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TRENTINO

AUTONOMUS PROVINCE OF TRENTO

BEAR REPORT 2012

WITH APPENDICES ON THE LYNX AND THE WOLF

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OF TRENTO

FORESTRY AND WILDLIFE
DEPARTMENT

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"Mother bear with two cubs in the Val di Tovel", August 2012
Photo by Matteo Zeni - Adamello Brenta Nature Park

Back cover
"Mother bear with three cubs in the upper Val Ambiez", August 2012
Photo by Michele Baldessari - APT Forestry and Wildlife Department Archives

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Presentation

Alors que le nombre d'ours actuel approche le seuil de viabilité estimé par l'étude de faisabilité de l'ISPRA, cette progression s'est accompagnée d'une baisse marquée du niveau d'acceptation sociale en dépit des mesures spécifiques adoptées en 2012

Management of the brown bear in Trentino is carried out on the basis of consolidated operational guidelines approved by the provincial government. The administration has assigned the **Forestry and Wildlife Department** with the task of acting as the organisation of reference in relation to carrying out specific programmes of action.

With the drawing up of this sixth issue of the **Bear Report**, supervised by the Wildlife Office, it is intended to confirm the choice made at the very beginning, namely to provide a complete and in-depth annual report, including detailed technical documentation on the results of management and progress of the project.

This report has been made possible with the support of all those involved, in various ways, in carrying out the activities involved in the project programmes, and to whom we would like to direct our most sincere **thanks**; these include the forestry and technical staff of the Forestry and Wildlife Department, the staff of the Museo delle Scienze **(MdS)**, the Adamello Brenta Nature Park, **(ABNP)**, the Istituto Superiore per la Protezione and la Ricerca Ambientale **(ISPRA)**, forest wardens, the gamekeepers of the Associazione Cacciatori Trentini **(ACT)** and numerous volunteers. Special thanks must go to the Autonomous **Province of Bolzano** and to the administrative **Regions** in the alpine area (Veneto, Friuli Venezia Giulia and Lombardia), which also participate in the project in order to put the programmes into effect and to gather and make available some of the data contained in this report.

Following further **success at biological level** in terms of the population, which has continued to increase, in **2012** the project entered a decidedly "**critical phase**", demanding widespread changes in a relatively short time.

While the number of bears is indeed by now close to the Minimum Vital Population threshold estimated by the feasibility study drawn up by ISPRA, with around 50 bears, this has been accompanied by a **marked fall in the level of social acceptance**, despite specific measures adopted in 2012. These included approval of the **new provincial law** no. 6 of 24 April 2012: "Modifications to the provincial law on hunting in relation to compensation for damage caused by wild animals" and the positive experience of the **round table** with the categories most exposed to the presence of bears. Hence the unavoidable need to **update management measures**, within an operational context which has undoubtedly changed since these measures were drawn up.

It is essentially a question of **redefining the types of problem behaviour** manifested by bears (both in relation to "dangerous" behaviour and excessive damage that may take place) and the consequential **controlling action** provided for by the *PACOBACE* (Plan of Action for the Conservation of the Brown Bear in the Central-Eastern Alps). This may also take place by giving the local authorities called on to manage the species the possibility of **acting with the necessary operational autonomy**, in the context of common and predetermined criteria, with the authorisation of the Ministry of the Environment.

It is clear that this new phase must necessarily be based on the **indispensable constructive and participatory contribution** of the Ministry of the Environment and ISPRA, and those called on to operate in the field on a daily basis have every trust that this will take place.

DOTT. MAURIZIO ZANIN
Manager of APT'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. However, just when all seemed lost, there was turn in fortunes, originating in the action taken by ABNP, which started up the *Life Ursus* project together with the Autonomous Province of Trento **(APT)** and ISPRA (formerly INFS), 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 population to which this report refers. 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 ultimate aim of the project. This area extends well beyond the confines of the province of Trento, also involving neighbouring regions and countries.

Photo 1 - Bear and lynx tracks in the snow. Campa mountains, April 2012 (C. Groff, APT Forestry and Wildlife Department Archives)

Following the conclusion of the phase involving the release of the animals, the phase dedicated to the conservation and standard 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. In particular, 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.

1. Monitoring

Monitoring of the bear has been carried out continuously by the Autonomous Province of Trento for almost 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.

Genetic monitoring was coordinated for the **eleventh consecutive year** by APT's Forestry and Wildlife Department, with the collaboration of ISPRA, ABNP, the MdS and volunteers.

Photo 2 - Staff busy in field monitoring (C. Groff, APT Forestry and Wildlife Department Archives)

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

Finally it should be recalled that monitoring of the other two species of large carnivores in the Alps (the **Eurasian lynx** and **the wolf**) began following their reappearance in the province, hence from the end of the 1980s for the lynx and since 2009 for the wolf. The monitoring of these two species also involved the use of traditional survey techniques in the field, camera traps, radio-tracking and genetic monitoring.

In 2012 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, while the data is validated using population genetics software. The organic samples collected may be analysed according to the standard procedure (549 in 2012), or in more urgent cases (15 in 2012), using a faster system, providing results within a couple of weeks from receipt of the sample. The methods developed, in accordance with the provisions of PACOBACE (Plan of Action for the Conservation of the Bear in the Central-Eastern Alps), 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 the use of laboratory procedures designed to minimise the risk of genotyping errors. With this scope the multiple amplifica-

tion 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 were used for these samples in order to clarify any uncertainty.

A total of **646 organic samples** from bears (226 from rub trees, 169 at damage sites and 251 elsewhere) were collected using the opportunistic system in the province of Trento in **2012**, of which **564** samples were sent to ISPRA for genetic testing (403 samples of hair, 156 of excrement, 4 of tissue and 1 tooth), bringing the total number of organic samples collected and subjected to genetic testing **since 2002** to **4,952**. Some of the samples collected (82) were not sent for testing, as they were duplicates (or further repeats) of samples already positively identified. The fact that **genetic monitoring** has now been carried out for **eleven consecutive years** makes the "Trentino case" 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.

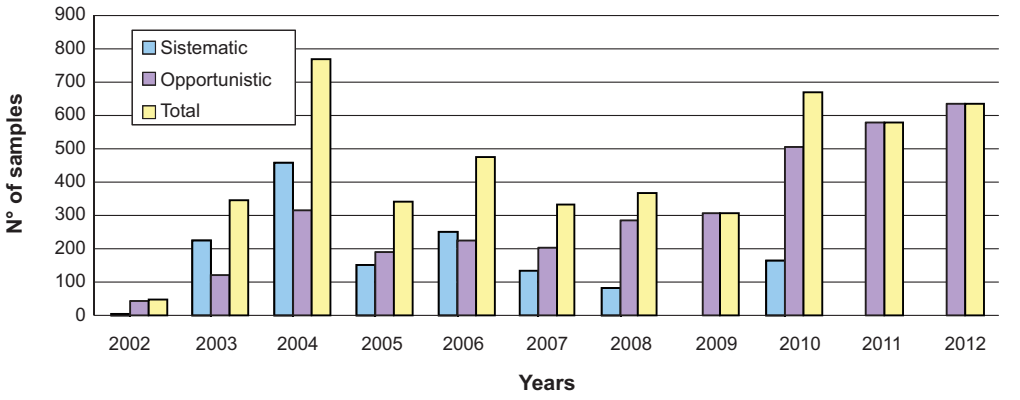
The 646 samples were collected by the staff of the Autonomous Province of Trento (414; 64%), ABNP (180; 27.8%) and by volunteers (52; 8%).

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 eleven seasons can be seen below (Graph 1).

Graph 1



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	TOT.
Opportunistic	45	125	319	193	228	205	290	311	514	587	646	3463
Systematic	4	227	464	154	255	135	83	-	167	-	-	1489
TOTAL	49	352	783	347	483	340	373	311	681	587	646	4952
N° of traps	4	39	41	42	47	17	57	-	57	-	-	

During 2012, alongside traditional opportunistic monitoring and with the collaboration of ABNP, the Forestry and Wildlife Department again carried out **monitoring of rub trees**, namely plants on which bears leave signs of their presence by leaving their odour and hair on the bark. This monitoring activity began in 2010 and for the first time it took place in a **standardised manner**, as described below and with the results summarised below.

Monitoring of a total of more than **100 trees** equipped with barbed wire was carried out systematically, 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. The checks, carried out **every three weeks** from April until November, on a total of **11 occasions**, 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 not to change 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 the Adamello Brenta Nature Park, the staff of the Trentino Forestry Service and forest wardens.

During the season **226 hair samples** were collected, representing around a third of the organic samples collected in an "opportunistic" manner during the year. A total of **13 bears** were genotyped; **7 males and 6 females** (representing 27% of males and 35% of females known to be present in the area studied in 2012, also considering all the cubs). Of these 11 were **adults**, 1 a young and

1 a cub. In the three years of monitoring **(2010-2012)**, a total of **16 bears** actively frequented the rub trees.

The significant difference between the sexes in the use of rub trees was confirmed: **males** made considerably more visits to rub trees than **females** and these visits were concentrated in the spring-summer months (during the reproductive season). The use of rub trees by females would instead appear to be more sporadic and mostly limited to the autumn months. Furthermore, young bears would appear to make only marginal use of rub trees in comparison to adults: all this suggests that bears may use the activity to establish a sort of social hierarchy, in order to avoid direct conflict.

Sampling bears by collecting hairs left naturally on rub trees was thus confirmed as a helpful addition to monitoring methods providing for opportunistic collection of samples and the use of hair traps with lures. Rub trees are indeed an efficient, safe, flexible, non-invasive and relatively cheap method for the collection of data useful for estimating the extent of the population investigated and population trends.

Photographic monitoring of rub trees was also commenced in a standardised manner for the first time in 2012 (Box 1).

BOX 1 - Photographic monitoring of rub trees

Following promising exploratory use of camera traps in 2010 and 2011 and the agreement signed by APT and the Museo delle Scienze, in collaboration with ABNP, ***standardised camera trap monitoring of rub trees*** *commenced for the first time in 2012.*

The main scope 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 the numerous other species captured on film.

20** "IR-plus"* ***camera traps *were used (Photo A). These are activated by infrared sensors following the passage of animals, recording a video or photographic image after a trigger time of around 1 second from the time the animal comes within the field of the sensor.*

Photo A - Camera trap positioned on a tree (P. Zanghellini - APT Forestry and Wildlife Department Archives)

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 (sequence lasting 20 seconds) 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 traps were ***checked every 3 weeks*** *by APT/ABNP staff, in order to download the data and control the batteries.*

20 of the more than 100 rub trees identified and monitored, uniformly distributed in the area frequented by bears, were chosen for monitoring with camera traps (Figure A).

The sites chosen, in addition to being uniformly distributed in the area, were known to be used regularly by bears, a fundamental requisite for maximising the data acquired. Photographic sampling was carried out ***from 6 May to 19 November 2012****, with a total of 3,022 camera days in terms of effective operation (an average of 151 days per camera). The sampling was not quite as extensive as expected, due to reduced operation by some of the cameras because of full memory cards or problems with batteries, and to the theft of three cameras. However, over and beyond this, all the cameras worked effectively and the sampling carried out was nevertheless significant.*

Figure A
Location of the camera traps and the relative number of bears passing

Results (bears)

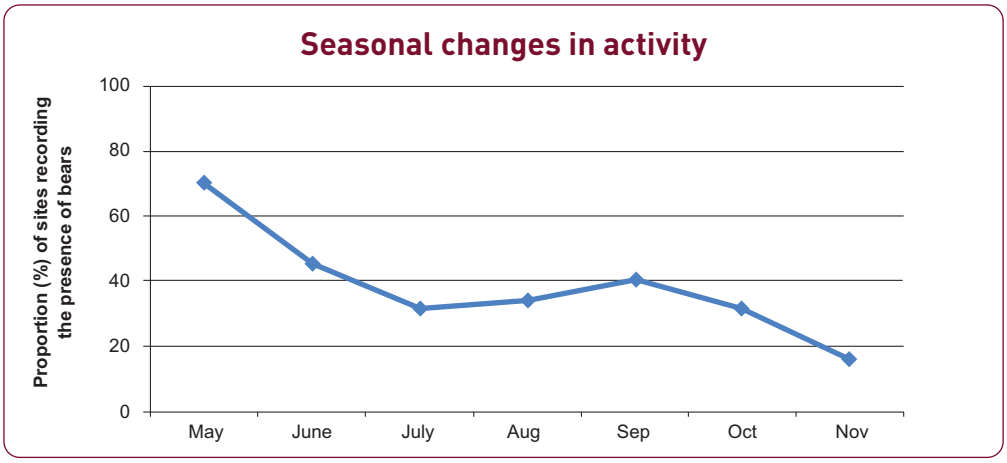
The cameras recorded a total of ***4,736 videos of animals and men****, including* ***128 of bears*** *(Photos B and C). For the purposes of analysis, "individual events" relating to the passage of bears (or other species) were established, joining together sequential videos because they referred to 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 110 (out of a total of 128 recordings) "individual events" (or separate events independent of each other) resulted for bears, with an average of 5.5 per camera (from a minimum of 0 to a maximum of 20).*

Photo B - Bear filmed by a camera trap at the foot of the rub tree (Andalo forestry station - APT Forestry and Wildlife Department Archives)

Photo C - Bear marking a rub tree (C. Sartori - APT Forestry and Wildlife Department Archives)

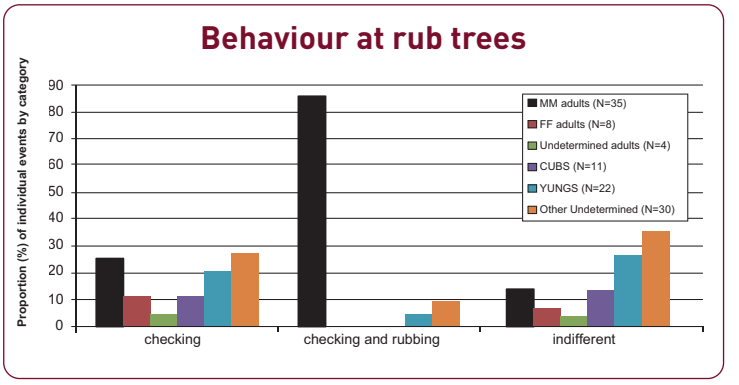
Graph 1 shows the seasonal changes in the presence of bears recorded by the cameras, expressed as the % of cameras capturing images of bears, in relation to the total number of cameras. The trend also provides information about changes in the activity of the species in general, given that the rub trees are situated along paths or forest roads used by bears: one can note a peak in May, coinciding with the reproductive season, decreasing up to July-August and with a "recovery" in terms of activity in September before pre-hibernation lethargy.

Graph 1 - Seasonal changes in the activity of bears 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



The bears' behaviour at rub trees was assigned to one of 4 categories: (1) indifferent (bear did not stop at tree), (2) checking of tree, (3) checking of tree and rubbing, (4) only rubbing. Graph 2 shows the percentages for these different categories of behaviour in terms of the 110 overall events recorded, also by age group and sex. Overall, 41% of events involved "indifferent" bears (Photo D), whereas the remaining 59% involved checking the tree (40%), checking and rubbing (12%), or just rubbing (7%). One interesting result is that the bears rubbing themselves against the tree were mostly male adults, as shown in the images (in 18 events out of 21), while the 3 remaining events involved individuals of unidentified gender (so the effective proportion of males is probably higher).

Graph 2 - % distribution of behavioural categories in terms of the use of rub trees (in relation to individual events recorded by camera traps) by different age groups



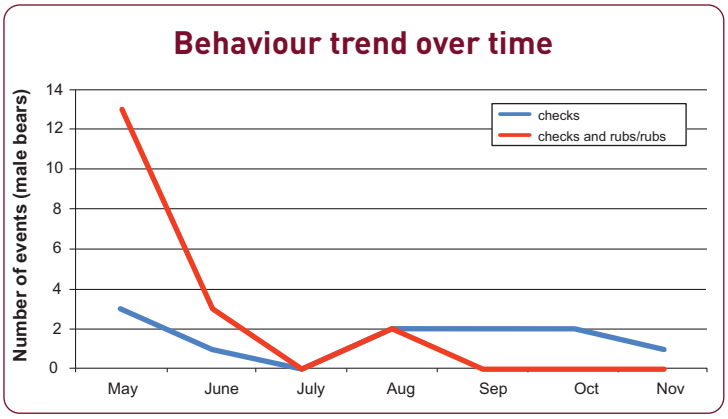
Proportion (%) of individual events by category

None of the adult females filmed rubbed themselves against the trees, however most of those ascertained to be females checked the rub tree (5 out of 8 individual events). This data confirms the results of genetic monitoring, providing further information about the use of rub trees: only a small proportion of males was indifferent to the rub trees (6 out of 35 individual events). As regards differentiation according to age groups, it is interesting to observe that in almost 45% of cases of passing cubs (5 out of 11) the cubs checked the rub tree, but none of them rubbed themselves; their behaviour is similar to that of youngs (41% checked trees), with the difference that there was one case of a young bear rubbing himself against the tree. In this context it should be underlined that youngs were necessarily identified in an empirical manner, based on the markedly smaller size of "young" as compared to adults. They were classified in a "conservative" manner, so it is possible that some young were considered to be adults, whereas the opposite is unlikely.

Photo D - Bear with indifferent attitude to the presence of the rub tree (M. Tiso - APT Forestry and Wildlife Department Archives)

It can be noted that active behaviour ("checking and rubbing" + "rubbing" categories) regards above all adult males. The "other undetermined bears" group relates to bears whose size did not make it possible to determine the sex or age group.

Graph 3 - Trend in the behaviour of adult male bears at rub trees over time. The data refers to individual events recording the passage of bears (N=29)

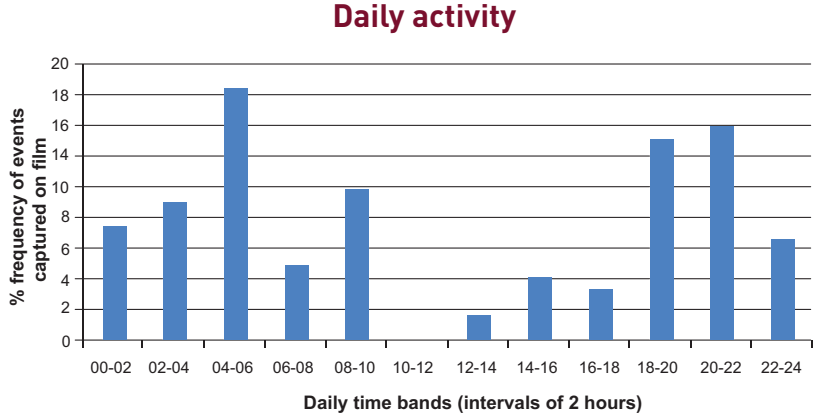


Analysis of seasonal changes in behaviour at rub trees (Graph 3) reveals an interesting trend for adult male bears, with a marked peak in activity in May, namely during the reproductive season, as compared to subsequent months. This further reinforces the theory that rub trees have a fundamental role in inter-specific communication linked to reproduction.

The behaviour of other species at rub trees was also analysed. There was widespread indifference to the trees, however active use (marking with urine) by the pine/beech marten and fox was recorded in a limited number of cases (6.5%), along with passive use (checking) by four ungulates (5.2%). The trend was only partially similar to the trend for use by bears, however it has emerged that rub trees also have a role in the social behaviour and intra-specific communication of other species. The overall results for events involving the use of rub trees for all months did not show any statistical link between the bear and other species, or any link between marking and checking species.

In addition to the use of rub trees, the results revealed other interesting aspects regarding the habits of bears. In particular, by plotting events by time bands, it is possible to arrive at a profile for daily activities (Graph 4). This shows the typical trend for a nocturnal and crepuscular species, with peaks in terms of passage (and hence activity) early in the morning (4:00-6:00) and in the evening (18:00-22:00).

