



IS THE MARSICAN BROWN BEAR DANGEROUS?

The answers
to the most
frequently asked
questions,
to know and
respect the Bear





Presentation

We are proud and lucky to have a particular group of bears - **the marsican brown bear** - that lives only here, in the Abruzzo Lazio and Molise National Park and in its border territories.

It is a very small population and a species at risk of extinction.

So we must protect it.

The Park has done it for over 90 years and the marsican bear is still here, but it has not yet exceeded the risk of extinction.

There are International and National acts to protect the bear. We have to make sure they are respected.

There is a National Plan to defend the marsican bear (**PATOM**) we have to realize it.

To reach this goal it's important to assume our responsibilities, starting from all those institutions that have to implement conservative actions.

To save the marsican bear we must respect it. To respect it we have to know it.

The 17 answers that have been selected among the most frequently asked questions about the marsican bear can help us to know it, overcoming common places, wrong convictions, or simply, filling a gap of information that everyone has. We ask you a little effort: using a few minutes of your time to read the pamphlet, we are sure that it will help us in the ambitious goal to give a future to the marsican bear.

Antonio Carrara
Presidente Parco Nazionale
d'Abruzzo, Lazio e Molise

1

What is the current situation of the bear in the Apennines?

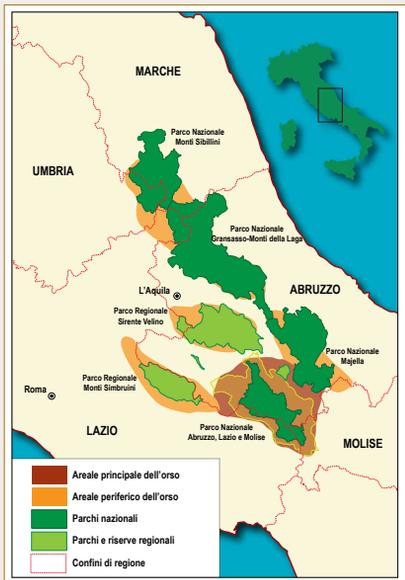
The brown marsican bear (*Ursus arctos marsicanus*, Altobello 1921), a subspecies of brown bear that lives only in the central Apennines, is present today with a population extremely reduced from a numerical point of view, distributed almost exclusively within the territory of the National Park of Abruzzo, Lazio and Molise (PNALM) and in the adjacent Apennine areas.

Within the PNALM, a population of about 50 individuals is estimated.

The studies conducted in the last 8 years reveal that every year an average of 3-4 females give birth and, considering the size of the population, we could not expect greater values.

On the other hand, this level of productivity does not necessarily mean that the population is out of danger, considering that the mortality for cubs in the first and second year of life is particularly high. In fact, despite the birth of more than 60 cubs in the last 8 years, there is no evidence of population growth.

From the 70's to today, every year at least 2-3 bears have been found dead, the majority due to anthropogenic causes (see question 4), too high of a value to allow a demographic recovery of the population.



Distribution area of the Marsican brown bear

2 *The population of the Apennine bear can be considered stable, increasing or endangered?*

According to most recent estimates, produced between 2008 and 2014, the population appears numerically stable in the central portions of the distribution area.

However, the limited number and current mortality levels of adult females in reproductive age (*more than 1 adult female a year between 2011 and 2014*) do not allow us to hope for a numerical recovery of the population, and leave unaltered the risks of demographic and genetic nature to which populations composed by few individuals are exposed.

3 *Is there any evidence of expansion in other areas? Why is the process so slow?*

In recent years an increasing number of reports of bears has been collected, mostly males, even outside the central area of presence of the species.

The factors that make this process seemingly so slow are primarily the reduced capacity of dispersion (*ie removal from the areas in which they were born*) of bears, especially females that tend to be bound to their territory and to the maternal one (*filopatRIA*).

