males). However, 4 of these remained in areas straddling the province of Trento and thus adjacent to the area frequented by the population in a stable manner.

22 bears are therefore effectively considered to have been involved in **dispersion. 9** of these (41%) have died or disappeared, a further 9 (41%) have returned, 2 (9%) have emigrated and 2 (9%) are still **outside the province**.

To date **no dispersion of females** born in Trentino has been documented.

Figure 4 shows the locations of the 22 animals involved in roaming, highlighting the points where they died or disappeared (in 9 cases), or their maximum distance from the area occupied by the females in the event that they returned (9 cases) or remained outside the province (2 cases). The arrows pointing beyond the figure instead refer to the 2 emigrating bears.

Figure 4 - Location of the bears involved in dispersion

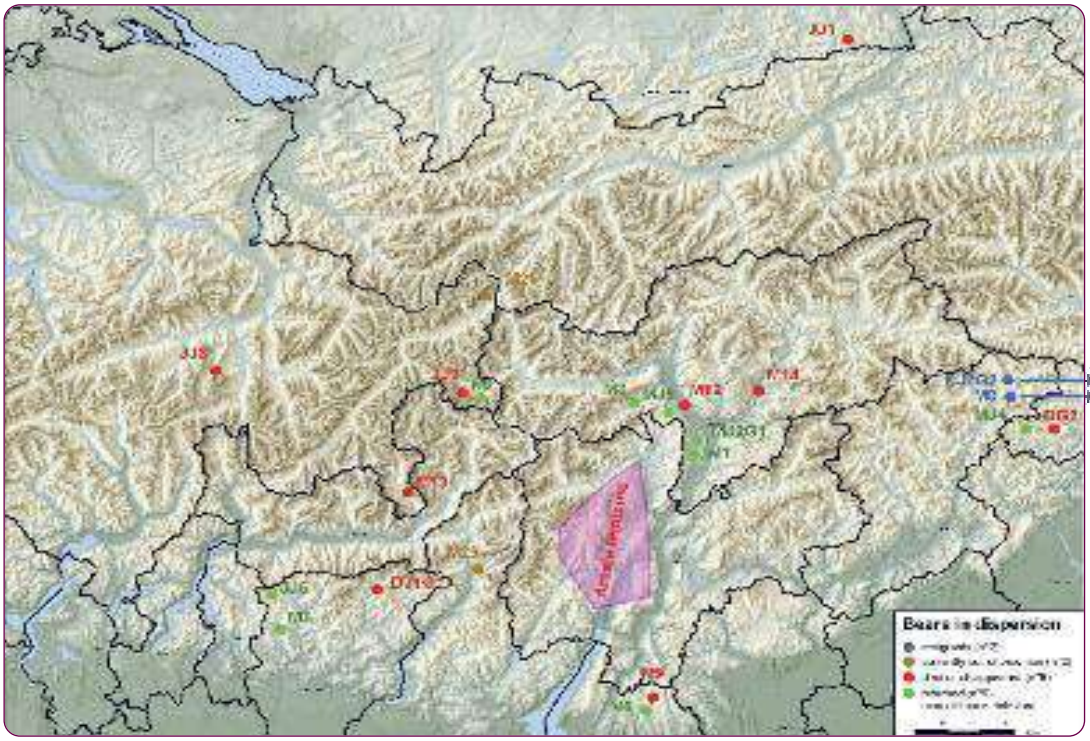



Photo T. Borghetti

Photo 8 - Inspection of MJ4's den (R. Calvetti - APT Forestry and Wildlife Department Archives)

Of the 9 bears returned, it is interesting to note that the male **MJ4**, whose various journeys between the provinces of Trento and Belluno were last described on page 37 of the 2013 Bear Report, spent **winter 2013-2014** in Trentino, specifically in the Val di Tovel, where this spring the Trentino forestry Service discovered his den; identification of the bear was possible through genetic testing of organic samples found in the den (photo 8).

Other monitoring activities in 2014

Radio and GPS telemetry

During 2014 3 bears were monitored using satellite telemetry: **Daniza**, **M6** and **M25**.

The relative ***home ranges*** **(HR)**, calculated using the minimum convex polygon (MCP) method, are given in Table 2 and shown in Figures 5, 6 and 7.

Table 2 - Main telemetry data for 2014

BEAR	SEX AND AGE GROUP	*HOME RANGE KM²*	MONITORING PERIOD	NO. OF FIXES
DANIZA	adult female	**132**	1/1/2014 - 12/18/2014	598
M25	young male	**6,829**	12/2/2014 - 31/12/2014	1,337
M6	adult male	**494**	1/1/2014 - 31/12/2014	1,773

Figure 5 - *Home range* of Daniza in 2014 (MCP)

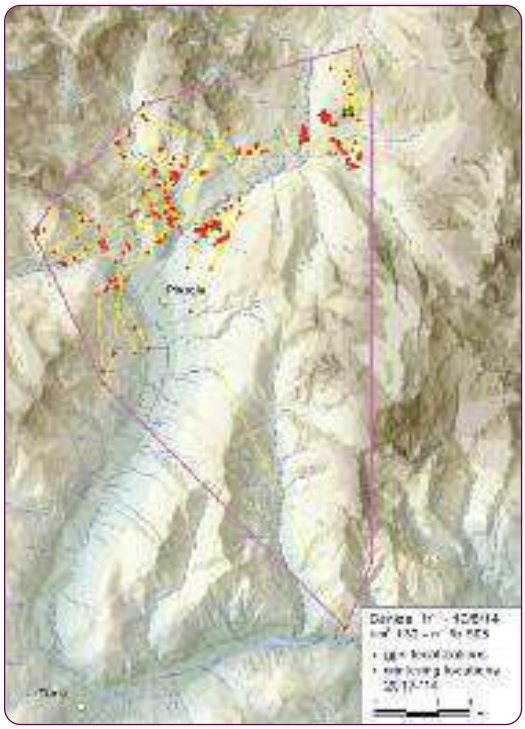


Figure 6 - *Home range* of M25 in 2014 (MCP)

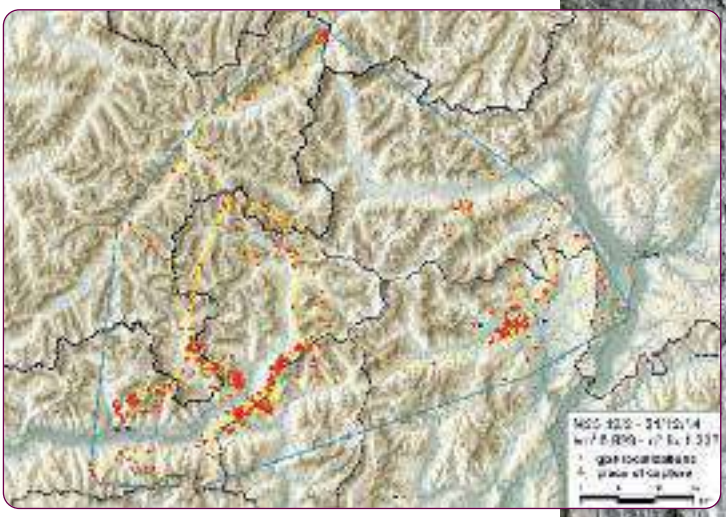
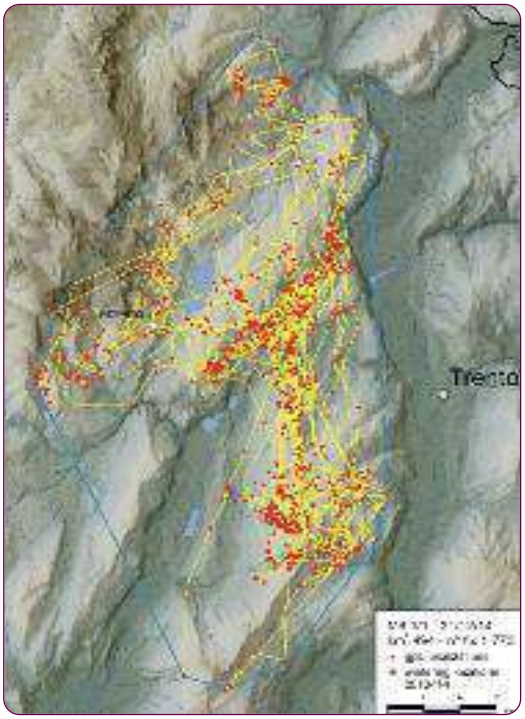


Figure 7 - *Home range* of M6 in 2014 (MCP)



2. Damage compensation and prevention

By now APT has gained forty years' experience as regards compensation and prevention of damage caused by brown bears. Indeed, since 1976 100% of the material value of assets damaged has been reimbursed and it is possible to acquire prevention works (mostly consisting of electric fences). The relative regulations, dealt with in article 33 of provincial law no.24/91, have been revised and updated several times over the years, also on the basis of directives imposed by the provincial government with the aforementioned resolution no. 1988 of 9 August 2002. With Resolution no. 697 of 8 April 2011 the provincial government further reviewed the regulations for damage compensation, also providing for compensation of ancillary expenses and extending 100% compensation to damage caused by lynx and wolves.

Bearing in mind the provisions of existing regulations, the Forestry and Wildlife Department also promotes the **prevention of damage** to beekeeping and livestock through the adoption of electric fences or other suitable protective measures, with the scope of reducing the damage caused by brown bears. This takes place in two main ways: **funding** covering up to 90% of the cost of works and/or **gratuitous loans** of prevention works, designed mainly to protect sheep and goats or beehives, along with support and consultancy provided to farmers by technical experts such as the **livestock liaison officers**.

Compensation for damage caused by bears

In 2014, **241** reports of damage caused by large carnivores were forwarded to the Forestry and Wildlife Department (194 in 2013). In **223** cases the reports related to possible damage by **brown bears** (216 in western Trentino and 7 in eastern Trentino), in **10** cases to possible damage by wolves (Lessinia and upper Val Rendena) and in **4** cases to possible damage by other wild predators (foxes/martens). In a further **4** cases the responsibility of wild predators for the damage was excluded or was not possible to ascertain. It should be noted that the latter category includes 2 cases of attacks by stray dogs and 1 case in which the death of a bovine was attributed to the theft of meat by unknown persons (the animal was killed and butchered at pasture (photo 9).

197 claims for compensation were received by the department (11% more than in 2013), of which 175 were accepted (164 regarding bears, 8 wolves, 2 foxes and 1 mustelidae), **4** are in the process of being evaluated and **18** were rejected (9 regarding bears, 1 foxes, 8 no preying involved). In the rejected claims category 3 were rejected because the user had not used or not correctly installed the prevention works funded by APT, 6 because they were presented after the term (30 days) for the presentation of claims, 8 because the damage could not be attributed to a wild predator and 1 because it was below the minimum threshold provided for (damage by a fox).

Photo 9 - Remains of a cow slaughtered by unknown persons (V. Calvetti - APT Forestry and Wildlife Department archives)

The remaining **45** claims were either not followed up by

the claimant or a cumulative claim was presented by the damaged party for the damage suffered. In **90%** of cases of damage, inspections were carried out by forestry staff, who drew up a report.

Overall, **99,900.00 €** compensation for damage was paid out, of which 89,000.00 € for damage caused by brown bears, 9,200,00 € for damage caused by wolves and 1,700.00 € for damage caused by other wild predators (fox-marten).

The cost of compensating damage by bears to livestock was 24,608.00 € (cattle 8,704.00 €, equines 4,928.00 €, goats (photo 10) 3,085.00 €, sheep 4,631.00 €, poultry 2,856.00 and pigs 402.00 €). A further **37,844.00 €** were spent to compensate damage to beehives, **24,766.00 €** to crops (photo 11) and **1,822.00 €** for other damage.

The data available (genetic testing and radiotelemetry) confirm that to date the **damage to cattle and equine livestock** has been caused exclusively by **male** bears. In contrast with previous years it would appear that these attacks are not carried out exclusively by adult males, but can also involve youngs. In this context it is possible to highlight the cases of M25 (aged 3), who was attributed, thanks mainly to radiotelemetry data, with preying on 17 donkeys outside the province (as well as 75 sheep and goats) and M19 (aged 3), who was attributed, thanks to genetic samples, with preying on a number of cattle in the Verona area of Monte Baldo.

Photo 10 - Damage to livestock (goats) caused by a bear (R. Calvetti - APT Forestry and Wildlife Department Archives)

Photo 11 - Damage to orchards caused by a bear (M. Baldessari - APT Forestry and Wildlife Department Archives)

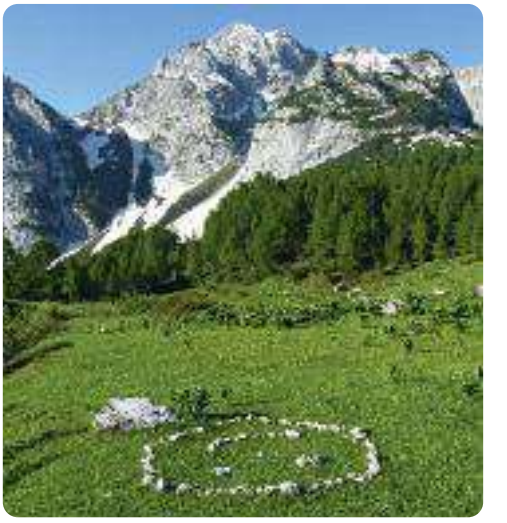
In **55 cases**, namely around 33% of all damage involving bears, it was possible to determine the i**dentity of the bear/s involved** with certainty, through genetic monitoring of organic samples (hairs or excrement) collected at the site of the damage. Overall 21 different genotypes were identified (12 males and 9 females), representing 57% of the population detected genetically in the province in 2014. Of these 10 (6 females and 4 males) were detected at only one damage site and 7 (3 females and 4 males) at two damage sites, 1 (the male M3) at five sites, 2 (the males MJ4 and MJ2G1) at six sites and 1 (the male M6) at fourteen sites. From the data collected in the last six years it would appear that the share of the population present in the area detectable through genetic samples collected when damage is ascertained varied from a minimum of 23% (2010) to a maximum of 57% (2014) with an average of around 35%. In this context, the ascertaining of damage thus represents an important moment for collecting information regarding the extent of the population as well as for definition of the genetic profile of the bears causing the damage.


Photo R. Rizzoli

Genetic data, together with other parameters such as the zones in which the damage took place, the type of damage, radiotelemetry monitoring of animals with radio collars and the use of camera traps made it possible to identify the bears causing significant damage. These were:

- the subadult male (aged 3) known as **M25**, who caused 3 cases of damage in the province of Trento, attributed thanks to genetic sampling (2) and radiotelemetry monitoring (1). Overall the damage involved 11 goats and 3 beehives. A further **8** cases of damage were reported in the province of Bolzano and concerned a total of 8 sheep (5 killed and 3 wounded) and 8 beehives. In Switzerland (Grisons Canton) a total of 7 damages were reported involving 4 donkeys, 32 sheep and 1 beehive. In the Lombardia region M25 was attributed with **12** cases of damage in the province of Sondrio, involving 13 donkeys (9 killed and 4 wounded), 1 goat, 5 beehives and around 20 sheep, and **1** in the province of Brescia (3 sheep). Thus overall M25 was attributed with 31 predatory events (17 donkeys, 75 sheep and goats and 17 beehives);
- the adult male (aged 7) known as **M4** who caused **4** cases of damage in the province of Trento (highland of Vezzena and Marcesina and the valley floor in the Valsugana), by preying on 4 calves, damaging 2 beehives and 7 apple trees. A further **17** cases of damage were reported in the province of Vicenza (highlands of Vezzena and Asiago), involving overall preying on 21 cattle, 2 donkeys and 1 goat, in addition to a further 10 cattle wounded and subsequently killed. Thus overall M4 was attributed with **21** predatory events (35 cattle, 2 donkeys, 1 goat, 2 beehives and 7 apple trees);
- the adult male (aged 7) known as **M6** who was attributed with a total of **19** cases of damage in the area of Monte Bondone, Stivo and Paganella (14 detected genetically, equivalent to 25% of the 55 cases of damage assigned genetically to a single animal, and 5 through radiotelemetry monitoring. The damage involved the preying on 7 henhouses, 3 donkeys, 1 bovine and 4 sheep, in addition to the wounding of a pig, damage to 3 fences and 3 agricultural plants (vines and cherry trees);

- the adult male (aged 9) known as **MJ2G1** who caused **6** cases of damage in the province of Trento (detected genetically and equivalent to 11% of the 55 cases of damage assigned genetically to a single animal), mainly to beehives and crops in the Val di Non area;
- the adult male (aged 10) known as **MJ4** who caused **6** cases of damage in the province of Trento (detected genetically and equivalent to 11% of the 55 cases of damage assigned genetically to a single animal), mainly to fences and crops in the area of the Val di Non and Val di Sole;
- the adult male (aged 7) known as **M3** who caused **5** cases of damage (detected genetically and equivalent to 9% of the 55 cases of damage assigned genetically to a single animal) mainly to crops and fences in the Paganella area.