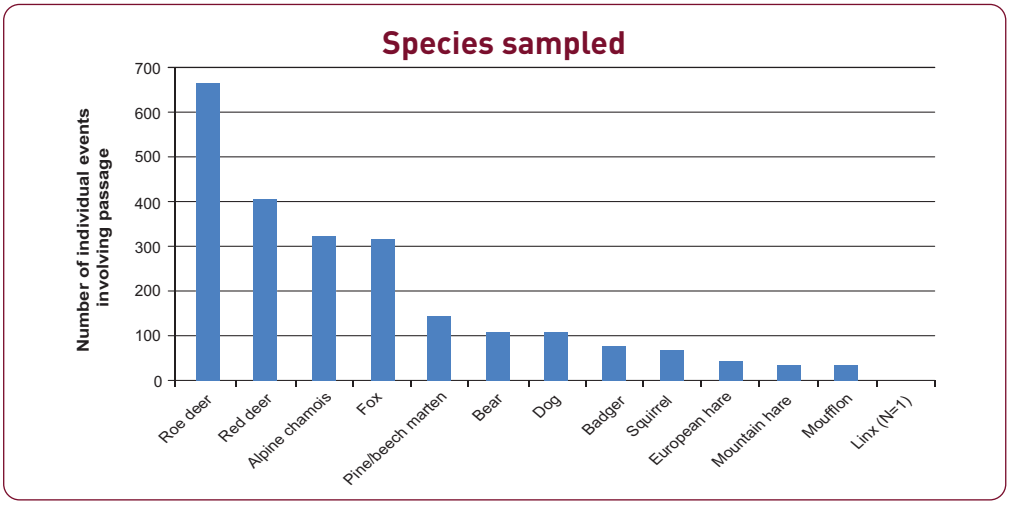
Graph 4 - Daily activity of bears, in terms of events in which passing bears were filmed by camera traps (the graph shows the % of events by time band out of the total, N=110)



Results (all species)

In addition to the bear, a further 13 species of medium-large mammals were captured on film, including man. In Graph 5, the species are placed in order of the overall number of events recorded, allowing straightforward comparison of the results for different species. It is interesting to observe that man is the species most frequently captured on film (2,080 events, not included in the graph in order to better appreciate the differences between the other species). The variety of species filmed shows the usefulness of camera traps in monitoring a wide range of mammals. The following animals were recorded more frequently than the bear, in order of frequency: roe deer, red deer, alpine chamois, fox and pine/beech marten (the latter were often not distinguishable as nocturnal images are in black and white).

Graph 5 - Individual events recorded for all species of medium-large mammals



Analysis of the data, in order to assess any possible links – related to avoidance or association – between the presence of the bear and other species, did not show any specific relationships. For example, there is no documentation supporting the theory that the presence of the bear may influence the behaviour of ungulates, limiting their numbers.

Conclusions

The positioning of cameras on "rub-trees" made it possible to obtain important data on the way such trees are effectively used by bears, along with a range of additional information (changes in coat, beginning and end of activity, daily pattern of activity, interaction between individuals and species, consistency between genetic and morphological data etc.).

As confirmed by many studies, camera traps are however only suitable for individual identification in the case of species with a specific coat, such as felines; recognising individuals on the basis of incidental marks or individual peculiarities is occasionally possible, but this is an exception, meaning that the method cannot be considered as an effective monitoring tool. Even the additional information provided by genetic testing in the specific case of rub trees does not usually allow visual identification of the individual which can also be used on other occasions.

by Francesco Rovero and Natalia Bragalanti

Status of the population in 2012

Processing of the data collected provided the information given subsequently regarding the **identification of the bears** sampled, **estimation** of the minimum **population**, the number of litters during 2012, the **trends** in terms of population development and the **use of the area** by the animals.

It should be noted that starting from this edition of the report, the **graphs regarding demographic aspects** have been **updated** not only in relation to 2012, but also with data regarding **previous years** that monitoring in 2012 has made it possible to recover (for example in relation to so-called "rediscovered" bears). This explains the differences which can sometimes be found between the graphs in previous reports and this year's report. This therefore leads to ***"ongoing"* updating** of the **data available** and the relative graphs, which must therefore be considered to substitute previous ones, bearing in mind the greater reliability of the background information and hence the related analysis.

Definitions

- **"cubs"**: bears aged between 0 and 1;
- **"youngs"**: males between the age of 1 and 5 and females between the age of 1 and 3;
- **"adults"**: males over the age of 5 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 which were 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 in the province of bears coming from the Dinaric-Balkan bear population.

Overall **43 animals were detected genetically in Trentino and neighbouring provinces and regions during 2012**. All of them were detected using **opportunistic** genetic monitoring. At least **7 cubs** belonging to four different litters must be **added** to these, as they were repeatedly observed and/or filmed in the company of their mothers (all genetically detected) during the year, although the cubs were not identified genetically.

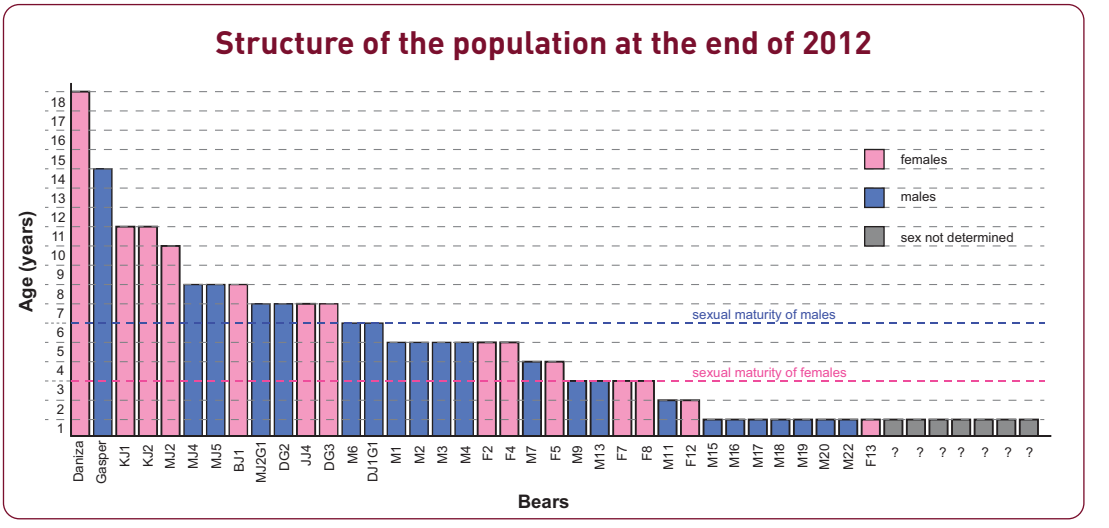
It is however necessary to subtract **7 bears** from the total: 5 of these died and 2 were considered to have "emigrated" as they were recorded in Friuli Venezia Giulia, in the eastern part of the region. The stable presence of a group of bears has been ascertained in this area, representing the most north-westerly ramification of the Dinaric-Balkan bear population.

Finally, it should be recalled that on the one hand a **further bear was found dead** in the province of Sondrio on 22 September 2012, which however had not been genetically identified at the time this report was printed (so for the moment it is has not been considered in the analysis which follows), while on the other hand a **further bear was identified** through genetic monitoring. The results suggested this was the son of DJ3, taken into captivity in 2011 (see the 2011 report for details). However, the presence of this last bear has not been confirmed by observations in the field (DJ3 was monitored at length with a radio collar) nor by known data on the reproduction of the bear in question. So for the moment it has not been included

in the calculations, but may be included subsequently should elements clarifying the situation emerge in the future.

Hence a minimum of **43** bears are considered to have been present at the end of 2012, of which **22 males**, **14 females** and **7 of undetermined sex** (Graph 2) (***sex ratio* M-F 1:0.4** - n=36).

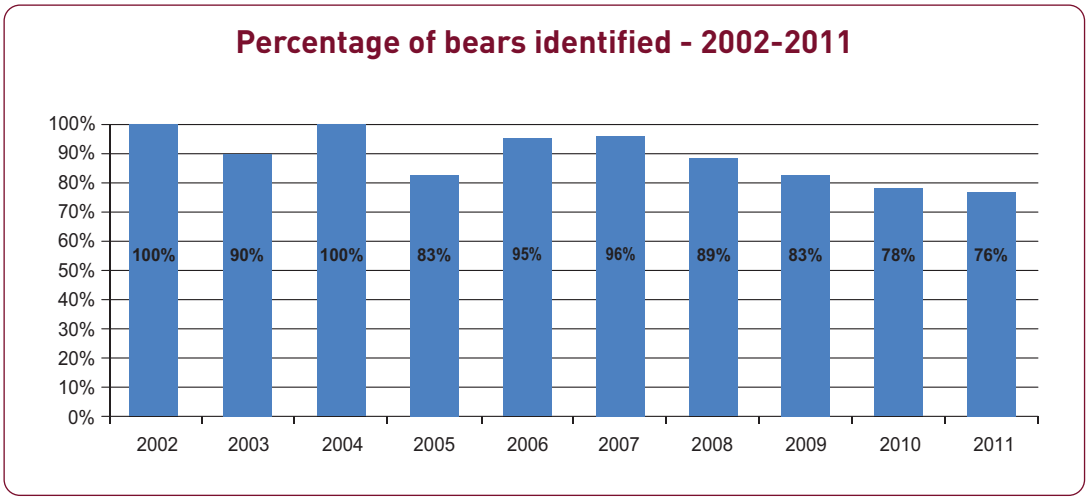
Graph 2



Once again this year it is very 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 (5, including 4 cubs that were not detected in 2012, although present in 2011) as possible, and excluding those missing for two or more years (13), the **estimated population in 2012** was from **43 to 48 bears**. It should be underlined that the minimum number (43) represents the number of bears certainly present, whereas the maximum (48) is exclusively an evaluation of probability, based on specific criteria shown to be essentially valid to date, but which have intrinsic limitations. The 43 bears therefore represent a "minimum population estimate", which is different from a genuine "**population estimate**", requiring the use of demographic models involving capture, marking and recapture (CMR).

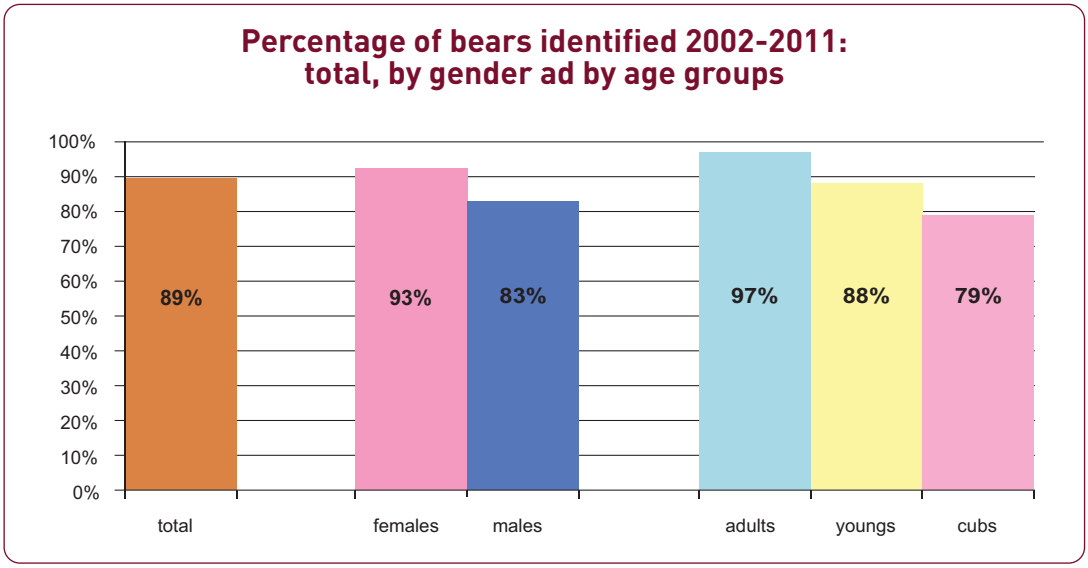
The acquisition of consolidated demographic data over time also makes it possible to evaluate the **efficacy of genetic monitoring** in retrospect, comparing the number of individuals identified year by year with the individuals shown by monitoring in subsequent years to be "actually" present in the same period (Graph 3).

Graph 3



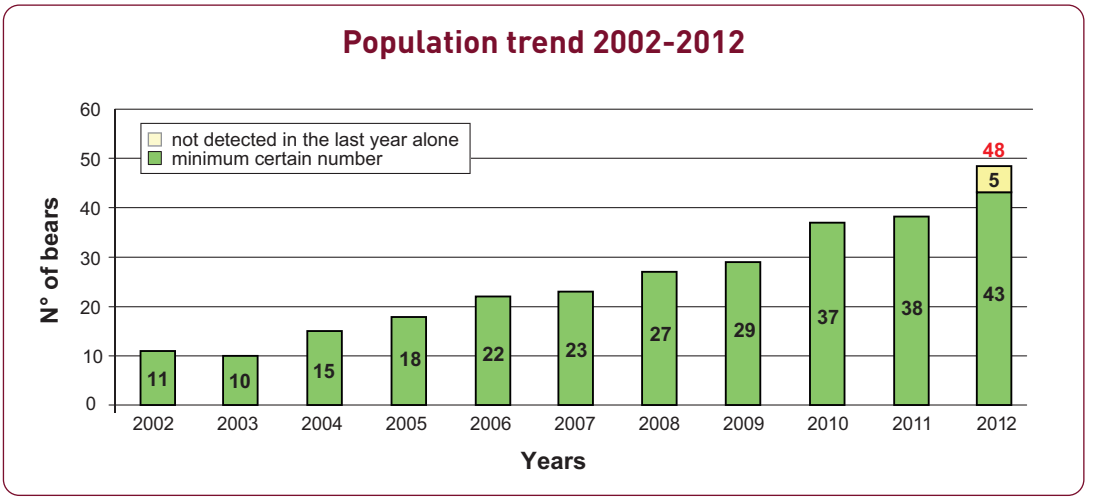
Graph 4 shows the average percentage of genetically identified bears in comparison to the bears "actually" present in the 2002-2011 period, with reference to the whole **population (89%)**, **females** and **males** (**93%** and **83%** respectively) and the three **age groups (adults 97%, youngs 88%, cubs 79%)**.

Graph 4



The population **trend** was once again confirmed to be positive in 2012 (Graph 5). In this graph the figures for previous years no longer show the range which characterises 2012, as the relative "minimum certain numbers" have been updated and supplemented using data acquired in subsequent years.

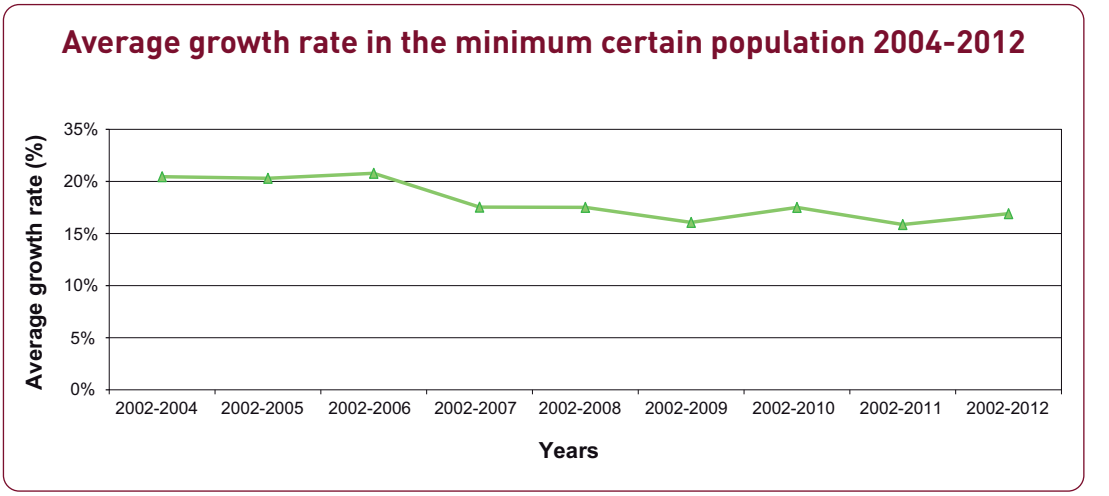
Graph 5



The **average annual growth** in the bear population in the 2002-2012 period, with reference to the minimum certain population, was **15.6%** and saw an increase last year.

Graph 6 shows the **evolution in the average annual growth rate** in the 2004-2012 period. Following an initial period, during which the growth rate was even higher than 20%, the rate has gradually settled around the current level of 15-16%. This is nevertheless positive when compared with the data in existing reference material as regards the species.

Graph 6



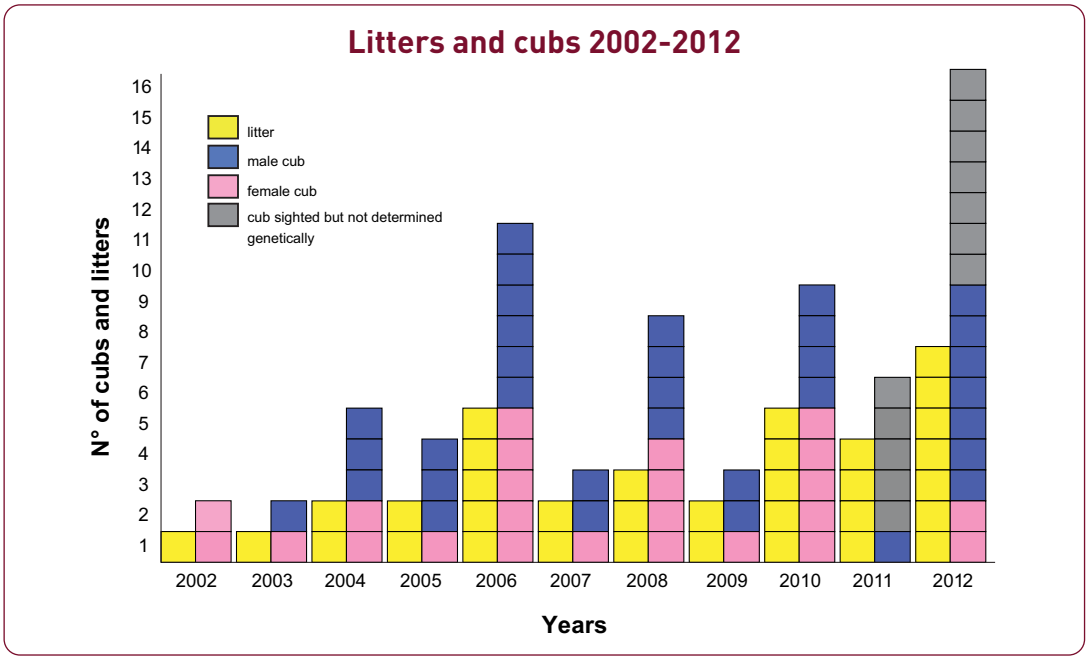
Reproduction

In **2012** the presence of **7 litters** during the year was ascertained (genetic monitoring plus certain sightings), with a total of **16 cubs**. In three cases the litters were made up of three cubs, in a further three cases there were two cubs, whereas in the last case there was a single cub (3+3+3+2+2+2+1). However, it is not possible to exclude the possibility of other cubs being present in the case of the litter with a single cub, so this is not taken into consideration in the calculations, for example with regard to the average number of cubs per litter.

Genetic testing made it possible to identify 9 of the 16 cubs (7 males and 2 females), along with a further cub **(F12)** probably born to F2 last year (2011), whose presence was already known but not accompanied by genetic identification.

There have therefore been **34 litters** ascertained to date in Trentino (32 genetically and 2 repeatedly observed in 2011) in the last **eleven years**, and at least **69 cubs** have been born (33 males, 25 females and eleven of unknown gender) – (Graph 7), **M-F sex ratio 1:0.76** (2002-2012, n=58).