The repeated cases of mortality due to anthropogenic causes reported during the years outside the PNALM and immediate adjoining areas, identify this aspect as one of the factors that could most limit the expansion of this bear population.

4

What are the main causes of bear mortality?

From 1970 to 2014 117 bear carcasses were found throughout the central Apennine area, an average of 2.6 bears / year.

If we analyze in detail the causes of known mortality in the period between 2000 and 2014 (29 carcasses out of 39 overall), 72.4% ($n = 21$) causes of death were due to poaching or accidental causes related to man.

In particular, we report:

- 13 cases of poisoning or killing with a firearm (44.8%);
- 5 cases for health reasons (17.3%);
- 3 cases of road accidents (10.3%).

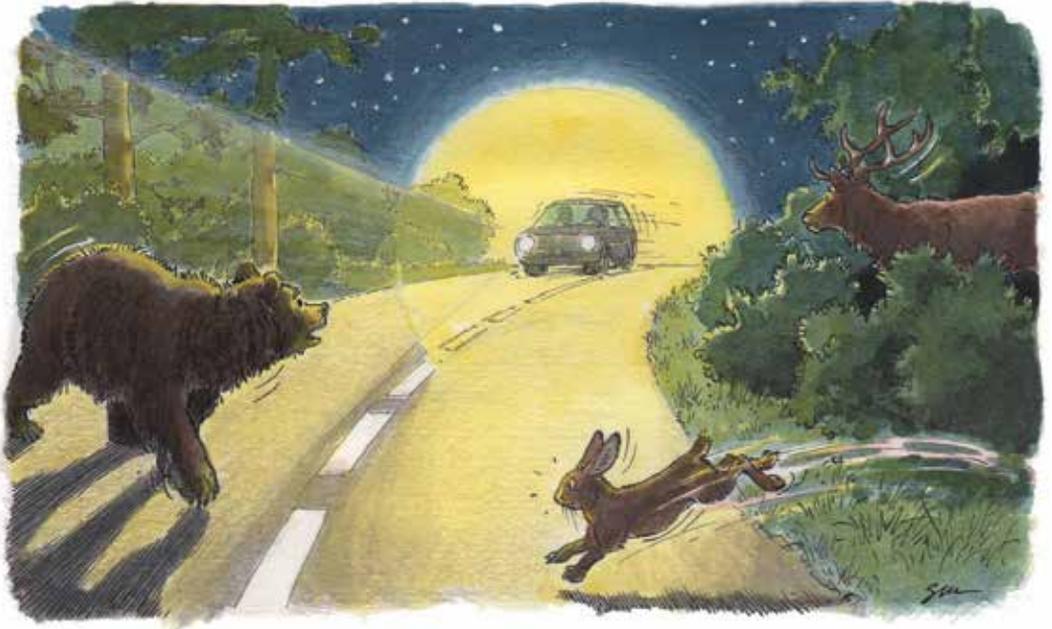
Another 27.6% ($n = 8$) were deaths by natural causes, including infanticide or intraspecific predation.

However, it should be considered that in many cases the finding of a few remains does not allow to determine the exact cause of death.

It is also important to underline that these values should be considered as underestimates, since they are based only on bears that have been actually found - between 2007 and 2009, for example, 5 of the 9 dead bears were recovered thanks to the radiocollar.

Still, the mortality due to illegal human activities remains widespread and the efforts to combat this threat in the past decades have proved to be largely ineffective.

Human-induced mortality is undoubtedly the main threat to the survival of the Marsican bear, considering also the reduced consistency and genetic variability of the population.



