

ASSESSMENT OF THE ILLEGAL USE OF POISON BAITS IN THE NATURA 2000 SITES FOR THE EGYPTIAN VULTURE IN GREECE AND BULGARIA FOR THE PERIOD 2003-2012

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Executive summary

Illegal actions in human behaviour such as that of illicit poisoning, which arises from human–wildlife conflicts threatens both the sustainable management of ecosystems and the conservation of biodiversity. Even though vultures aren't themselves target species for poisoning they are extremely vulnerable because they are scavenger species and may feed on carcasses of poisoned animals.

This study aims to assess the use of poison within the study area that covers 27 Special Protection Areas (SPAs) in Bulgaria and continental Greece and to demonstrate the scale of the problem to the responsible authorities. Qualitative data were collected within face-to-face interviews with the two principal groups: i) land users (comprising farmers, hunters and livestock breeders) and ii) agencies which comprises public services involved with the prevention, control and diagnosis of poisoning incidents (forestry and veterinary services, police and municipalities), NGOs, private veterinary clinics and private stores holding pesticides.

The use of poisoned baits was confirmed by 62.67% of land users and 80.91% of agencies in Greece. However the use of poisoned baits was confirmed by only 7.63% of land users and 27.91% of agencies in Bulgaria. The Bulgarian interviewees mentioned mainly non-intentional poisoning arising as a consequence of the intensive use of pesticides and rodenticides, particularly in North Bulgaria; although this is a legal action it has a negative impact on wild mammals and vultures. Even though this study aims to assess the levels of intentional poisoning, it also recorded information on the secondary poisoning of wild mammals and vultures caused by the use of pesticides.

In Greece, the main social groups indicated as responsible for the use of poison baits based on the answers by land owners were hunters (45.83%) and livestock breeders (29.95%) while the answers from agencies indicated that those responsible for the use of poison baits were village/urban residents (27.8%), livestock breeders (26.34%) and hunters (24.88%). Both Greek land users and agencies highlighted the main target animals for poisoning as belonging to 3 species: dogs, foxes and wolves (34.32%, 33.05% and 22.38% respectively by land users and 43.62%, 18.52% and 18.11% respectively by agencies). Shepherd's dogs were the main dogs mentioned by land users as target species while stray dogs were mainly those mentioned by the agencies. The type of bait used to kill the damaging and nuisance animals was a piece of meat poisoned either with pesticides, as indicated by both land users and agencies (59.61% and 64.60% respectively) or capsules of cyanide (20.20%) as mentioned by land users.

In Bulgaria, the conclusion that the main social group responsible for the non-intentional use of poisons was farmers came from the answers of both land users (65.3%) and agencies (47.6%), while land users said that livestock breeders were the main group responsible for the intentional use of poisoned baits (28.57%). Other animals such as livestock, herbivorous mammals, predatory mammals and especially vultures are non-intentionally poisoned due to the intensive use of pesticides and rodenticides. The control of insects and rodents are the main target groups of species for poisoning shown in the answers by land users (55.88%) and agencies (35.29%) in Bulgaria.

According to the results of the study, actions against illegal poisoning in the Greek study area should aim to resolve a quite wide list of potential conflicts. One clear example is the conflict between hunters and livestock breeders in relation to attacks by shepherd dogs on hunting dogs. Other examples that need to be resolved include the conflict of interest that arises between wild animals and human activities such as exists in the case between the interests of foxes and the hunting of wild hares or between wolves and the practice of livestock farming of sheep and goats. A final and different example is the conflict felt by both village and urban residents against the presence of stray dogs.

In the Bulgarian study area, actions against poisoning should aim to mitigate two problems. The first problem results from the intensive use of pesticides and rodenticides in agricultural practices within both the NATURA 2000 network and the buffer zone around the SPAs. The second problem arises from the conflict of interests occurring between livestock breeders and wolves, which should be resolved within the implementation of an

appropriate compensation scheme in the country.

The present study confirms the magnitude of poisoning events in the study area where the last remaining Egyptian Vultures are exposed to this threat. In both countries urgent measures to control the illegal use of poisons should be undertaken.