Graph 7



5 of the 30 litters (17%) for which both parents have been genetically identified were the result of mating between blood relatives (between father and daughter in three cases, between mother and son in one case and between bears with only the father in common in the fifth case).

Reproductive animals

As mentioned above, all seven of the mothers in 2012 were identified through genetic testing, combined with direct sighting or footage with camera traps (such as the photo on the cover page, showing the female BJ1 accompanied by two cubs born during the year and not yet genetically identified). They were **Daniza**, **KJ1** and **KJ2** (Photo 3) (3 cubs each), **F4**, **JJ4** and **BJ1** (2 cubs each) and **MJ2** (apparently with a single cub). This is the 5th ascertained birth for Daniza, the 4th for KJ1 and KJ2, the 3rd for MJ2, the 2nd for BJ1 and JJ4 and the 1st for F4.

Photo 3 - The mother bear KJ2 with her cubs (I. Bommassar - published in the "Trentino" on 14.05.2012)

There were three recognised **fathers** for these litters: **Gasper** (three litters), **M4** (one) and **MJ5** (one). Information about the fathers and cubs of the other two litters is not available.

14 females and **5 males** have therefore reproduced in the period 2002-2012.

There were **7 sexually mature males** and **10 sexually mature females** present at the end of 2012.

The **average age of primiparous females** in the period 2006-2012 (n=9) has to date been 3.67.

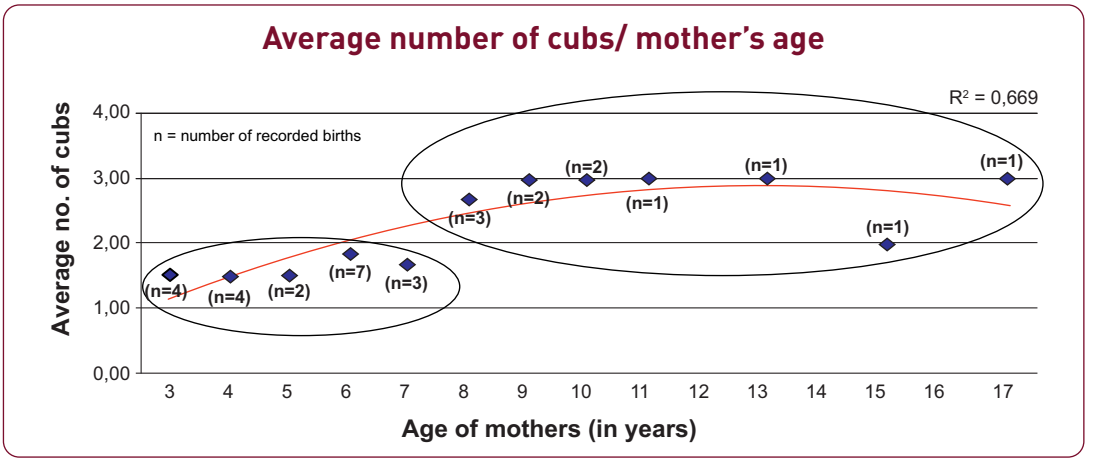
The **average gap between consecutive litters for the same female**, recorded in the period 2002-2012 (n=18 gaps, referring to 9 females), is **2.11 years**.

The **average number of cubs per litter** is **2.06** (2002-2012, n=33), a figure to be considered in relation to the **average age of mothers**, which is **7.2**.

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 (Graph 8).

This data refers to 31 litters out of 34, naturally not bearing in mind the two litters in 2011 whose mothers are not currently known,

Graph 8



nor MJ2's litter this year, for which the number of cubs is unknown.

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 0.616.

"Rediscovered" bears

During 2012, **3 bears**, all males, which had not been identified for at least two years, were "rediscovered" genetically (M7, M1 and DJ1G1, not detected for 2, 3, and 4 years respectively). In the past this had only happened with one bear. All three bears were "rediscovered" outside the province.

Bears undetected in 2012

Only one bear present in 2011 **was undetected for the first year** in 2012 (F3, a female who would now be five years old). She has not yet been classified as a "missing" bear (see definitions on page 16), as there is a concrete possibility that she is still present.

Missing bears

As mentioned previously, once again in 2012 it was possible to document cases of "**emigration**", with reference to the male bear **KJ2G2**, who was already based in the area of the Dinaric-Balkan bear population (a frontier area between Italy, Austria and Slovenia) during 2011, and **M8**, who instead only moved this far east this year (see Box 4 on page 20 of the 2011 Bear Report for further details of the case).

The case of the 7-year-old male bear **KJ2G2**, who has spent the last 6 years away from his original population, is particularly worthy of note: in 2007, just after leaving his mother, he reached the southern part of Monte Baldo (VR) (2007 Bear Report, page 11), the following year he crossed the Adige Valley (the first documented crossing, to the south of Bolzano), making his way across the Vallarsa and the foothills of Vicenza to the Asiago tableland (2008 Bear Report, page 15). In 2009 he continued to move north and east, crossing the whole length of the province of Belluno and entering eastern Tyrol in Austria (2009 Bear Report, page 20). In 2010 KJ2G2 was detected in Friuli Venezia Giulia and for the first time also further east in Carinthia, south of Villach, a short distance away from the Slovenian border. In 2011 KJ2G2 was still in the area, specifically around Tarvisio (2011 Bear Report, pages 21-22). Finally, this year the bear was followed, again through genetic tests, on a long journey taking him from the frontier with Slovenia further north-east to Styria in central Austria, to then return to the frontier area between Italy, Austria and Slovenia (Georg Rauer, pers. comm.). Thus he has probably made the longest documented journey in the Alps for a bear (around 1,000 linear km over the six years taken into consideration, estimated however exclusively on the basis of genetic data, which is much more limited than the data provided by radiotelemetry).

Two new bears (the female **F9** and the male **M10**) are instead considered to be **missing**, as they have not been genetically detected in the last two years.

When calculating the number of "missing" bears in 2012 it is also necessary to consider the death of 5 bears:

- The female F10, aged 2.5 (Photo 4), found on 20 September 2012 on wooded slopes above the town of Caderzone in the Val Rendena, on the right-hand side of the River Sarca.

Photo 4 - The carcass of the female bear F10 (V. Calvetti - APT Forestry and Wildlife Department Archives)

The condition of the carcass (several months old) meant that it was not possible to establish the cause of death. The autopsy, carried out at the Istituto Zooprofilattico delle Tre Venezie in Trento, did not show any signs of firearms, the remains of bullets or any traces of poison.

- A cub born during the year (aged 3-4 months), female, called F11, whose remains were found in the Val di Nambrone on 26 April 2012. Once again it was not possible to establish the cause of death, which is in any case very likely to be from natural causes (Photo 5).

Photo 5 - Carcass of the cub F11 (E. Bonapace - APT Forestry and Wildlife Department archives)

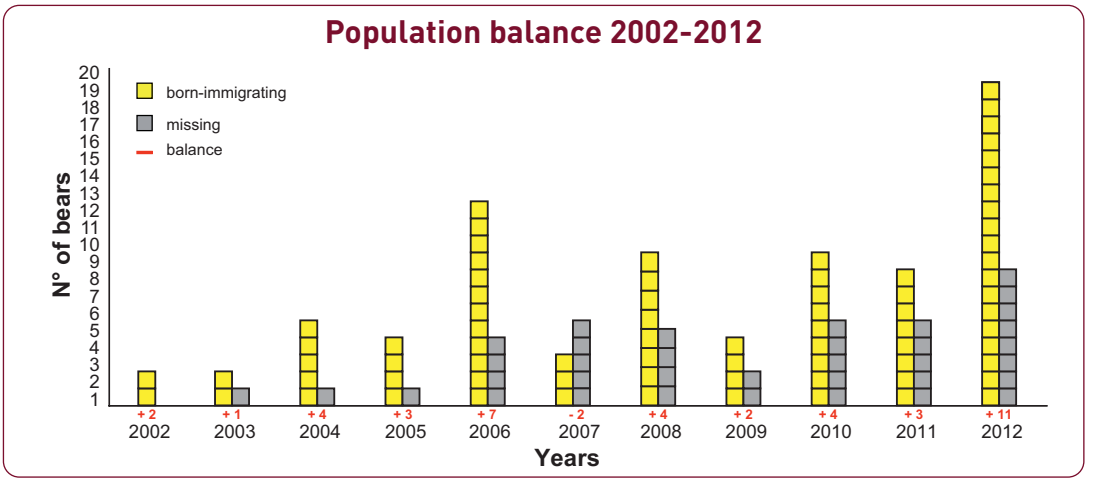
- **M14 and M12**, two two-year-old brothers, who met with a very similar fate, both being killed in road accidents in the province of Bolzano, respectively on 22 April 2012 in the Val d'Isarco on the main road near Ponte Gardena and on 8 June 2012 on the "Me-Bo" road near Terlano. There is a third brother, M13, who is the only one still alive and who spent most of 2012 in Swiss territory (see Box 2).
- The male bear **JJ5**, aged **6**, who died of suffocation during an attempt to capture him on 12 June 2012 near Monte Terlago (see the section regarding captures for details).

Thus by the end of 2012 there were **13 bears undetected genetically for at least the last two years, 14 dead bears** (7 corpses found and 7 bears killed accidentally or deliberately), **2 taken into captivity and two emigrating bears**.

Hence there were a total of **31 missing bears** at the end of 2012. As regards this data, see the considerations in the "survival rates" section on page 25.

Graph 9 shows the **balance between births-rediscovered-immigrating/missing** bears year by year. In 2012 there was a very positive balance (+11). This was the result of 16 births in 2012, 3 "rediscovered" bears, 5 deaths, 1 new emigrating bear and 2 new bears classified as missing.

Graph 9

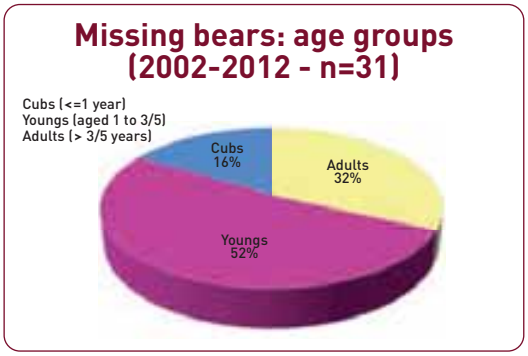


In the year of their disappearance the **missing bears** (n=31) included 10 adults, 16 youngs and 5 cubs (Graph 10). Of the **missing bears**, 14 have died, two have emigrated and thirteen have not been detected genetically for at least two years, (see definitions on page 16), (Graph 11).

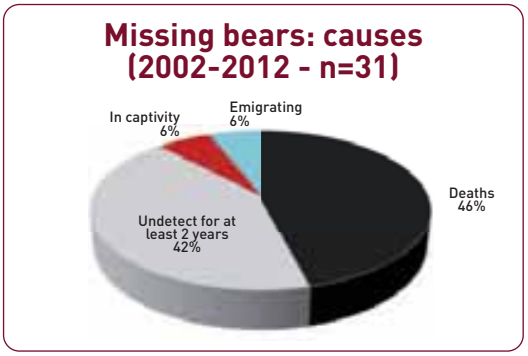
The **dead** bears (n=14) belonged to the following age groups: cubs (5), youngs (6) and adults (3), the shares being shown in Graph 12.

The **deaths** (Table 1) were the result of natural causes in 4 cases, unknown in 3 cases and as a result of action by man in the other 7 cases (Graph 13).

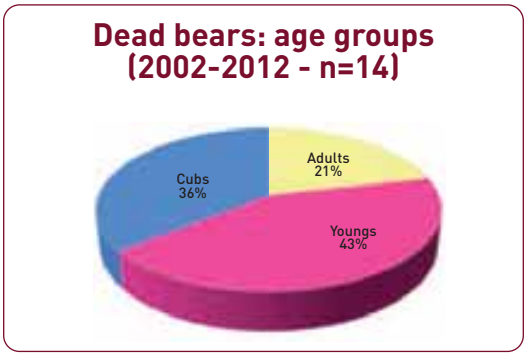
Graph 10



Graph 11



Graph 12



Graph 13

Table 1
Cause of death * in Germany ** in Switzerland, ad=adult, juv=young, cub=cub

Year	natural causes	road accident	shot down for management	management accident	unknown	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	5
TOTAL	4	3	2	2	3	14

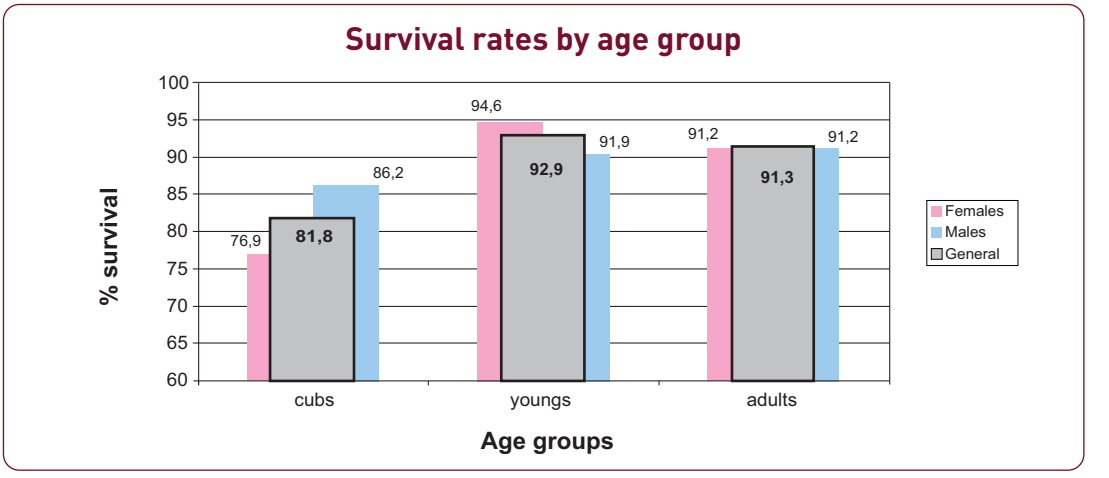
Survival rates

The new data available makes it possible to update the survival rates for the three different age groups (cubs, youngs and adults, according to the definitions on page 162) as compared to 2011, differentiated for the two sexes (Graph 14).

The data refers to a period of **11 years** (2002-2012), during which it was possible to record the survival or death of **64** different **bears**, with 291 passages from one year to another **(291 bear-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.

Graph 14



Excluding the four bears killed or removed following management decisions and referring thus **exclusively to "natural" causes of death**, one can note an increase in the survival rate for young males (from 91.9% to 94.3%) and adult females (from 91.2% to 92.4%).

Cubs are therefore confirmed as the category with the lowest survival rate (around 4 out of 5 cubs reach their first birthday). Furthermore, it should also be considered that it is very likely that the calculation excludes a number of cubs born and dying within the first year of life without their presence being detected through genetic monitoring. The survival rate for young and adult bears (over 90%) instead shows that around one out of 10 individuals (young/adult bears) disappears from the population each year.

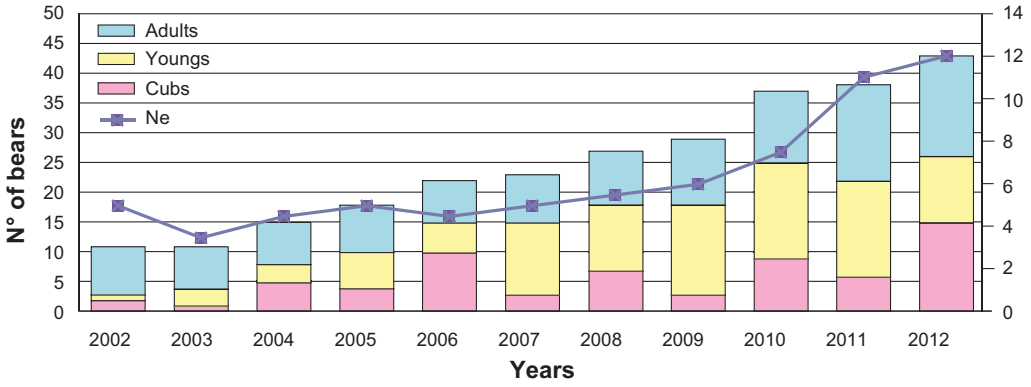
Structure of the population

At the end of 2012 the certain population was made up of **17 adults** (7 males and 10 females), **11 youngs** (8 males and 3 females) and **15 cubs** (7 males, 1 female and 7 of undetermined sex). Graph 15 shows the trend for the 2002-2012 period.

It should be noted that this again shows the figures for each year including data acquired thanks to monitoring in subsequent years; so all the data, even if relating to previous years, is constantly updated in relation to the new knowledge provided by continuing monitoring.

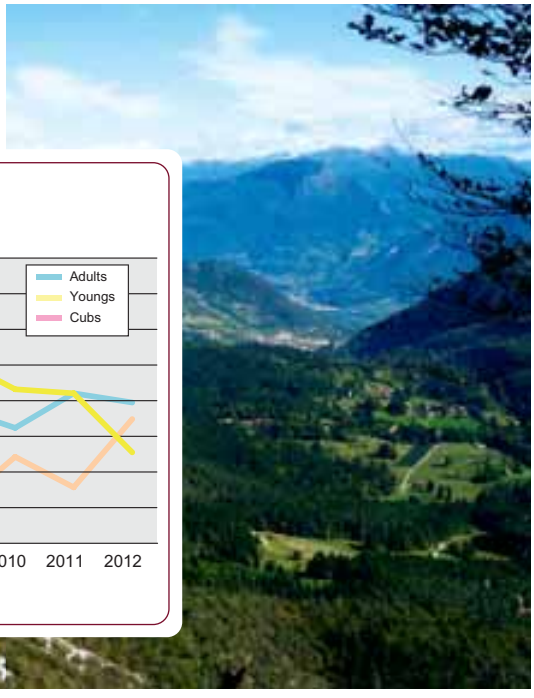
This graph also shows the **effective population (Ne)** recorded annually, namely the number of bears capable of reproducing in that year, made up of adult males plus half the female bears recorded (given that they generally give birth in alternate years).

Graph 15

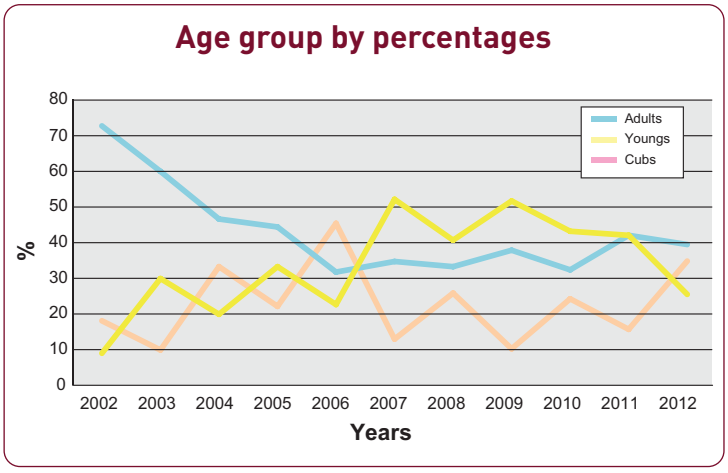


	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Adults	8	6	7	8	7	8	9	11	12	16	17
Youngs	1	3	3	6	5	12	11	15	16	16	11
Cubs	2	1	5	4	10	3	7	3	9	6	15
Total	**11**	**10**	**15**	**18**	**22**	**23**	**27**	**29**	**37**	**38**	**43**
Ne	**5**	**3,5**	**4,5**	**5**	**4,5**	**5**	**5,5**	**6**	**7,5**	**11**	**12**

The **percentage of bears in the three age groups (adults, youngs and cubs)** in the period 2002-2012 is shown in Graph 16.

