



## LAYMAN'S REPORT

### **LIFE AMYBEAR** LIFE15 NAT/GR/001108

*Improving Human-Bear Coexistence Conditions  
in Municipality of Amyntaio*



The LIFE15 NAT/GR/001108 – LIFE AMYBEAR project is co-financed by the European Union LIFE program, the Green Fund, and the project beneficiaries.



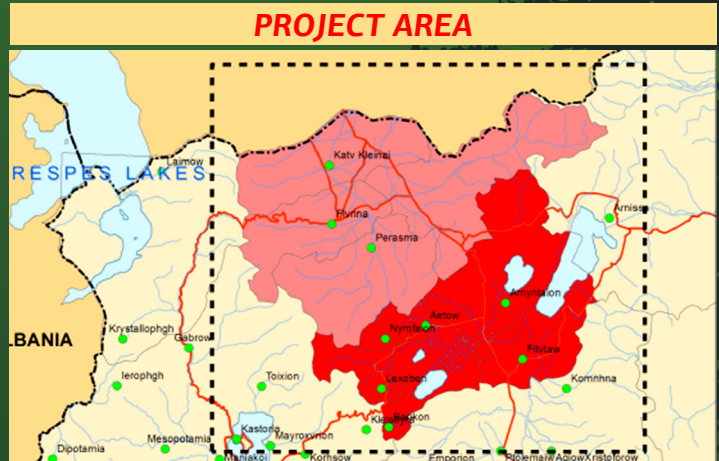
# PROJECT BACKGROUND

In Europe, for the last two centuries the bear population has been reduced by 50% and its habitat by 60%. Today, in Europe, the brown bear lives in small, isolated populations. Today, in the project area, the Municipalities of Amyntaio and Florina, the brown bear (*Ursus arctos*) population is approximately 160 individuals. However, this population needs special management. This is very important, as it may be endangered in the future by a reduction in its genetic diversity, which may lead the population to extinction

because the effective minimum population number ( $N_e$ ) was calculated lower than the limit of 50, which is considered sufficient to prevent inbreeding in the population (Frankham et al, 2002).

Bear and human are linked intrinsically as parts of the natural ecosystem. This interaction causes several problems that are known for many years now, such as damage to the agricultural economy (livestock, bee-keeping, crops), but also others that have been observed relatively recently at a remarkable intensity, such as the bear approach to settlements or car accidents increase involving bears. This intensity is mainly due to the disruption of bear ecosystems caused by infrastructure development.

At the same time, there are several positive interactions identified, such as the development of special forms of tourism around Aetos-Nymfaio, which is mainly due to the Bear Protection Centre located in the area. The increase and the dissemination of benefits in the wider area of the Municipality of Amyntaio (were Aetos and Nymfaio are based) remain of high demand, as well as one of the main objectives of the project. In this context, we managed to implement actions towards this direction, with the significant contribution of the relevant stakeholders of the region and the public.



## OBJECTIVES

The main goal of the project is the improvement of *Ursus Arctos* conservation status by achieving sustainable management of human-bear co-existence through minimization of bear-human negative interaction.

### Sub-objectives are:

- Maintain human-caused bear mortality at a sustainable level not exceeding 6% of the minimum estimated brown bear's population in the project area.
- Maintain the number of yearly reproductive females at no less than 10-12% of the minimum estimated bear population in the targeted area.
- Improve the tolerance level of specific target groups regarding their coexistence with the targeted species.
- Improvement of the awareness level on the added value of the targeted species in relation to the attractiveness of the area targeted by the project.
- Sound acquisition of know-how by the personnel of the local competent authorities on specific and concrete management techniques.

## CHALLENGES

In Greece during the past few years, the phenomenon of bears approaching settlements or residential areas is occurring more systematically. The brown bear is a very intelligent creature, and its behaviour is always shifting as it is in a constant process of learning. Thus, if a bear holds easy access to food in and around settlements, such as fruit trees, beehives, vegetables, and household waste in bins and landfills, it will continue to approach residential areas and have direct contact with humans.