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Introduction

The Egyptian Vulture (*Neophron percnopterus*, Linnaeus 1758) is a medium sized opportunistic scavenger with a broad distribution throughout the southern Palaearctic and North Africa (Cramp & Simmons 1980, del Hoyo et al. 1994, Baumgart 2001). The species is listed in the IUCN Red List as globally endangered because of consistent and steep declines in its populations throughout its range (Birdlife International 2008). Especially critical is the status of the population in the Balkans, where it has declined by over 80% over the last 30 years and the population currently consists of approximately 70 pairs (Velevski et al. 2015). There is a wide range of threats that the Balkan population faces in its breeding grounds and along its migration flyway. The main threats include non-intentional poisoning, disturbance, lead poisoning, electrocution by power lines, collisions with wind turbines, reduced food availability and habitat change as well as direct persecution (Kurtev et al. 2008, Grubač et al. 2014, Angelov et al. 2013, BirdLife International 2014, Arkumarev et al. 2014, Galanaki et al. in prep.). However, the illegal albeit non-intentional poisoning of Egyptian Vultures is considered to be the main threat affecting the Balkan population in its breeding grounds (Andevski 2013, Dobrev & Stoychev 2013, Xirouchakis 2014).

The present study aims to evaluate what the initial conditions are regarding mortality factors affecting Egyptian Vultures in NATURA 2000 sites (SPAs), which are important for the species in Greece and Bulgaria (both countries together hold ca. 60% of the population in the Balkans). Knowledge of the principal mortality factors is a basic requirement to properly target conservation and dissemination actions. Because it is the most important threat to the species special attention was given to non-intentional poisoning of vultures by assessing both the recent and historic use of poisoned baits. The assessment refers to the period 2003-2012 and it was done in both Greece and Bulgaria. Different variables were collected from answers given in interviews carried out with both local people and local authorities, NGOs, etc. The interviews addressed issues such as the actual impact of poison on the Egyptian Vulture and other sensitive and endangered species, types of poisoned baits used, evaluation of predator damage to stakeholder activities and the methods available and commonly used to reduce these damages. Incidents reported by interviewees were used in the implementation of the current LIFE Action C1, which is related to planning for the use of patrols of “anti-poison” dog units. In this report an historical overview on the use of poisoned baits is included along with the methods, results, discussion and conclusions of the current study. It is the first study on this subject done at a trans-boundary level and covers both a wide region per country and a diverse sample of interviewees.

In Greece, studies on similar subjects have been done in a range of sites under parts of the current LIFE project. In the framework of the LIFE NAT 97/GR/04249 project, the use of poisoned baits was estimated in continental Greece for the period 1998-2000 during a survey to determine wolf presence by means of interviews (Iliopoulos 2000, Arcturos). In the framework of the LIFE07NAT/GR/000291 project, an assessment of the use of poisoned baits and their impact on brown bear was done in the Grevena prefecture for the period 2007-2009 (Tragos et al. 2010). Moreover within the framework of LIFE+09NAT/ES/000533, an assessment of bear and wolf damage in agricultural production was done in Antichasia-Meteora and in Koziakas where an estimation of the use of poisoned baits was presented (Kraboboukis 2011).

In Greece, a National Anti-Poison Task Force (NAPTF) was created in June 2012, which operates under the coordination of the Hellenic Ornithological Society (HOS) with the participation of several environmental NGOs and agencies participate including the Hellenic Society for the Protection of Nature, WWF Greece, Anima, Arcturos, Callisto and the Natural History Museum of Crete. In December 2012, a policy document was prepared, where a collection of poisoning events from all the NGO databases was presented along with an evaluation of the weaknesses and gaps in the existing administration and legislation, and concluded with a list of proposals (Korbeti et al. 2012). This document was used to motivate Ministries to act and provide measures against the illegal use of poisoned baits. The work of NAPTF continues to be coordinated by HOS and is part of Action C1 of this LIFE project.

In Bulgaria, even though the majority of known mortality cases in vultures are due to poisoning (Dobrev and

Stoychev 2013, Demerdzhiev et al. 2014) the problem with poisoning of wildlife is not considered to be as serious as it is in Greece. In addition there have only been fragmentary studies on the subject in Bulgaria up to the present date. During the first LIFE project in Bulgaria, with the title “Save the Raptors” (LIFE 07 NAT/BG/000068), evidence was collected that documented cases of mortality of Eastern Imperial Eagles due to poison baits used by pigeon keepers. Under the programme LIFE for Kresna Gorge (LIFE11 NAT/BG/000363) research was done on the methods used by people managing livestock herds to decrease the depredations done by wolves in south-western Bulgaria (a region where poisoning incidents occurred the last decade) in order to minimize the use of poisons (Stoynov et al. 2014). A long-term study on the diet of wolves and the damage caused by this species to livestock in the Eastern Rhodopes was implemented in the framework of the project “The New Thracian Gold”. Information on the impact and use of poisons in Bulgaria was presented in the National Species Action Plan for the Egyptian Vulture (Kurtev et al. 2008) as well as in the National Species Action Plans for the large vultures developed under the LIFE+ project “Vultures Return in Bulgaria” (LIFE08 NAT/BG/000278) and the Action Plan for the Wolf in Bulgaria which are both still under preparation. There are not any nation wide initiatives aimed at solving the poisoning issue in Bulgaria even though the problem has been widely discussed among different NGOs and representatives of the state.