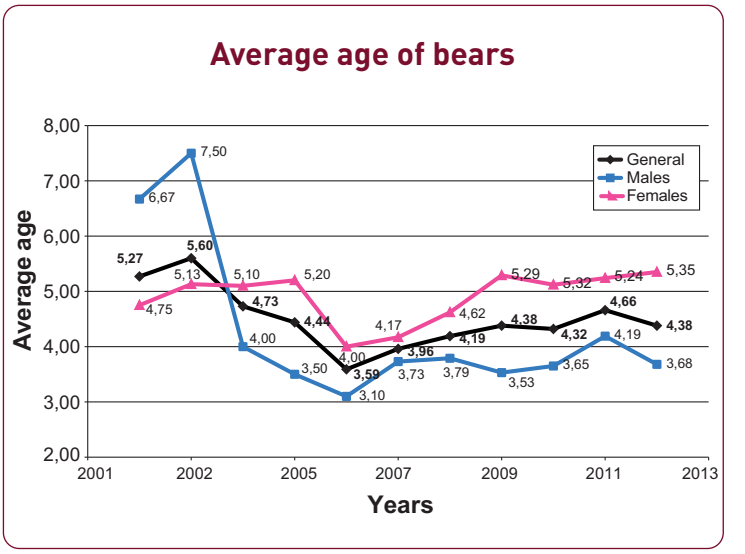


Graph 16



It is also interesting to note the **evolution in the average age of the bear population** over the 11 year period examined (Graph 17). In 2012 there was a slight fall in average age **(now 4.38)**, after several years in which it had risen. This was due above all to the high number of cubs recorded this year. It should be noted that to calculate the average age for males and females the gender of cubs born during the year was attributed arbitrarily, respecting the M/F proportions in the known population.

Graph 17

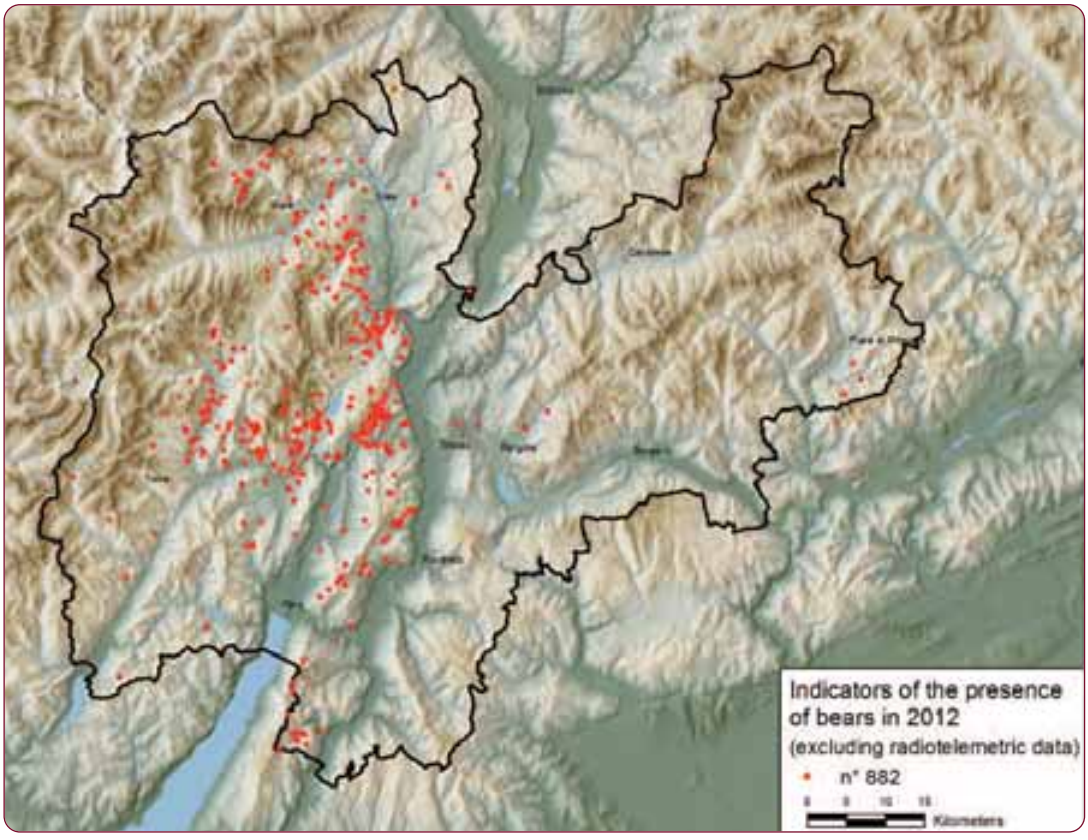


Use of the territory

36 out of the 43 bears detected in 2012 were present within the territory of **Trentino** (34 only in Trentino, 2 also in neighbouring provinces/countries). The other 7 were present only in neighbouring regions: 2 in the **province of Bolzano** (M1 and MJ2G1), 2 in Veneto (DG2 and M4), 3 **in Lombardia** (DJ1G1,M7 and M9). All 9 bears identified as also or completely present outside the province in 2012 were males.

The **882 area fixes** related to the presence of bears collected within the province during 2012 (all recorded indicators 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 2012



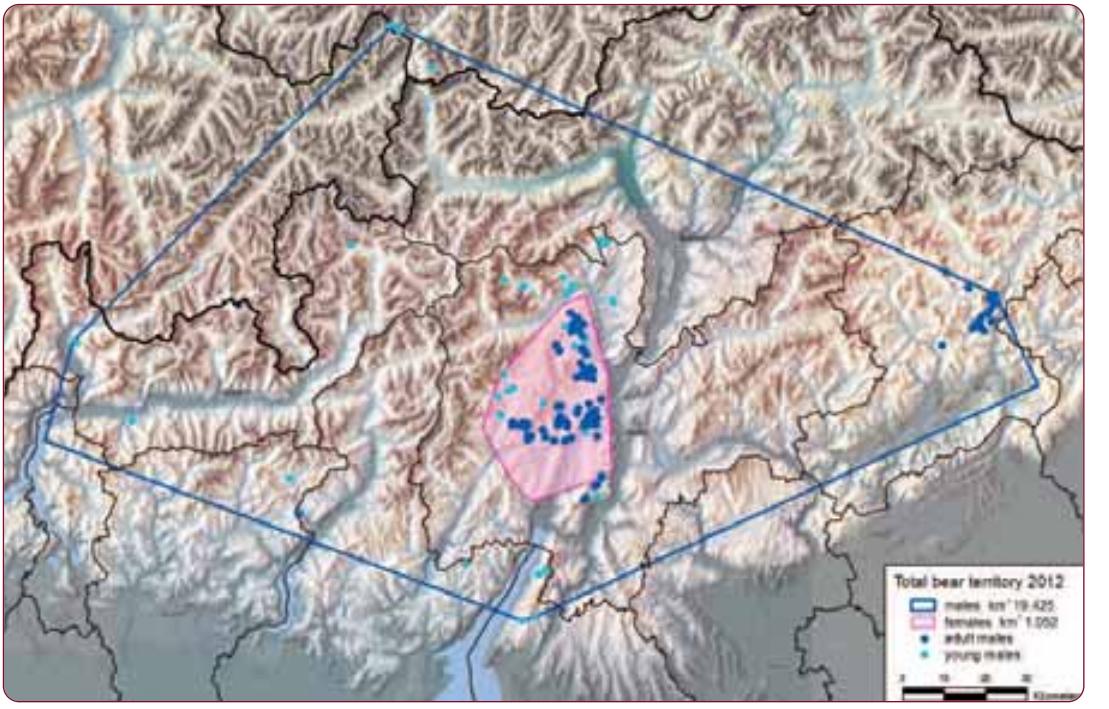
Area occupied by the population

Considering also the longest journeys made by young males during 2012, the **population** of brown bears present in the central Alps, which is mainly centred around western Trentino, **was distributed over a theoretical area stretching out over 19,425 km² in 2012** (Figure 2). The **area occupied by the females in a stable manner** is decidedly smaller **(1,052 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. Furthermore, as regards Figure 2, it should be emphasised that it shows genetic fixes for adult males (in dark blue) and young (in light blue), highlighting the greater links of the former with the areas frequented by the females.

The only clear exception would appear to be the fixes in the most easterly sector of the territory (in the province of Belluno), which however refer to only two adults, one of whom (MJ4) in any case returned to the female's area during the mating season.

Figure 2
Area occupied by bears in the central Alps in 2012 (in light blue), highlighting the area within this occupied by females in a stable manner (in pink). Data from outside the province provided by the Lombardia and Veneto regions and the Grigioni Canton (CH)



Population density

The population density in the area frequented by the bears in a more stable manner in 2012 was **3.2 bears/100 km²** (34 bears, including cubs born during the year, within the area occupied by the females, namely 1,052 km²). It should be considered that this figure is to some extent underestimated, given that the territory also includes areas which are unsuitable and not actually used (e.g. valley floor with urban development, rocky peaks). At all events, it is essentially in line with the data present in the bibliography in relation to the alpine environment and the forecasts of the feasibility study preceding the *Life Ursus* project.

Roaming

In the period **2005-2012** it was possible to document roaming (understood as movement outside western Trentino) involving **21 bears** (all young males). **4** of these have died (2 killed following management decisions in foreign countries and 2 run over in the province of Bolzano), **1 disappeared** in 2005 in the frontier area between Engadina (CH) and the province of Bolzano and **2 are currently considered to have emigrated** to the Dinaric-Balkan bear population.

The **other 14** were still **present** in 2012: some (6) have returned (although it is not possible to say whether definitively or not) or

have remained in areas straddling the province of Trento, whereas **8** are currently outside the province.

In this context it is interesting to recall the case of the male MJ4 who left the Belluno area in spring and returned to western Trentino (Paganella area), to then return to the province of Belluno a few weeks later (data obtained from genetic monitoring). The traces found in the Val dei Mocheni (eastern Trentino) in May (Photo 6) very probably belong to this bear.

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

Photo 6 - Bear tracks in the Val dei Mocheni, at Sant'Orsola (F. Zambotti)

Other monitoring activities in 2012

During 2012 3 bears were monitored using satellite telemetry: **Daniza**, **M2** and **M13**.

M11 (see Box 3 on page 15 of the 2011 Bear Report) was instead monitored using radiotelemetry (through ear tags).

The **2012 home-ranges** of Daniza and **M2**, calculated using the minimum convex polygon method, stretched respectively over **346 km²** and **408 km²** (respectively 1,031 and 391 GPS fixes in the periods 1 January - 31 December 2012 and 1 July -31 December 2012) and are shown in Figures 3 and 4. **M13** instead spent almost the whole of the year outside the province. See Box 2 as regards this.

Figure 3
Home-range of Daniza in 2012 (MCP)

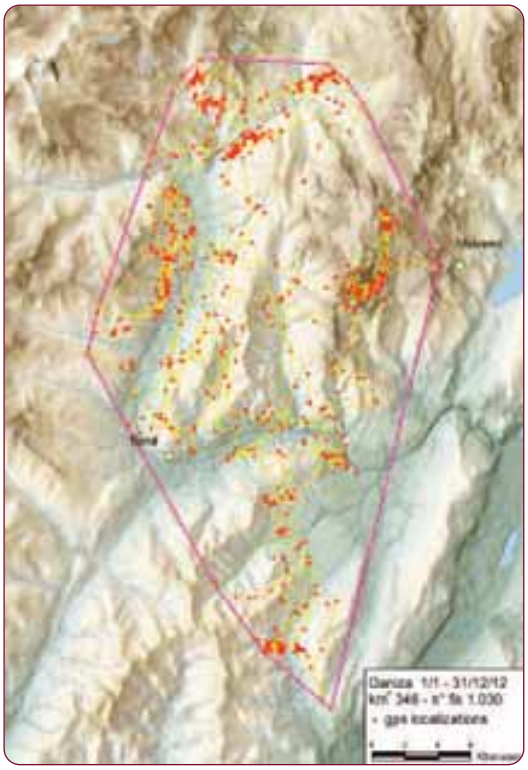


Figure 4
Home-range of M2 in 2012 (MCP)

BOX 2 - M13

M13 was born in January 2010 in the Paganella-Gazza mountain range, in the municipality of Terlago (Tn). Only the following year was it possible to ascertain, thanks to genetic monitoring, that he was the son of KJ2 and Gasper and the brother of M12 and M14.

The young male spent the whole of 2010 and part of 2011 with his mother and brothers in the area around the Paganella and Monte Bondone. In May 2011 M13 left his mother, a new mating season beginning for her, and headed first south towards Garniga (Monte Bondone) and Monte Stivo (municipality of Arco), exploring an area further south than the one he had previously frequented with his mother. M13's vagabond nature, typical of males of his age, soon led him to move on again, this time heading north, first to the mountainous area near Cles and then to the Val di Sole. In autumn he established himself in the Maddalene mountains, causing some damage to sheep in the Val d'Ultimo (right-hand bank). These events led the staff of the Autonomous Province of Bolzano, with the support of APT personnel, to decide the capture of the bear, which was fitted with a GPS radio collar on 16 October 2011 (Photo A).

Photo A - Awakening of M13 following capture in the Val d'Ultimo (D. Righetti - Autonomous Province of Bolzano Archives)

Immediately after his capture M13 returned to Trentino, more specifically to the Val di Bresimo, where he was sighted and filmed on several occasions in January 2012, together with another bear, subsequently identified, thanks to genetic tests, as his brother M14. Shortly afterwards M13 also spent time with his other brother, M12, confirming that in some cases bears from the same litter can maintain a bond even after leaving their mother and roaming to other areas.

Figure A
Home range of M13 in 2012 (MCP) KORA – Ecology of carnivores and management of wild fauna – Hunting and Fishing Office of the Grigioni Canton (CH)

On 7 February 2012, M13's collar was found by APT staff in the Val di Bresimo, the fastening screws having broken. From that moment on, the bear was followed thanks to genetic tests and sightings, also facilitated by the frequent presence of his brother M12, making it possible to attribute sightings to the two male bears. In March the two brothers headed northwest, to the frontier between the province of Bolzano and Austria, in the Spiss area (Inn valley). Subsequently M13 continued alone, heading south down the same valley and crossing the frontier into

Switzerland, where he was filmed near Scuol on at least one occasion. Following damage caused by the bear, the Swiss authorities decided to equip him with a new GPS radio collar. The transmitter was fitted on 12 April 2012. Shortly afterwards, on 1 May 2012, M13 met with an accident, being hit by a train in Switzerland in the Inn valley, fortunately without serious consequences. However, the impact caused the GPS radio collar to break.

On 30 June the Swiss authorities saw to once again capturing and fitting a transmitter, which made it possible to follow the bear throughout the summer and autumn. In this period M13 adopted a specific method for moving between Bormio (SO), Poschiavo (CH) and the Val Camonica (BS). Indeed the young bear crossed very high mountains no less than four times, remaining at high altitude for over 24 hours, during which he crossed glaciers and passes over 3,000 metres high in the Ortles-Cevedale, Adamello and Bernina ranges (Figures B, C, D and E).

On one occasion he arrived at an altitude of 3,405 metres, the highest altitude ever documented for a bear in Europe.

M13 then decided to spend the hibernation period in the Poschiavo area, his home range in 2012 having covered an area of 3,701 km2.

As this report was about to be printed we learned that M13 had been shot down on 19 February 2013 in Val Poschiavo (CH) by gamekeepers in the Grigioni Canton.

M13's satellite telemetry data was kindly provided by ***KORA*** *- Ecology of carnivores and management of wild fauna, and by the* ***Hunting and Fishing Office of the Grigioni Canton (CH)****.*

Figure B - First crossing of glaciers in the Ortles-Cevedale range
KORA - Ecology of carnivores and management of wild fauna - Hunting and Fishing Office of the Grigioni Canton (CH)

Figure C - Crossing of glaciers in the Bernina range
KORA - Ecology of carnivores and management of wild fauna - Hunting and Fishing Office of the Grigioni Canton (CH)

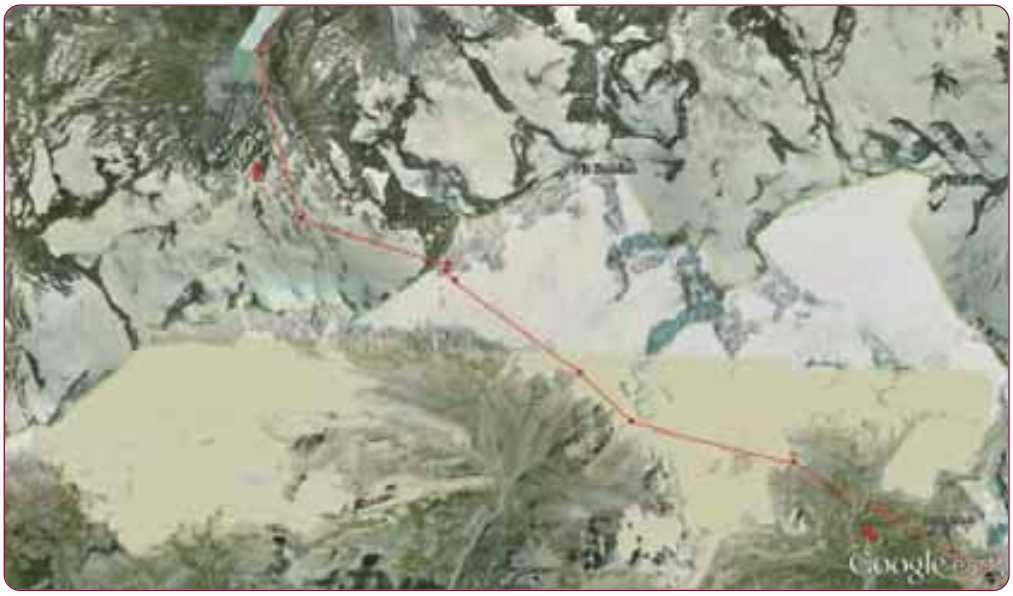


Figure D - Second crossing of glaciers in the Ortles-Cevedale range (13 Cime area)
KORA - Ecology of carnivores and management of wild fauna - Hunting and Fishing Office of the Grigioni Canton (CH)

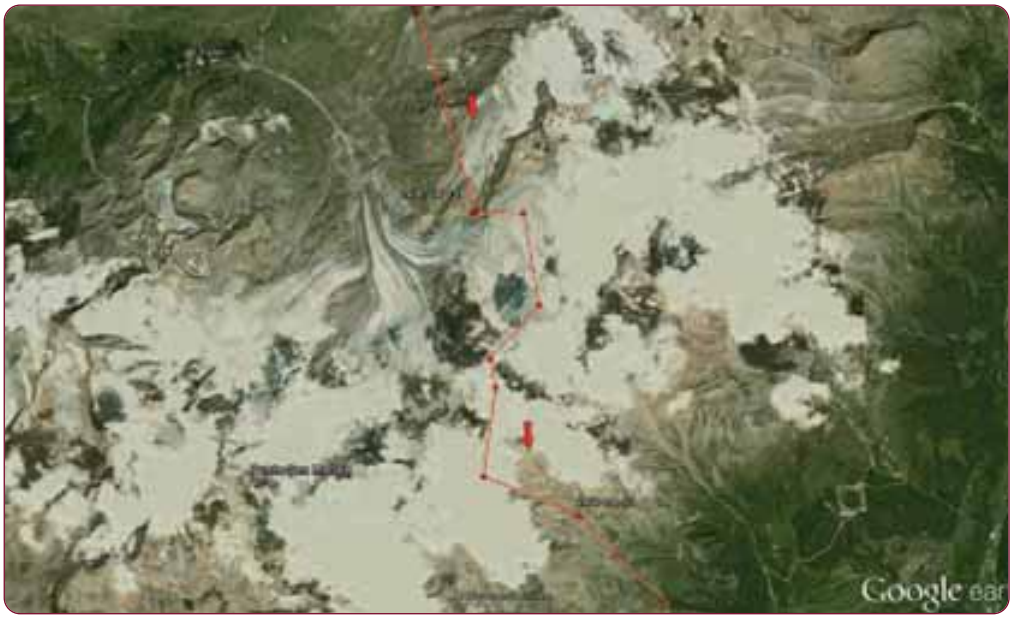


Figure E - Crossing of glaciers in the Adamello range
KORA - Ecology of carnivores and management of wild fauna - Hunting and Fishing Office of the Grigioni Canton (CH)

The genetic monitoring conducted without interruption since 2002 has made it possible to follow most of the bears in a continuing manner, confirming their presence over time and the **home-ranges used**, at least partially. These are recorded year by year for each individual animal. As an example, below we give the home-ranges (MCP) of the male Gasper and the female Daniza from 2004 to 2012 (Figures 5 and 6). Naturally these figures are indicative and not in any way comparable with those obtained from radiotelemetric monitoring of animals, as compared to which they are likely to be significantly underestimated.