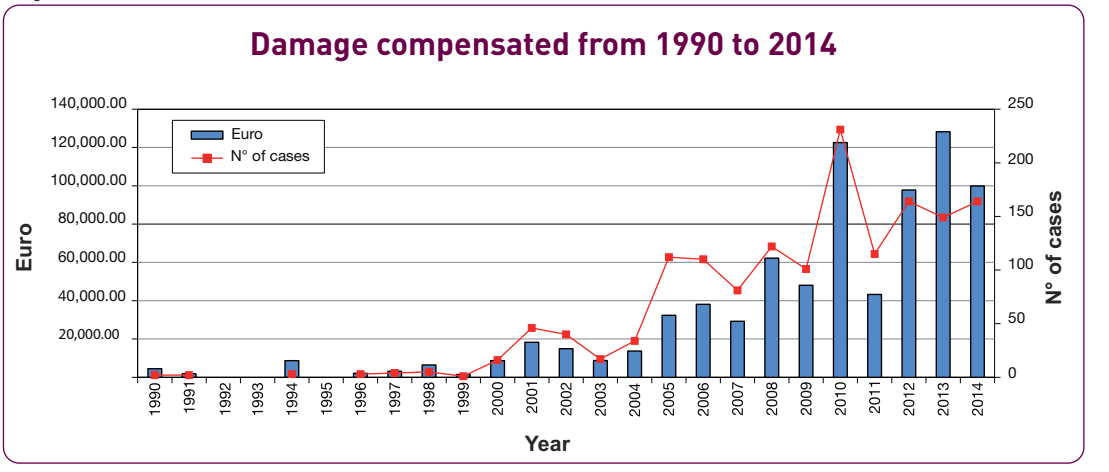


The problematical nature of an individual bear is assessed not so much in relation to the extent of the individual case of damage or critical situation, as by constructing a dossier that traces its behaviour over time (overconfidence, tendency to cause damage, any aggressiveness) and identifying intervention to attempt reconditioning, capture for fitting with a radio collar or removal of the bear.

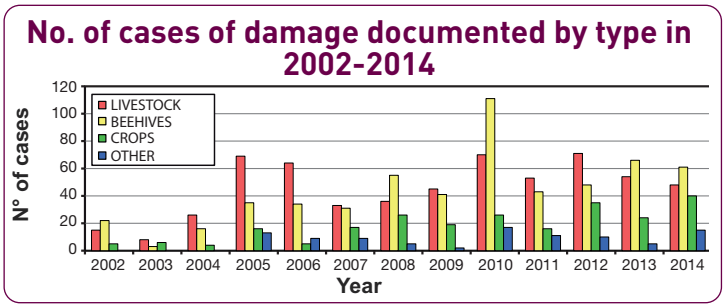
It follows that in the first three cases (M4, M25 and M6), the previous history of the bears concerned, the frequency and type of damage, the impact properties and social acceptance and the difficulty in carrying out dissuasive action and/or of defending the assets concerned with prevention works, mean that these bears can reasonably be considered to be problematical or potentially problematical.

Graph 17 shows the long-term trend in terms of compensation paid for damage caused by brown bears, whereas graphs 18 and 19 show the chronological distribution of this damage in 2014 and in the period 2002-2014.

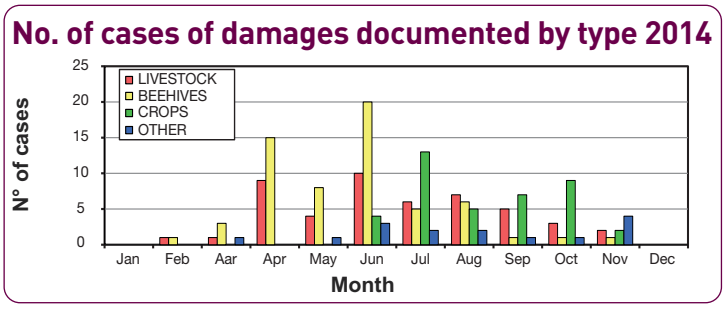
Graph 17



Graph 18

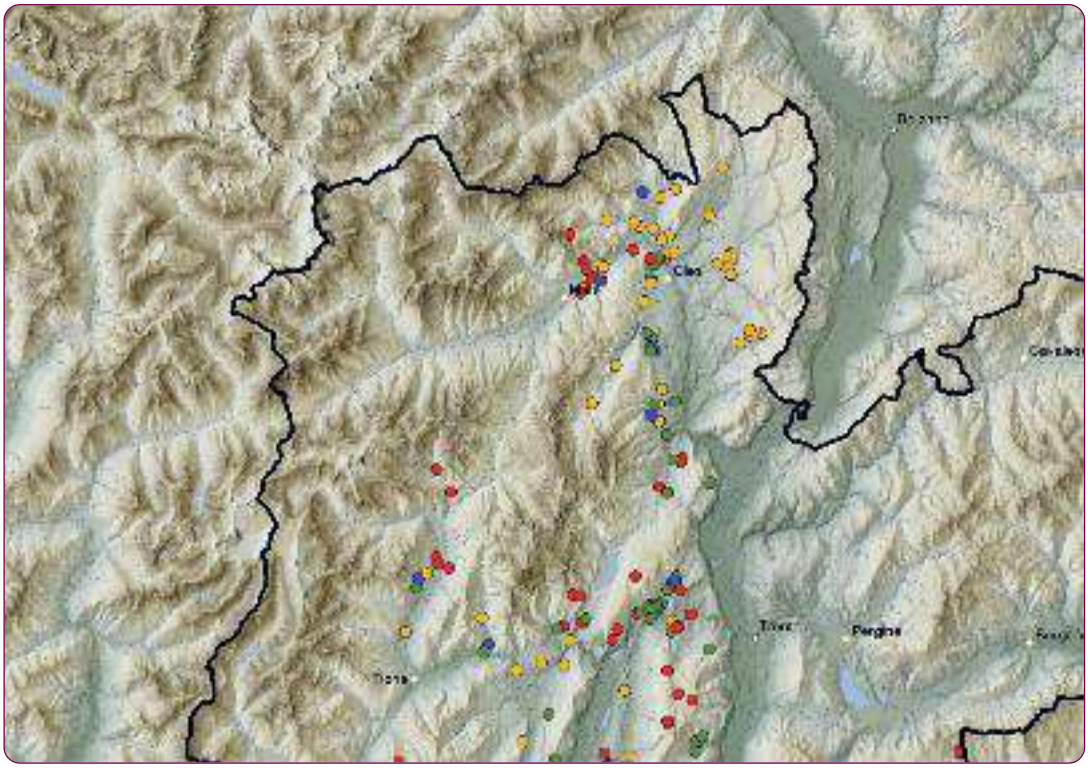


Graph 19



The geographical distribution of reported damage can be seen in Figure 8.

Figure 8 - Geographical distribution of damage by bears reported in 2014



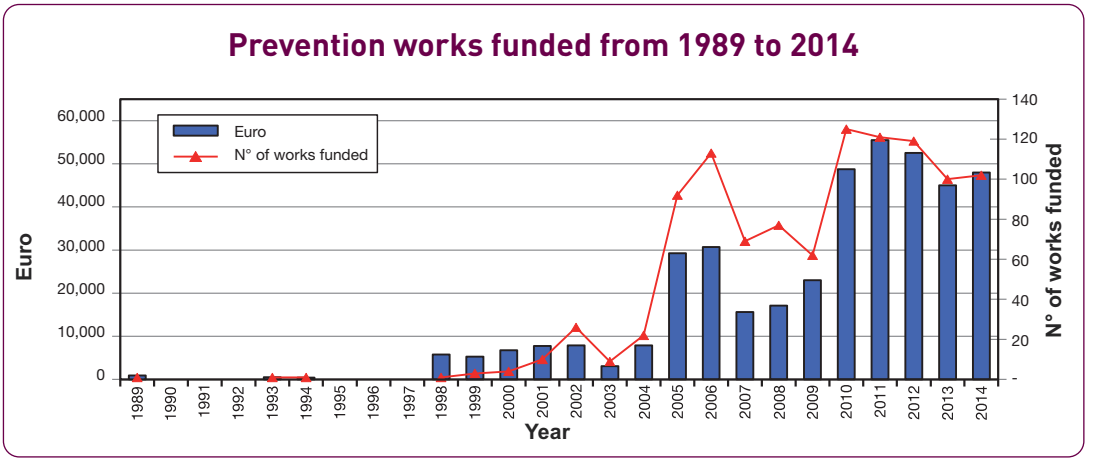
Prevention of damage by bears

During the year, a total of **116 applications** for prevention works to protect properties from damage by brown bears were presented (as compared to 114 in 2013). Of these **102** were provided by the Districts Forestry Offices in the form of **gratuitous loans** (district offices: Malé 7, Tione 33, Trento 20, Cles 24, Rovereto 18), 59 of which designed to protect beehives (600 in total since 2002) and 42 livestock (436 in total since 2002). The remaining **14 applications** concerned cattle and equines and were dealt with by the Wildlife Office. Of these, 10 were **accepted** with funding of 60% of admissible expenditure, 2 were **rejected** and **2 cancelled** as the prevention works were not implemented or did not comply with the construction criteria required.

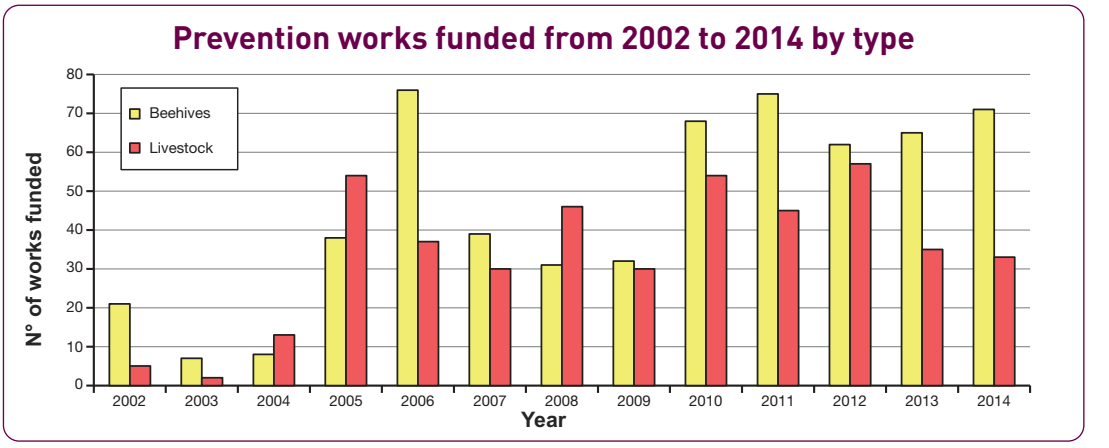
The **overall expenditure** borne by the Department, also thanks to funds from the ***"Life Arctos"* project** (which covered 60% of expenditure) amounted to a total of around **48,000.00 €**.

Below it is possible to see the long-term trend for the distribution of prevention works (Graph 20) and the different types of works in the period 2002-2014 (Graph 21), with reference to livestock and beekeeping.

Graph 20

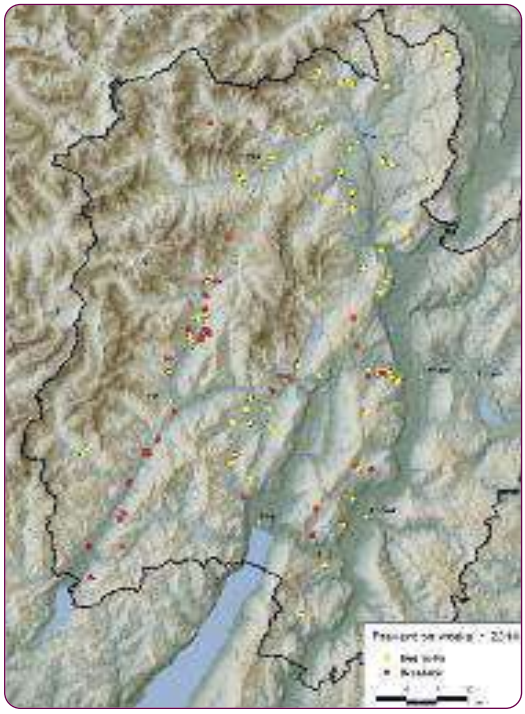


Graph 21



The geographical distribution of the works set up in western Trentino in 2012 can be seen in Figure 9.

Figure 9 - Location of prevention works distributed in 2014



Checks on prevention works

During 2014, forestry staff carried out checks on prevention works distributed in the context of the *"Life Arctos"* Project. The checks were carried out by **sampling**, with **189 works** of the 282 distributed (67%) being subjected to controls. 117 of these were electric fences designed to protect beehives (photo 12) and 72 were designed to protect livestock.

Of the 189 prevention works checked, 155 **(82%)** were installed and present in the area, whereas in the remaining 34 cases (18%) it was not possible to check on their presence at the time of the inspection because the works were awaiting use at summer pasture, were not used continually during the year or were in the process of being set up.

Evaluation of the **efficacy of the prevention works** is based on checking the state and maintenance of the battery and wires.

Photo 12 - Prevention works protecting beehives with attempts of digging by bears (C. Groff - APT Forestry and Wildlife Department archives)

As far as the **battery** is concerned, in **42%** of the works checked it **did not work**, as it was flat or not sufficiently charged (36%) or even not present at all (17%).

The checks carried out on **fences** showed that **26%** of these were **inadequate** for facing an attempt at intrusion by a bear, mainly because of the incorrect positioning of the perimeter wires, often with an insufficient number or not continuously present around the border.

The combination of the two elements used to assess the functioning of the prevention works, namely the state of the battery and the fencing, showed that **42%** of works were **considered to be unsuitable** for the purpose of defending the properties, confirming the indications already given in relation to the first of the two parameters (Figure 10).

Figure 10 - Location of the works checked and their state of maintenance

It is therefore clear that the main problem in relation to the functioning of prevention works is represented by poor maintenance carried out by the user in order to manage them once they have been installed.

Analysis of the data regarding **users** who had **already suffered damage** (48, equivalent to 31% of the installed works checked), showed that 27% works were **inadequate** for the purpose, demonstrating that greater attention was paid to the maintenance of works by this category of users.

Finally, the data acquired to date shows a certain difference between beekeepers and farmers protecting livestock: 19% of users in the former category (36) maintained the works in an inadequate manner, as compared to 50% of those in the second category (12). It can be surmised that this clear distinction is linked to the fact that whereas beekeepers usually set up the prevention works at the site where they will remain for the rest of the season, farmers are obliged to move them more frequently as a result of the different management requirements typical of their activities.

First experimentation with guarding dogs

In 2014, for the first time in the province, two Maremmano sheepdogs were handed over to a farmer with the scope of defending herds from possible attacks by bears and wolves (photo 13).

The request for funding of this prevention measure came from a farmer in the upper Val di Non who has a herd of around 150 goats that graze at summer pasture in an area where the presence of both bears and wolves has been ascertained for some time. The two dogs (a male and a female) were purchased from breeders/shepherds belonging to the Maremmano sheepdog association; the animals handed over were therefore of certified pedigree and were evaluated for their behavioural characteristics and aptitude for work.

Photo 13 - Handing over of Maremma sheepdog puppies (P. Zanghellini - APT Forestry and Wildlife Department archives)

The handing over of the two pups was also an opportunity for the farmer to obtain information and training from the breeders from Abruzzo, as regards effectiveness and problems relating to handling and managing this race (photo 14).