The producers of the area (breeders, beekeepers, farmers) face many losses both in the Municipality of Amyntaio and in the wider area, which is very challenging for the competent authorities responsible for facing and managing the issue of bear approaching. The Egnatia Motorway along with its vertical routes fragment the single zone of bear distribution in Pindos and Rodopi. This is likely to have a significant negative impact on the genetic variability and diversity of the population in the future if no appropriate measures are taken to maintain the Brown Bear habitat. In the Prefecture of Florina, there are several recorded accidents, most of which occurred during the summer and autumn periods, when bears are very active.

**To achieve these objectives, several management actions were implemented to improve the conditions of human-bear coexistence, the most important of which were:**

- ▶ Estimation of the brown bear's population size and distribution of the species targeted in the project area;
- ▶ Identification of areas and sectors with a high risk of human-bear conflicts;
- ▶ Installation of warning signs and deterrents for a safer road network of the project area;
- ▶ Operation of the Bear Emergency Team and its reinforcement by acquiring relevant equipment;
- ▶ Installation of bear-proof refuse containers;
- ▶ Distribution and installation of electric fences;
- ▶ Development of a Stock breeder network and exchanging of Livestock Guarding Dogs (LGD);
- ▶ Development and distribution of Anti-poison first aid kits for LGDs;
- ▶ Consultation and participation of local stakeholders;
- ▶ Information and awareness actions

**LIFE AMYBEAR PROJECT HAS MADE A SIGNIFICANT CONTRIBUTION TO ADDRESSING THESE ISSUES.**



## **BROWN BEAR POPULATION AND SECTORS OF HIGH RISK OF HUMAN-BEAR CONFLICTS**

Through this project, we made a big effort to estimate the brown bear's population size and its presence/distribution, along with bear activities in the area of the Municipalities of Amyntaio and Florina.

### **Brown bear population**

In 2017, we developed and installed in the project area a network of 121 hair-traps on electric power poles to collect brown bear's biological material. A total of 500 samples were collected during 2017 and 2019.

The samples were then identified through DNA analysis to assess the bear's population in the area in 2017 and 2019. The results for both periods were identical, as 56 unique individuals were identified in both assessments, while the population size was calculated at 154 and 161 individuals by using statistical methods. In addition, the effective minimum population ( $N_e$ ) number was calculated lower than the limit of 50 individuals that is sufficient to prevent inbreeding in the population (Frankham et al, 2002).

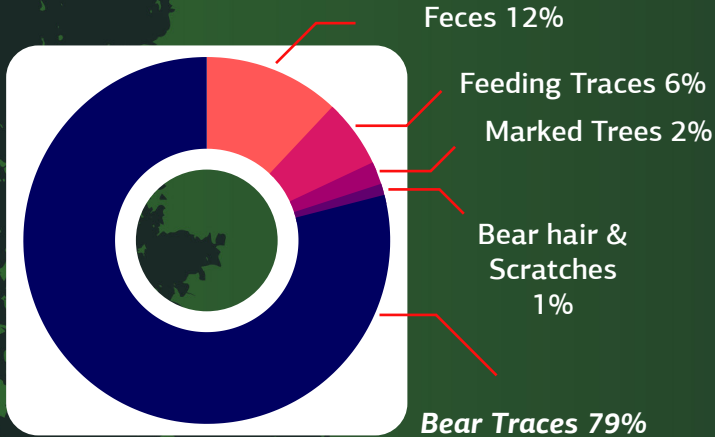


### **High-risk areas of brown bear presence**

By collecting bear bio-indices (approximately 350), installing 12 IR camera traps, radio-tagging four (4) bears and collecting telemetry data, along with collecting data in the field through the dissemination of three (3) types of questionnaires via forty (40) interviews, mapping of the potential conflict points and locations in Florina Prefecture took place and the high and low-risk areas were defined. In particular, in 2017 we conducted a systematic survey to record bio-indices evidence of the bear's presence. This survey had as a result the collection of 355 samples.