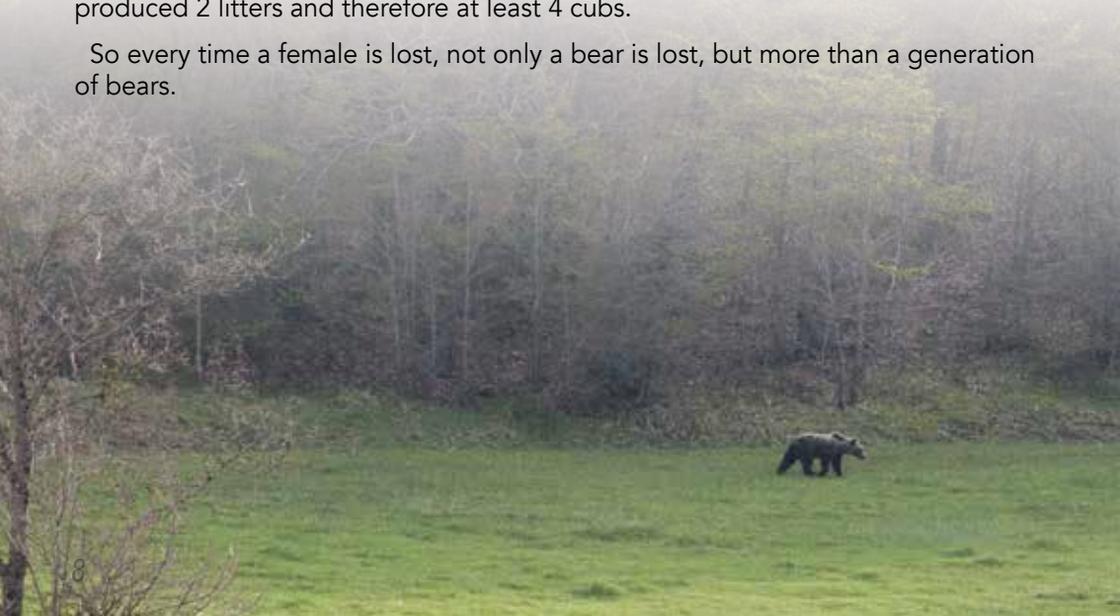
5 What are the consequences of the removal of a reproductive female on the future of the bear population?

Bears have a reduced reproduction frequency, due to their significant parental investment: the females give birth for the first time no earlier than 4 - 8 years of age, the litters on average almost never have more than 2 - 3 cubs and the interval for subsequent births is between 3 and 5 years.

In this context, assuming high survival rates for females, it is possible that 3-4 litters are produced by a female throughout her life (*about 6 - 8 cubs, if they all survive*).

Therefore, during the time when a female cub reaches sexual maturity and begins to reproduce (*about 4 - 8 years*), an adult female may have already produced 2 litters and therefore at least 4 cubs.

So every time a female is lost, not only a bear is lost, but more than a generation of bears.