Clearly, given the young age of the two animals, it is too early to evaluate the effectiveness of this prevention measure. In any case the essential satisfaction of the farmer should be noted and he did not report any problems in relation to the management of the dogs. On the contrary he has already noted a positive tendency for the dogs to adopt defensive behaviour in this phase of their development.

Photo 14 - Maremmano sheepdog at work (C. Groff - APT Forestry and Wildlife Department Archives)

Meetings with stakeholders

In 2014 the relations already started up for some time with the stakeholders groups most affected by the presence of bears and other large carnivores continued.

Once again this year, a **round table with representatives of farmers, breeders and beekeepers** was organised, the meeting being held on **8 April 2014**.

During the meeting the provincial administration underlined on the one hand its desire to constantly **inform** and update the relevant categories as regards the system for compensation and prevention of damage currently adopted, and to evaluate the experience of previous years, while on the other it expressed its intention to **listen** to the needs and proposals of those involved and to gather any possible comments and suggestions that may emerge during consultation. Among other things, the new criteria for compensating damage adopted with the Decision of the Manager of the Forestry and Wildlife Department n° 244 of 17 June 2014 *"Definition of criteria for the quantification of damage by brown bears and other large carnivores (article 33, L.P. no. 24/91 and provincial government resolution no. 1455 of 15 July 2005)"* were presented.

The Rural Development Plan (RDP) as a tool for mitigating conflict with large carnivores

The advisability of promoting possible forms of support for the use of works preventing damage by large carnivores was considered, also making use of the **Rural Development Plan (RDP)** as an instrument. The new RDP (covering the period 2014 - 2020) therefore provides for funding measures of between 60% and 80% for the erection of **traditional wood fencing with external electrification** suitable for protecting livestock and beehives (funding linked to the creation of closed beehives - *Biennenhaus* or with open canopies) from raids by wolves and bears. It also provides for the possibility of the Forestry and Wildlife Department equipping itself with **accommodation modules transportable by helicopter** to encourage shepherds to remain close to their flocks at night.

Intervention to support livestock husbandry

The presence of the shepherd and the adoption of more appropriate systems for preventing damage, along with fair and fast compensation, are fundamental in guaranteeing coexistence between large carnivores and livestock reared in the mountains. Bearing this in mind, one of the objectives of the provincial administration is to encourage shepherds to stay in the mountains with their flocks, also by providing temporary shelters. These objectives are also pursued through the activities carried out by the **livestock liaison officers**, which take the form of support and consultancy, mainly during the period of alpine pasture. The main objective of the livestock liaison officer is thus to establish collaborative relations with shepherds and to provide training and information. The structure of the department currently provides for subdivision of the provincial territory within which brown bears are present in a stable manner into **6 areas**, with a contact person being identified for each area.

In **2014** support for shepherds continued and was consolidated, above all in areas with the largest numbers of bears. Overall, a total of **30 flocks** with around **16,500 sheep and goats** (photo 15) and **90 cattle** were supervised and assisted.

The shepherds requesting assistance were supplied with **electric fences** and fence electrifiers of adequate **power (2.6 joules)**, with rechargeable batteries fuelled by solar panels.

Furthermore **five prefabs** (accommodation units) were **transported to the mountains** to allow shepherds to remain close to their flocks at night. In areas not reachable by other means, the material necessary for mountain pasture activities, the prevention works and the accommodation units were transported to the mountains by the helicopter unit of APT's Fire and Civil Defence Service.

Photo 15 - Herds of sheep at pasture (R. Rizzoli - APT Forestry and Wildlife Department archives)

The results were excellent: over the whole year just 15 attacks on the aforementioned protected flocks were ascertained, leading to the death of only 20 sheep (0.1% of the livestock protected). There was also a damage with a bear preying on a donkey. In any case the level of damage was decidedly contained, despite the fact that this area has the highest density of bears.

As in previous years, it was confirmed that the systematic adoption of prevention works (electric fences), the expertise of shepherds and the constant consultancy and support provided to shepherds by the livestock liaison officers helped to reduce attacks by bears and quickly resolve difficult situations.

3. Management of emergencies

The Law of 11 February 1992 no. 157 includes the brown bear among the species granted special protection (article 2, paragraph 1).

The D.P.R. of 8 September 1997 no. 357 (subsequently amended and supplemented by D.P.R. 120/03), implementing the 92/43/EEC directive (Habitat Directive) regarding the conservation of natural and semi-natural habitats and wild flora and fauna, includes this species in Annex II (species of community interest, whose conservation requires the designation of special areas of conservation) and Annex IV (species of community interest which require strict protection), thus considering the brown bear as a priority species.

The current national legal framework therefore forbids the disturbing, capture and killing of large carnivores (D.P.R. 357/97, article 8).

However, action may be taken to control problem bears in critical situations, in accordance with the provisions of national regulations (D.P.R. 357/97, article 11, paragraph 1; L. 157/92, article 19, paragraph 2; L. 394/91, article 11, paragraph 4 and article 22, paragraph 6), and regional and provincial regulations.

Indeed, in order to avoid conflict with human activities and for reasons of public safety or for other compelling reasons of significant public interest, the possibility of an exception to the ban on the capturing or killing of animals is provided for, subject to the authorisation of the Ministry for the Environment, Land and Sea, having consulted ISPRA, on condition that there are no other practicable solutions and that departure from the rules does not prejudice the satisfactory conservation of populations of the protected species, (D.P.R. 357/97, article 11 paragraph 1).

In the **province of Trento** the management of emergencies represents a field of action in which it has been necessary to operate for some time, given the expansion of the bear population and more specifically as a result of the presence of individual animals considered to be "problematic".

The Action plan **PACOBACE** represents the document of reference for this programme of action in the province of Trento and in the rest of the Italian alpine region.

This protocol provides the technical guidelines on the basis of which the Forestry and Wildlife Department, which represents the provincial organisation of reference, has identified, trained and equipped the staff responsible for intervening in these situations. Operational management in Trentino is based on the use of staff from the Provincial Forestry Service (PFS), to which the Forestry and Wildlife Department makes recourse, through the setting up of a special unit which is on call.

This has been operational since 2004 and is active each year from March to November, availing itself of the support of a coordinator and an **emergency team** made up of two people. When necessary the team is joined by veterinary staff from the provincial health services (given special training since 2008).

In 2013, starting from 1 July, the **system of on-call availability** in the **forestry and wildlife sector was modified**. The new system of on-call availability supervised by the Forestry and Wildlife Department still involves the staff of the PFS and is based on weekly shifts involving a coordinator, nine staff members (one for each forestry district) and, from 1 March to 30 November, two specialist staff with expertise regarding bears. As far as the bear is concerned, the only difference as compared to the previous system of on-call availability regards the increase in the number of coordinators involved, which goes from 8 to 19, while the organisational structure and demands made (in terms of days and hours) remain the same.

Activities of the emergency team

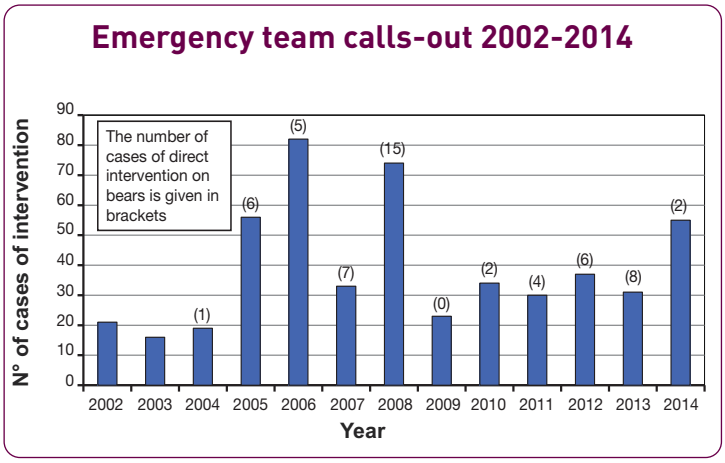
In 2014 the activities of the emergency team took place from 3 March to 8 December.

During this period the coordinators received **597 calls** of various kinds, of which 504 during the day (from 7.00 to 20.00), 84 at night (from 20.00 to 7.00) and 9 at unspecified times. In addition to these, there were an unspecified number of calls received and passed on in order to organise inspections to ascertain damage, to set in motion and coordinate the emergency team, to inform the department in more critical cases or simply to inform or reassure users. The significant increase in the number of calls as compared to previous years (392 in 2013 and 413 in 2012) can be attributed mainly to the Daniza case.

The calls came from private citizens (171), Trentino forestry service staff (335), forest wardens (4), the switchboard of Trento Fire Service (34), the Wildlife Office (9), the Italian State Forestry Service staff (3) or other parties (8).

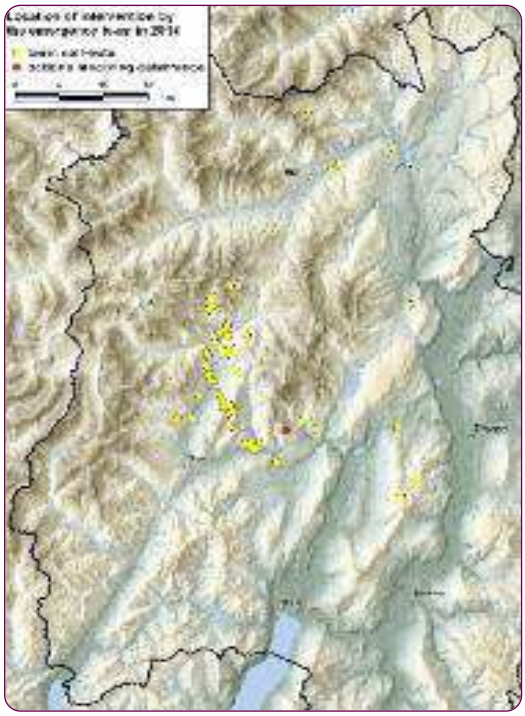
The calls mainly concerned the reporting of possible damage by bears (237) or wolves (10), sighting or signs of the presence of bears (77) or wolves (6), reports of potentially problematical situations (26) or other matters (226). This last category mainly included calls linked to the Daniza case. On numerous occasions (212) no inspection was necessary, whereas intervention was required from forestry service staff responsible for ascertaining damage in 221 cases, the staff of the relevant forestry stations in 104 cases, the staff of the emergency team in 55 cases and the leaders of the bear-dogs in 8 cases.

Graph 22



In 2014 the **emergency team** was called into action **55 times** (Graph 22). The staff were called out **4** times (7%) with a code red call (possible capture/removal/killing of the bear), 3 of which following the attack on a man by the female bear called Daniza and 1 following a road accident. In **11** cases (20%) the team was called into action with a code yellow call out (operational), mainly to carry out deterrent action in relation to a bear preying repeatedly on a flock (Valandro - Stenico) and another bear causing damage near inhabited areas (Caldes, Ragoli, Stenico, Cles, Comano, Trento, Vezzano and Villa Rendena). In the remaining **40** cases (72%) the team responded to a code white call out (safeguarding action), mainly to follow the movements of Daniza and inform the population.

Figure 11 - Location of intervention by the emergency team in 2014



Thus the activities of the team were mostly limited to watching over and informing the population, while only **6** cases (11% of call outs) involved visual contact with the bear. In **2** cases (4%) the staff carried out **direct intervention to deter the animal** (once with rubber bullets and once with a combination of rubber bullets and bear dogs). In both cases the deterrent action was directed at an adult bear that returned repeatedly to prey on a flock of sheep at mountain pasture in the Valandro area (Stenico).

The sites at which the emergency bear team intervened in 2014 are shown in Figure 11.

Close encounters between men and bears

In addition to the case involving **Daniza**, the first report of a direct attack on man ascertained in Italy in around the last 150 years, dealt with in Box 3, four so-called **"false attacks"** were reported, described briefly below.

- On **20 April** in the area of **Iron** (Municipality of Ragoli) a close encounter was reported between a bear and a motorcyclist proceeding along a wood hauling route on a trial motorbike. The biker, having spotted the bear a short distance away apparently intent on climbing up a tree, slowly turned around with the intention of moving away when the bear began to chase after him. After around 150 -200 metres the biker turned round and noted that the bear had abandoned the chase to disappear into the woods. The emergency team was called out to intervene using the bear dogs.
- On **25 May** at Palù di Carciato in the Municipality of **Dimaro** a local resident was walking along a wood hauling trail accompanied by his dog, when he saw a bear cub a short distance away. The mother of the cub arrived immediately afterwards and planted herself in front of him, growling and forcing him to move back several metres, resulting in him tripping over and falling. The man then apparently hit the bear several times with a stick. The unfortunate walker then got up and moved off again, keeping an eye on the bear, which at this point did not attempt to follow him. The forestry staff were called to the site with the bear dogs and spoke to the person concerned directly, establishing the exact circumstances of the incident. Organic samples were collected for genetic testing and a further inspection was carried out together with the person concerned.


R. Rizzoli

- On **17 June** at Priori in the Municipality of **Cavedago**, a jogger spotted a bear around 60 m away, while running down a forest road. Having already had similar encounters he continued on his way, but after a few metres he was obliged to stop because a second bear came out of the woods a short distance from him, while the first bear came bounding jerkily towards him, growling and pawing the ground. The intimidating actions of the bear were repeated several times, forcing the jogger to move away and retrace his footsteps. The jogger subsequently stated that he had the feeling that the bear followed him for a short stretch in the woods along the road, although he was unable to see it. Considering the season, the description of the two bears (both medium-large) provided by the person concerned and repeated sightings of a pair of bears in the area in this period, the bears concerned were probably a female in heat "defended" by the male.
- On **17 August** on the slopes of Mount **Cles** a local walker was following a footpath through a stretch of thick woods and bushes with little visibility when he suddenly found himself at a distance of 6-7 metres from a bear cub, which immediately climbed up a tree. The walker immediately retraced his steps until he reached a more open area and made plenty of noise

in order to indicate his presence; after a few moments he saw an adult bear (the mother of the cub) coming towards him and he took refuge behind a large hazel tree. The bear, on the other side of the tree, huffed and growled in his direction to then turn around and move away.

In all four cases it was not possible to identify the bears, as organic samples were not found or were not suitable for genetic testing.

BOX 3 – The Daniza case

On 15 August, above the village of Pinzolo in the Val Rendena a mushroom picker inadvertently arrived just a few metres from a bear (Daniza, aged 19) resting together with two cubs born that year. The man immediately began to move away but was followed and attacked by the bear. During the subsequent scuffle the man received wounds requiring 40 stitches, injuries that were taken care of that day at the hospital. He then had to stay in hospital for several days following an infection.

It was decided to capture the bear (already collared) for reasons of public safety, following an order of the President of the provincial government. The Ministry of the Environment and ISPRA confirmed the decision, as it had been made in accordance with the provisions of the PACOBACE. This was followed by around three weeks of attempts at capture using a tube trap. On 10 September Daniza was captured in free-ranging, but died during the capture.

The cubs were left in the wild, considering the good likelihood of survival for cubs of this age (8-9 months), and in line with the suggestions of the literature on the subject, it was proceeded to:

- *fit one of the cubs with VHF ear tag radio transmitters (photo A);*
- *make food available to the cubs only in the initial phase immediately after the loss of their mother (2-3 days);*
- *monitor the movements of the cubs intensively (initially via radio, then with camera traps (photo B) and direct observation, raising the awareness of hunters and encouraging them to report any sightings);*
- *draw up specific guidelines for the best management of the cubs, in agreement with ISPRA and the Ministry of the Environment and by exchanging ideas with the greatest international experts;*
- *preparing road signs in the most dangerous areas to reduce the risk of road accidents;*
- *prepare targeted communication material (a spe-*

Photo A - The female bear cub F20 with radio transmitter ear tag (APT Forestry and Wildlife Department archives)

cial brochure sent to all the families living in the area frequented by the cubs, updating of the web site, press releases, press conference with the mass media, meetings with environmental and animal protection associations, other measures);

- *organise a round table of experts (30 October 2014), for a direct exchange of ideas on these matters (the text of the official document, signed by the foreign experts attending the round table, is given below).*

Foto B - F20 and M31 monitored with a camera trap (APT Forestry and Wildlife Department archives)

All these joint actions made it possible to monitor the cubs in an essentially continuous manner up to the first ten days of November, after which no more reports were received, precisely from the time when most bears in the alpine environment go into hibernation. All the evidence suggests that the bears successfully reached the hibernation period, as expected.