Figure 5
Home-range of Gasper in the 2004-2012 period

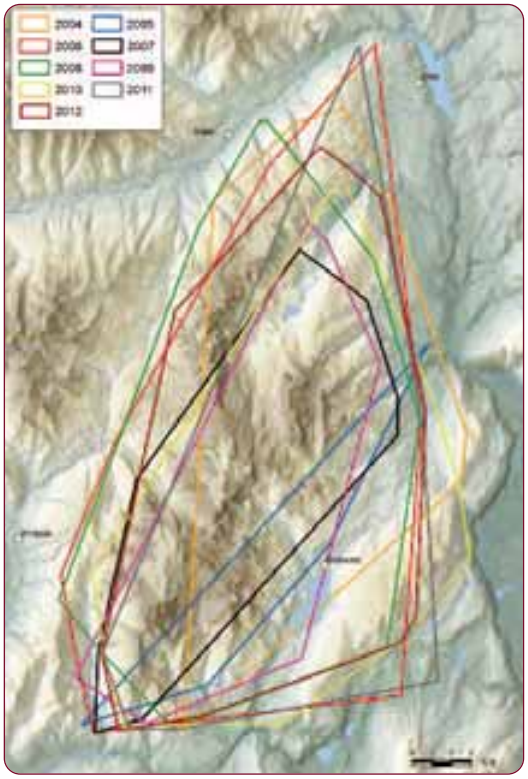
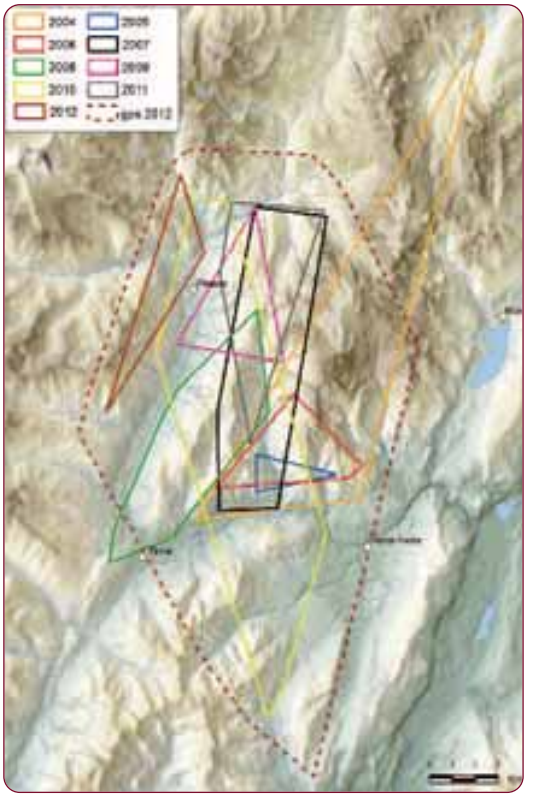


Figure 6
Home-range of Daniza in the 2004-2012 period. The dotted line shows the 2012 home-range resulting from satellite fixes



201 déclarations > 191 cas de dommages reconnus = + 55% / 2011
(chiffres certains : 11 ours en 2002, 37/2010, 38/2012, 43/2012 = ours +13%, dommages = + 55%!)

2. Damage compensation and prevention

By now APT has gained more than thirty 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 resolution no. 1988 of 9 August 2002. With Resolution no. 697 of 8 April 2011 the provincial government further reviewed the regulation of damage compensation, also providing for compensation of ancillary expenses and extending 100% compensation to damage caused by lynx and wolves.

During 2012 new regulations were approved on the compensation of damage caused by wild animals, particularly brown bears, lynx and wolves **(L.P. no. 6 of 24 April 2012)**, modifying previous regulations in order to assure better guarantees of compensation for those suffering damage.

The process of approving these regulations was the result of three different bills, one of popular origin, which came together in a single proposal, leading to a new bill which introduced article 33 bis into Law no. 24/91 and almost entirely cancelled the old article 33.

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 fencing or other protective measures considered suitable, 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 mainly to protect livestock or beehives, along with support and consultancy provided to farmers by technical experts, such as the **livestock liaison officers.**

Finally, in the context of reducing bureaucracy for the administration and the public, the **forms relating to processes for damage compensation, the granting of funding for prevention works** and for reporting bears and other large carnivores were reviewed and updated in 2012.

Compensation for damage caused by bears

In 2012, 201 reports of damage caused by wild predators were forwarded to the Forestry and Wildlife Department. **191** cases of damage were attributed to **brown bears** (187 in western Trentino and 4 in eastern Trentino), with an increase of 55% as compared to 2011 (123 cases of damage). In **1** case the predator was identified as a **wolf**, in **2** cases the damage was attributed to dogs, whereas in 7 cases the responsibility of predators was excluded.

172 claims for compensation were received by the department, of which 169 have been processed (164 accepted and 5 rejected), while 3 are currently being examined. The remaining 29 reports were either not followed up by the claimant or a cumulative claim was presented by the damaged party for the damage suffered.

In 82% of cases of damage, **inspections** were carried out by forestry staff, who were responsible for drawing up a report.

Overall, **€ 97,800.29** compensation for damage caused by **brown bears** was paid out, whereas no claim for compensation was presented in the only case of damage attributed to a wolf.

The considerable **increase** in the number of cases of **damage** as compared to the previous year would once again appear to be linked to the availability of wild fruit and nuts, given the scarcity in 2012, particularly in relation to beechnuts.

In 56 cases, namely around 29% of all incidents recorded, genetic monitoring made it possible to determine the identity of the

bear/s involved with certainty. **The animals causing most damage** were, as in 2010 and 2011, **M6** (in 9 cases - 16% of damage in which the bear responsible was identified genetically), **JJ5** and **M2** (with 8 cases of damage - 14% each). However the bear causing the most damage was **Daniza**, one of the founding bears, accompanied by her 2 cubs. Once she had been fitted with a radio collar, through GPS fixes it was possible to attribute no less than 16 cases of damage to her (29% of the total), for an overall value of 15,400 euro (16% of the total compensation in 2012).

Photo 7 - Damage to a beehive (APT Forestry and Wildlife Department Archives)

Thus almost **three quarters of the damage** (73%) which can be attributed to a known animal involved just **four bears**.

Daniza, together with another female bear (KJ1), accompanied by 3 cubs, can also be attributed with one of the two most serious situations involving damage in 2012. This took place in the **Val Ambiez** with the killing of at least 24 sheep over a period of around fifteen days (Photo 8). The two bears made several attacks on a flock protected by a single electrified fence, which the bears broke through several times. In order to reduce the problems caused to the shepherd by the constant presence of the bears and to encourage him to remain near the flock at night, an accommodation unit was transported up the mountain using a helicopter and intense monitoring activities were carried out by the emergency teams. This intervention made it possible for the shepherd to better supervise his flock and reduce the predatory activity of the bears, which only took place on one further occasion, when the sheep were taken to an area of pasture where it was not possible for the shepherd to remain overnight.

The second particularly problematical situation linked to damage was caused by the bear called **M2**, who was attributed with preying on around ten donkeys in the **Val Rendena** and **Val di Rabbi**, (Photo 9) and a number

Photo 8 - Preying on sheep in the upper Val Ambiez (M. Baldessari - APT Forestry and Wildlife Department Archives)

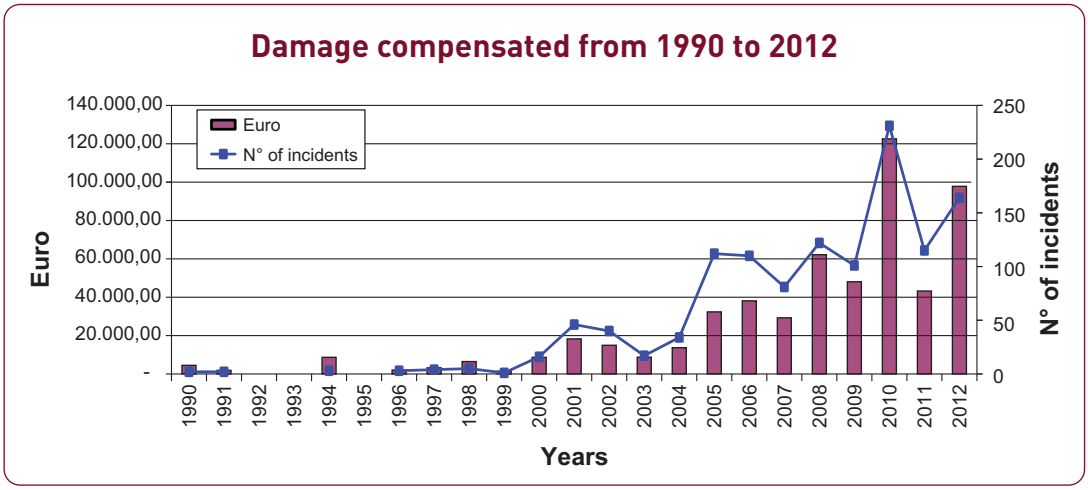
attaque d'une dizaine d'ânes et de plusieurs vaches dans le Val Rendena et le Val di Rabbi. Etant donné le nombre de proies et dans certains cas la proximité de zones habitées, ces incidents ont eu un grand retentissement dans les médias et un impact significatif au niveau local

of cows. Given the type of prey and in some cases the vicinity to inhabited areas, these incidents were given a great deal of publicity in the local media and had a considerable impact at local level. As a result of the problems caused by M2, he was captured (see specific chapter), with the scope of better following his movements and improving the efficacy of possible deterrent measures or eventually to remove him.

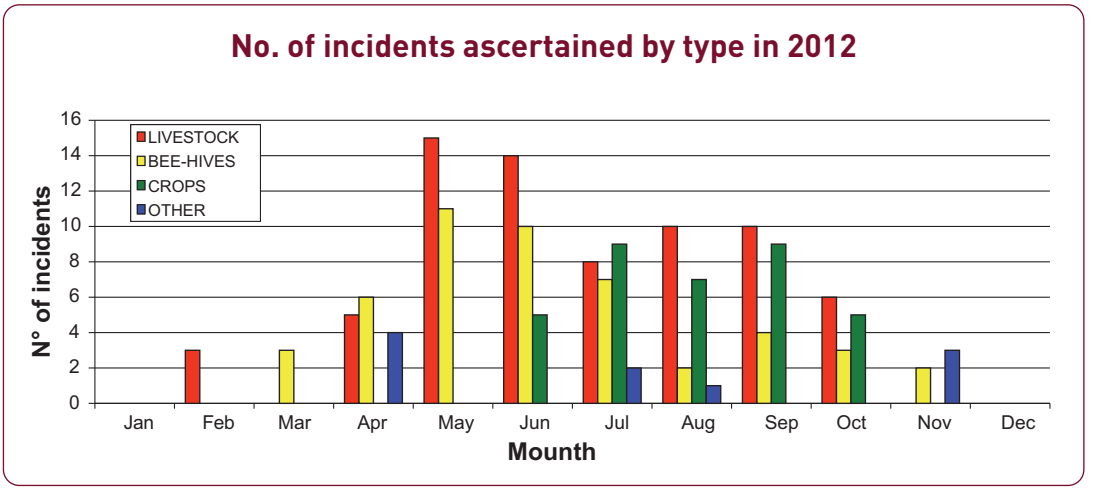
Photo 9 - A donkey preyed on by M2 (R. Calvetti - APT Forestry and Wildlife Department Archives)

Graph 18 shows the trend for damage caused by brown bears and for which compensation has been paid since 1990, whereas graphs 19 and 20 show the chronological distribution of this damage in 2012 and in the period 2002-2012.

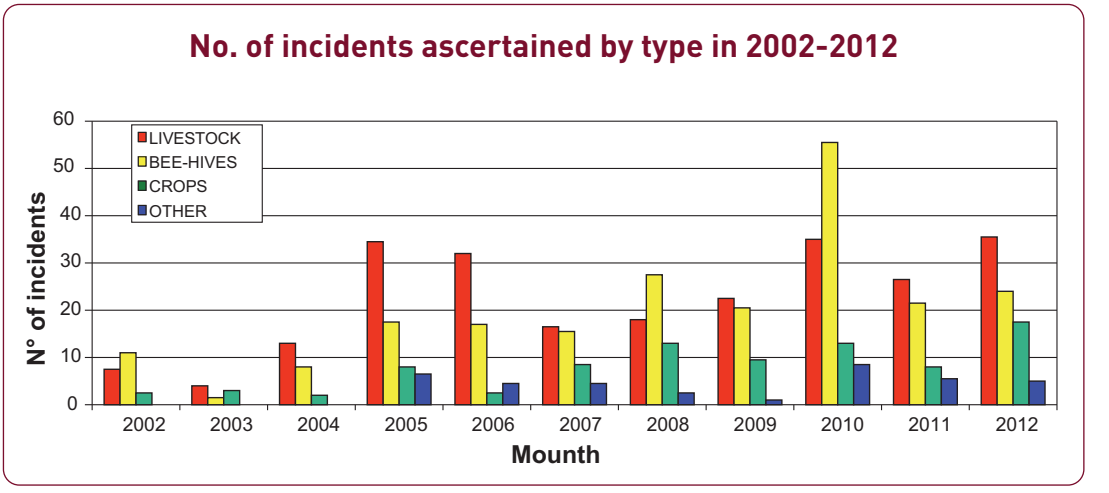
Graph 18



Graph 19

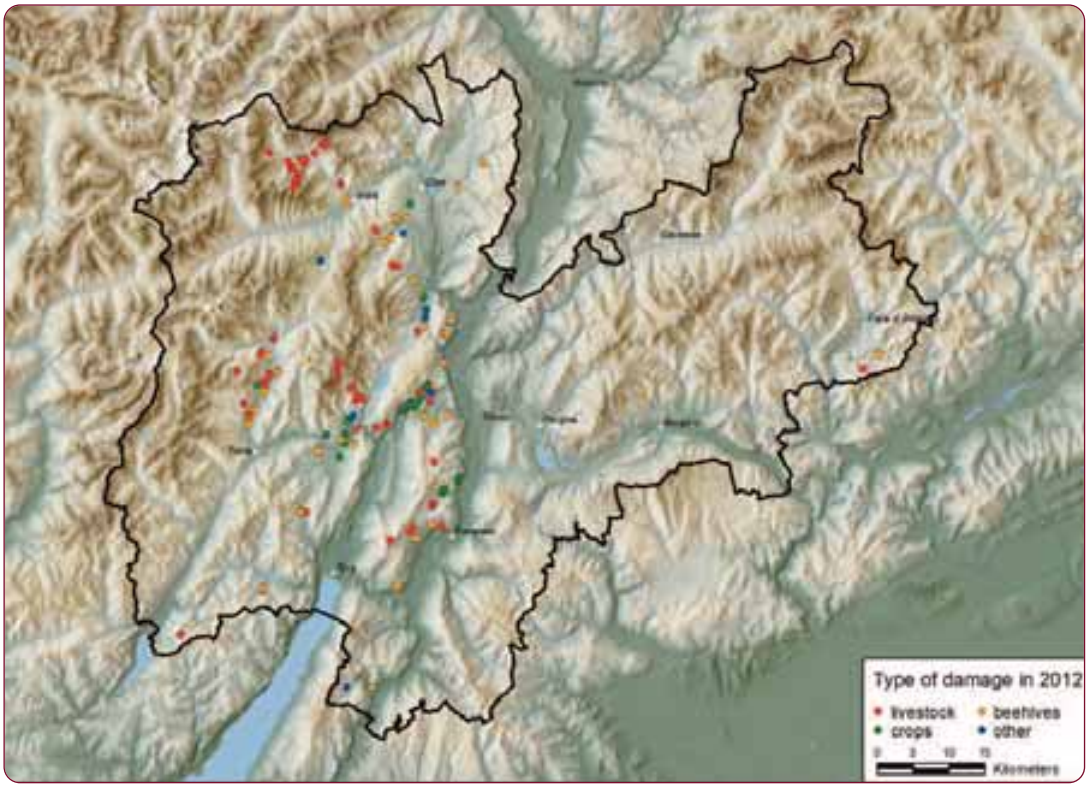


Graph 20



The geographical distribution of recorded damage can be seen in Figure 7.

Figure 7
Geographical distribution of damage by bears recorded in 2012



Prevention of damage by bears

Following internal reorganisation of the Forestry and Wildlife Department, since 2011 the **District Forestry Offices** have seen to the distribution of prevention works in the form of gratuitous loans, while the Wildlife Office has dealt with applications for the funding of prevention works.

Overall, the new system has made it possible to improve the service and in particular to improve contact between users and the staff responsible for distributing materials. Indeed, in many cases it is forestry station staff who suggest that applicants request prevention works or ask for consultancy or an inspection before deciding whether to present an application. A preliminary inspection also makes it possible to suggest the type of protection most suitable for the user's needs, to recommend specific measures to improve the efficacy of works and to raise awareness of the various problems linked to the care and maintenance of the works among users. Close contact with users also allows evaluation of the validity of the materials supplied over time and of whether they respond to the operational needs of users. Last but not least, an awareness of the siting of prevention works by local forestry staff allows **more effective control** of their use.

During the year, a total of **128 applications** for prevention works to protect assets from damage by brown bears were presented. Of these **113** were provided by the District Forestry Offices in the form of **gratuitous loans** (district offices: Malé 32, Tione

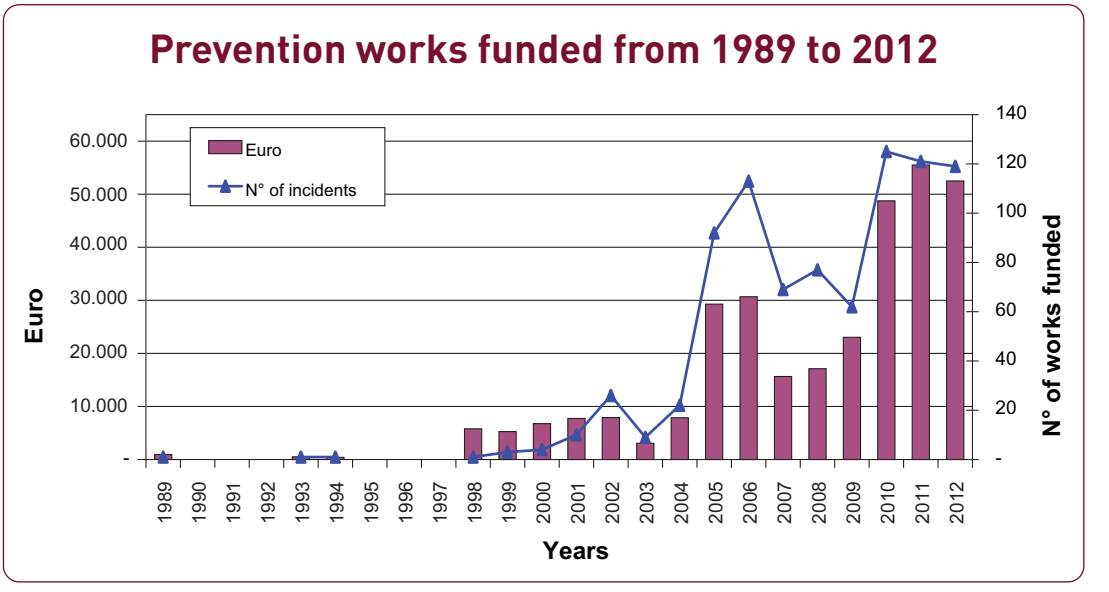
46, Trento 20, Cles 13, Rovereto 2), 62 of which designed to protect beehives (476 in total since 2002) and 51 livestock (359 in total since 2002). The remaining **15 applications** concerned cattle and horses and were dealt with by the Wildlife Office. Of these, 6 were accepted with funding of 60% of admissible expenditure, 6 were **rejected** and **3 cancelled** as the prevention works were not carried out 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** (**63.24%** of the expenditure) amounted to a total of around **52,500 euro**.