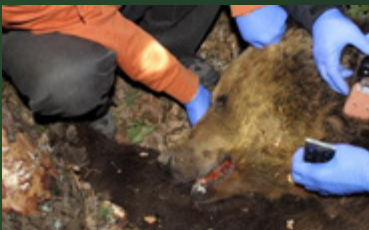


## Frequency of observation of different types off bio-indices



## IR camera traps

In order to record the presence and activities of the brown bear, we used IR camera traps. Specifically, 12 cameras with infrared sensors were used for 1,612 days and were placed in specific locations based on an adapted version of the Ancreaz sampling protocol (2012). The cameras gave 59,000 frames and 300 bear events were documented.



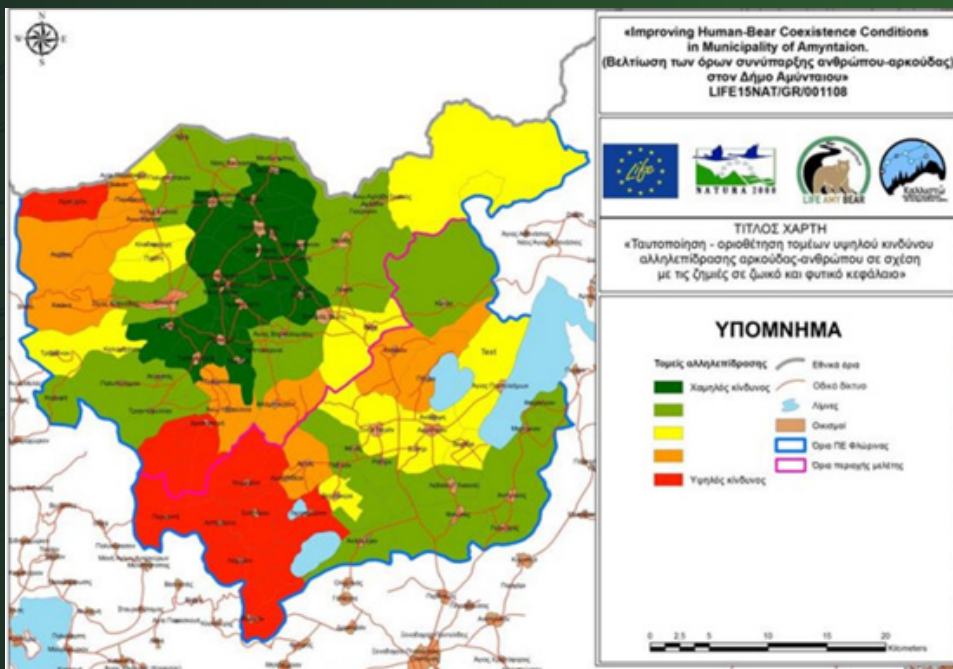
## Radio-tagging

To collect more data about the bear's movements, we radio-tagged four (4) adult male bears. The duration of bear monitoring ranged from two (2) weeks up to six (6) months. In particular, we analysed 6,128 radio locations.



## Interviews

Lastly, we conducted 40 interviews with livestock owners-producers to gather information about bear approaching and the losses/damages that it has caused. As a result, we identified the high-risk areas of negative human-bear interaction (conflict) in the project area, to improve and upgrade the location of the management measures that will be selected to minimize such conflicts and their effects on bear population and losses in agricultural production (which is also linked to economic losses) in terms of the human factor (Map).



Mertzanis Y. et al., 2018 LIFE15 NAT/GR/001108 - Action A3

# HUMAN-BEAR CONFLICT

The conflict with large carnivores is one of the most difficult issues often faced by bodies involved in the management of protected areas. Also, in many cases, it affects local population opinion and acceptance of the overall conservation and management efforts in the project area. The main reason a bear is constantly moving is the need for food. In this context, through the LIFE AMYBEAR project, we implemented several actions towards dealing with human-bear conflicts in high-risk areas.