Genetic monitoring will also be carried out in 2015, with particular attention for genetic tests making it possible to ascertain the presence of the two youngs in the medium-long term.

OFFICIAL DOCUMENT ISSUED BY THE TECHNICAL PANEL ON THE BEAR HELD AT CASTELER ON 30 OCTOBER 2014

To date the project to transfer and manage bears carried out in Trentino has been extremely successful. The population of bears in the central Alps, almost extinct at the end of the 1990s, has now arrived at around 50 animals (estimate at the end of 2013: 40 - 49 bears) and in the 2002 - 2014 period there have been 40 litters, with the birth of more than 80 cubs.

Despite these encouraging results, the biggest challenge facing the Italian authorities is maintaining social acceptance for the project and in general for the return of the bear in the Alps.

The strong decline in the support of local inhabitants for the project and bears requires an even more effective policy of prevention and damage compensation, clear information, constant monitoring of the population and a rapid and effective system responding to cases placing the safety of man at risk. Social acceptance and the coexistence of bears and human activities is the key factor in conserving many bear populations, but above all smaller populations in southern Europe.

In every area of the world where the bear is present there are cases in which individual animals adopt problematical behaviour, including behaviour involving risks for humans. These cases must first be dealt with by trying to prevent the development of this behaviour and when possible, by attempting to correct it. However, it must be clear that there are situations in which the removal of individual bears is a necessary measure, that must be taken based on rigorous and prompt evaluation of the bear's behaviour and all other related aspects.

Without effective policy to combat conflict between bears and man, including the management of bears representing a risk to public safety, the efforts to reconstruct a bear population in the Alps are at risk of failure, and there is a concrete possibility of an increase in illegal killings, as has already taken place in other European regions.

In this context, the case of Daniza and her cubs highlighted the very high level of attention paid by most of Italian society to the wellbeing of the bears. This requires even more effective communication with the public and a rigorous approach to the management of the bear population, based on authoritative assessment of all the possible alternatives that can be applied by the relevant authorities to mitigate conflict, based on scientific data, with particular reference to the removal of bears, which must be authorised only when other measures are not applicable.

After the death of Daniza, occurring during the attempt to capture the bear, and the decision to leave the two cubs in their natural environment, the Autonomous Province of Trento produced technical guidelines in relation to the cubs to manage this specific case, but also to provide an instrument that can be used in any similar cases that may occur in the future. The guidelines were drawn up with the support of ISPRA, which is the Italian scientific authority on questions related to the conservation and management of wildlife, in collaboration with the state forestry service.

The document was also discussed with the Presidents of the IUCN-SSC European Brown Bear Expert Team, Djuro Huber and Jon Swenson, who provided input and suggestions. Finally, the guidelines were discussed with the greatest European experts on wild bears and with experience of the management of cubs at a meeting held in Trento on 30 October 2014, attended by Marko Jonozovic (Slovenian Forestry Service), Fernando Ballesteros Bienzovas (Fundaciòn Oso Pardo-Spain) and Georg Rauer (University of Vienna), along with representatives of the competent Italian authorities (Forestry and Wildlife Department of the Autonomous Province of Trento, ISPRA, the state forestry service, Adamello Brenta Nature Park).

All the experts signing the document have carefully analysed the guidelines on the management of bear cubs, which are based on the most up-to-date international literature and on all the comments and input provided by the experts, also on the basis of the experience gained in other areas of Europe.

The document indeed concerns all the management aspects that must be taken into consideration, from the monitoring of bears, to the prevention of contact with people, the possibility of providing dietary support if this becomes necessary, a specific communication strategy and the prevention of road accidents. The guidelines also highlight all the possi-

ble scenarios and the relative measures that should be applied in each case, starting from the ideal situation, in which the cubs continue to be elusive in natural areas, to a situation in which they begin to become accustomed to the presence of man, the possibility of the cubs showing signs of deterioration, should they be involved in road accidents or in the case of other problems.

These guidelines are scientifically effective, reliable and exhaustive. It is requested that all the competent Italian authorities collaborate fully to apply the measures contained in the guidelines. In any case, the competent authorities must also be ready to respond rapidly to any other circumstances that should arise; once again in this case a rigorous and scientific approach to the decision-making process is required.

We also invite the representatives of the different economic categories and the whole of Italian society to support the efforts to conserve the bear population in the Alps, efforts that must ensure coexistence between bears and people and at the same time pay attention to the wellbeing of the animals.

Despite the problems caused to local communities on the one hand, and the concern for the wellbeing of the bears manifested by many Italians on the other, the return of bears to Trentino has been a considerable success in terms of conservation to date. It has brought added value to the natural ecosystem of the Alps and could also have positive effects on local communities and the economy of the region, as demonstrated in other areas of Europe where the bear is present.

Djuro Huber - Professor at the University of Zagreb, Faculty of Veterinary Science, Department of Biology, Co-Chair of the IUCN European Brown Bear Expert Team
Jon Swenson - Professor at the Norwegian University of Life Science, Department of Ecology and Management of Natural Resources, Co-Chair of the IUCN European Brown Bear Expert Team
Marko Jonozovic - Director of the Slovenian Forestry Service
Fernando Ballesteros Bienzovas - Fundaciòn Oso Pardo
Georg Rauer - University of Veterinary Medicine, Vienna

The technical content of this document and the guidelines was agreed by all the participants at the meeting on 30 October 2014.

Waste management

Following further inspections of the zones most frequented by bears, additional bear-proof bins for organic waste collection were distributed. Currently 181 bins have been positioned in the municipalities of Fai della Paganella, Spormaggiore, Cavedago, Andalo, Molveno, Vezzano and Terlago. By georeferencing the points at which the bins have been installed, a map indicating the location of the waste bins has been drawn up, useful for checks and further evaluation regarding the future distribution of materials, and for coordination with the company responsible for the collection and disposal of waste in the relevant area (ASIA - Azienda Speciale per l'Igiene Ambientale). The bins have been shown to be capable of effectively resisting bears, except in a very few cases, in particularly isolated areas where the bear had plenty of time to "work" on attempting to break into them (Photo 17).

The modifications to the bins were made possible thanks to the funding guaranteed by the ***Life Arctos*** **project**.

Photo 16 - A bin forced open by a bear (A. Stoffella - APT Forestry and Wildlife Department Archives)

Capture

In the Captures of emergency management, as previously reported, there is a "capture team" made up of forestry staff specially trained for such activities. They are supported by two vets from the provincial health services, dealing with health aspects.

During 2014 it was necessary to **capture** the 19-year-old female bear called **Daniza**, and one of her cubs, following the aggression and wounding of a man occurring on 15 August just above Pinzolo in the Val Rendena. Attempts were also made to capture the adult male bear called **M4**, who preyed on numerous animals, above all cattle, on the Asiago tableland (Photo 17), in order to fit him with a radio collar. The data summarising the activities of the capture team during 2014 are described, divided according to the type of capture (tube trap - Aldrich snare - free ranging).

Photo 17 - M4 photographed by a camera trap near the remains of a cow preyed on (M. Zotta - APT Forestry and Wildlife Department Archives)

The two **tube traps** with which the Forestry and Wildlife Department is

equipped were positioned at 8 different sites, for a total of 413 days permanence in the area, remaining active for 38 nights and being visited by bears on 15 occasions. In addition to their activation for the attempts to capture Daniza, as regards which see the relative box, the tube traps were also activated in the following situations.

At Mondal in the Municipality of **Vezzano** a tube trap was activated for 6 nights with the main scope of capturing a female for the purposes of research and monitoring. During the period in which the trap was active, it was visited by a bear of undetermined sex, that did not go into the tube, and by the adult male called M6. The presence of the latter in the area led to the interruption of the capture attempts.

Another attempt at capture was carried out at Tana dell'Ermellino (Municipality of **Andalo**) with the objective of capturing a bear feeding from organic waste bins. During the 10 nights in which the trap was active it was never visited.

Finally, there were attempts to capture the adult male bear called M4 with an Aldrich snare, when he was present on Monte Baldo (twice) and on the **Trentino side of the Asiago highland** (twice). The highly suspicious nature of the animal meant that he only returned to the site once to feed, however the snare was triggered without capturing the bear.

During the year the collaborative relations with colleagues at the Autonomous Province of Bolzano were maintained and consolidated, through a continuous exchange of information and experience. These colleagues also loaned one of the tube traps used for the attempts to capture Daniza.

The following table summarises the **captures** carried out in the period 2002-2014.

Table 3
Captures taking place in the period 2002-2014

No.	Date of capture	Location	Bear	Method of capture	Scope of intervention	Period of radio monitoring	Method of release	Sex	Age	Weight	Notes
1	30/08/2002	A22- Municipality of Laives (BZ)	Vida	Free ranging on stationary, inured animal	Rehabilitation following road accident		Val di Tovel without deterrence	F	3	70	
2	23/08/2006	Malga Grum (Terzolas)	Jurka (1st)	Free ranging	Fitting of GPS radio-collar	23/08/2006 28/06/2007	On site without deterrence	F	9	140	Weight estimated, female with 3 cubs
3	28/06/2007	Rifugio Genzianella (Terres)	Jurka (2nd)	Free ranging	Taken into captivity	-	-	F	10	130	No cubs
4	02/07/2007	Maso Dos (Pinzolo)	Daniza (1st)	Free ranging	Fitting of GPS radio-collar	02/07/2007 05/05/2008	On site without deterrence	F	12	106	No cubs
5	13/06/2008	Molveno (Molveno)	KJ2G1	Free ranging	Fitting of GPS radio-collar	-	-	F	3	95	Died by drowning in Lake Molveno
6	13/07/2008	Loc. Mangio (Castel Condino)	DJ3 (1st)	Free ranging	Fitting of GPS radio-collar	13/07/2008 23/06/2010	On site with deterrence (dogs + rubber bullets)	F	5	95	No cubs
7	27/09/2008	Loc. Pineta (Molveno)	KJ1G1	Aldrich snare	Fitting of GPS radio-collar	27/09/2008 05/04/2009	On site with deterrence (dogs + rubber bullets)	F	3	130	No cubs
8	15/10/2009	Val Canali (Tonadico)	M5	Aldrich snare	Fitting of GPS radio-collar	15/10/2009 13/05/2010	On site with deterrence (dogs + rubber bullets)	M	3 - 5	175	Bear immigrating from the eastern Alps
9	22/10/2010	Malga Pozze (Praso)	DJ3 (2nd)	Aldrich snare (modified)	Fitting of GPS radio-collar	22/10/2010 17/05/2011	On site without deterrencee	F	7	130	No cubs
10	16/05/2011	Rodugol (Stenico)	Daniza (2nd)	Tube trap	Fitting of GPS radio-collar	16/05/2011 22/05/2013	On site without deterrence	F	15	80*	Accompanied by male
11	17/05/2011	Rodugol (Stenico)	DJ3 (3rd)	Tube trap	Taken into captivity	-	-	F	7	75	Accompanied by male
12	23/05/2011	Verdesina (Tione)	M11	By hand	Rehabilitation	-	38 days after, end rehabilitation	M	1	7	Very debilitated
13	12/06/2012	Monte Terlago (Terlago)	JJ5	Tube trap	Fitting of GPS radio-collar	-	-	M	6	185	Died following anaesthesia
14	31/07/2012	Malga Polinar (Rabbi)	M2	Aldrich snare	Fitting of GPS radio-collar	31/07/2012 28/09/2013	On site with deterrence (dogs + rubber bullets)	M	5	210	
15	10/09/2012	Malga Alpesina (Avio)	M11 (2nd)	Tube trap	Fitting with ear tags	10/09/2012 -	On site with deterrence (dogs + rubber bullets)	M	2	60	
16	22/05/2013	Val Brenta (Ragoli)	Daniza (3rd)	Tube trap	Fitting of GPS radio-collar	22/05/2013 10/09/2014	On site without deterrence	F	18	90	No cubs
17	27/09/2013	M. Bondone (Trento)	M6	Tube trap	Fitting of GPS radio-collar	27/09/2013 -	On site with deterrence (dogs + rubber bullets)	M	6	207	
18	10/09/2014	Val di Borzago	Daniza (4th)	Free ranging	Taken into captivity	-	-	F	19	106	Died following anaesthesia
19	11/09/2014	Val di Borzago	F20	Free ranging	Fitting with ear tags	10/09/2014 30/10/2014	On site without deterrence	F	1	28	

*estimated weight

Road accidents

During 2014 there were **three recorded cases of road accidents** involving bears, bringing the total number of such accidents reported since 2002 to 25 (see Table 4).

Table 4
Road accidents reported in the period 2002-2014 (provinces of Trento and Bolzano)

N.	Date	Location	Bear/s involved *	Sex and age	Fate of the bear
1	30 August 2002 at 00.50	Laives (BZ) (A22 motorway	Vida	Female aged 4.5	Injured quite seriously but survived
2	4 November 2005 at 6.45	Preare (S.P. n° 34)	DJ3	Female aged 2	Survived and reproduced
3	28 June 2006 at 00.30	Fai (S.P. n° 64)	MJ2	Female aged 3.5	Survived and reproduced
4	28 October 2006 at 3.00	Caldes (S.S. n° 42)	Unknown	Unknown	Unknown **
5	29 October 2007 at 23.25	Ciago (S.P.n° 18)	Unknown	Unknown	Unknown **
6	18 July 2008 at 4.00	Villa Rendena (S.P.n° 34)	Daniza + 3 cubs	Female aged 13 with 3 cubs born that year	1 female cub died
7	22 July 2008 at 22.30	Nembia (S.P.n° 421)	KJ1G1	Female aged 2.5	Survived with no consequences
8	16 August 2008 at 23.45	Strembo (S.P.n°236)	Daniza + 2 cubs	Female aged 13 with 2 cubs born that year	1 cub injured, probably survived
9	15 October 2008 at 00.30	Bus de Vela (S.S. n° 45 bis)	Unknown	Unknown	Unknown **
10	9 April 2009 at 23.00	Passo Palade (BZ) (S.S. n° 238)	Unknown	Unknown	Unknown **
11	9 December 2009 at 19.30	Tione (S.P.n° 37)	Unknown	Unknown	Unknown **
12	25 May 2010 at 22.30	Strada del Faè (S.P. n° 43)	Unknown	Unknown	Unknown **
13	22 October 2010 at 6.30	Vicolo Baselga (S.P. n° 84)	Unknown	Unknown	Unknown **
14	21 April 2012	Chiusa (S.S. Brennero)	M14	Male aged 3	Died
15	4 June 2012 at 22.35	Molino Manzoni (S.S. n° 45 bis)	M3	Male aged 5	Survived
16	8 June 2012 at 00.30	Vilpiano (Mebo)	M12	Male aged 3	Died
17	16 August 2012 at 21.00	Vecchio Mulino (S.S. n° 45 bis)	KJ2 + 3 cubs	Female aged 10 + 3 cubs	Survived
18	15 September 2012 at 20.30	Stenico - Doss da Doa (S.S. n° 45 bis)	Unknown	Unknown	Unknown **
19	1 October 2012 at 6.15	Vecchio Mulino (S.S. n° 45 bis)	KJ2 + 3 cubs	Female aged 10 + 3 cubs	Survived
20	27 April 2013 at 6.00	Nembia (S.P.n° 421)	Unknown	Unknown	Unknown **
21	18 May 2013 at 3.45	Cis (S.S. n° 42 Tonale)	M21	Male aged 1.5	Survived
22	21 August 2013 at 11.30	Andalo (S.P.n° 421)	F2	Female aged 5.5	Survived
23	18 July 2014 at 21.30	Cavedago (S.P.n° 421)	F19	Female aged 2.5	Unknown**
24	22 August 2014 at 7.40	Vezzano (S.P.n° 18)	Unknown	Unknown	Unknown**
25	2 October 2014 at 20.10	Vecchio Mulino (S.S. n° 45 bis)	KJ2	Female aged 12.5	Unknown**

* the identity of the bear was ascertained through genetic testing
** an immediate inspection took place with dogs, suggesting that the animal (or animals) hit moved off autonomously