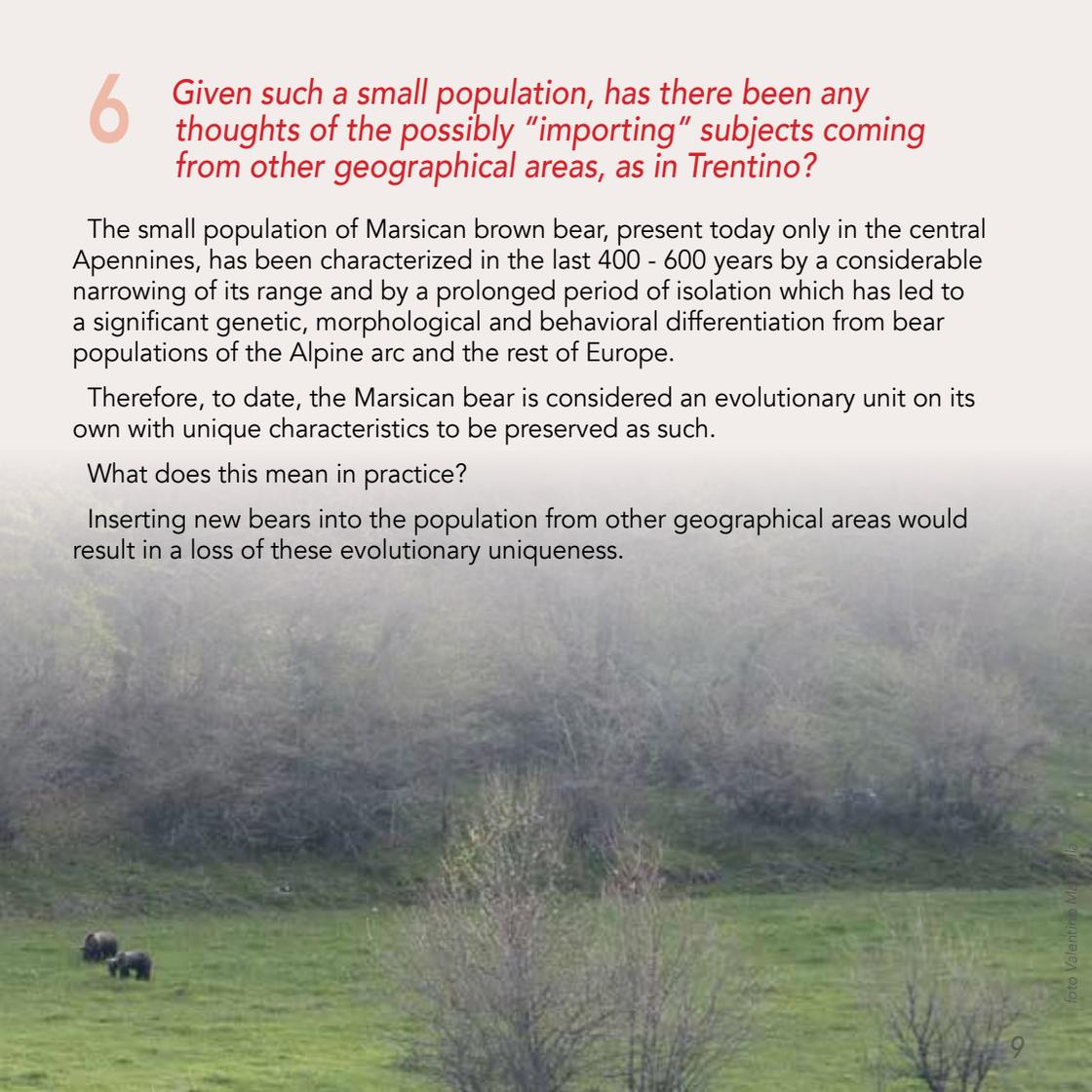
6 *Given such a small population, has there been any thoughts of the possibly "importing" subjects coming from other geographical areas, as in Trentino?*

The small population of Marsican brown bear, present today only in the central Apennines, has been characterized in the last 400 - 600 years by a considerable narrowing of its range and by a prolonged period of isolation which has led to a significant genetic, morphological and behavioral differentiation from bear populations of the Alpine arc and the rest of Europe.

Therefore, to date, the Marsican bear is considered an evolutionary unit on its own with unique characteristics to be preserved as such.

What does this mean in practice?

Inserting new bears into the population from other geographical areas would result in a loss of these evolutionary uniqueness.



7 Are there enough food resources in the PNALM area to support the Marsican bear population?

To date there are no studies that quantify how many bears can potentially be present in relation to the current food resources available in the Park, but indirect evidence suggests that the Park area constitutes an environment with good food availability for the bear.

The constant presence in the diet of bears of highly energetic resources in all seasons and the observed food variety (*more than 27 species including fruits and herbaceous plants, more than 22 animal species, which mostly include insects and mammals*), would seem to allow bears to effectively assimilate proteins, sugars and fats throughout the year and accumulate the biomass and fat needed to survive and reproduce.

This is further confirmed by the physical conditions of the animals captured for study and by their metabolic profiles, the frequency of reproduction and the degree of overlap observed between the areas used by them.