## *Bear-proof refuse containers*

Easily accessible food resources near settlements are the main reason for attracting bears. Therefore, it is important to prevent bears from accessing household waste, compost bins, orchards, hives, animals, and other food sources located in settlements. To deal with the waste problem, we installed 22 special metal shells in seven (7) local communities/settlements of the Municipality of Amyntaio, where a bear appearance has been identified and recorded.





## Electric Fences

Another important problem of the human-bear conflict is the damages caused by the latter to the livestock capital. A useful tool for the control of livestock and beekeeping facilities is the electric fences (e-fences).

For this reason, we acquired 54 e-fences, out of which 38 were given to beekeepers, livestock breeders, and farmers in the area, and the rest were kept by the project beneficiaries, to be given in case of bears approaching settlements or places of agricultural activities, in the future.





## **Livestock Guarding Dogs (LGDs) Network**

Furthermore, in order to prevent losses in livestock, we successfully implemented the action of development, extension, maintenance, and support of the Breeder Network for the donation/exchange of Livestock Guarding Dogs (LGD).

This network consists of 52 Livestock Breeders and the core network includes 29 LGD owners. In total, 66 pups from two to three months old, and twelve (12) adult dogs of the two Greek shepherd breeds were donated.

Moreover, 15 network breeders continue with the exchange of LGDs. The project's field team has made the necessary contacts between livestock breeders that own good LGDs, and the efforts of expanding and renewing the network members is still ongoing.





## BEAR MORTALITY

The most common cause of death of the brown bear is of human origin and in particular through illegal killings or car accidents. Both illegal killings and road accidents pose a threat to the health (and life) of the local residents and their animals and of course the health (and life) of drivers and passengers of vehicles. Thus, during the project, measures to eliminate the above-mentioned issues were taken.

## Anti-Poison First Aid Kit

The illegal use of poisoned baits to kill animals that cause damages to agricultural production has several negative consequences, such as the loss of Livestock Guarding Dogs, and other wildlife animals, as a collateral loss. Through our project, we managed to actively support livestock breeders of the project area by creating an anti-poison first aid kit, which contains all the necessary medicine and related consumables for treating the poisoned LDGs. A total of 680 kits were donated in 47 settlements. Our partners made meetings, where people were informed on how to use the kit.

**In that way, until the end of the project, we managed with the use of 51 kits to save 25 LGDs and 2 hunting dogs.**



## Installation of warning signs and deterrents for a safer road network

In Florina Prefecture between 2003 and 2021, the recorded traffic accidents with bears that resulted in the death of the animal, amounted to 31. Most of the accidents were located in the two (2) parallel roads that connect Amyntaio with Vevi. Twelve (12) incidents have occurred on the New National Road and five in the old National Road.

## Warning Signs

To prevent car accidents with wildlife, we installed 28 warning signs, small, medium, and large signs, in a total road length of 41.85 km, which inform drivers about the possible bear passage.



## Virtual Fence

In addition, a special virtual fence was installed consisting of Visual and Acoustic deterrent in the New and Old National Road of Amyntaio-Vevi with a total length of 13.24km. The virtual fence's efficiency is very high, as 86% of the wild fauna did not cross the road network, according to the installed monitoring system!

Moreover, the effectiveness and impact of the warning signs were tested through the distribution of a questionnaire.

**SINCE THE INSTALLATION OF THE SIGNS AND DETERRENTS, IN JUNE 2020, NO BEAR ACCIDENT HAS BEEN RECORDED IN THE PROJECT AREA UNTIL FEBRUARY 2022.**