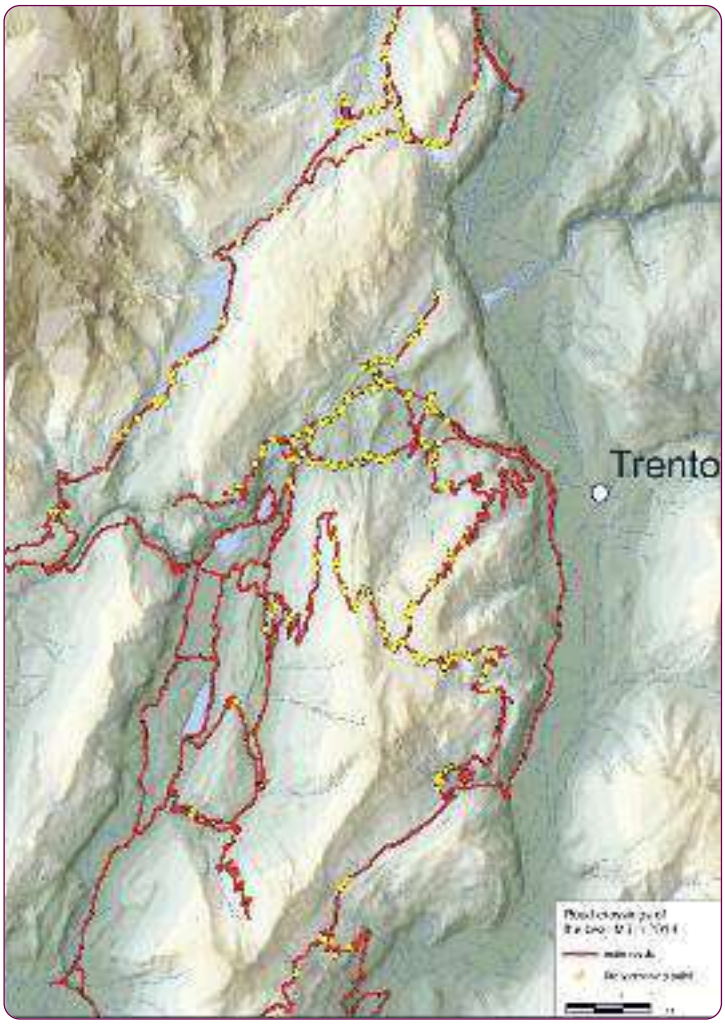
The first accident took place on the night of **18 July** on the SP 421 road near the village of **Cavedago**. The driver reported that the accident involved a small-medium sized bear which moved off immediately after the impact. Dog handlers intervened the following morning at the

site, trying unsuccessfully to locate the bear. Hairs were collected from the vehicle, making it possible to identify the animal involved genetically as the young female F19 (aged 2.5). It is likely that the bear did not suffer serious consequences but there is no certainty as she was not subsequently detected genetically.

The second accident took place on **22 August** on the SP 18 road near **Covelo** in the Municipality of Vezzano. Once again the dog handlers intervened early in the morning, following the trail of the animal, which was sighted while it moved away rapidly without apparently having suffered any consequences. Hairs were collected along the route followed by the dogs, but it was not possible to genetically identify the bear involved. Once again the animal probably did not suffer any serious consequences as a result of the impact, but there is no certainty.

The third accident took place during the night of **2 October** on the SS **Gardesana** road at Km 144 in the Municipality of **Vezzano**. The bear was hit by two vehicles heading towards Trento. After the accident the animal remained on the road for a moment, before getting up and making off, without apparently having suffered serious consequences. On the same evening a search was carried out with a bear-dog but with no success. The following morning a new search was carried out, again without success. However, some hair samples were taken from the vehicle, making it possible to identify the animal involved genetically as the adult female (aged 12.5) called **KJ2**. Once again the consequences were probably not fatal, but there is no certainty as she was not subsequently detected genetically.

Figure 12 - Road crossings by M6 in 2014



As an example, Figure 12 shows **road crossings** by the male bear **M6** during the year. The total theoretical number of crossings (369) is probably overestimated, given that it is merely the result of superimposition of the lines joining subsequent GPS fixes,

but it can nevertheless give an idea of the extent of the phenomenon, even if all in relation to an adult male bear, thus extremely mobile and with a relatively extensive home range (around 500 km^2 in this case).

Bear dogs

In 2014 the dogs were **put into action** on at least **20 occasions**, **3** of which related to operations to deter bears, **3** looking for bears hit in road accidents, **3** to check on false attacks, in 1 case to assist with the radiotelemetry search for the captured cub and in 2 cases for anti-poaching operations, while the remaining cases were linked to checks on damage and searches for traces of presence or to check dens (Photo 18).

Photo 18 - Bear dog (A. Stoffella - APT Forestry and Wildlife Department Archives)

The dog handlers and their animals also participated at **Expo Riva Caccia Pesca Ambiente 2014**, in the working dogs section.

Furthermore, the dog handlers made their experience available by providing instructions and suggestions useful for the drawing up of a **Dog Training Course** on *"Laika dogs used for activities to manage problem bears"*.

Once again this year the dogs represented a useful tool, particularly in the management of critical situations, such as deterring problem bears or in the event of accidents. They also made an important contribution to checking damage reports, particularly those involving livestock, and to looking for signs of presence in specific situations.

4. Communication

Communication is considered by the provincial administration to be an aspect of fundamental importance in the management of bears and represents one of the six programmes of action referred to in the previously mentioned resolution of the provincial government no. 1988 of 9 August 2002.

Considering this, starting from 2003 a specific **information campaign** was started up called **"Getting to know the brown bear"**, which has involved numerous initiatives in the past and is still underway. This report, which among other things also has an informative role, is one of the initiatives designed to allow the wider public to better understand this animal, with the conviction that only knowledge can lead to harmonious coexistence with the bear in the medium to long-term.

With regard to these communication activities, the Forestry and Wildlife Department has always been supported by the Adamello Brenta Nature Park, which has been active in this field for many years in its own area, and by the Science Museum in Trento, which has offered educational activities on bears to schools from the very beginning.

Informative activities have involved the organisation of evenings with the public, meetings with representatives of the authorities and representative associations, talks at schools, press releases etc.

The main activities undertaken during 2014 are summarised below.

Public meetings

Table 5 lists the meetings/evenings organised by the Forestry and Wildlife Department within the context of the information campaign "Getting to know the brown bear" (660 participants overall). Some of these meetings were specifically organised in response to requests for information and the exchanging of ideas, also in relation to situations arising when certain bears caused special concern due to the number of incidents involving damage.

Table 5
Public meetings held within the context of the "Getting to know the brown bear" campaign in 2014

Type	Date	Place	In collaboration with	No. of participants
Public meeting	19/02/2014	Cortaccia (BZ)	Hunting and Fishing Office, Bolzano	150
Public meeting - presentation of the 2013 Bear report	05/03/2014	Science Museum, Trento	Science Museum, Trento	100
Public meeting The brown bear in Europe	02/04/2014	Science Museum, Trento	Science Museum, Trento	70
Public meeting	08/05/2014	Nomesino (Mori)	Municipality of Mori	70
Public meeting	16/05/2014	Rovereto	Museo Civico, Rovereto	40
Public meeting	30/07/2014	Concei	SAT, Val di Ledro	60
Public meeting	05/08/2014	Luserna	Municipality of Luserna	70
Public meeting	12/08/2014	Ronzo Chienis	Municipality of Ronzo Chienis	60
Public meeting	14/11/2014	Calavino	Municipality of Calavino	40

28 press releases regarding the bear were issued directly or supporting of the Press Office:

- No. 8 of 3 Jan. 2014

The video, made by the Forestry and Wildlife Department, can be seen at the web site: www.orso.provincia.tn.it
BEARS AND WOLVES: THE BEST IMAGES OF 2013

- No. 475 of 4 March 2014
  At 20.45 presentation of the 2013 Bear Report and a summary of the presence of the lynx, wolf and golden jackal
  BEARS AND LARGE CARNIVORES: A SUMMARY AT THE SCIENCE MUSEUM ON WEDNESDAY 5 MARCH
- No. 501 of 6 March 2014
  The main news includes a possible turnaround in the population trend for bears
  THE BEAR, THE WOLF, THE LYNX AND THE JACKAL: 2013 REPORT PRESENTED
- No. 1163 of 25 May 2014
  A short time ago the President of the Province telephoned the man involved in the
  CLOSE ENCOUNTER WITH A BEAR: "FALSE ATTACK" TO PROTECT THE CUB
- No. 1540 of 19 June 2014
  Important agreement at the meeting with the economic interest groups most subject to damage
  BEARS AND OTHER LARGE CARNIVORES: VALUATIONS AND CRITERIA FOR DAMAGE COMPENSATION ESTABLISHED
- No. 1850 of 18 July 2014
  Interregional plan of action for the management of the bear updated
  "DAMAGING BEAR" CATEGORY INTRODUCED
- No. 2072 of 15 Aug. 2014
  After the aggression this morning at Pinzolo
  ORDER ISSUED FOR THE CAPTURE OF THE BEAR DANIZA
- No. 2073 of 15 Aug. 2014
  IDENTITY OF THE BEAR CONFIRMED: MEETING IN PINZOLO ON DANIZA'S CAPTURE
- No. 2077 of 16 Aug. 2014
  CAPTURE OF DANIZA AUTHORISED: VICE-PRESIDENT OLIVI SIGNS THE ORDER
- No. 2097 of 20 Aug. 2014
  TELEPHONE CONVERSATION BETWEEN ROSSI AND THE MINISTRY OF THE ENVIRONMENT ON THE DANIZA CASE
- No. 2113 of 22 Aug. 2014
  Protests in Piazza Dante
  THE DANIZA CASE, THE PROVINCE CONFIRMS THE EFFICACY OF ITS ACTION
- No. 2259 of 11 Sept. 2014
  One of the cubs captured and freed after being fitted with an ear tag
  DANIZA: BEAR DOES NOT RECOVER FROM THE ANAESTHETIC

Photo M. Vettorazzi

- No. 2261 of 11 Sept. 2014
  In the press room at the Provincial building
  DANIZA BEAR: PRESS CONFERENCE AT 4 PM
- No. 2274 of 12 Sept. 2014
  They are monitored continuously in this period
  DANIZA: THE TWO CUBS ARE TOGETHER AGAIN
- No. 2281 of 13 Sept. 2014
  According to a document issued by the Istituto Superiore per la Protezione e la Ricerca ambientale
  ISPRA: MANAGEMENT OF THE BEAR DANIZA BY THE PROVINCE FOLLOWED THE PACOBACE PROCEDURE
- No. 2333 of 19 Sept. 2014
  A series of activities have been put into effect to increase the likelihood of survival for the cubs. Information available at the web site www.orso.provincia.tn.it
  DANIZA'S CUBS: UPDATE ON MONITORING ACTIVITIES
- No. 2388 of 25 Sept. 2014
  BEAR CUBS: UPDATE ON MONITORING ACTIVITIES
- No. 2445 of 1 Oct. 2014
  Clarification from the Province
  THE REAL FIGURES ON EUROPEAN FUNDING FOR MANAGEMENT OF THE BEAR
- No. 2454 of 2 Ott. 2014
  Councillor Michele Dallapiccola underlines the positive nature of today's meeting
  THE DANIZA CASE AT THE WILDLIFE COMMITTEE

- No. 2455 of 2 Oct. 2014
  BEAR HIT BY A CAR THIS EVENING AT VEZZANO
- No. 2478 of 6 Oct. 2014
  Continuing monitoring of animals and information campaigns directed at residents and tourists
  DANIZA'S CUBS: EVERYTHING THAT IS BEING DONE
- No. 2530 of 9 Oct. 2014
  Councillor Michele Dallapiccola has met the technical staff of ISPRA and the state forestry service
  DANIZA'S CUBS: MEETING TODAY IN ROME ON GUIDELINES FOR THEIR MANAGEMENT
- No. 2605 of 16 Oct. 2014
  The activities put into effect by the Autonomous Province of Trento to monitor Daniza's cubs proceed in a continuous manner
  THE CUBS ARE DOING WELL, MONITORING CONFIRMS
- No. 2727 of 27 Oct. 2014
  NEWS UPDATE FROM MONITORING OF DANIZA'S CUBS
- No. 2755 of 30 Oct. 2014
  Biggest European experts on bears in Trento today. Approval of guidelines for management of the cubs
  BEARS IN TRENTINO, A "CONSERVATION SUCCESS"
- No. 2803 of 5 Nov. 2014
  At the web site www.orso.provincia.tn.it
  THE BEAR, THE WOLF AND THE LYNX: NEW IMAGES
- No. 3197 of 12 Dec. 2014
  Councillor Michele Dallapiccola summed up the situation with environmental associations
  BEAR CUBS: ALL THE SIGNS SUGGEST THE BEGINNING OF HIBERNATION
- No. 3302 of 23 Dec. 2014
  Also with the contribution of the Autonomous Province of Trento
  SUMMARY OF THE RETURN OF LARGE CARNIVORES IN EUROPE IN "SCIENCE" MAGAZINE

Questions

The necessary information was provided in order to respond to the following 20 questions raised at the Autonomous Province's Council regarding bears:

- QUESTION No. 293/XV FOR WRITTEN ANSWER
  Presence of the bear within the province and episodes of aggression towards animals
- QUESTION No. 447/XV FOR WRITTEN ANSWER
  Presence of bears in the area and monitoring of their movements
- QUESTION No. 551/XV FOR WRITTEN ANSWER
  On the presence of the bear in Trentino and the relative intervention by the Province
- QUESTION No. 559/XV FOR WRITTEN ANSWER
  Information regarding the "Life Ursus" Project and problems relating to the presence of the bear on Monte Baldo
- QUESTION No. 569/XV FOR WRITTEN ANSWER
  Information regarding the procedure for claiming compensation for damage caused by bears
- QUESTION No. 579/XV FOR IMMEDIATE ORAL RESPONSE
  Review of the "Life Ursus" Project in the light of the recent attacks on man
- QUESTION No. 667/XV FOR WRITTEN ANSWER
  Control and monitoring of the bear in Vezzena
- QUESTION No. 672/XV FOR WRITTEN ANSWER
  Intervention in relation to the bear on the Marcesina and Vezzena highland
- QUESTION No. 795/XV FOR WRITTEN ANSWER
  Measures to be adopted in relation to the "Life Ursus" Project in the light of the recent attacks on man
- QUESTION No. 796/XV FOR WRITTEN ANSWER
  On the relative costs of communication initiatives in the context of the "Life Ursus" Project
- QUESTION No. 802/XV FOR WRITTEN ANSWER
  Presence of the bear on Monte Cucal in the Val di Stava: information and prevention
- QUESTION No. 808/XV FOR WRITTEN ANSWER
  On costs related to the "Life Ursus" Project
- QUESTION No. 824/XV FOR WRITTEN ANSWER
  Action taken in response to problematic behaviour by bears present in Trentino
- QUESTION No. 847/XV FOR WRITTEN ANSWER
  On the provision of an insurance policy covering attacks by bears on man
- QUESTION No. 880/XV FOR WRITTEN ANSWER
  On the provincial government resolution regarding the capture of the bear Daniza and its absence at the institutional web site
- QUESTION No. 893/XV FOR WRITTEN ANSWER
  On the "Life Ursus" project and possible limits to the number of bears in the area
- QUESTION No. 901/XV FOR WRITTEN ANSWER
  Use of signs regarding the presence of bears near roads
- QUESTION No. 941/XV FOR WRITTEN ANSWER
  On the presence of the bear in the Valle dei Laghi
- QUESTION No. 1019/XV FOR WRITTEN ANSWER
  Presence of a bear at Selva di Grigno
  QUESTION No. 1021/XV FOR WRITTEN ANSWER
  Awarding of assignment to take care of Daniza's cubs

Informative meetings

On 31 October 2014 an **Informative Conference organised by the Council of the Autonomous Province of Trento** was held in the Conference Hall of the Consortium of Municipalities, with the collaboration of the Forestry and Wildlife Department, entitled "On the 'Life Ursus' project and its evolution".

On 2 October 2014 the P**rovincial Wildlife Committee** met to discuss the single item on the agenda, with an update on the case of the bear Daniza and her cubs.

A special update meeting was also held with **environmental and animal protection associations** on 12 December 2014 at APT's Forestry and Wildlife Department.