The bears, as confirmed also in previous studies, feed mainly with natural resources (*berries, fruits, insects, etc.*) and, although they are characterized by a high flexibility in the food spectrum, some resources play a key role in terms of energy, especially in the late summer-autumn period before entering the den: ramno (*Rhamnus alpinus*), beechnuts (*the fruits of the beech*) and large fruits (*for example wild and domestic apples and pears*).

These results suggest the importance of investing in monitoring and redevelopment existing food sources, for example through forest management interventions that maintain a high productivity of acorns, beechnuts and ramno, or through the recovery, with targeted pruning of abandoned apple and pear trees, all this in order to allow the maintenance of this variety of food resources.



8

Is there any relationship between female productivity and food availability and what are the management implications?

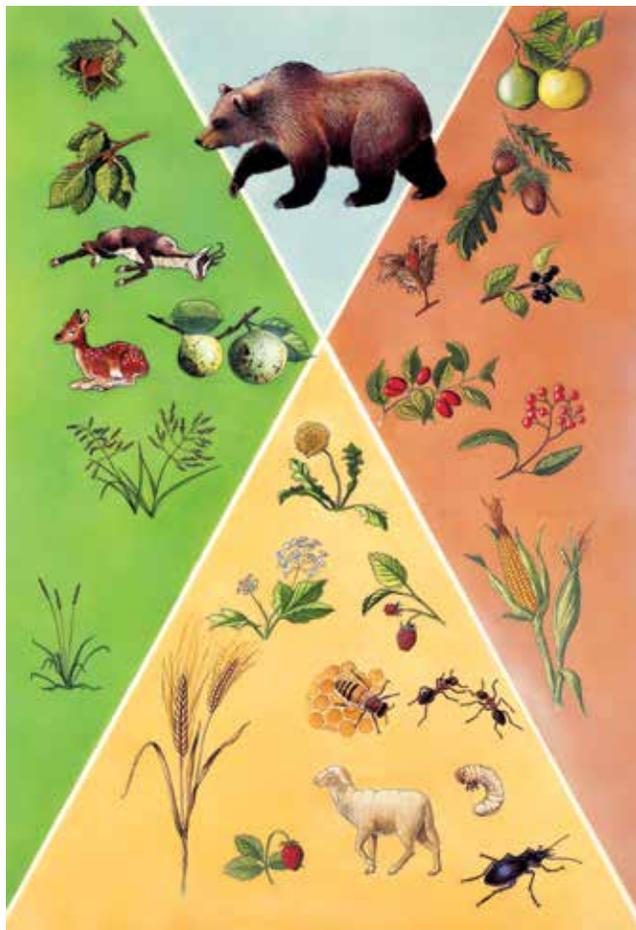
For female bears, the ability to access in late summer and autumn periods to highly energetic resources (*rich in proteins, minerals and fats*), and therefore to be in a good nutritional state, is a guarantee for reproduction; that is, it allows females to have sufficient energies for the development of the fetus, the breeding and lactation of the young during the first weeks of life (*the young are born in the den and in the first months of life they are totally dependent on the mother*).

Also with the Marsican bear population a relationship has been observed between the productivity of the females (*understood as the number of breeding females and the number of cubs born*) and the annual production of acorns and beechnuts.

However, the observed good levels of reproduction suggest that the possibility to access a high variety of other food resources (*fruit, meat, etc.*) allows the females to reach the correct physical condition to reproduce each year.



THE BEAR'S DIET



SPRING

FALL

SUMMER



9 Why do bears approach villages? Can it be avoided?

The “*choice*” for a bear to approach human areas depends on many factors, but it may be considered more natural than what is commonly thought.

Bears can be attracted by the possibility of accessing “*easy*” and very nutritious resources (eg. *feed, beehives, livestock*), a phenomenon that can amplify in seasons or years of lack of natural food, which eventually will cause conflicts with humans.