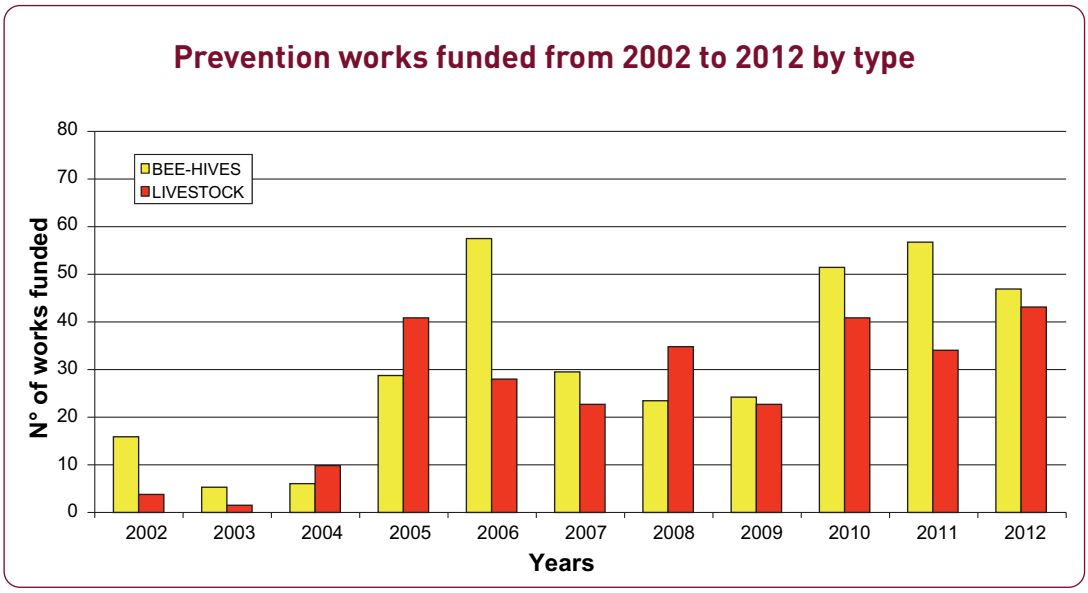
Below it is possible to see the trend in the distribution of prevention works over a number of years (Graph 21) and the different types of works in the period 2002-2012 (Graph 22), with reference to livestock and beekeeping.

Photo 10 - An electric fence around beehives (APT Forestry and Wildlife Department Archives)

Graph 21



Graph 22



The geographical distribution of the works set up in western Trentino in 2012 can be seen in Figure 8.

Figure 8
Location of prevention works distributed in 2012

Meetings with farmers and businesses

In 2012 the relations already started up for some time with the sectors and farmers most affected by the presence of bears and other large carnivores continued.

Once again, a **Round Table with representatives of breeders, farmers and beekeepers** was organised, the meeting being held on **20 September 2012**. 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.

Intervention to support shepherds and protect livestock

The constant presence of the shepherd and the adoption of more appropriate systems for preventing damage, along with fair 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 at high altitude with their flocks, also by providing temporary shelters, and encourage them to make use of prevention works. 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 organisation of the department currently provides for subdivision of the provincial territory within which brown bears are present in a stable manner into **6 homogeneous areas**, with one person taking responsibility for each area. In **2012** a total of **43 flocks** with almost **17,000 sheep** and **800 goats** overall were supervised or assisted.

The shepherds requesting assistance were supplied with a total of **95 fences** and **21 fence electrifiers** of adequate power (2.6 joules), with rechargeable batteries fuelled by solar panels.

Furthermore **four prefabricated structures** (accommodation units) (Photo 11) were **transported to the mountains** to allow shepherds to remain close to their flocks during the 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 the Fire and Civil Defence Service.

Photo 11 - Transport of an accommodation unit to the mountains (APT Forestry and Wildlife Department Archives)

On at least **50** occasions the livestock liaison officers or forestry staff from the relevant

Dans le contexte global, un pb important et rémanent reste celui de l'embauche de bergers d'Europe de l'Est par les propriétaires de troupeaux : relations parfois difficiles avec en outre des pbs de langage. De plus une question reste sans solution et le restera sans doute au moins à court terme, liée à des situations spécifiques dans lesquelles l'éleveur ne souhaite pas accepter les mesures de prévention ni les systèmes de garde compatibles avec la présence de grands carnivores.

areas carried out **visits** to support and control mountain pasture activities.

In **2012** there were **9 incidents involving damage** by brown bears to the **21 flocks** protected (around 14,000 sheep) (Photo 12). Overall, the deaths of 30 sheep (0.2% of the livestock protected) can be attributed to brown bears, 24 of the sheep being killed during four attacks on the same flock.

Photo 12 - Flock of sheep (APT Forestry and Wildlife Department Archives)

As in 2011, the systematic adoption of prevention works (electric fences) and the constant consultancy and support provided to shepherds by the livestock liaison officers contributed towards reducing attacks by bears and the rapid solution of difficult situations, despite the problems noted above.

In the overall context, a significant problem which has remained relevant regards the hiring of shepherds from Eastern Europe by the owners of flocks, relations sometimes proving difficult, also due to language problems. Furthermore there are unsolved, and probably unsolvable issues, at least in the short term, linked to specific situations in which the farmer does not wish to accept the adoption of prevention measures and management systems compatible with the presence of large carnivores. Ultimately it is believed that the support of figures such as the livestock liaison officers is indispensible for guaranteeing the coexistence of livestock in the mountains with brown bears.

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 enclosure B (species of community interest, whose conservation requires the designation of special areas of conservation) and D (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 predators (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), 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 relevant 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 Seas, 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 the 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 only been necessary to operate in the last few years, given the considerable expansion in the bear population and more specifically as a result of the presence of a few animals considered to be "problematic".

In July 2003, the Autonomous Province of Trento, in agreement with the Ministry for the Environment, Land and Seas, had already prepared a specific "Protocol for action regarding problem bears and intervention in critical situations", in accordance with D.P.R. 357/97 and subsequent amendments. Together with the Plan of Action for the Conservation of the Brown Bear in the Central-Eastern Alps, it represents the document of reference for the operational programme.

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 in charge of 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. In 2012 it was made up of 9 coordinators, who have the support of an **emergency team** of two people, also on call in turn within a group of specially chosen and trained staff made up of 14 members. When necessary the team is joined by veterinary staff from the provincial health services (given special training since 2008).

Activities of the emergency team

In 2012 the activities of the emergency team took place from 5 March to 3 December.

During this period the coordinators received **413 calls** of various kinds, of which 344 during the day (from 7.00 to 20.00), 18 at night (from 20.00 to 7.00) and 51 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, set in motion and coor-

dinate the emergency team, inform the department in more critical cases or simply to inform or reassure users.

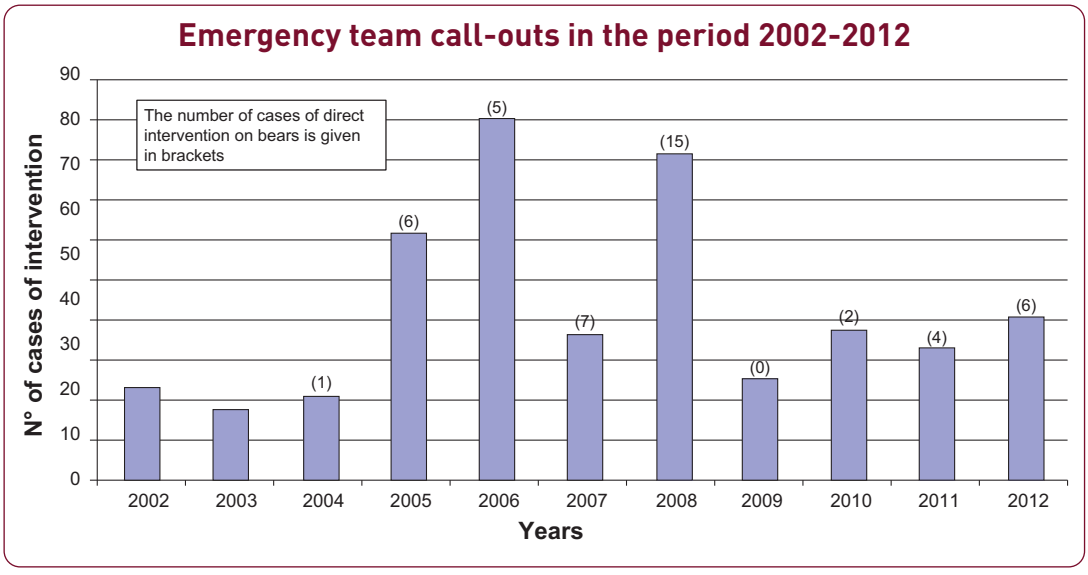
The calls came from forestry service staff present in the area (227), directly from private citizens (105), forest wardens (14), the Fire Service (5), the Wildlife Office (23), the forest emergency unit (4) or other parties (7), while 28 calls were of unknown provenance.

The calls mainly concerned the reporting of possible damage (211), sightings of bears or the finding of signs of their presence (97), presumed problematical situations (33) or other aspects (72).

In numerous cases (160) no inspections were necessary, whereas in the other cases direct intervention was requested: by forestry service staff responsible for ascertaining damage (in 160 cases), by staff at the relevant forestry stations responsible for the area (66), by the staff of the emergency team (16) and by bear dog handlers (3).

In 2012 the **emergency team** was called into action **37 times** (Graph 23), in most cases following reports of damage or the sighting of bears close to facilities frequented by man or inhabited areas (Photo 13). The activities of the team were mostly limited to watching over and informing the population, while only 7 cases (19% of call outs) involved visual contact with the bear, during 6 of which the staff carried out **direct intervention to deter the animal**.

Graph 23



The most significant cases requiring the intervention of the emergency team concerned:

- the Valle dei Laghi (Terlago area above all), due to two bears (JJ5 and M6), who frequented farmyards close to dwellings, at night, preying mostly on poultry. The unit intervened on a number of occasions to deter the bears and one of the two animals (JJ5) was subsequently captured in the same area and died as a result of the anaesthesia (see chapter on captures on page 49);
- the Val Rendena and Val di Rabbi, where following repeated preying on donkeys and cows also close to inhabited areas, staff intervened to deter and capture the male bear M2;
- the area at the Ballino pass (Tenno), where bear dogs were used to deter Daniza and her

cubs while she was close to the carcass of an animal she had killed.

The experience gained to date certainly reinforces the theory that deterrence gives better results if carried out on young and that it must be intensive and continuing. Furthermore, it should undoubtedly be accompanied by the adoption and correct use of prevention works.

Photo 13 - Intervention by the emergency team (APT Forestry and Wildlife Department Archives)

The location of intervention by the emergency bear team in 2012 is shown in Figure 9.

Figure 9
Location of intervention by the emergency team in 2012

Close encounters with mother bears defending their cubs

There were a number of particularly significant incidents linked to so called "false attacks" taking place during 2012 and involving female bears accompanied by their cubs.

On **24 May** there was a close encounter between a mother bear accompanied by two cubs born during the year and three people in the woods above **Carisolo**.

Tests of organic samples collected and satellite collar data made it possible to ascertain that the bear involved in the false attack was Daniza.

The incident was characterised by the classic charge of the bear towards the people, to then return to her cubs once the danger to them had been overcome. In this case it should be noted that in order to defend himself one of the people even hit the bear a glancing blow with a stick.

On **2 August** two people met a mother bear accompanied by at least one cub born during the year in the area between **Spormaggiore** and Castel Belfort. In this case the bear bounded up to the protagonists twice in rapid succession, to then move away and disappear once she had seen that the two people had removed themselves.

Genetic tests of organic samples (faeces) collected at the site did not make it possible to identify the female involved in the false attack with certainty. However, MJ2 (with one cub, probably) and F4 (with two cubs) were present in the area.

On the evening of **8 August** a man coming down the path linking Vallene di Monte Terlago and **Terlago** on his bicycle encountered a bear cub on the path, with a female bear accompanied by a second cub a short distance away; the mother bear immediately approached him with a couple of bounds and growled. She then moved away from the path, allowing the cyclist to get back on his bike and move away without further problems.

A few days later a similar situation arose on the slopes above Monte Terlago, near the forest refuge, where a jogger encountered a bear accompanied by two cubs, which initially approached him before moving away immediately.

In neither of these last two cases was it possible to discover the identity of the bear, but it is presumed that it may have been F4.

Waste management

In 2012 problems linked to the distribution of bins for organic waste were once again dealt with. The experience gained in the production and distribution of bins in the previous phase made it possible to prevent practical problems, such as those linked to freezing of the closing mechanism of bins in areas remaining in the shade for much of the winter.

Municipalities requiring further modifications to bins already in use in the area were also identified: Spormaggiore, Cavedago, Fai della Paganella, Andalo, Molveno, Vezzano and Terlago. ASIA (Azienda Speciale per l'Igiene Ambientale), the company responsible for the collection and disposal of organic waste in the municipalities concerned, provided a list of waste bins currently situated within the area. On the basis of this information, a map indicating the location of waste bins has been drawn up and linked to a scale of priorities for the substitution of bins which have not yet modified. There are around a hundred standard bins which it is expected to substitute with bear-proof bins in 2013 and 2014, also thanks to the funding guaranteed by the **Life Arctos *project***.

Replacement of the existing bins with the new type of bins will proceed once the appropriate sites have been identified: the locations will be georeferenced using GPS and a special map will be drawn up which can be immediately consulted as required.

Capture

In the context of emergency management, there is a "capture team" made up of staff specially trained for such activities. They are supported by two vets from the

provincial health services, dealing with health aspects.

During 2012 it was necessary to capture three male bears (JJ5, M2 and M11, aged 6.5, 4.5 and 1.5 respectively), who for different reasons displayed problematic or potentially problematic behaviour. The reasons and situations leading to the capture of the three bears are described below.

Capture of JJ5

As in previous years, numerous incidents involving damage to chicken coops situated close to the towns of Monte Terlago, Covelo, Ciago and Lon were recorded in 2012. It was possible to attribute these incidents to two adult male bears: M6 (aged 5) and JJ5 (aged 6). This situation once again caused apprehension and alarm among the population and the local authority asked the Forestry and Wildlife Department to intervene, in order to try and limit the problems caused by the bears' raids.

Forestry staff from the Vezzano station and the emergency teams on call therefore began intensive monitoring activities in the area, with the scope of carrying out deterrence and equipping one or both of the problem bears with a GPS radio collar.

Given the nature of the problem bears to be captured, bears having no difficulty in approaching inhabited areas and entering closed structures such as chicken coops, it was decided to make use of a tube trap. The trap was then positioned at Maso Parisol and on 4 June the trap was activated, having confirmed through video footage that it was frequented by a bear which could well have been JJ5 or M6, judging by its size.

The alarm went off in the early hours of the morning on 12 June and the staff on duty confirmed that a large male bear had been captured. It appeared to be relatively calm at the time of the control and had no evident problems. After checking the bear's state of health visually, the vet prepared the anaesthetic for the bear according to the standard procedure. A few minutes after the drug was administered and while the bear was still inside the trap, it began to show sudden difficulty in breathing. The coordinator of the capture team, in agreement with the vet responsible, evaluated the danger and having ascertained that the operators were safe, ordered the rapid removal of the bear from the trap, so that its condition could be evaluated directly.

An initial assessment immediately showed that the bear had stopped breathing and that there was no heartbeat; despite manoeuvres carried out to resuscitate the bear and the administration of specific drugs, there was no sign of recovery by the animal (Photo 14).

From the autopsy carried out on 14 June by health service vets, in collaboration with the Istituto Zooprofilattico delle Venezie, Trento branch, it was possible to ascertain that the cause of death could be attributed to layrngospasm following the inhaling of regurgitated food into the trachea, with consequential worsening of the hypoxia inevitable during the course of pharmacological sedation.

Photo 14 - The carcass of JJ5 (C. Groff - APT Forestry and Wildlife Department Archives)

Capture of M2

At the beginning of May there were a series of incidents involving the killing of donkeys, some of which very close to the towns of Strembo and Caderzone in the Val Rendena. This type of preying on animals, essentially new in Trentino, was immediately given a great deal of attention by the local media and had a considerable social impact, leading the Department to attempt to capture the bear and equip it with a radio collar, in order to facilitate attempts to condition the bear's behaviour through deterrent action. As regards this, it should be recalled that subsequent events, summarised below, led to the issuing of an extraordinary emergency order by the President of the Province for the removal of the bear in question.

Preying on other animals, in this case cattle, took place in June near Malga Polinar in the Val di Rabbi. A further heifer was then killed at Malga Arza in the municipality of Denno, followed by another donkey in July at Malga Tassulla in the municipality of Tassullo.

In all the cases above there were attempts to capture the bear, but without success.

On 30 July a new killing of a heifer in the Val di Rabbi was reported and the capture team was immediately set in motion, a capture site with two Aldrich snares already being set up that same evening. The alarm sounded shortly after midnight on 31 July and the staff in the team ascertained that a large male had been captured. Following genetic testing this was identified as M2 himself (Photo 15). After having been weighed (210 Kg), the bear was fitted with a radio collar, measured and released at the site, carrying out the highest possible level of deterrent action with the use of rubber bullets and bear dogs.

Photo 15 - M2 at the time of capture (E. Bonapace - APT Forestry and Wildlife Department Archives)

Capture of M11 (Box 3)

BOX 3 - "M11", A CONTINUING STORY

M11, recovered as a cub in spring 2011, treated and cared for over a period of almost forty days at the Casteller centre and subsequently freed in the heart of the Brenta mountains (see Box 3 on page 15 of the 2011 Bear Report), succeeded in spending his first winter alone. After he was freed there was no trace of him for some time; the first certain sighting took place in September on the Paganella. During the autumn of 2011 other sightings in the southern Stivo area (Val di Gresta) and near Loppio suggested that this was again M11 and that he had probably spent the winter without going into genuine hibernation, as he was observed several times in vineyards above Mori or in the countryside around Ronzo.

In spring 2012 the Verona newspaper "L'Arena" published an article recounting that a family from Verona had been fortunate enough to observe and photograph a small bear in the Monte Baldo area, which had first stopped for a few seconds, intrigued, to then run away suddenly into the woods. While there was no certainty, the circumstances suggested that the bear could have been M11. After this first sighting, there were numerous others during the summer and early autumn, with several articles in the press in both Veneto and Trentino.

While M11 had never been shown to have caused any damage, let alone to be dangerous in any way, his interest in areas frequented by man led to some concern among certain residents, as well as among those working in the sector.

Following the familiarity shown by this young bear (1.5-years-old at the time of capture), the Forestry and Wildlife Department then began monitoring activities in order to deter him and at the same time create the conditions for possible capture and radio tagging.

Given the confident nature of the bear it was decided to opt exclusively for capture with a tube trap. A trap was positioned at Malga Alpesina on 28 August and on subsequent days this was monitored and supplied by the staff of the Rovereto-Riva forestry unit.

The same staff also carried out deterrent action with rubber bullets, which however did not essentially modify the bear's behaviour; the young bear continued to show himself and to approach people without showing much wariness (Photo A).