Communication project for schools: "Alpine biodiversity", in collaboration with the Science Museum in Trento

In the context of the activities promoted by the MUSE for schools, the bear and other large carnivores were among the protagonists during activities related to alpine biodiversity at the **40 educational workshops** held, involving **697 students** in the 2013/2014 academic year. It should also be recalled that large carnivores are a constant feature of the displays at the MUSE, as they are presented and discussed during all the guided trips, with observation of the stuffed animals present along the itinerary.

Communication project for schools "Sometimes they return…", in collaboration with the Fondazione Museo Civico in Rovereto

Since the 2012-2013 school year, in collaboration with the Forestry and Wildlife Department, the Museo Civico in Rovereto has also offered an educational workshop to increase knowledge and understanding of large carnivores, entitled "Sometimes they return…".

The workshop dedicated to nursery schools has the objective of raising awareness of large carnivores, starting from one of the many popular stories in which they are the protagonists. With primary and secondary school pupils it is also aimed to encourage responsible behaviour, after providing an initial summary of biological and behavioural information regarding the bear, analysing articles taken from the local press to stimulate critical discussion. This was designed to overcome the usual stereotypes and encourage the formation of responsible citizens in the future.

75 pupils attended the workshops on large carnivores during the 2013-2014 school year.

Collaboration with the local Monte Baldo Nature Park was also started up, providing for the involvement of five municipalities and schools with the relative classes. These were offered a series of activities, including a session on mammals with a trip to the Monte Baldo Park, also to raise the awareness of pupils as regards the presence of the bear.

The Fondazione Museo Civico in Rovereto, in collaboration with the Società Museo Civico, also organises a series of **meetings on zoology**, and in 2014 one evening was dedicated to the theme of large carnivores.

Informative material produced and distributed

The sixth "Bear Report" (2013 Bear Report) was issued (1,000 copies), representing both a valid means of communicating and raising public awareness and a useful working tool for the Wildlife Office.

In 2014 a further 5,000 copies of the brochure "The Brown Bear in Trentino" were printed, updating the text (Figure 13). Furthermore, in collaboration with the Adamello Brenta Nature Park, 7,500 brochures regarding the behaviour to adopt to maximise the chances of survival in the wild for the cubs left without their mother (with reference to the Daniza affair) were printed and distributed (Figure 14).

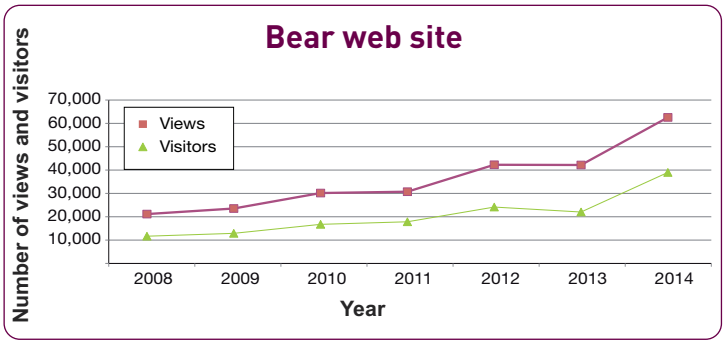
Figure 13 - Front page of the brochure "The brown bear in Trentino"

Figure 14 - Front page of the brochure "Bear cubs: how to help them to live in freedom"

Web site

The site **www.orso.provincia.tn.it**, also in English, was further updated and completed. It is currently made up of around 250 pages and received **62,567** views by **38,990** visitors in 2014. The site also contains this report and the documents referred to in it.

Graph 23



The site is updated regularly, at least once a month, also giving the main news regarding the presence of the lynx and the wolf in the province.

Graph 23 shows the trend for the number of views and visitors over the last 7 years.

Other communication initiatives

APT's Forestry and WildlifeDepartment supervised the production of articles (scientific and informative) and interviews, providing content and images on the following occasions:

- **RAI Storia** edited by Piero Badaloni - (The Dolomites, episode dedicated to wildlife) recorded on 27 February 2014
- Article in **"IBA *news*"** - May 2014: *Status of the brown bear population in the central Alps (Trentino - Italy)*
- Interview on **Striscia la Notizia** (Canale 5) on matters relating to the acceptance of the bear in the provinces of Bolzano and Trento (events involving the bear M25) - recorded on 3 March 2014
- Article in **Terra Trentina** (the role of the Alpine Convention Large Carnivores Platform) - March-April 2014
- Article in **Terra Trentina** (on the management of Daniza's cubs) - November-December 2014
- Recording for TV broadcast on RAI 3 - **Geo&Geo** on 24 September 2014 (the Daniza case and the management of the bear in general)
- Interview on the **regional Radio 2** channel on 18 March 2014 - (the Daniza case and the management of the bear in general)
- Interview on **German national radio** (The presence of the bear in the Alps) - recorded on 12 April 2014
- Interview on Swiss national radio (The presence of the bear in the Alps) - broadcast on 8 May 2014
- Article in the magazine **Focus** - interview on 15 April 2014 (The management of the bear in Trentino and the Daniza case)
- **Swiss Italian TV (Web TV)**, recording of the interview on 23 July 2014 (The presence of the bear In the Alps)
- **Life Dimensione Natura** programme (Rete 4) - recording of the episode on 6 August 2014 - (the Daniza case and management of the bear in general)
- Interview for the British newspaper ***The Guardian*** on 21 August 2014 (The Daniza case)
- **Melaverde** programme (Italia 1) recorded on 22 September 2014 - (The Daniza case and the management of the bear in general)
- **Interview for the news programme Leonardo** - RAI3 on 1 October 2014 (The management of the bear in Trentino)
- Episode dedicated to the bear recorded for **Trentino TV** on 13 November 2014 - (The management of the bear in Trentino)
- Article on *"Recovery of large carnivores in Europe's modern human-dominated landscapes"* in the

5. Training and experimentation

Correct management of the bear population is inextricably linked to the availability of specially trained staff, prepared to deal with any problems of a technical and non-technical nature that may arise during activities in the field, above all as regards the management of emergencies, dealing with damage and, to a lesser extent, monitoring. Training represents one of the six programmes of action referred to in the previously mentioned resolution of the provincial government no. 1988 of 9 August 2002.

APT's staff are given specific training which is constantly updated. The training initiatives realised during 2014 are illustrated below.

Main training initiatives regarding bears

The following sessions were held to train staff in various roles responsible for the management of bears:

- Meeting to update and **train staff** on the management of large carnivores (Casteler, 27 February 2013).
- **Course** for **SAT** leaders (two levels, basic and advanced, on 17-18 May and 27-28 September 2014, in collaboration with the Adamello Brenta Nature Park (Photo 19).
- Visit to compare the monitoring programme for **large carnivores** with camera traps in the **Bernese Alps (CH)**, in collaboration with the MUSE (30-31 January 2014).
- Educational trip to **Slovenia**, to the **Slovenian Forestry Service** and the **University of Lubiana**, 13-15 May 2014 (Photo 20).
- Training session with the breeders of Maremma sheepdogs from Abruzzo, used to defend flocks, directed at livestock liaison officers, held in **Cloz** on 15 February 2014.

Photo 19 - Training session for the SAT leaders (C. Groff - APT Forestry and Wildlife Department Archives)

Photo 20 - Training session during the educational trip to Slovenia (APT Forestry and Wildlife Department Archives)

Modifications made to the spring of Aldrich snares

The capture of bears using an Aldrich snare offers considerable guarantees in terms of efficacy and safety for staff, making it one of the most widely used capture systems. The experience gained in Trentino has made it possible to evaluate the strong points of the system (simplicity, versatility and efficacy) but also to highlight some problems. One of these is the possibility of the snare being deactivated by the passage of other wild predators present in the area, such as foxes and martens or by domestic animals such as dogs. This possibility has led to research into solutions to minimise this risk, making changes to the snares and in particular to the mechanism releasing the spring. Ultimately, it was borne in mind that an adult bear is much heavier than any other predator present in the province and that the pressure resulting when its front paw presses on the release mechanism is undoubtedly greater than that exerted by the passage of a fox, marten or medium-sized dog. On the basis of this simple consideration, a new spring was developed that provides for, among other things, the possibility of regulating the resistance of the release mechanism (over 10/15 kg), making it possible to "select" the animals to be captured according to their weight (photo 21).

Photo 21 - Modification to an Aldrich snare (P. Zanghellini, APT Forestry and Wildlife Department Archives)

New alarm system for tube traps

Tube traps provide a high level of safety for the animals captured, as well as for staff, while intervention times can be relatively "longer" as compared to capture with an Aldrich snare, for example. This also allows staff to remain at a certain distance from the trap in a logistically more convenient position. For the purposes of setting in motion the capture team, it is therefore fundamentally important to have a simple, reliable and effective alarm system that guarantees extensive coverage in terms of signal transmission.

For this purpose the traps have been equipped with a further alarm system based on the provincial radio network (TETRA), making it possible to monitor the state of the traps from any point in the province (Photo 22). The system provides for the transmitter remaining in stand-by, only being activated at the moment in which the control circuit, normally closed, is opened when the wires are yanked following the closing of the door to the trap. The system has the further advantage of also generating an alarm message if the circuit is in any way tampered with or if a bear rips off the power supply wires without entering the trap. The alarm signal generated by the transmitter is both acoustic and visual and is accompanied by a code that also makes it possible to identify which trap has been triggered, in the event of simultaneous activation of more than one trap.

Photo 22 - New alarm system for tube traps (P. Zanghellini - APT Forestry and Wildlife Department Archives)

6. National and international links

Links with neighbouring regions and countries take on strategic importance in the management of such a highly mobile species as the brown bear. Bearing this in mind, even before the start of the Life Ursus project, official contact was made with neighbouring regions, it being clear that the area of western Trentino was not sufficiently large to house a viable population of bears. Over time these relationships have been strengthened and consolidated, with regard both to the territorial expansion of the small population, which has effectively concerned neighbouring regions and countries, and effective policy coordination implemented by the provincial government with the previously mentioned resolution no. 1988 of 9 August 2002. Following this, links transcending provincial boundaries were institutionalised and with the input of the Ministry for the Environment, Land and Sea and the coordination of APT, the **PACOBACE** (Plan of Action for the Conservation of the Brown Bear in the Central-Eastern Alps) was approved by all the partners and printed in 2010. In addition to the Autonomous Province of Trento, this also involved the Autonomous Province of Bolzano, the Lombardia and Veneto regions and the Autonomous Region of Friuli Venezia Giulia.

Activities designed to guarantee **transnational coordination** have also continued, in the light of the numerous cases of youngs moving into neighbouring areas reported over the last few years.

Updating of PACOBACE

The process of updating the **PACOBACE**, begun in 2013 (see page 63 of the 2013 Bear Report), is still underway. Ratification of the new text by the Lombardia region is still awaited. This will be followed by approval from the Ministry of the Environment.

The end of the *LIFE+ "ARCTOS"* Project (2010-2014)

APT's Forestry and Wildlife Department, together with the Adamello Brenta Nature Park as the other provincial body, is a partner in the Life Arctos project (Figure 15). The project, begun on 1 October 2010 and **ending on 31 December 2014**, was implemented within the context of the European Commission LIFE+ Natura funding programme (with funds of € 172,368 available to APT, the EU quota being € 109,013). The initiative was designed to encourage the safeguarding of the brown bear *(Ursus arctos)* population in the Alps and the Apennines and an expansion in numbers, by adopting management measures compatible with the presence of the bear, promoting a reduction in conflict with human activities, providing information and raising the awareness of the main stakeholders. Specifically, the activities involving APT mainly concerned the supply of prevention works and the modification of differentiated refuse bins for organic waste, to prevent access by bears.

Figure 15 - Logos of the Natura 2000 network and the *LIFE+ Arctos project*

In the context of its participation in this project, the staff of the Wildlife Office attended the following meetings with other partners:

Meetings in the context of the *Life Arctos* project:

- **Verona**, 17 January 20143 (*Life* meeting)
- **Rome**, 26-27 May 2014 (*Life* meeting)
- **Pescasseroli (AQ)**, 29-30 September 2014 (*Life* meeting)

The beginning of the *LIFE+ "DinAlp"* Project (2014-2019)

APT is participating in the *Life "DinAlp Bear" project* (Figure 16) within the context of the European Commission LIFE+ Natura funding programme (with funds of € 248,011 available to APT, the EU quota being € 173,608). The project, running from 1 July 2014 - 30 June 2019, sets itself the objective of managing and conserving the brown bear population in the **North Dinaric Alps and the Alps**, through the involvement of partners in **Italy**, **Austria**, **Slovenia** and **Croatia**. Specifically, the activities involving APT mainly involve **checking the effectiveness of prevention works** through the use of camera traps, monitoring the movements of bears equipped with radio collars, and the supplying of **guard dogs** to farmers showing an interest in trying out this further approach to protecting livestock. Furthermore, the activities of *Life DinAlp Bear* provide for the sharing of data useful for the identification of areas most sensitive to the presence of the bear, together with **communication and dissemination activities**.

In the context of APT's participation in this project, the staff of the Wildlife Office attended the first coordination meeting with the other partners on 26-27 November in Ljubljana (SLO).

Figure 16 - Logos of the Natura 2000 network and the *LIFE+ DinAlp Bear* project

LIFE DINALP BEAR

NATURA 2000

LIFE13 NAT/SI/000550

Alpine Convention Large Carnivores Platform WISO

During 2014, the activities of the **Alpine Convention Large Carnivores Platform** continued, the task of presidency being taken on by staff from APT's Forestry and Wildlife Department. Four meetings involving departmental staff took place in 2014 (Gorizia on 20 March, Brescia on 23-24 June, Venzone-UD on 2-4 July (Photo 23), Amden-Stiria, Austria on 11-12 December).

Photo 23 - Meeting of the Alpine Convention Large Carnivores Platform in Venzone (Udine) (APT Forestry and Wildlife Department Archives)

The main results achieved were:

- Support for delineating the report drawn up by the LCIE *(Large Carnivores Initiative for Europe)* on the request of the European Commission ***"Defining, preventing and reacting to problem bear behaviour in Europe"***;

- The starting up of coordination with the newly established **European Union Large Carnivores Platform**;
- The starting up of coordination with the Alpine Convention **"ECONET"** Platform;
- The setting up of the **Bear Alpine Group**;
- Support for initiatives to reintroduce the **lynx** implemented (ULyCA project in the Tarvisio area) or planned (Din-Alp Lynx project in the context of *Life* projects that should begin in 2015).

Figure 17 - Logos of the Alpine Convention

The role of the European Commission

In 2014 it is once again necessary to mention the initiative taken by **European Commission of the EU**, which in association with the activities of the **EU Large Carnivores Platform**, drew up a final report, through the Istituto di Ecologia Applicata in Rome, regarding "Defining, preventing and reacting to problem bear behaviour in Europe", with APT also making an active contribution to the study. Two workshops were held in connection with this, in **Ljubljana (SLO)** on **9 May** and in **Venzone** (UD) on **4 July**.

Furthermore, the supporting work of the European Commission continued in relation to the drawing up of **priority actions** for the management of large carnivores, for each species and at population level. The work takes place with the support of the *Large Carnivore Initiative for Europe (LCIE)*.

7. Conferences

Conferences and workshops

The staff of the Wildlife Office attended the following **conferences**:

- **CAI** conference on the **return of large carnivores** at Sedico (BL) on 8 March 2014;
- **Expo Riva Caccia, Pesca e Ambiente** conference - Riva del Garda, 29-30 March 2014 (stand dedicated to the wolf and presentation dedicated to large carnivores at an associated event);
- **IBA international conference *(International Bear Association)*** in Thessaloniki - Greece, 6-10 October 2014 (Figure 18);
- Conference on **"The management of wild fauna in the Euroregion"** in Bolzano, Free University of Bozen-Bolzano, 5 December 2014.

Figure 18 - Logo of the 23rd IBA international conference

APPENDIX 1
The Lynx

Monitoring of the species **began** when the lynx made its return to the province, namely in the second half of the **1980s**, with the appearance of a number of animals in eastern Trentino (these were present for around a decade). Traditional survey methods such as camera traps, radio-tracking and genetic monitoring were also used for this species from the beginning.

As previously reported, the only lynx certainly present in the province of Trento starting from 2008 is the **male known as B132**, who comes from the small Swiss population reintroduced in the St Gallen Canton (see page 45 and the following pages of the 2008 report and the Appendices on the lynx in subsequent Bear Reports in order to reconstruct his history).

