

Executive Summary - Results

Background:

In the area targeted by the project (see map 1)¹, brown bear subpopulation and habitat are suffering from severe pressure, degradation and disruption, related to the construction of a 72km highway branch “Siatista – Ieropigi/Krystallopiigi”, which is connected to the Egnatia highway (TENT) network. This large infrastructure has severe consequences upon brown bear habitat and population integrity in the area.

¹ All maps and photos mentioned in this chapter are included in Annex I of this (Final) Report.

From 2000 traffic accidents involving brown bears (*Ursus arctos*) evolved into both an important cause of human caused mortality for this carnivore in Greece, and into a serious threat for public safety. According to several memoranda submitted to the competent authorities by environmental organizations, (including "CALLISTO") there have been 26 fatal road accidents involving bears from 2000 to 2010, 19 of which occurred along the Egnatia Motorway network. Fortunately, no human lives were lost in these accidents.

The frequency of traffic accidents was increased immediately after the construction company handed over the road to traffic in June 2009. During 2009-2010, in the above mentioned areas, there were eight (8) cases of traffic accidents with bears, out of which six (6) died in the end. In summer 2010 an adult male bear (5 years old and weighing about 120 kg) died in a road accident. In this part of the motorway, from 2009 to 2013, totally 19 fatal traffic accidents with bear victims were recorded (see map 2).

The fence along the road was a conventional one (1.60 meters height only, see photo 1). Moreover, apart from the insufficiency of the fence, no special wildlife passages had been built, nor distinct warning signs and artificial deterrents aiming at keeping wildlife away from the roadway had been installed, putting the life of both drivers and animals in danger (see photos 2

and 3). Actually, the motorway builders had not taken under consideration the presence of bears and other large mammals in the area.

In the same time, in the prefecture of Kastoria there has been an increase in the number of bears that tend to approach residential areas (e.g. villages of Nestorio and Klisoura). In order to address these incidents, specific preventive measures are required: These measures need to be deployed according to a precise technical protocol, depending on the case and the complexity of each incident. It was absolutely necessary, therefore, to establish and operate a special "Bear Emergency Team" (BET), which could intervene to such cases, either providing advices to local authorities (e.g. on management of garbage dumps or small orchards close to villages), or undertaking implementation of recommended methods and techniques (relocation, aversive conditioning).

Moreover, in the district of Kastoria, the agricultural sector (farming, animal breeding, and apiculture) plays a very important role for the economic and social life of the community. The damages caused by bears on livestock, apiaries, fruit trees and crops are a significant nuisance in rural areas and sometimes result in illegal methods of human caused bear mortality.

Finally, environmental education programs, awareness-raising campaigns, mobilization of volunteers and involvement of stakeholders, are essential actions for the successful implementation of conservation measures.

Project objectives:

- Improvement of *Ursus arctos** conservation status in terms of habitat condition and especially population levels and trends in relation to the major threats related to transportation infrastructure, traffic and human caused mortality.
- Maintain bear human caused mortality at a sustainable level not exceeding 4% of the minimum estimated population in the area targeted by the project.
- Maintain the number of the yearly reproductive females no less than the 10-12% of the minimum estimated bear population in the area targeted by the project.
- Improvement of drivers' awareness level on the risk of traffic accidents and subsequent minimization of bear traffic mortality.
- Improvement of the awareness level of specific target groups on the existing preventive measures and tools and subsequent minimization of bear-human conflict levels.

- Acquisition of know-how by local authorities on specific and concrete monitoring and management tools dealing with the conservation and management of brown bear.

Actions and means involved:

The project was implemented between October 2010 and September 2015 in Kastoria Prefecture, with emphasis given on areas of permanent or seasonal presence of brown bears. Main actions and means involved were the following ones:

- Establishment and monitoring of specific mitigation measures related to traffic mortality risks.
- Bear population systematic monitoring and analysis of genetic status
- Establishment and operation of a Bear Emergency Team
- Establishment and operation of a self-sustainable unit supporting on a long term basis a certain category of preventive measures (i.e. guarding dogs)
- Enhancement of possibilities for preventive measures propagation and implementation through networking
- Operation of a long term supporting mechanism facilitating awareness process of local communities, information diffusion and implementation of preventive measures (i.e. guarding dogs)

