LIFE DINALP BEAR

Population level management and conservation of brown bears in northern Dinaric Mountains and the Alps

LIFE13 NAT/SI/000550

Monitoring of bears exhibiting conflict behaviour and effectiveness of mitigation measures In conflict hot-spot areas

Action D1: Monitoring of bears exhibiting conflict behaviour and effectiveness of mitigation measures in conflict hot-spot areas

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CONTENTS

ABSTRACT

The alpine bear (*Ursus arctos*) population was on the verge of extinction at the end of the last century. Thanks to the Life Ursus project, 9 bears coming from Slovenia have been moved to the Parco Adamello-Brenta, in Trentino, between 1999 e il 2002. The present population developed from such founders who began to reproduce in 2002. In 2018 a population of some 58 bears (IC 52-72), plus 21-23 cubs, has been estimated. The population is still growing.

In the central-eastern Alps bears are living in a highly fragmented habitat and in a human dominated landscape.

Such fragmentation together with the relatively small place where “wilderness” patches get in touch with areas of constant man presence, force the bears to get in touch with people who live in the same territory.

Bears habituated to live close to people and villages are often causing lot of damages, can occasionally become dangerous and create troubles to residents because of their presence or for unusual/confident behaviours.

The main goal of the management and conservation of brown bears in the Alps is to find out a coexistence with people, their activities and interests.

This having regards to both aspects of the ecological connectivity, wich is needed to facilitate dispersion processes with the aim to establish a connection with the Dinaric bear population, and of the “social connectivity”, allowing in this way a mitigation of conflicts with people and the persistence of the bear population in the long term.

That’s the reason why monitoring and managing bears who show conflict behaviours (i.e. problem bears) and experimenting and implementing all possible mitigation tools is needed to preserve the whole alpine bear population in the future.

This report summarize the activities carried out by the Settore Grandi Carnivori – Servizio Foreste e Fauna of the Provincia Autonoma di Trento, in the frame of the activities of the action D.1 of the Life Dinalp LIFE13 NAT/SI/000550 project.

1. MAIN CONTENTS OF THE REPORT

The **first chapter (2.)** describe and analyse the presence of problem bears within the population.
The conflicts between man and bear are often connected to the opportunistic modalities with which the bears seeks food and feed with food of anthropogenic origin.
An important key factor for the onset of conflicts is also the number of problem bears present in the population. Usually they represent a small part of the entire population, but they are the cause of most conflicts.
Paragraph 2.1 analyzes the distribution of the amount of damages in relation to responsible individuals and traces the history of terms of survival and causes of death.
To try to limit conflicts with problematic bears, emergency teams have carried out defense and dissuasion actions (aversive conditioning) over time, the outcomes of which are discussed in **Section 2.2**
In light of the results achieved so far, a new program has recently been proposed and prepared to be adopted and followed for the actions of dissuasion and removal of confident, harmful or dangerous bears.

The **second chapter (3.)** outlines a summary of the verification of the efficiency and usefulness of the prevention works system activated by the Autonomous Province of Trento for damage reduction and conflict mitigation. The characteristics of the various types of prevention works provided by the Province on loan or co-financing are briefly described in **Section 3.1**.
The functionality and effectiveness of electric fences strongly depends on their correct installation and careful maintenance.

In **Section 3.2** an experiment is presented which illustrates how the correct installation of the works is a fundamental factor for their effectiveness.
Starting from the years in which bears coming from Slovenia took place, the Province has taken steps to reorganize and strengthen the system of verification and compensation of bear damages, granting and supplying prevention works.
If the instrument of compensation of damages is important as a factor of conflict mitigation, the actions aimed at preventing them are even more important, as they provide proactive responses and greater involvement by the public administration.
Twenty years after the start of the new Trentino bear population management, it has been verified whether and to what extent the systematic supply and installation of prevention works has contributed to a reduction of the average number of damage per bear (**Section 3.3**).

Finally, in **Section 3.4** the first phase of the experimentation of an integrated system of dissuasion and re-education of problematic and harmful bears is synthetically presented through an automatic system based on the availability of marked bears with radiocollars.