The last capture of B132 (the third) to substitute his radio collar, which had ceased to function, was on 14 February 2012. The animal was caught in the same place as two years previously, using the same method (wooden box trap with lynx urine scent lure) and fitted with a GPS-GSM radio collar capable of transmitting satellite fixes at pre-established intervals through the cellular phone network, as well as functioning using traditional VHF radio mode, allowing it to be traced in the field. B132 was monitored thanks to the **GPS and VHF radio collar** up to 15 September **2013**.

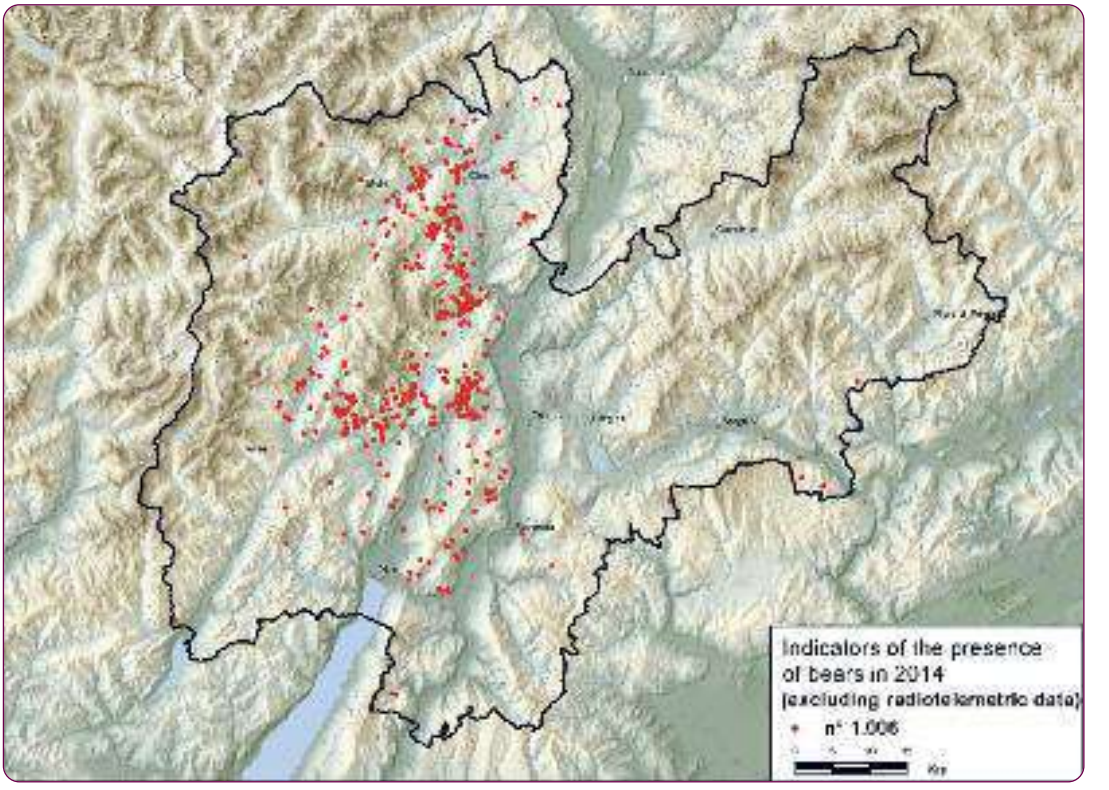
Photos 1 and 2 - The lynx filmed on the Brescia side of the Tremalzo ridge (photo by G. Pace)

During **2014** there were no reports of the presence of the feline, at least until **18 October 2014**, when the lynx was filmed by a camera trap on the Brescia side of upper Lake Garda, a few hundred metres from the border with the **province of Trento** at Tremalzo (Val di Ledro) (photos 1 and 2).

This was the first certain report for around 13 months, recorded about 10 km as the crow flies from the area reg-

ularly used by the feline from November 2012 until (at least) September 2013. At macroscopic level, Figure 1 shows the area used by the animal starting from his arrival in Trentino, which as can be recalled took place on 23 March 2008 in the upper Val di Sole.

Figure 1 - Area occupied by B132 in the period 2008-2014



For the seventh consecutive year there were no cases of **damage** attributable to the **lynx** within the province.

In 2014 B132, who belongs to a species which is, if possible, even shyer and more elusive than the brown bear and the wolf, remained the **only lynx** whose presence was ascertained (also) within Trentino.

Once again this year there were reports of **sporadic unconfirmed sightings**, impossible to confirm, which are noted for the sake of completeness; future confirmation could show the presence of at least one other lynx:

9 March: Masi di Jon (S. Lorenzo-Dorsino) - tracks in the snow;
8 May: Ronchi di Ala - sighting;
24 May: church of S. Tommaso (Cavedago) - sighting;
1 June: eastern side of Lake Molveno - sighting;
16 August: Dosson in Paganella (Municipality of Zambana) - sighting;
August: Passo Fedaia - sighting;
August: Penia - sighting;
7 September - just south of Vigo Cavedine - sighting.

Finally, in the **alpine context** we should recall the initiatives taken to reintroduce the lynx during 2014 (**ULyCA Project** - *Urgent Lynx Conservation Action*, in the Tarvisio area (UD), with the release of a male and a female that gave birth to two cubs last spring), or planned for the future (Photo 3) (***DinAlp Lynx*** project with Italian, Austrian, Slovenian and Croatian and Carpathian partners) in the context of Life projects that should start up in 2015.

Photo 3 - The male lynx at the moment of his release in the Tarvisio area (UD) (R. Pontarini - Italian Lynx Project))

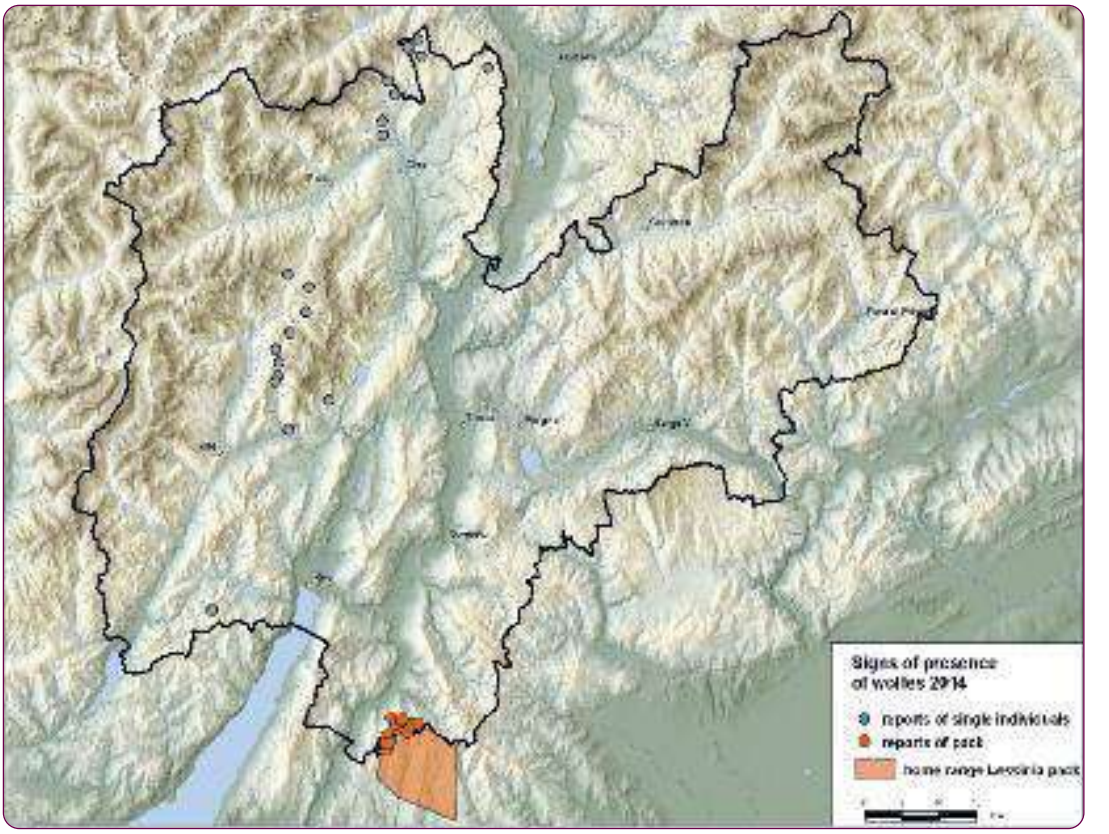
APPENDIX 2
The Wolf

Monitoring

Monitoring of the species **began** when the wolf made its return to the province, namely in **2010**. Traditional survey methods such as camera traps, radio-tracking and genetic monitoring were also used for this species from the beginning.

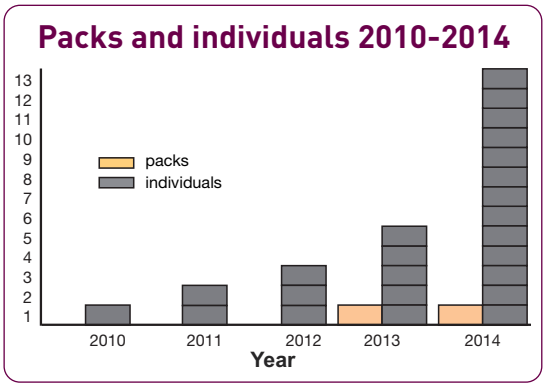
During 2014 **46 reports** relating to the presence of the **wolf** were recorded in the province; 9 in the upper Val di Non, 14 in the Val Rendena-southern Brenta area and 23 in the Lessini mountains (Figure 1). 4 of these were sightings, 16 filming with camera traps, 4 resulted from organic samples, 10 from tracks in the snow, 8 involved cases of damage and 4 cases of preying on wild animals.

Figure 1 - Geographical distribution of ascertained reports of wolves in the province in 2014, distinguishing between packs and individuals, in accordance with the criteria established by the W.A.G. *(Wolf Alpine Group)*



For the fifth consecutive year it was thus possible to document the presence of the wolf in the province of Trento. Specifically, at least **thirteen wolves** were roaming in Trentino and/or neighbouring areas during the year, bearing in mind a new litter of 7 wolf cubs recorded in the Lessini mountains and a new wolf identified genetically in the upper Val Rendena.

Graph 1



Graph 1 shows the trend for the minimum ascertained presence of the wolf in the province and neighbouring areas from 2010 to the present day.

The situation in the three areas of the province where the presence of the wolf was ascertained in 2014 is summarised below.

Upper Val di Non

For the fifth consecutive year, there was confirmation of the presence of the male wolf known as **M24**, first reported in Trentino on 13 April 2010 by wardens of the Adamello Brenta Nature Park (in the north-eastern Brenta mountains) and subsequently identified genetically (for his story see the 2010 Bear Report, pages 56-58 and subsequently the 2011 Bear Report, pages 63-65, 2012 Bear Report, page 68 and 2013 Bear Report, page 69).

In 2014 the same wolf (most probably) was filmed by **camera traps** on the Trentino side of its home range on at least 3 occasions during the year (photo 1).

Finally, it was photographed during an exceptional close encounter with a member of the Wildlife Office's technical staff on 25 May 2014 (see Box 1).

Photo 1 - Wolf caught on film by a camera trap in the upper Val di Non (I. Albertini - APT Forestry and Wildlife Department Archives)

To date there is no objective data proving the existence of other wolves in the same area. **No damage** was attributed to this wolf in the province of Trento during the course of the year.

BOX 1 - Close encounter with a wolf

I am a naturalist and as a hobby I have carried out naturalistic research for more than twenty years within an area of around 15,000 ha.

In the last few years I have noted traces of the wolf during my walks wandering through the woods. I have asked myself many times whether I would ever see one, hoping to be in the right place at the right time, but also aware that the likelihood of seeing one without being scented was very low.

However, I took my hopes and desires with me on my walks.

One day in late spring I had taken up position under a large, branchy spruce tree, whose branches helped to keep me hidden, observing a glade and listening to the reawakening of nature with the arrival of the first light of dawn...

As the sun rose and the birdsong faded away, the colours of the woods took on shades of gold...

My attention was also diminishing with the arrival of the sun, a sign that it was time for a nice cup of hot tea and a few biscuits ...

After having consumed my refreshments and put everything back in my rucksack, I was thinking precisely about the wolf, "the ghost of the forest"...

I remained in position for a while, waiting for the sun to warm me up a little before beginning the return trip down to the valley, when I suddenly saw an animal illuminated by the sun in the midst of the forest heading towards me!

There he was! It was really him, the wolf!

The animal came towards me, stopping a few dozen metres away and looking at his reflection in a pool that had formed with the melting snow (photo A).

Photo A

Photo B

After having sniffed the air and ground, the wolf allowed himself a short rest on the dry warm grass, yawning and closing his eyes ...

In those few minutes at close quarters with the wolf, I felt rewarded for all the cold, wet and negative days that I have spent in the midst of nature!

Photo C

Another thing I asked myself as I continued watching the animal, was whether Mother Nature had made the wolf first or the place that it had lain down to rest, given that the colours of its coat coincided exactly with the surrounding environment...

After a few minutes resting in the sun, yawning and stretching, the wolf lifted its head, suddenly smelling something in the air. Without becoming agitated, he slowly got up and took a few steps away, disappearing from my sight, returning to the forests that have protected him since time immemorial (photo D).

Photo D

I lay in, wait for an hour, before leaving the magical site of the encounter as it was...

I made my way back to the valley and as I gradually approached the frenetic rhythms of civilisation I realised how lucky I was to have experienced this marvellous and unforgettable adventure...

By Ivan Stocchetti - APT Wildlife Office

Val Rendena and the southern Brenta mountains

The presence of the wolf in this area was documented for the first time in 2014.

Specifically, on **2 June** a wolf was filmed by a camera trap positioned to monitor the bear in the **southern Brenta mountains** (Bregaìn pass), while it was heading north (Photo 2).

Photo 2 - Wolf photographed by a camera trap in June in the southern Brenta mountains (Matteo Zeni - APT Forest and Wildlife Office Archives - Adamello Brenta Nature Park

Photo 3 - Wolf filmed by a camera trap bear a bear rub tree (Michele Zeni - APT Forest and Wildlife Office archives - Adamello Brenta Nature Park)

A few hours later a wolf, probably the same animal, was filmed 8 km away by a camera trap, again while it was heading north, this time at a bear rub tree in the **Val d'Algone** (photo 3). In the next seven months the presence of the wolf was recorded regularly in the Val d'Algone and upper Val Rendena.

Specifically, evidence of the wolf's presence in the area was recorded at Malga **Zeledria** (near Campo Carlo Magno on the western slopes) in June and August, at Vagliana (Passo Campo Carlo Magno, east-

Photo 4 - Wolf filmed in the Val d'Algone between July and December (Michele Zeni - APT Forest and Wildlife Office Archives - Adamello Brenta Nature Park)

ern slope) in June, again in the **Val d'Algone** from July to September and then again in December (photo 4), in the Val d'Agola (photo 5) and the **Vallesinella** (photo 6) in September and November.

On two occasions (at Malga Zeledria and Vagliana) the organic samples collected by the staff of the Trentino forestry service and the Adamello Brenta Nature Park made it possible to identify the animal genetically. The wolf is a **female** of **"Italian"** origin, representing a completely new case in Trentino since the species began to return to its ancient hunting grounds (in 2010).

Further genetic investigations promoted by APT and carried out by ISPRA in collaboration with the genetics laboratory in Lausanne (CH) made it possible to identify the animal and verify its origin; it was born in spring 2013 in Switzerland in the **"Calanda pack"** (north-western Grisons canton) and was identified with the code **F10**. Specifically, the wolf was last genetically recorded on two occasions, on 27 November 2013 and 31 January 2014, a few kilometres west of Coire, again in the Grisons canton.

Confirmation is awaited in relation to the presence of a **second wolf** in the Val d'Algone-upper Val Rendena area, which could be surmised from images filmed by camera traps at different sites this year.