- Seminars, awareness campaigns and production of printed material
- Development-implementation of environmental education programmes
- Improvement of conditions for preventing forest fires during critical periods
- Restoration-cultivation of old orchards present in the brown bear habitat
- Mobilization and activation of local people and other citizens/volunteers (eco-volunteering)

Main outputs-results of the project:

The most important achievements of the project are presented below, categorized under the 3 major set of actions that have been implemented:

Reducing - eliminating the phenomenon of road accidents involving bears:

- Using radio-telemetry data from nine (9) radio-tagged bears and other input from in situ extensive surveys conducted by CALLISTO for identification of sections of the road and highway network with a high risk of bear traffic fatalities, 5400 optical Wildlife Warning Reflectors - WWR (deflecting the light from headlights of approaching vehicles towards the roadside to create a constantly changing optical warning fence, which prompts large mammals to stop moving or to flee back into the woods/fields) and 22 Warning Road Signs – WRS (alerting drivers to potential collision with bears and other wildlife species) were installed along

the newly constructed highway as well as the old national and county roads network. See photos 3 and 4 for the two types of WWR and photos 5 and 6-7 for the two types of WRS (for the highway and secondary/county roads, respectively).

- Following successful pressure by CALLISTO, EGNATIA ODOS SA (the company that constructed the highway) installed additional warning signs at crucial points of the highway segments (see photo 8).

- EGNATIA ODOS SA proceeded with the installation of an upgraded 130 km bear-proof fence (see photo 9). The new fence has been constructed according specific standards with a height of 3 meters, and reinforced, galvanized fencing wire. The distances between the piles, which have been fastened on the ground with concrete, are maximum 2 meters.

- Moreover, radio-telemetry operation and regular inspection surveys of the mitigation structures to investigate status and detect use by bears, in synergy with a research project in which CALLISTO participated as partner too (ALPINE), documented the functionality and attractiveness of the mitigation structures along the KA45 highway segment and identified the precise use of underpasses by the radio-tagged bears (see photo 10).

- Finally, the monitoring of brown bear population and distribution status and trends in the project area offered evidence that (a) the bear population in the project area is considered genetically robust, (b) the minimum estimated abundance is 97 individuals, and (c) the global population size estimation is 220 individuals. These findings show that the bear population in the project area has been maintained stable (see photo 11).

Addressing incidents of bears approaching populated areas and supporting implementation of prevention measures to minimize bear caused damages:

- Following a preliminary assessment of damage caused by bears in the project area (during which 54 individuals were contacted in 23 rural areas), as well as the results of the aforementioned radio-telemetry operation, which provided the project team with additional information, thirty two (32) electric fences (see photo 12) and forty (40) bear-proof garbage containers (see photo 13) were placed in sectors with high risk of human-bear conflicts.

- Following a preparatory phase during which a Livestock Guarding Dog (LGD) owner registry was created (data and useful information were retrieved from databases of all registered farmers provided by the General Directorate of Rural Development as well as the Veterinary Services of the Region of Western Macedonia), a network of LGD owners was developed (23 participants – see photo 14). Whenever a dog owned to a member of the Network was giving birth to puppies, the relevant info was provided to both ANKAS and CALLISTO, who in turn were informing the other members of the network possibly interested in adopting the LGD puppy/ies (giving also details on condition of the puppy/ies, gender, etc.). The requested puppies were transported either by the interested receiver or the facilitator of the Network employed by CALLISTO. Moreover, during the action's implementation period, an expert (veterinarian), staff member of CALLISTO, provided technical support to the implementation of the action by paying visits to members of the Network, for confirming the quality of the dog/s and for providing advices and veterinarian care for free. Following this procedure, facilitating and monitoring the LGD Owners' Network, twenty eight (28) LGDs were provided to livestock breeders for free, during the project's implementation period. The LGDs provided preferably belong to local breeds (see photo 15 for a typical dog belonging to the "Ellinikos Poimenikos" breed and photo 16 for one belonging to the "Molossikos Ipeirou" breed).