### OPINION

### PERCENTAGE OF THE PEOPLE THAT AGREE WITH THE OPINION

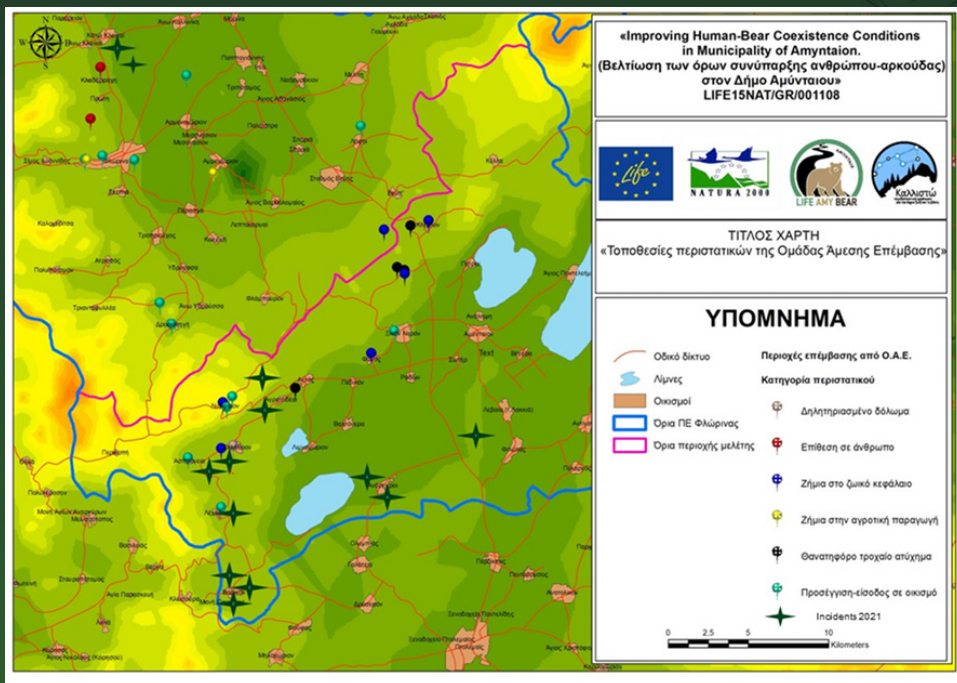
Driving behaviour changed at the sight of the signs (speed reduction).	90%
The installation of such signs on the road network is considered appropriate.	86%
I have seen at least one of the signs installed.	79%
I consider that road network measures are either not implemented or are partially implemented.	98%



## BEAR EMERGENCY TEAM

A very important action of our project was the operation of the Bear Emergency Team (BET). This group was formed following the provisions of the relevant articles (4 and 5) of the Greek Official Gazette 272/07-02-2014.

For five (5) years, the BET has intervened in 53 incidents of human-bear interaction in the project area. Specifically, 11.5% of interventions were related to road accidents, 25% related to damages to agricultural production, 3.85% related to cases of bear attacks that lead to human injuries, 7.69% to cases of bear release, and 44.2% to cases of bears approaching in residential areas.



Mertzanis G., 2020, LIFE15 NAT/GR/001108 - Action C4

**In order to strengthen the operational capacity of the newly established BET, equipment was acquired including:**

- one (1) vehicle for the consistent, efficient, and timely transition of BET to the areas of human-bear interaction,
- 45 waterproof boxes of special equipment (bangers, screamers, whistlers, whistlers with silver comet, scarecrow, horns),
- as well as other equipment necessary for its effective intervention.



A general assessment of the BET presence and operation in the framework of the project had a positive impact on the attitude and tolerance of local communities regarding the presence of bears and aided to achieve, to a satisfactory degree, mitigation of the two (2) fundamental threats to bear population: anthropogenic mortality, and negative attitude of local communities towards bears.