On the other hand, even social dynamics can influence the predisposition of individuals to approach urbanized areas: for example, females with cubs, as well as young bears, can find in adjacent village areas temporary or permanent shelters, to reduce risk of aggression by adult males.

Infanticide and / or intra-specific predation deaths have been documented in several bear populations in European and North American context.

We must also consider that in the Apennines a female, to find enough resources to live (eg. *food, rest areas*), needs to move in a area of up to 140 km² and males up to 300 km²; therefore a village can easily fall within a bear’s territory.

The Apennines is also a man-made environment and it is easy to find human food resources in “*natural*” areas, such as abandoned orchards, just as it is easy as natural food sources, such as acorns, close to villages; therefore, a bear that frequents anthropized areas does not necessarily depend on food resources associated with humans.

What is important to avoid?

It is important to prevent this behavior from becoming such a habit.

Bears can completely lose their “*mistrust*” in man and eventually will continue to enter villages to feed.

This is why we talk about “*sanitizing*” populated areas, which simply means to avoid bear getting an easy “*prize*” when it enters a village, and then come back to get it whenever it wants to.

How is it possible?

For example, protecting trash cans, vegetable gardens and chicken coops to prevent any access to the bear.



10 *What is a confident bear and what is a problematic bear?*

Often the expressions “*problematic bear*” and “*confident bear*” are indistinctly used to indicate those animals that cause damage or are the protagonists of man-bear interactions, with such a frequency as to create economic and / or social problems to the point of requiring an immediate and decisive management action.

Actually the definitions developed from the experience of the Life ARCTOS project in the PNALM are:

Problematic bear:

a bear that causes damages or is the protagonist of man - bear interactions with such a frequency as to create economic and/or social problems to the point that it requires immediate and decisive management action;

Confident bear:

a bear that does not show evident reactions in the presence of man as a consequence of a repeated exposure to anthropogenic stimuli, without negative consequences to the bear itself.

A bear can be confident but not necessarily problematic, and vice versa, but it is better to impede *confident behavior* in bears to prevent them from maturing with *problematic attitudes*.





11

How much and what damages does the bear do?

In the PNALM, the extent of the damage caused by the Marsican brown bear to zootechnical and agricultural assets is, overall, very limited compared, for example, to 60% of the total damage attributed to the wolf (*which often includes those caused by dogs*).

Annually, within the territory of the PNALM and its buffer area, there are from a minimum of 119 to a maximum of 245 inspections for wildlife damages attributable to the bear.

In 66% of cases, bear damages concerned livestock with possible damages to structures and 34% to crops.

Many of the damages recorded (*around 29%*) are attributable to a few cases of problem bears that use these easily accessible and very "**profitable**" abundant food sources (*hens, crops and beehives*).

However, in recent years the human-bear conflict has become exaggerated not only as a result of economic damage, but also because of the perception of danger that arises from the presence of bears in inhabited areas.

All the damages are regularly economically compensated and in many cases the PNALM has intervened with safety devices (*night shelters or electrified fences*), whose correct use can completely eliminate any possible wildlife damage.

Preventing access to food associated with humans is essential to contrast any bear's attitude of confidence towards man and therefore the onset of new, potentially problematic bears.





12 *Is the bear dangerous?*

To date, no case of aggression has been reported for the Marsican bear.

Close encounters have been documented several times, but in no case there was any evidence or attitudes of aggression.

The most commonly reported attitudes were escape or curiosity (*the bear stood up, looking in the direction of the person*).

However the bear is a wild animal. Certain situations may be more dangerous than others since they stimulate the defence instinct of the animals, as it would be for human beings too: the presence of females with cubs, a wounded animal, a bear in a den or a bear whose escape routes are closed off.

13 *What makes the bear more vulnerable than other species?*

The bear is defined a species that is not very resilient, meaning that it is unlikely it will adapt to changes, especially if caused by man, affecting the environment.

Although the bear is an omnivorous, it is however bound by the need to be able to feed itself with resources that are very abundant and of high quality (*high nutritional and energetic content*).