- A Bear Emergency Team (BET), consisting of 2 experienced veterinarians and 2 biologists, dealt successfully with fifty seven (57) cases of bear-human interactions which occurred within the project area (average: approx. 20 cases/year): 18% concerned traffic fatalities with bears and vehicles (see photo 17), 52% concerned the overall damage incidents on agricultural production, 3% concerned poaching cases and finally 25% concerned bears approaching human settlements at unusual hours of the day or distances (see photo 18)

- Moreover, the operation of the BET was officially adopted by a Common Ministerial Decision (Ministers of Environment and of the Rural Development and Food) for management of incidents involving human-bear interactions. Green Fund (a national organisation supervised by the Ministry of Environment, which finances environmental activities and initiatives) will cover the costs of future interventions when necessary.

- The project actions contributed substantially to the activation of the Measure 216, Action 1.1 of the Greek Rural Development Programme (RDP) 2007-2013, under which beekeepers and livestock breeders received financial support, in order to cover the cost of purchasing and installing portable electric fences devices, as a means to prevent bear damages on their properties. The measure, which was inactive till June 2012, was implemented after successful lobbying by the project partner CALLISTO and meetings organized in Athens with staff members of the RDP's Managing Authority.

Increasing/enhancing public awareness on the aforementioned issues and dissemination of results:

- Intensive media work was organized during the implementation of the project: Sixty seven (67) publications have been recorded in local, national and international press. Much more have been published in web media.

- The project partners printed and disseminated more than 38.000 copies of informative leaflets, brochures (see photo 19), best practice manuals, as well as 2.500 copies of posters, regarding different aspects of coexistence between bears and humans, including application of preventive measures (see photo 20).

- More than 14 information meetings and seminars were conducted, targeting either the broad public or special groups of stakeholders (agriculture professionals, livestock raisers and bee-keepers, hunting associations, local authorities' employees etc.). Timing of the seminars in combination with face-to-face communication with agricultural professionals addressed real problems in real time (see photo 21).

- An "Eco-Volunteers Programme" was established in the project area, through which more than 100 volunteers were activated. They disseminated leaflets, conducted special meetings (15 in total) and informed more than 500 visitors and residents of the area (see photo 22).

- Moreover, volunteers recorded abandoned orchards in remote mountainous areas while in spring 2015 they supported cultivation and pruning works in a couple of them (see photo 23).

- Thirty (30) environmental education actions were implemented in the project area: 18 actions for 307 primary school students, 9 actions for 71 secondary school students, and 3 actions for 60 adults. Educational activities were starting with presentations and discussion on the natural values of the region, the flora and fauna of the area and the problems of bear/human coexistence (see photo 24). They were followed by site visits in representative bear habitats and "hot spots" of bear/human conflicts.

- An International Symposium on «Transportation, Infrastructure and other categories of bear - human conflicts» was organized by the project, 6-8 February 2015, in Kastoria. Seventeen (17) speakers from Greece, Spain, Italy, Romania, Portugal and Bulgaria covered relevant subjects. More than 140 participants attended the Symposium (see photo 25).

- Analysis of local people attitudes about coexistence with bear and follow-up surveys on the local people perception of human-bear coexistence, offered valuable feedback for the proper implementation of all conservation and dissemination actions of the project.

- The operation of the project's website contributed considerably to the improvement of the awareness level of the local people and to informing specific target groups on the existing preventive measures and tools. More than 19.000 visits to the project's website (<http://www.arctoslife.gr/>) were recorded.

- Finally, networking with other LIFE Projects in Greece (EX-TRA, PINDOS/GREVENA) and abroad (ANTIDOTO, STRADE, MEDWOLF, BEAR DEFAGMENTATION etc.), participation in international conferences (IENE – Infra Eco Network Europe, IBA - International Bear Association), and exchange of visits (Portugal, Italy) contributed also to the transfer of expertise and of best practices and to the establishment of cooperation with organizations and projects dealing with brown bear conservation and human/large carnivores conflicts (see photo 26).

Please see *Annexes I and X that accompany this (Final) Report*: Annex I illustrates with maps and photos the results mentioned above, while Annex X includes a Gantt chart, which presents an overview of the project progress during all its implementation period, including the 15-month extension.

-