# ACTIVITIES FOR THE PUBLIC...

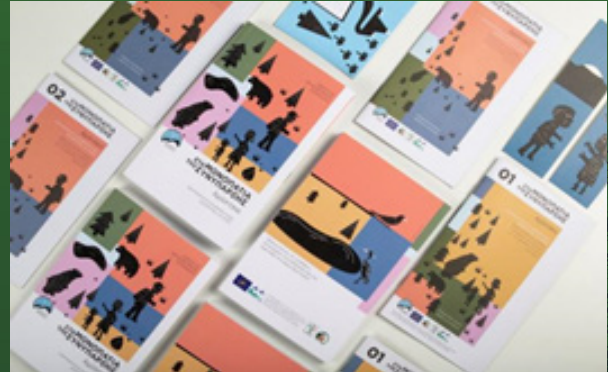
## On the TV

As part of the project, a video was created to promote and disseminate the main objectives of the project to the public about human-bear coexistence. The TV spot was broadcasted on two (2) local TV Channels.



## On Environmental education Activities

A very interesting activity was the one defining two thematic trails in the Study area, "The trails of coexistence". Orientation signs and environmental interpretation boards were placed along the paths. Also, to enhance the dissemination of the action, brochures and an education guide were produced, which were addressed to teachers, environmental education specialists, and students. Three (3) seminars were implemented, as well two (2) virtual tours, one for each path to have a better outcome concerning public awareness on environmental issues.



## On the radio

During the project, two (2) radio spots were created; the one elaborates on the traffic accidents that take place on the road network and the project actions to deal with them, and the other one presents the all the main actions of the project. The broadcast was made by three (3) radio stations.



## **...AS WELL AS FOR STAKEHOLDERS AND OTHER LOCAL COMPETENT AUTHORITIES**

### ***Interviews***

In the context of identifying stakeholders and their relevant roles, 32 interviews took place with members of key stakeholder groups (farmers, beekeepers, members of environmental organisations, local government, chambers, etc.). Essentially, a recording of the current situation and first identification of the strengths and weaknesses of those involved was made. As a result, five (5) focus groups were formed, focusing on the bear approach to settlements, electric fences, and LGDs. These groups met to exchange views, experiences, and to assess any obstacles towards the implementation of practices.

### ***Meeting with Stakeholders***

A series of events-consultation took place during the entire project. A total of 11 workshops were organized, attended by more than 150 representatives of local stakeholders. The purpose of these events was to present stakeholders' perceptions and behaviour, to present the project's practices, to discuss how their implementation will be achieved in the project area, as well as their participation in the adoption and implementation of best practices, and the adaptation of project activities at a local level.

### ***Trainings***

Two (2) trainings were conducted for the Forest Service Staff, and other bodies involved in bear population management incidents, to be informed about the importance of the project actions that could be used as a tool for protection and coexistence.