Beyond that, females reproduce only a few times during their lifespan and are unable to compensate for the excessive mortality with the number of births.

Finally, bears need large territories (*up to 300 km² in the case of adult males in the National Park of Abruzzo, Lazio and Molise*) and seldom move away from areas commonly frequented once identified safe areas for refuge, raising the offspring and availability of large quantities of food.



14 *What disturbs the bear and when is it more vulnerable?*

How can a bear react to human presence or activities (*infrastructures and use of the territory by different stakeholders*)?

Like a prey, it reacts to a potential predator: it escapes, increases its alertness, modifies its movements and habits.

All these reactions, from the more or less obvious ones, can be associated with significant changes in physiological and nutritional conditions of individuals, due to chronic stress conditions or because the reduced efficiency with which the bears feed (*less feeding time, loss of feeding areas*).

In anthropized contexts bears may have few “*choices*” and almost no chances of adapting to increasing levels of human pressure.

For example, a bear who leaves a disturbed area, with high probability will encounter an area that is also disturbed.

The most vulnerable periods are the months between August and November, during which the bear dedicates almost all the time feeding to accumulate enough energy resources (*fats*) for the winter (*November-April*).

Disturbing a bear in a den, especially a female with cubs, may cause not only the abandonment of the den, but also that of the mother leaving behind the newborn.

Various human activities potentially come into conflict with the autumn and winter period (*hunting, dog training, forest cutting, truffle harvesting, hiking*), activities that in areas with the presence of the bears during these periods should be regulated in any possible compatible way, but unfortunately as of today they are only minimally.



15 *What could be the future strategy for the conservation of the Marsican bear?*

Given the critical state in which the population is located, its preservation must go through the identification of political, creative, courageous and timely solutions that can only be activated in the presence of effective territorial and political coordination.

All this should be aimed at:

- *reduce the current anthropogenic origin causes of mortality;*
- *reduce and / or control the disturbing factors on this population;*
- *reduce the levels of conflict with man and his activities.*

For a population to remain stable or to grow and expand, it is necessary that the number of individuals recruited into the population compensates or is greater than the number of individuals that die.

Given the small size of this population, the risks at present are very high and therefore the first option from a management point of view is the significant reduction in current levels of anthropogenic origin mortality (*for example through the reduction of poaching or health control of grazing animals*), a potential decisive effect on population demography and therefore on its capacity for persistence.

Considering that the conflict with man is one of the main causes of mortality for the bear, these activities can not ignore the creation of a national and local campaign of communication, awareness and correct information that increases the level of sensitivity and tolerance for the species; it is therefore necessary to encourage the growth of a local bear culture through the participation of local communities in the resolution of conflicts.

16 Why is the future of the bear a game played outside the borders of the Park?

The bear is a species that needs very large territories for its survival.

There are several indications that suggest that the population of the Park may be close to its carrying capacity (*ie the maximum number of bears that the Park can sustain*): the wide overlap of the territories of males and females with areas of lower protection regime, the high degree of overlap observed between bears and observed high densities ($3.5 \text{ bears} / 100 \text{ km}^2$).

It is therefore essential, for the conservation of the population, to favor its expansion and the consequent stable settlement outside the Park.