Photo A - M11 on Monte Baldo

Photo B - M11 at the time of capture (P. Zanghellini - APT Forestry and Wildlife Department Archives)

On 10 September the trap was prepared. The trap was triggered on the same evening at 8 p.m. and the staff on duty, having ascertained that the bear had been captured, proceeded to anaesthetise the young animal, weigh him (60 Kg), measure him and equip him with two RFID ear tags, given the impossibility of using a GPS radio collar, due to the age and size of the young bear (Photo B).

Once the operations above had been completed, the bear was released at the site, carrying out intense deterrent action with the use of rubber bullets and bear dogs.

After capture M11 was only seen again on a few occasions, despite intensive monitoring. In subsequent months the young bear was observed increasingly less frequently, before going into hibernation in November.

by Alberto Stoffella

The following table summarises captures taking place in the period 2006-2012.

Table 2 Captures taking place in the period 2006-2011

No.	Date of capture	Location	Bear	Method of capture	Scope of intervention	Period of radio monitoring	Method of release	Sex	Age	Weight	Notes
1	23/08/2006	Malga Grum	Jurka (1st)	Free ranging	Fitting of GPS radio-collar	23/8/06 28/6/07	On site without deterrence	F	9	140	Weight estimated
2	28/06/2007	Rifugio Genzianella (Terres)	Jurka (2nd)	Free ranging	Taken into captivity	–		F	10	130	No cubs
3	02/07/2007	Maso Dos (Pinzolo)	Daniza	Free ranging	Fitting of GPS radio-collar	2/7/07 5/5/08	On site without deterrence	F	12	106	No cubs
4	13/06/2008	Molveno (Molveno)	KJ2G1	Free ranging	Fitting of GPS radio-collar	–		F	3	95	Died by drowning in Lake Molveno
5	13/07/2008	Loc. Mangio (Castel Condino)	DJ3	Free ranging	Fitting of GPS radio-collar	13/7/08 23/6/10	On site with deterrence (dogs + rubber bullets)	F	5	95	No cubs
6	27/09/2008	Loc. Pineta (Molveno)	KJ1G1	Aldrich snare	Fitting of GPS radio-collar	27/9/08 5/4/09	On site with deterrence (dogs + rubber bullets)	F	3	130	No cubs
7	15/10/2009	Val Canali (Tonadico)	M5	Aldrich snare	Fitting of GPS radio-collar	15/10/09 13/5/10	On site with deterrence (dogs + rubber bullets)	M	3-5	175	Bear immigrating from the eastern Alps
8	22/10/2010	Malga Pozze (Praso)	DJ3	Aldrich snare	Fitting of GPS radio-collar	22/10/10	On site without deterrence	F	7	130	No cubs
9	16/05/2011	Rodugol (Stenico	Daniza	Tube trap	Fitting of GPS radio-collar	16/05/2011 -	On site without deterrence	F	15	80*	Accompanied by male
10	17/05/2011	Rodugol (Stenico	DJ3	Tube trap	Taken into captivity	–	–	F	7	75*	Accompanied by male
11	12/06/2012	Monte Terlago	JJ5	Tube trap	Fitting of GPS radio-collar	–	–	M	6	185	Died following anaesthesia
12	31/07/2012	Malga Polinar	M2	Aldrich snare	Fitting of GPS radio-collar	31/07/2012 –	On site with deterrence (dogs + rubber bullets	M	5	210	
13	10/09/2012	Malga Alpesina	M11	Tube trap	Fitting with RFID ear tags	10/09/2012 –	On site with deterrence (dogs + rubber bullets	M	1.9	60	

*estimated weight

Road accidents

During 2012 there were no less than **six cases of road accidents** involving bears (two outside the province), bringing the total number of such accidents recorded since 2002 to 19 (Table 3). In one case, in the Valle dei Laghi, the young bear **M3**, the so-called "white bear" was hit by a car. He undoubtedly survived the accident, as he was subsequently detected genetically in the Cimone and Vezzano areas. On **two occasions** accidents involved the family of the female **KJ2**, once again in the Valle dei Laghi, but in both cases the impact was not fatal, as both mother and cubs were subsequently caught on film by a camera trap.

In one case (near Stenico) the **identity** and the fate of the bear are **unknown**. An inspection carried out on site with the use of bear dogs suggested that the bear had immediately moved away from the site of the accident without suffering physical damage. In two cases the accidents took place in the province of Bolzano, involving two young males **(M12 and M14)** who both died immediately. The drivers of the vehicles were not physically injured in any of the cases recorded.

Table 3
Road accidents reported in the period 2002-2012 (provinces of Trento and Bolzano)

No.	Date	Location	Bear/s involved *	Sex and age	Fate of the bear
1	30 August 2001 at 00.50	Laives (BZ) (A22 motorway	Vida	Female	Injured quite seriously but survived
2	4 November 2005 at 6.45	Preare (S.P. n° 34)	DJ3	Female	Survived and reproduced
3	28 June 2006 at 00.30	Fai (S.P. n° 64)	MJ2	Female	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 (Strada Prov. n. 34)	Daniza + 3 cubs born that year	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 + 2cubs	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 (Brenner main road)	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

* 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

Bear dogs

In 2012 the dogs were **put into action** on a total of **27 occasions**. 3 of these involved checks on reported damage, while in 11 cases the dogs were used in operations to deter bears (in 2 cases for deterrent action on captured bears), in 3 cases to look for bears hit in road accidents, in 1 case for checks linked to a false attack and in 9 cases for other reasons, such as searching for traces or checking dens (Photo 16).

Once again this year the dogs represented a useful tool, particularly in the management of critical situations, such as operations to deter 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.

The fundamental importance of continuing training is confirmed, both for handlers, in relation to technical aspects linked to the management of the dogs during operations, and for emergency team coordinators, in order to correctly evaluate cases in which the dogs can be used effectively.

Photo 16 - Bear dog with handler (APT Forestry and Wildlife Department Archives)

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 currently active. 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 Museo delle Scienze in Trento, which has offered educational activities on bears to schools from the very beginning.

The main activities undertaken during 2012 are summarised below.

Evening sessions and meetings

Table 4 lists the **16 meetings/evenings** organised by the Department within the context of the information campaign "Getting to know the brown bear" (**772 participants** overall). Some of these meetings were specifically organised in response to local situations and requests for information, also in relation to situations arising when certain bears caused special concern due to the number of incidents involving damage.

Table 4
Public meetings held within the context of the "Getting to know the brown bear" campaign

Type	Date	Place	In collaboration with	No. o participants
Public meeting - presentation of 2011 Bear report	7/3/2012	Museo delle Scienze di Trento	Museo delle Scienze di Trento	170
Public meeting	10/4/2012	Campodenno	Municipality of Campodenno	30
Public meeting	20/5/2011	Cogolo	Stelvio National Park	10
Meeting for schools	5/6/2012	Trento	Primary schools	50
Meeting for beekeepers	14/6/2011	Trento	Beekeepers' association	30
Meeting for beekeepers	18/6/2012	Cles	Beekeepers' association	60
Meeting for beekeepers	20/6/2012	Tione	Beekeepers' association	70
Public meeting	25/7/2011	Rabbi	Stelvio National Park	20
Public meeting	27/7/2012	Monte Bondone	Local businesses	20
Public meeting	10/8/2012	Monte Bondone	ELocal businesses	20
Public meeting	2/9/2012	Vallarsa	"Tra le rocce e il cielo" Festival	60
Public meeting	19/9/2012	Stravino	Municipality of Stravino	60
Meeting with farmers and beekeepers	20/9/2012	Trento	Representative organisations	12
Meeting for beekeepers	13/10/2012	Croviana	Beekeepers' association	40
Public meeting	16/11/2012	Malé	Tourist office, Malé	70
Meeting for beekeepers	19/11/2012	Rovereto	Beekeepers' association	50

Press releases

13 press releases regarding the bear were issued by the Forestry and Wildlife Department with the assistance of the Press Office:

- No. 448 of 24 Feb. 2012
  Meeting this morning with the members of the special group of forestry staff
  BEARS, WOLVES AND LYNX: DELLAI COMPLIMENTS THE "CAPTURE TEAM"
- No. 565 of 5 March 2012
  Presentation of the 2011 Report on Wednesday 7 March 2012 at 20.30
  BEARS, WOLVES AND LYNX: A SUMMARY AT THE SCIENCE MUSEUM
- No. 1283 of 15 May 2012
  Published at the bear web site and on the web TV channel of the Autonomous Province of Trento
  THE VIDEO OF THE "WHITE" BEAR
- No. 1413 of 25 May 2012
  President requests a meeting to find "new and more effective solutions"
  PROBLEM BEAR, DELLAI WRITES TO MINISTER CLINI AND THE EUROPEAN COMMISSIONER, POTOČNIK
- No. 1652 of 5 June 2012
  Summary of May news at the web site orso.provincia.tn.it: lots of sightings, bear hit in road accident at Vezzano on Monday evening
  VIDEO OF BEAR WITH CUB ON THE PROVINCIAL WEB TV CHANNEL
- No. 1666 of 6 June 2012
  The image was "stolen" on the Internet
  THE DEAD BEAR WHOSE PHOTOS WERE SENT TO THE MEDIA IS AN AMERICAN BLACK BEAR
- No. 1749 of 12 June 2012
  Forestry and Wildlife Department reports on events in Terlago woods during control operations
  BEAR CAPTURED THIS MORNING DIES
- No. 2080 of 9 July 2012
  There is also a report with the June news at the dedicated site of the Autonomous Province of Trento
  IMAGES OF A MOTHER BEAR SUCKLING HER CUBS IN THE VAL RENDENA
- No. 2127 of 13 July 2012
  Second edition of the sweetest event of the summer returns to Croviana in the Val di Sole
  MELISSA, THE NEW HONEY FESTIVAL
- No. 2161 of 16 July 2012
  Second edition of the sweetest event of the summer presented in Trento
  MELISSA, THE NEW HONEY FESTIVAL
- No. 2227 of 20 July 2012
  DELLAI: HYDROELECTRIC DEVELOPMENT AND BEARS, DISCONCERTING NEWS FROM ROME
- No. 2759 of 16 Sep. 2012
  BEAR AT RABBI. DELLAI ASSURES MAYOR: IF NECESSARY THE BEAR WILL BE CAPTURED
- No. 3095 of 11 Oct. 2012
  Today and tomorrow 12 October in Zenzer
  IN THE GRIGIONI REGION, THE LAST ARGE ALP WORKSHOP DEDICATED TO LARGE PREDATORS

Questions

The necessary information was provided in order to respond to the following 13 questions raised regarding bears:

- Question for written reply no. 4043/XIV:
  Introduction of the bear to the S.Romedio enclosure and relative costs
- Question for immediate oral reply no. 4106/XIV:
  Carrying out of a survey on appreciation of the bear by the Trentino population
- Question for immediate oral reply no. 4426/XIV:
  Incursion of bear in the town of Terlago
- Question for written reply no. 4549/XIV:
  Damage caused to farms and businesses by the presence of the bear
- Question for immediate oral reply no. 4595/XIV:
  Presence of the bear and measures to guarantee the security of the Trentino population
- Question for written reply no. 4699/XIV:
  Presence of the bear and relative controls to guarantee the security of people and animals
- Question for immediate oral reply no. 4752/XIV:

Presence of the bear in the area and relative control measures to guarantee the security of people

- Question for immediate oral reply no. 4755/XIV:
  Presence of the bear in the area and identification of a numeric threshold
- Question for written reply no. 4806/XIV:
  Compensation for damage caused by the presence of the bear in Trentino and relative control measures
- Question for written reply no. 4898/XIV:
  Discussion of problems related to the capture of the bear
- Question for written reply no. 4992/XIV:
  Presence of the bear on Monte Baldo
- Question for written reply no. 5073/XIV:
  Incursions by the bear on Monte Baldo

Communication project for schools: "Getting to know the brown bear", in collaboration with the Museo delle Scienze in Trento

For the ninth consecutive year the museum continued to offer a package of tried and tested educational activities on the subject of brown bears in Trentino. The activities are kept up-to-date thanks to coordination with the Wildlife Office of APT, which also guarantees consultancy on the content. The 2011-2012 edition of the guide to the educational activities of the museum also contained all the educational initiatives realised in collaboration with the Forestry and Wildlife Department, as has taken place since the 2003-2004 edition.

In the context of the agreement between the Forestry and Wildlife Department and the museum, the **Museo delle Scienze in Trento** organised six educational activities in schools regarding bears, involving a total of 104 pupils.

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

During the 2012-2013 school year, in collaboration with the Forestry and Wildlife Department, the Museo Civico in Rovereto also started up workshops to increase knowledge and understanding of large carnivores, entitled "Sometimes they return…", within the context of educational activities for schools.

The workshop dedicated to nursery schools had 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 was also attempted 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.

125 pupils attended the workshops on large carnivores during the 2012-2013 school year. In spring 2013 the Museo Civico in Rovereto also organised a cycle of zoology meetings entitled "Men and Animals: a Story of Coexistence", in collaboration with the Società Museo Civico. The first three meetings all had large carnivores (bears, wolves and lynx) as their theme.

Informative material produced and distributed

The fifth "Bear Report" **(2011 Bear Report)** was issued, representing both a valid means of communicating and raising public awareness and a useful working tool for the office.

In 2012 a further 5,000 copies of the **brochure "In the Land of the Bear"** were printed, updating the text, along with new versions of the **poster** (**1,000** copies of each of the three versions).

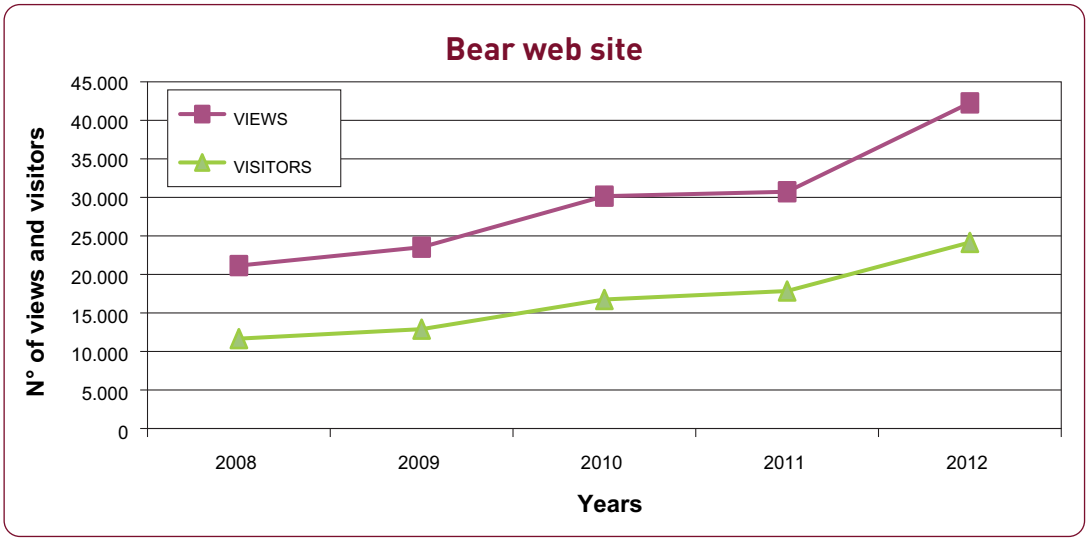
Web sites

The site **www.orso.provincia.tn.it**, also available in English, was further updated and all sections completed. It is currently organised into 250 pages and received **42,269 views** by **24,155** visitors in 2012. The site also contains this report and the documents mentioned it. The site is updated at least once

a month, also giving the main news regarding the presence of the lynx and the wolf in the province.

Graph 24 shows the increase in the number of views and visitors over the last five years (more than doubled).

Graph 24



Other communication initiatives

Radio-TV broadcasts

Under the supervision of APT's Forestry and Wildlife Department, interviews and participation in the following radio and television programmes took place:

- Participation in a radio programme on Radio 24 (17 May 2012)
- Debate on large carnivores on RTTR (25 May 2012)
- Participation in a radio programme on Radio NBC (2 July 2012)
- Participation in a RSI (Swiss Italian-speaking channel) television broadcast (20 November 2012)
- Support for the making of a documentary on bears for the German TV channel Servus TV (July-August 2012)
- Support for the making of a documentary on bears destined for RAI-TV, in terms of images and footage provided, staff in the field, aerial filming and other support.

Newspaper and magazine articles

APT's Forestry and Wildlife Department supervised the production of articles (scientific or informative) and interviews, supplying content and iconographic material, in the following publications:

- Article in *"IBA news"* - February 2012: *Rub trees: testing a new methodology for genetic monitoring of brown bear (Ursus arctos L.) in the province of Trento, Italian central Alps*
- Article in *"IBA news"* - May 2012: *Status of the brown bear population in the central Alps (Trentino - Italy)*
- Article in *Schweizer Familie* no. 23 of 7 June 2012 *("Die Abenteuer von Meister Petz")*
- Article on the bear in Alpenvereinjahrsbuch "Berg 2013" (magazine for alpine clubs in Bavaria. Tyrol and South Tyrol)
- Article providing an update on the bear and other large carnivores in the Alps for UNCZA's "Caccia alpina" magazine (November 2012)
- Article providing an update on the bear and other large carnivores in the Alps for the magazine "Il Cacciatore trentino" (December 2012).

5. Training

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 2012 are illustrated below.

Main training initiatives regarding bears

The following meetings were held by the Forestry and Wildlife Department to train staff in various roles responsible for the management of bears:

- meeting to update forestry staff involved in the management of bears (Casteler, 1 March 2012);
- participation in a day of training and updates for forestry staff and forest wardens promoted by Cles District Forestry Office (Castelfondo, 20 April 2012);
- training day for the forestry staff of ABNP involved in the monitoring of large predators on the use of camera traps (Spormaggiore, 4 May 2012);
- training session with a delegation from the Bavarian government (Trento, 17-20 October 2012);
- training session with the forestry service staff of the Autonomous Region of Friuli Venezia-Giulia and the Veneto Region (Paluzza, 27-29 November 2012);
- participation in a day of training and updates for forestry staff and forest wardens promoted by Tione District Forestry Office (Tione, 11 December 2012).

6. National and international links

Links with neighbouring regions and countries take on a 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 Seas and the coordination of APT the **Action Plan for the Conservation of the Brown Bear in the Central-Eastern Alps (PACOBACE)** 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 and the Lombardia, Veneto and Friuli Venezia Giulia Regions.

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

LIFE+ "ARCTOS" Project (continuation in 2012)

On 31 May 2010 the European Commission approved the co-funding proposal for a new LIFE+ project on the brown bear (Figure 10).

The project, called "ARCTOS – Conservation of the Brown Bear: Coordinated Action for the Alps and Apennines" (LIFE09 NAT/IT/000160), is promoted by Abruzzo, Lazio and Molise National Park and provides for the participation of WWF Italia, the State Forestry Service, the University of Rome La Sapienza, the Abruzzo, Lazio and Lombardia regions, the Autonomous Region of Friuli Venezia Giulia, the **Autonomous Province of Trento** and **Adamello Brenta Nature Park**, all partners which have previous experience of European projects (LIFE NATURA) aimed at the conservation of the species.

The initiative developed out of the need to combat the main threats to the conservation of the brown bear in Italy, identified as the progressive loss of the natural habitat, conflict with the activities of man (particularly animal husbandry) and the lack of sufficient ecological-ethological knowledge about the species to enable adoption of the most suitable management practices.

The main objective of LIFE+ ARCTOS is to implement management procedures and protocols designed to ensure conservation of the brown bear populations present in Italy in the long term, through careful identification, sharing and preparation of experience, methods and effective tools for safeguarding the species (for further details see www.life-arctos.it).

Figure 10
Logos of the Natura 2000 network and the LIFE Arctos project

The project provides for a **duration of 4 years**, starting on 1 September 2010 and ending on 31 August 2014, with **total expenditure of € 3,984,820**, of which **67.63% (€ 2,694,934)** funded by the European Commission.