2. THE PRESENCE OF PROBLEM BEARS IN THE TRENTINO POPULATION

2.1 Analysis of the distribution of the amount of damage in relation to the individuality of the bears and the fate of the bears considered problematic

Out of a total of 104 bears taken into consideration (genetically identified on damages), 33 never made themselves responsible for any damage (32% of the population sample), while 16 carried out

more than 2.5 genetically certified damages per year of their life and were considered harmful bears - problematic.
It is possible to appreciate how the number of subjects considered problematic is very concentrated and represents 15% of bears present in the Trentino population between 2000 and 2018.
This percentage drops to 11.6% if weighted for the years of presence of each subject in the population.
In the Trentino population the frequency of harmful bears is higher in the case of males (n = 14), than in that of females (n = 2) and is mainly regarding young males.
The problem bears in the Trentino population showed a short life expectancy. Out of 24 bears defined as problematic, there are e currently alive. The causes of death include road investments (n = 1), the reduction in captivity (n = 2); poaching (n = 3); capture activities (n = 3) and "control removals" (n = 5).
To these are added 2 cases of definitive emigration outside the distribution area of the Trentino population and 5 cases of definitive but not documented disappearance.
The average age of death / disappearance / emigration is 8.0 ± 4.5 years in the case of females and 3.8 ± 1.97 years in the case of males.

2.2 Description and quantification of emergency team activities and their effectiveness

From 2007 to 2018 the emergency team has been called 428 times (78 man/days per year) following situations of conflict between man and bear, mainly occurring in cases of damage or excessive confidence of the bear against the man or anthropic structures.
In 19% of the cases (80 events) the team was able to visually contact the bear and on 50 occasions (63% of the times in which the bear was spotted), to carry out the aversive conditioning.

The bears on whom it was decided to intervene and who were identified by genetic analysis or marking, are 17 (12 females and 5 males), but only on 7 of these it was possible to carry out dissuasion actions.

Based on the information currently available on the deterrent actions carried out by the emergency teams, it is not possible to highlight any significant effect of the actions themselves on the behavior of bears considered problematic.

3. VERIFICATION OF THE EFFICIENCY OF PREVENTION WORKS

3.1 Analysis of the behavior of the bear in the presence of prevention works at different levels of correct installation

To assess the importance of the correct installation of a prevention work an electrified fence with different and progressive degrees of correctness of installation and electrification was used.
The index of "bear daily attendance of the fence", as well as the number of times a bear has been successful in taking food from inside the electrified fence, has progressively decreased with the progress of the correctness of the installation methods of the fence itself and of the consequent effectiveness of the fence protection.

3.2 Analysis of the evolution of the extent of the damages in relation to the growth of the bear population and the number of prevention works installed

The costs incurred annually by the administration for damages compensation have grown with the progressive increase in the number of bears in the area.
But over time, the average cost, in terms of damage per animal has been gradually reduced.
In a hypothetical future situation in which the number of plantigrades can be considered stable in relation to the carrying capacity of the territory, the average costs related to compensation can be estimated on average 2000 - 2500 € per bear/year.

Overall, predatory events affecting beehives accounted for 38.0%, those for livestock for 35.4%, those for agriculture for 19.9%.
Damages to livestock, in terms of predation events that occurred, involved 49% sheep, 11.2% goats, 3.8% cattle, 5.7% horses. and for 25.5% the poultry patrimony, thus confirming how the sheep and goats are the domestic most at risk.
In the period 2005 - 2018 a total of 1,894 damage events were verified, for an average annual number of 135 ± 36.1 and with a slightly increasing trend.
In the same period, a total of 1,616 prevention works were granted.
The average number of prevention works granted annually during this period is 115 ± 35.0, for a total value of around € 644,000.

To assess the effectiveness of the prevention works, the number of damage events has been correlated with the estimated size of the bear population and with the number of functioning prevention works present in the territory in each year.
The analysis shows a significant and inverse relationship between the average annual number of damage events and the number of active prevention works, taking into account the variation in the size of the bear population, confirming the utility of investments in prevention works.

3.3 BearFence project: testing of an integrated deterrent and rehabilitation system for problematic and harmful bears

The goal of BearFence project is to provide a hi-tech system for the defense of specific and high value resources and to operate deterrent and reconditioning activities for harmful bears in order to "re-educate" them to a less confident behaviour towards man.

BearFence is based on the integration of radio and magnetic technologies to create virtual protective fences.
The system is able to detect the presence of radio-labeled bears in proximity to the resource to be defended (or to the situation in which it is appropriate to effect a negative conditioning to the subject), activating a random sequence of dissuasion actions.

At present the system was produced as a prototype and was tested in controlled conditions and in the field.
A future assembly phase of the system is planned on GPS radio collars, which will be used on confident and harmful bears to start testing aversive conditioning.