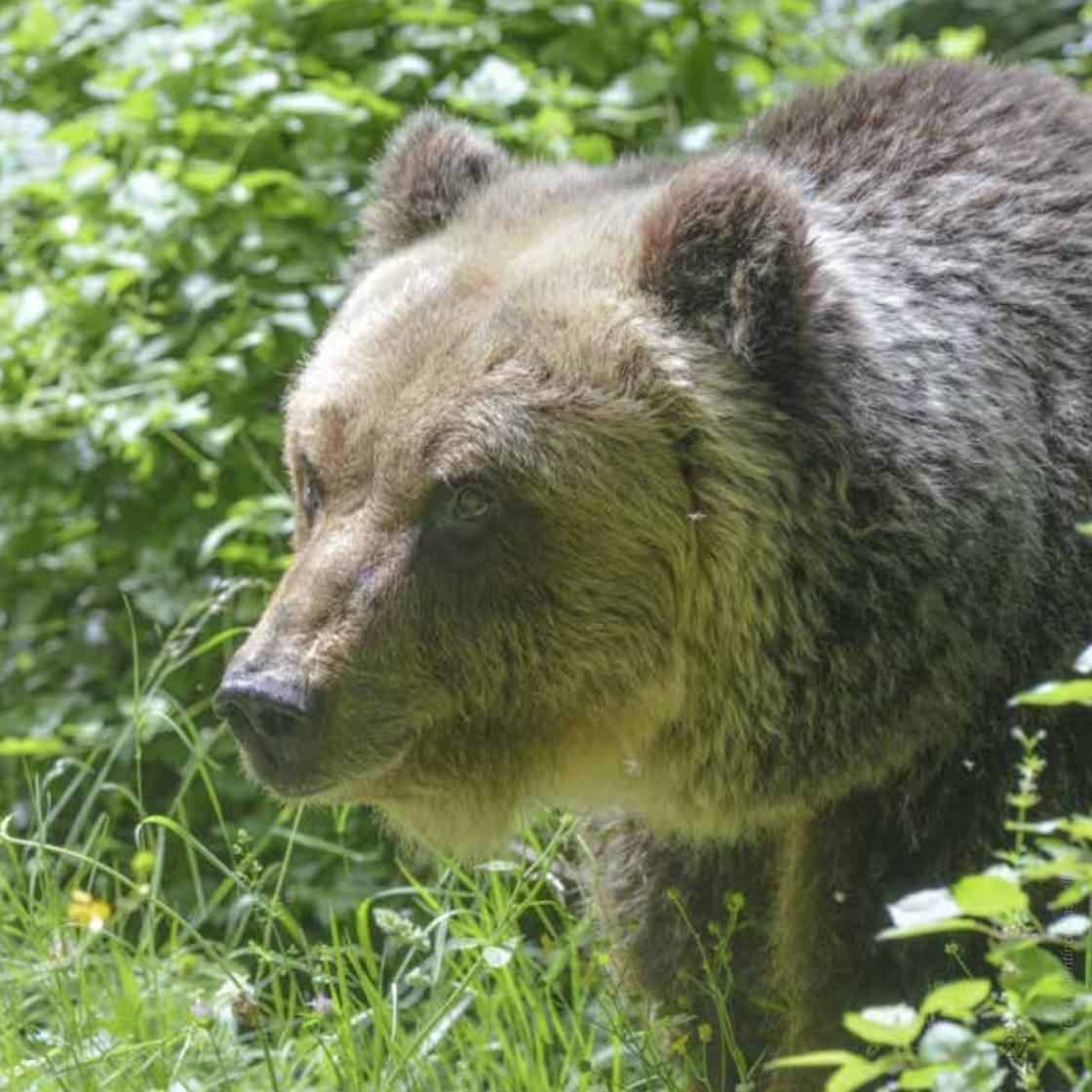
This can be achieved first of all by maintaining the functionality of natural corridors to other suitable areas and the substantial removal of sources of disturbance and anthropogenic mortality factors.



17 *Other information about the bear?*

- *Parco Nazionale d'Abruzzo, Lazio e Molise website*
- *Ministero dell'Ambiente e della Tutela del Territorio e del Mare*
- *Piano d'Azione nazionale per la Tutela dell'Orso Marsicano (PATOM)*
- *Progetto LIFE Arctos website*
- *Salviamo l'Orso website*
- *Rete di Monitoraggio dell'Orso bruno marsicano della Regione Lazio website*
- *Sito dell'ATIt (Associazione Teriologica Italiana) Comunicati Stampa e documenti*







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