Finally, the **tracks in the snow** attributed to a wolf, followed at length on **18 March** and over the following days in the **Val di Ledro** (Photo 7) could be linked to the pres-

Photo 5 - Wolf photographed in September in the Val d'Agola (L. Titta - Associazione Cacciatori Trentini)

Photo 6 - Wolf filmed in November in the Vallesinella (P. Cirmarolli, G. Cirmarolli, S. Giacomini - Associazione Cacciatori Trentini)

Photo 7 - Tracks in the snow attributed to a wolf found in the Val di Ledro in March (M. Luzzani - APT Forest and Wildlife Office Archives)

ence of the wolf in this part of the province (but also possibly not). The tracks made it possible to document the progress of the animal towards the north-west, crossing the Bocca del Casèt and moving from the Pur valley to the Lake Ampola area. It was not possible to determine the genetic origin of the animal leaving the tracks, although the characteristics leave little space for doubt.

Lessini mountains

As previously reported, at the end of December 2011 a young **male wolf fitted with a radio collar in Slovenia** (called Slavc) made a long journey in the summer of the same year, terminating probably not by chance in the Lessini mountains, where a **further wolf** (female, of Italian origin) had been present from the beginning of 2012. This wolf had made an equally long journey, but in the opposite direction, towards the east, starting from the western Alps, where numerous packs have been present over the last twenty years.

The extraordinary journey made by the young male of Slovenian origin (lasting months and documented daily in an extremely precise way by the fixes of the GPS collar transmitted to researchers), demonstrated once again, should there be any need to do so, the **completely natural nature of the wolf's return to the Alps**.

As noted in the previous Report (see pages 70-71), the couple produced its first two cubs in spring of 2013. This year it was possible to ascertain the presence of a **further litter** (reported by staff of the state forestry service and the Lessinia Regional Nature Park - VR) made up of **7 cubs**, demonstrated both by direct sighting and photographic images (photo 8).

Photo 8 - The seven wolf cubs born in 2014 (P. Parricelli - Lessinia Regional Nature Park Archives)

The pack, which therefore included a total of 11 members, continued to remain principally in the province of Verona, but also moved regularly into Trentino, up to the end of 2014. The presence of the pack in Trentino was documented specifically several times dur-

ing the year, with the finding of numerous **tracks in the snow** (photo 9), **biological samples** collected (faeces, hairs and urine) and various footage from camera traps (photo 10). The genetic tests carried out by ISPRA on the samples collected in Trentino also made it possible to identify **two of the cubs** born in Lessinia: these were two males identified with the codes **WTN4M** and **WTN5M**.

At the time that this report was printed **(February 2015)**, on the basis of tracks in the snow, images from camera traps and sightings, the wolf **pack** would not appear to include more than **7 members**. If this is effectively the case, it is likely that during the winter some of the wolves have died or separated from the pack to roam. In 2014 the pack moved over a **territory** estimated to cover **100 km²** using the minimum convex polygon method (Figure 1).

Photo 9 - Tracks of the wolf pack in the snow on the Lessini mountains (T. Borghetti - APT Forestry and Wildlife Department Archives)

Photo 10 - Some of members of the Lessini pack filmed by a camera trap (T. Borghetti - Forestry and Wildlife Department Archives)

Damage management

In 2014 in the area of the Lessini mountains, particularly the **Ala** area, there was damage to domestic livestock caused by wolves involving cattle (3 animals killed and one injured), equines (4 animals killed) and goats (4 animals killed), in a total of **5 attacks** (photo 11). Considering also the more extensive damage recorded on the Verona side of the Lessini mountains, the overall balance in terms of damage was 42 attacks and 53 animals lost. The data regarding predatory activities on the Verona side of the Lessini mountains was provided by the Lessinia Regional Nature Park. The losses represent around 1%

Photo 11 - Remains of a bovine preyed on by the pack of wolves in Lessinia (T. Borghetti - Forestry and Wildlife Department Archives)

of the herds of cattle taken to alpine pasture on the tableland, made up of over 5,000 animals.

Confirming the increase in roaming wolves in our area, in 2014 damage was also recorded in the **upper Val Rendena** area (Malga Zeledria) for the first time, with 3 attacks (involving 4 goats). Furthermore, the carcasses of at least three wild animals were reported in this area (2 red deer and 1 roe deer) eaten, completely or partly, by wolves.

A glimpse outside the province

As far as areas neighbouring on the province of Trento are concerned, the presence of the wolf was reported in **Lombardia** in the provinces of Brescia and Sondrio (between the upper Valcamonica and the areas around Passo dell'Aprica) from April 2014, involving a **wolf of undetermined sex**, and between the province of Sondrio and Switzerland (Val Bregaglia) with a second wolf, probably the male called **M41**. In the **province of Bolzano**, in addition to M24, who was also partly present in Trentino territory, the presence of a **second male (WMBZ1)** was reported from spring 2014 between the Val Venosta and the Val d'Ultimo. These updates were kindly provided by the Azienda Faunistico Venatoria "Valbelvisio-Barbellino", the Lombardia Region, the Provinces of Sondrio and Brescia, Stelvio National Park and the Hunting and Fishing Office of the Autonomous Province of Bolzano.

Conferences

The Forestry and Wildlife Department attended the following **conferences/training sessions** on the wolf:

- training for staff involved in monitoring the wolf, in the context of the ***LIFE Wolfalps*** project, in **Ceva (CN)** on **17-19 March 2014** (photo 12);
- workshop on "The biology and monitoring of the wolf, and anti-poaching activities", held in the context of the ***LIFE Wolfalps*** project, in **Sondrio** on **15 October 2014**;
- refresher workshop on wolf monitoring activities, in the context of the ***LIFE Wolfalps*** project, in **Belluno** on 21 October 2014;
- planning meeting for activities to monitor the wolf in the province of Trento, in the context of the ***LIFE Wolfalps*** project, in Trento on **18 November 2014**.

Photo 12 - Training course held in Ceva (CN) in the context of the *LIFE Wolfalps* project (C. Groff - Forestry and Wildlife Department archives)

Communication

Communication initiatives concerning wolves in 2014:

- **Documentary** on the wolf on **Bavarian national TV** (broadcast on 13 February 2014)
- **"The Wolf in Trentino" brochure**, 2,500 copies printed in March 2014 (Figure 2).
- **Course on the wolf at the MUSE** for teachers, in the context of the LIFE Wolfalps project on 3 October 2014.
- **Public meeting on the wolf**, held in **Ala** on 15 December 2014 in collaboration with the municipal administration, regarding the presence of wolves on the Lessini mountains.

Figure 2 - Front page of the brochure "The wolf in Trentino"

Questions

The necessary information was provided in order to respond to the following 5 questions raised at the provincial Council regarding wolves:

- **Question no. 798/XV for written answer**
  Position of the provincial government as regards the increasing presence of wolves in Trentino
- **Question no. 826/XV for written answer**
  The presence of the wolf on the Lessini mountains
- **Question no. 884/XV for written answer**
  Project supporting the presence of wolves within the province
- **Question no. 956/XV for written answer**
  The presence of wolves in the area and control mechanisms
- **Question no. 1009/XV for written answer**
  The presence of wolves on the Lessini mountains and action to protect livestock

In 2013 PAT joined the ***LIFE Wolfalps*** project as a supporter (see Box 2). Specifically, the staff of the Forestry and Wildlife Department contribute to carrying out monitoring activities and communicating the presence of the carnivore, in collaboration with the MUSE, the Adamello Brenta Nature Park and the Stelvio National Park.MUSE, Parco Naturale Adamello Brenta, e Parco Nazionale dello Stelvio.

BOX 2 - LIFE Wolfalps

A European project for the conservation and management of the wolf in the Alps

Co-funded by the European Union in the context of the 2007-2013 LIFE+ "Nature and biodiversity" programme, the LIFE Wolfalps project has the objective of carrying out coordinated action for the conservation and long-term management of the alpine wolf population.

LIFE Wolfalps intervenes in seven key geographical areas, identified as particularly important due to the presence of the species and/or because they are decisive for its diffusion within the overall alpine ecosystem (Figure A).

The objectives of LIFE Wolfalps include the identification of strategies designed to ensure the coexistence of the wolf and traditional economic activities, favouring a reduction in potential conflict, both in areas where the wolf has already been present for some time, and in areas where the process of natural recolonisation is currently underway.

The project takes concrete form thanks to the joint work of ten Italian partners, including the MUSE in Trento, two Slovenian partners and numerous supporting bodies, including the Autonomous Province of Trento, through the Forestry and Wildlife Department. Together they make up an international working group, indispensable for starting up forms of coordinated management for the wolf population at alpine level.

In addition to monitoring, the activities provided for by the project include measures to prevent attacks by wolves on domestic livestock, action to combat poaching and strategies to control wolf-dog interbreeding, necessary to maintain the genetic diversity of the alpine wolf population in the long term.

Other essential intervention, coordinated by the MUSE, concerns communication, necessary in order to increase knowledge of the species, dispel myths and false beliefs and reduce distrust in relation to the wolf, in order to guarantee the conservation of this important animal throughout the Alps.

The project was started up in September 2013 and will terminate formally in May 2018.

Title of the project:

THE WOLF IN THE ALPS: IMPLEMENTATION OF COORDINATED WOLF CONSERVATION ACTIONS IN CORE AREAS AND BEYOND

Acronym:

LIFE Wolfalps

Founds:

(funds of euro 538,940 available to MUSE, with the EU quota being euro 358,940)

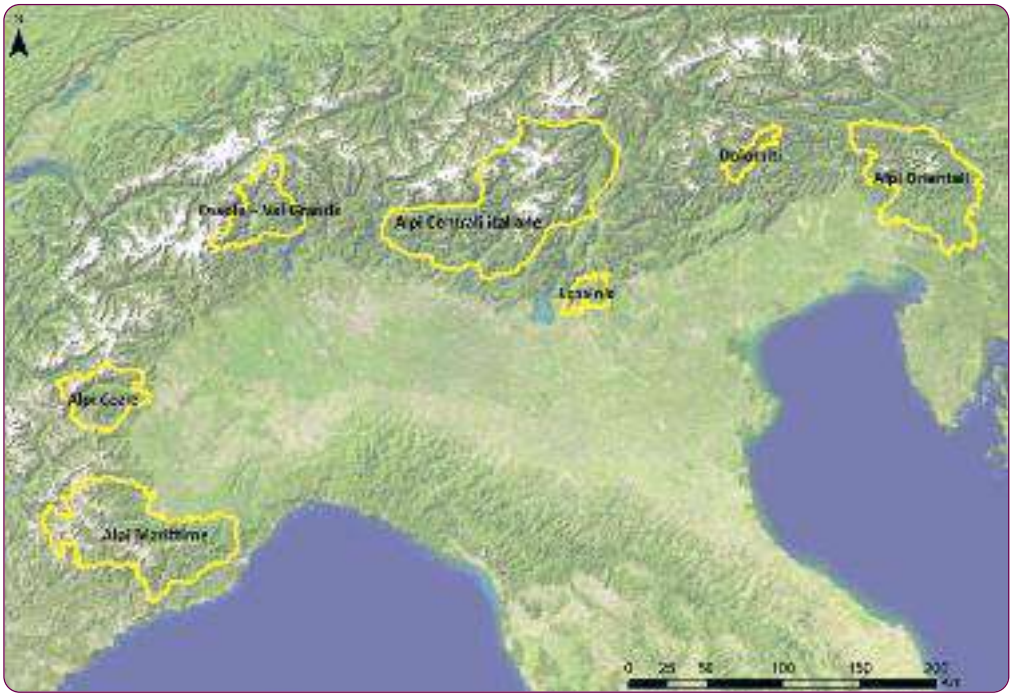
List of beneficiaries:

- *Maritime Alps Nature Park (coordinating beneficiary)*
- *Italian State Forestry Service (associated beneficiary)*
- *Marguareis Nature Park Managing Body (associated beneficiary)*
- *Cottian Alps Protected Areas Managing Body (associated beneficiary)*
- *Ossola Protected Areas Managing Body (associated beneficiary)*
- *Val Grande National Park (associated beneficiary)*
- *Stelvio National Park Consortium (associated beneficiary)*
- *Lombardia Region (associated beneficiary)*
- *Veneto Region (associated beneficiary)*
- *MUSE - Trento Science Museum (Associated beneficiary)*
- *Triglavski Narodni Park (associated beneficiary)*
- *University of Ljubljana (associated beneficiary)*

List of areas of intervention:

- *Area of intervention 1: Maritime Alps*
- *Area of intervention 2: Cottian Alps*
- *Area of intervention 3: Ossola - Val Grande*
- *Area of intervention 4: Central Italian Alps*
- *Area of intervention 5: Lessinia*
- *Area of intervention 6: Dolomites*
- *Area of intervention 7: Eastern Alps*

Figure A - Areas of intervention in the *Wolfalps* project



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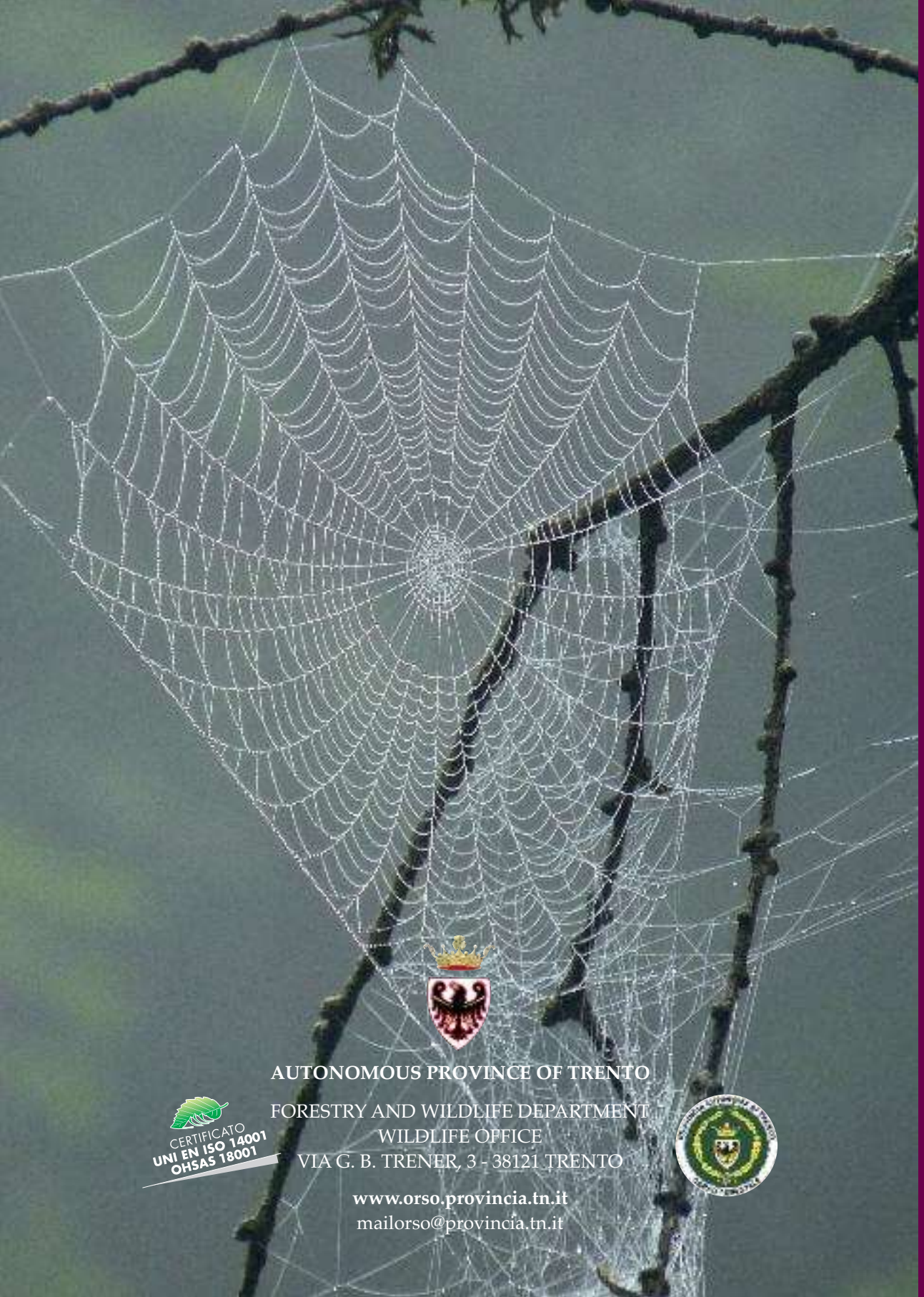

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