APT is involved in the implementation of action designed to prevent damage (installation of electric fences), discourage bears from approaching inhabited areas (production and distribution of bear-proof waste bins) and actions related to communication.

In order to do so it has available a budget of € 172,368, with EU funding representing € 109,013 of this.

ABNP is involved in implementing communication activities (promotion and dissemination of information on bears and project actions, through the involvement of residents, administrators, schools etc), for which overall expenditure of € 114,967 euro is provided for, of which around a third (€ 34,452) covered directly by the Park.

In the context of initiatives linked to general coordination of the project, APT and ABNP attended technical meetings organised in **Verona** (Technical Round Table on the Alps, on **20 March 2012** and **25 September 2012**) and the workshop on the management of difficult situations and emergencies held in **Abruzzo National Park on 6/7 May 2012**).

As regards actions involving APT, the provincial administration has acquired and distributed **113 prevention works** in the area (as specified in the chapter relating to damage compensation and prevention), with **total investment of € 52,500**.

7. Research and conferences

Conferences and workshops

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

- Conference on "Reintroduction, a tool to restore ecosystems?". Lyon (FRA), 10 / 11 February 2012.
- Workshop on the management of critical situations involving bears. Abruzzo National Park, 6/7 May 2012.

Degree thesis

APT's Wildlife Office also supervised the following decree thesis during 2012: **"Mitigating conflict between man and the brown bear *(Ursus arctos L.)* as a tool for conserving the species in Trentino"** (dr.ssa Tarin Tonon). University of Parma, 19 April 2012 - Faculty of Mathematical, Physical and Natural Science, Nature Conservation specialisation.

The results of sample monitoring have confirmed that works are often not managed properly by users, prejudicing the effectiveness of the measures. This has given rise to a programme of specific control activities which it is expected to begin implementing in 2013.

APPENDIX 1
The linx

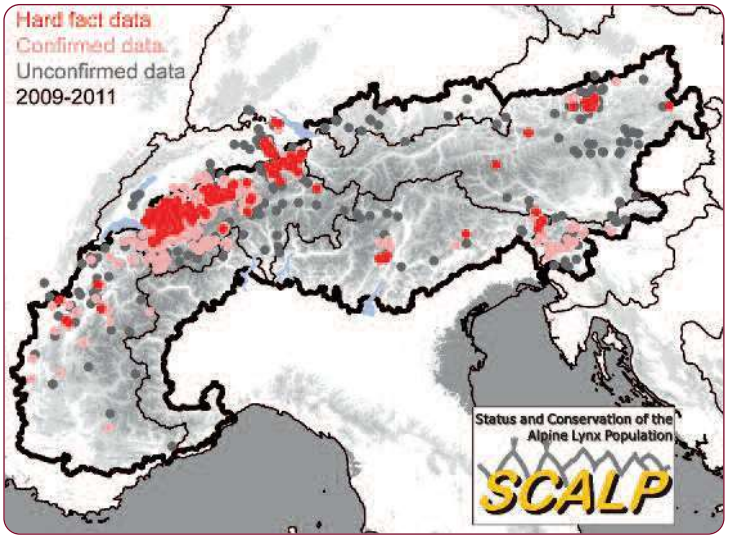
Photo 1 - B132 shortly after capture on 14 February 2012 (C. Groff - APT Forestry and Wildlife Department Archives)

Today the lynx is only present in the Alps thanks to reintroduction programmes taking place in the 1970s in Switzerland and Slovenia, as it had become completely extinct at the beginning of the 20th century.

The most up-to-date information on the distribution of the feline in the alpine area regards its presence in the three-year period 2009-2011 and was drawn up by SCALP *(Status and Conservation of the Alpine Lynx Population)* (Figure 1).

The only viable population is present in the central-

Figure 1
Distribution of the lynx in the Alps 2009-2011 (SCALP)



western Alps (in Switzerland) and is made up of around a hundred animals. There is a small nucleus settled in the St Gallen Canton (north-eastern Switzerland), while individual animals from these source populations can be found in the French Alps and the central Alps, also in Trentino.

All the animals present in the eastern Alps probably originate from the by now very small Slovenian-Croatian population (a few dozen lynx).

As reported, the only lynx certainly present in the province of Trento starting from 2008 (the male known as B132), comes from the small Swiss population in the St Gallen Canton (see page 45 and subsequent pages of the 2008 report, and subsequent Bear Reports).

Given that the radio collar batteries had ceased to function in spring 201, the animal was captured on **14 February 2012** (Photos 2 and 3) (see the 2010 Bear Report, pages 52-54 as regards the first capture carried out in Trentino). 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 equipped 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 the traditional VHF radio mode for searching in the field.

Photo 2 - The capture team with B132 (C. Groff - APT Forestry and Wildlife Department Archives)

Photo 3 - Close-up of the front paw of B132 (C. Groff - APT Forestry and Wildlife Department Archives)

During 2012 there were several reports of the presence of the feline not linked to GPS/VHF monitoring, thanks to monitoring with **video-camera traps**; on no less than **25 occasions** it was possible to film the animal

Photo 4 - B132 immortalised by the camera trap (M. Tiso - APT Forestry and Wildlife Department Archives)

Photo 5 - B132 filmed by the camera trap while marking his territory (E. Dorigatti)

using this equipment, 24 times in the period between **23 February and 15 April 2012** (Photos 4 and 5), and on one further occasion on **18 October 2012**.

The monitoring of **prey**, carried out thanks to the support of a student writing a degree thesis, made it possible to identify **14 prey: 10 roe deer** (2 females, 3 males and 5 of undetermined sex), **3 alpine chamois** (undetermined) and **1 red deer** (female) (Photo 6).

Photo 6 - Carcass of a red deer preyed on by B132 (C. Groff - APT Forestry and Wildlife Department Archives)

In this last case it was also possible to document the use of the lynx's prey by other species, such as the bear and the golden eagle (Photos 7 and 8), demonstrating the important role of carcasses left on the ground for the ecosystem.

For much of the year, the lynx again frequented the area in the Brenta mountains and Monte Gazza, where he has effectively established his **home range** since spring 2008.

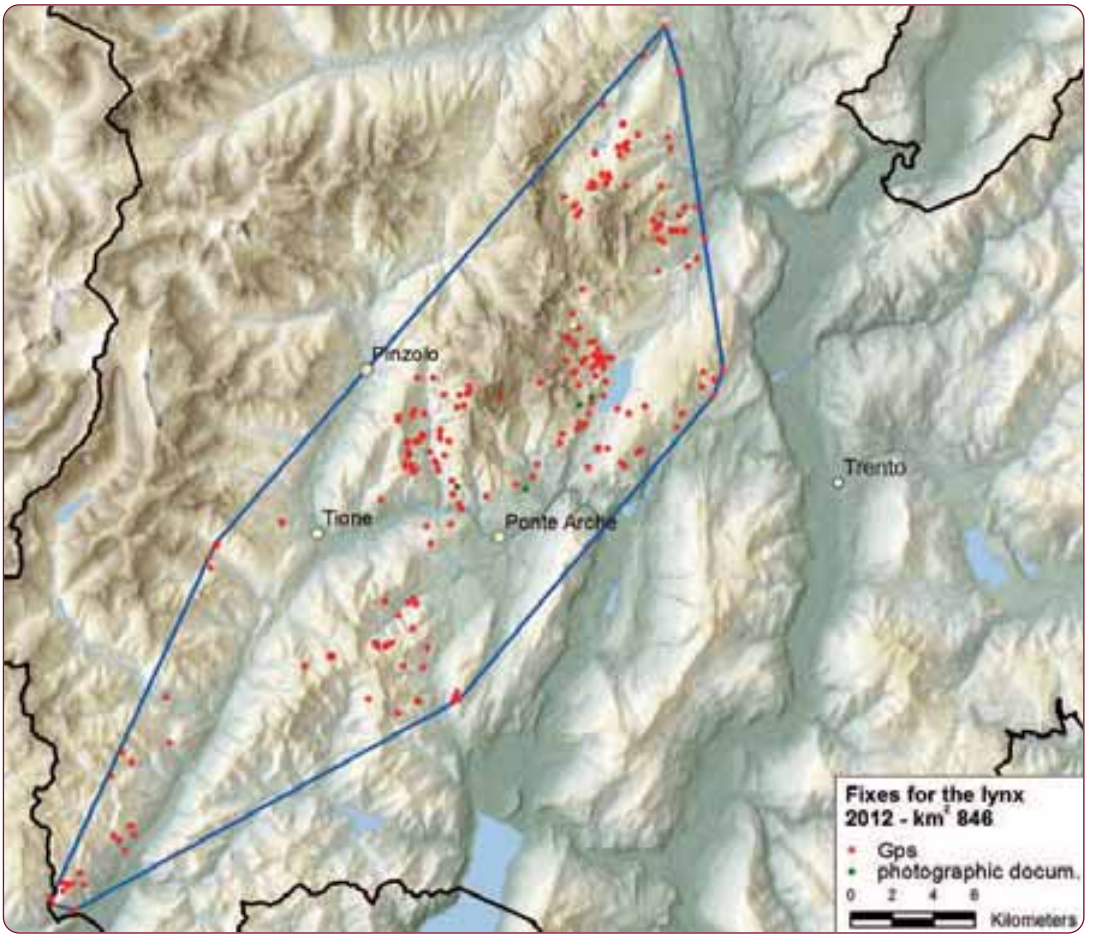
However, starting from the middle of November the lynx abandoned his traditional area, moving south-west until he reached the mountains on the right-hand bank of the **Chiese** valley, on the border with the province of Brescia. He remained in this area until at least the end of January 2013.

Before this sortie, B132 had already left his traditional territory on two previous occasions, again heading south, frequenting the

Photo 7 - A bear at the carcass of the deer killed by B132 (S. Hueller - APT Forestry and Wildlife Department Archives)

Photo 8 - Golden eagles at the carcass of the deer killed by B132 (S. Hueller - APT Forestry and Wildlife Department Archives)

Figure 2
Home range of the lynx B132 from 14 February to 31 December 2012 calculated using the minimum convex polygon (MCP) method



mountains above the Bleggio area (**Cadria** and Misone-Casale mountains) for brief periods (from 2 September to 6 October and from 24 October to 8 November), to then return to the southern Brenta mountains.

The home range of the lynx from 14 February to 31 December 2012, calculated using the minimum convex polygon (MCP) method, was thus **846 km²** (Figure 2), more than triple the HR recorded in previous years.

The animal, which belongs to a species which is, if possible, even shyer and more elusive than the brown bear, remained the only lynx whose presence was ascertained within Trentino.

As regards communication activities, the **documentary "The Lynx: the Story of its Return"**, produced by the Forestry and Wildlife Department with direction by Enrico Costanzo, was screened during the **Festival of the Mountains in Trento** on 1 May 2012.

Finally, staff from the Wildlife Office participated at the Arge Alp **conference** on management of the lynx in the Alps, held in **Zernez** (CH) on 11/12 October 2012.

APPENDIX 2
The Wolf

For the third consecutive year it was possible to document the presence of the wolf in the province of Trento. At least four wolves gravitated around Trentino and/or neighbouring areas during the year. First of all, 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).

Once again in 2012 the animal's presence was documented objectively (with **genetic tests**) on at least three occasions in the province of Trento. The same wolf was also filmed by **camera traps** on the Trentino side of its home range on **seven** occasions during the year (Photo 1).

Photo 1 - The wolf M24 with a deer carcass (Fondo forestry station - APT Forestry and Wildlife Department Archives)

The data acquired in 2012 provides a relatively precise idea of the territory occupied by the wolf over the course of the year, situated between the Maddalene mountains and mountains in the upper Val di Non (Figure 1).

Only one case of damage was attributed to wolves in the province of Trento. This took place in the municipality of Castelfondo (upper Val di Non) on 24 September 2012 and concerned

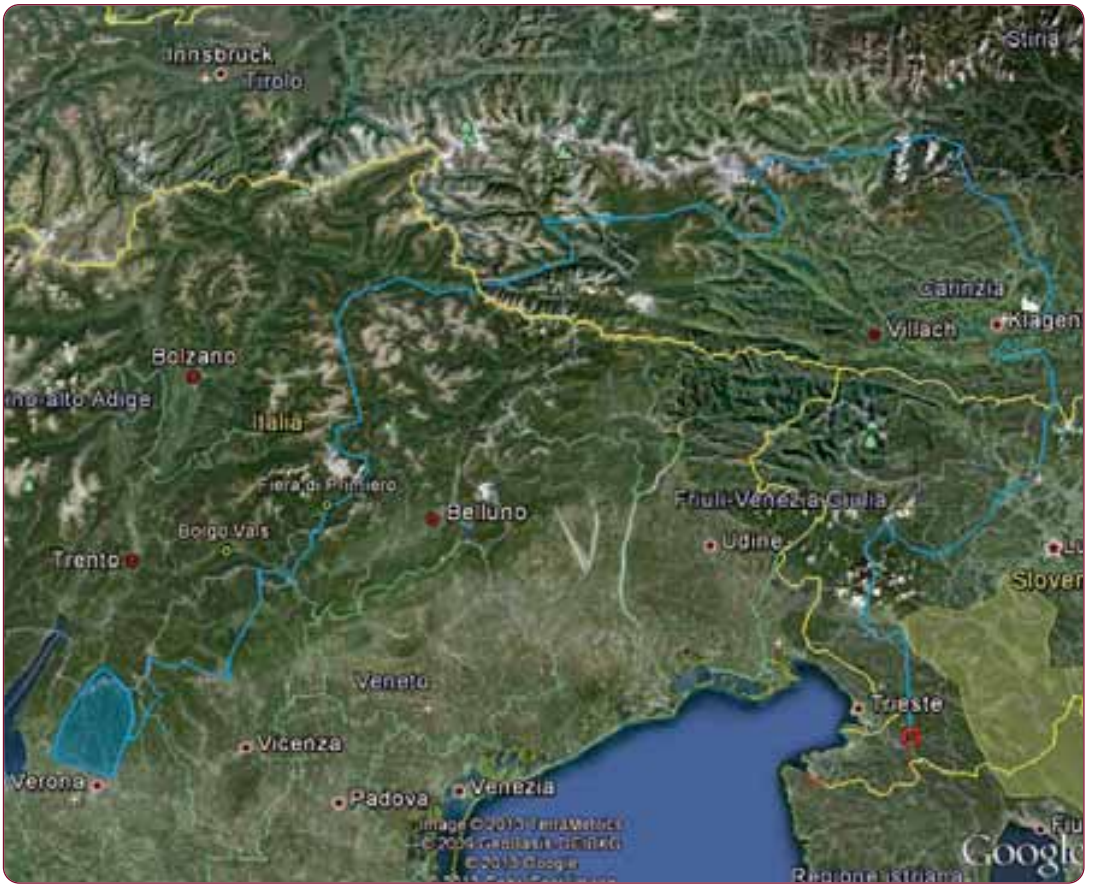
Figure 1
Signs of the presence of wolves in the provinces of Trento and Bolzano during 2012. Data for Alto Adige: Hunting and Fishing Office, Autonomous Province of Bolzano

four sheep, for which no compensation was requested.

However, the most interesting news in 2012 as regards the presence of the wolf in the province came from the southern area, specifically from the Lessini mountains. As reported, at the end of December 2011 a young **male wolf fitted with a radio collar** in **Slovenia** in the summer of the same year entered Austria, crossing Carinthia and heading north until it reached lower Styria, then moving south-west until it reached the Isel valley and Alto Adige (Val Pusteria) in eastern Tyrol at the beginning of February 2012. The wolf, known as **"Slavc"**, then continued its long journey in a south-westerly direction until it reached the southern edge of the Alps, in the provinces of Vicenza and Verona. During this journey, on two occasions it also crossed territory in the province of Trentino, first at Primiero (20/21 February in the Sagron Mis area and 27/28 February, crossing the Val Noana and Vederne) and then in the lower Valsugana (1/2 March, when it crossed the River Brenta, to then make its way to the Asiago tableland at Tezze).

This long journey eventually terminated, probably not by chance, in the Lessini mountains, where a further **wolf** of unknown origin has been reported in the province of Verona since the beginning of 2012, not far from the border with the province of Trento (camera trap images from the State Forestry Service of Bosco Chiesanuova - VR) (Figure 2).

Figure 2
The long journey of the wolf Slavc from Slovenia to the Monti Lessini (SLOWOLF - *Life+* - University of Ljubljana)



During the year it was then possible to ascertain that the two wolves moved around together and above all, thanks to genetic tests, that the second wolf was a **female** coming from the **"Italian" population**. However, after Slavc's radio collar stopped working (August 2012), the first genetic confirmation of the new couple was only obtained at the end of October, when tracks in the snow were found at Revoltel (Ala - TN, 30 October 2012 - Photo 2) and organic samples collected there confirmed that the two wolves were still present and moving around together.

Photo 2 - Tracks of the two wolves in the snow (B. Pinter - APT Forestry and Wildlife Department Archives)

Before this report, it was not possible to take this for granted, as on **12 August 2012** a **female wolf** was found **dead**, again in the Lessini mountains on the Verona side. She was also of Italian origin and showed signs of poisoning. For some time it was therefore believed that this was the Slavc's companion.

Subsequently the pair of wolves was filmed for the first time by a camera trap (again in Trentino, by staff from the Wildlife Office and Ala Forestry Station - **4 December 2012**) (Photo 3).

Very clear images of the two wolves were also ob-

Photo 3 - Pair of wolves in Lessinia (Wildlife Office and Ala Forestry Station - APT Forestry and Wildlife Department Archives)

tained during the day by staff from the Lessinia Regional Park (VR), on **27 December 2012** (Photo 4).

Finally on **7 January 2013** for the first time it was succeeded in obtaining a short nocturnal video of the two wolves with a camera trap (again in Trentino by staff from the Wildlife Office and Ala Forestry Station).

This is the **first couple of wolves** whose

Photo 4 - Pair of wolves in the Lessinia mountains (P. Parricelli, M. Samaritani – Lessinia Park Archives)

presence has been documented in the **eastern alpine** area, around one and a half centuries after the disappearance of the species in the area.

The event is also particularly significant because it involves two wolves coming from different populations (Italian and Dinaric-Balkan) and it is the first time that the joining of the two populations has been demonstrated with certainty.

Clearly the hope is that they will reproduce and have a litter, perhaps already in spring 2013 (Photo 5).

Thus 2012 saw continuation of **the natural expansion of the species in the Alps** into the province and neighbouring areas. In the last few years this has been demonstrated by documentation of individual wolves in Trentino and Alto Adige, but also in neighbouring Lombardia, Austria and Bavaria.

In **2012** it was possible to document the presence of at least a further three wolves in

Photo 5 - Wolf cub (M. Krofel)

Austria in the eastern alpine area (one in southern Austria, Schneeberg area, since 2010, one in Styria, Gleinalm area, at least since spring 2012 and one in Carinthia, Karawanken, where there could also be a second wolf) - G. Rauer, pers. comm.

The Forestry and Wildlife Department attended two **conferences** regarding management of the wolf:

- Conference on management of the wolf in Bologna (22 October 2012)
- Workshop on management of the wolf in Innsbruck within the context of Arge Alp (26/ 27 April 2012).

A specific **training** initiative was also organised in **Slovenia** (15-18 April 2012), where a Life project is underway to monitor the wolf (Photo 6).

Photo 6 - Inspection of the prey of a wolf (C. Groff - APT Forestry and Wildlife Department Archives)

A **stand on the wolf** (as well as one on fish) was set up during the Expo Riva Caccia Pesca e Ambiente fair (Expo Riva: Hunting, Fishing and the Environment) held in Riva del Garda on 31 March and 1 April 2012 (Photo 7).

Photo 7 - View of the stand dedicated to the wolf (C. Frapporti - APT Forestry and Wildlife Department archives)

NOTES

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