### ***Surveys***

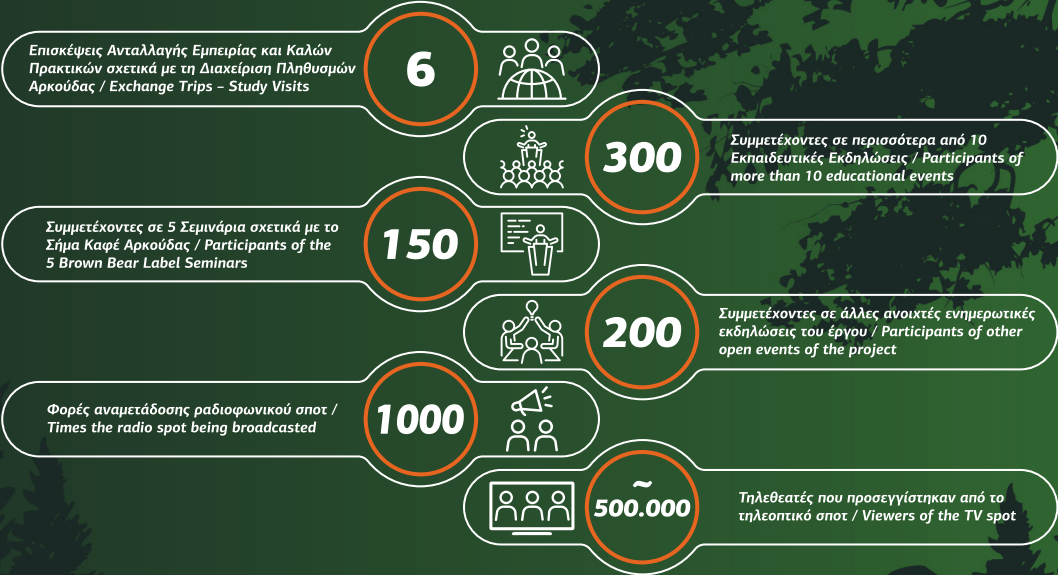
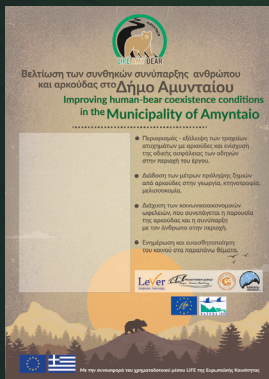
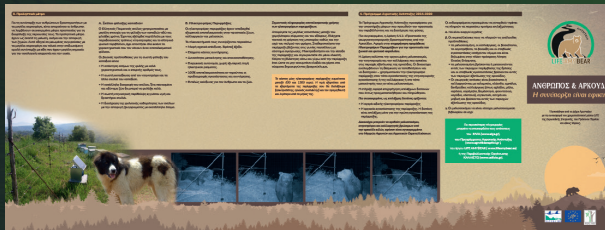
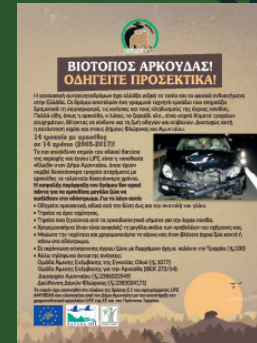
Surveys on stakeholders' perceptions and attitudes towards bear protection and management were conducted by distributing questionnaires. In particular, five (5) opinion polls were performed, and more than 600 questionnaires were collected and processed.





# Promotional Material

In the framework of the LIFE AMYBEAR project, a very rich informative material was created with the production of three (3) leaflets with several thematic areas, posters, information boards created to inform and raise awareness of the public and local bodies, as well as disseminating the project's objectives.



## “Brown Bear” Standard and Label

A very important achievement of the project was convincing the businesses of the project area to recognize the brown bear, as a species that holds not only environmental but also economic value, thus adding value to their products/services that apply specific bear-friendly practices. To achieve this, we created the Local Quality Label “Brown Bear” to certify and promote bear-friendly products and services. The impact of this action is expected to have long-term sustainable results that will continue after the end of the project.

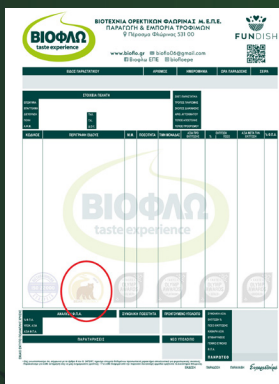


“Brown Bear” Quality Label Awarding Ceremony



Our main goal was to inform, raise awareness, mobilise and train local businesses. Therefore, we organized a total of five (5) information events and training seminars. The result of these was to guide in cooperation with the Chamber of Florina, which agreed on being the Management and Certification Body of the Standard, the businesses that expressed their interest in receiving the Local Label.

The Local Label “Brown Bear” was awarded to 15 companies, members of the Chamber of Florina, which managed to comply with the Standard’s requirements.



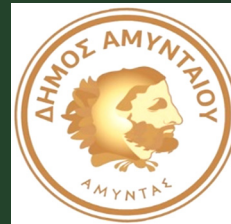


**Coordinating Beneficiary:** LEVER Development Consultants S.A.

**Associated Beneficiaries:** Municipality of Amyntaio, CALLISTO - Wildlife and Nature Conservation Society, Decentralized Administration of Epirus and Western Macedonia Directorate of Forests of Florina Prefecture

**Budget:** 1,521,156 € (75% EU Contribution): 1,140,116€

**Project Duration:** 01/10/2016 – 30/11/2021 (62 months)





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