Overview of the poisoning history in Greece

The first known reference on the use of poison baits for predator control (mainly for mammals such as foxes or wolves but occasionally also for birds, insects, etc) in Greece dates back to 1927, which in a hunters book the author explained that the best way to kill foxes was to use “a dead cat covered with strychnine” (Ilyadis, 1927). In the same year we find another reference to poison baits, this time to kill wolves (Zervas, 1927), although here, the author also highlights the danger of the method to other mammals and birds. Further references in the 1930s attest that the use of poisoned baits in Greece was quite popular and had been so from the beginning of the 20th century.

The extermination of the so called “harmful” species in that period (wolf, fox, jackal, and marten) began formally in 1924 and was implemented in any way and at any time of the year according to the Forestry Code¹. In 1939 and then subsequently by annual published circulars the Ministry of Agriculture regulated the control of “harmful” species with traps or strychnine. The Forestry Code of 1969² allowed the Forestry Services to use strychnine for the control of predators but this was done with little supervision and guidance. During 1950-1975 the widespread and prolonged use of strychnine seems to have reached critical dimensions. After this period, it was clear that the use of poison baits had been the main cause leading to the dramatic decrease or even extinction of vultures and other large raptor species in many regions of Greece. In 1981³, the matter of secondary poisoning was addressed by prohibiting the use of poisons endangering protected species of wild fauna and native flora”.

According to the Forestry Codes that were approved during the main part of the 20th century, the use of poison baits for the control of predators was not only permitted under the supervision of the Ministry of Agriculture, but was also, for a long time, encouraged by providing a financial reward. The reward was defined by the Ministry of Agriculture and was provided by the Regional Forestry Services after evidence was presented to indicate the specific dead animals (recognizable part of the animal eg. tail, leg etc. or the number of animals poisoned by hunting clubs). After 1981, fox was the main target species for poisoning. Its control was supervised by the forestry service and was implemented by the hunting clubs. Apart from the financial reward, an intensive illegal exploitation of fox fur for trade was developed by private individuals. Some areas started to suffer from population increases of rodents because their main predator had been dramatically decreased (Chatzimichail et al. 2005).

Due to the excesses in common practice, it became apparent that the use of poisoned baits and financial rewards associated with control measures created many problems, not only in wildlife management, but also in legal terms since Greece should have been respecting both international and EC laws⁴ for the protection of rare and endangered species of fauna. Moreover, constant and often indiscriminate use of poisoned baits (even within the legal procedures of the Forestry Service) jeopardized the survival of raptors (vultures and eagles) and large numbers of shepherd and hunting dogs.

It wasn't until 1993 that the use of poisoned baits stopped in Greece after a temporary decision by the Council of State⁵ was issued and this was based on an appeal against a Ministerial decision that once again outlawed “harmful” species⁶ and permitted the culling of foxes by means of baits laced with potassium cyanide. At this point, the Ministry of Agriculture enforced the ban on using poisoned baits and ceased giving licenses for the extermination of foxes using poison. The annual hunting regulations permitted the shooting of foxes only in prefectures that had not been formally declared as infested with rats. However, the practice was by then deeply rooted in all rural areas, and thus, deliberate poisoning continued illegally in most regions where

1 Forestry code N3077/1924: art. 116-par.1b

2 Forestry code N86/1969: art. 257-par.5, art. 261-par.6

3 Presidential Decree 67/1981, art 6 for the protection of wild fauna and native flora

4 Bern convention and EU regulations 79/409 and 92/43 prohibited the use of traps and poisoned baits

5 Decisions of Council of Stat 366/1993, 540/1993, 641/1993

6 Ministerial decision 742/1993: harmful species and their population's control

predators were present. Moreover, the practice had broadened to include baits aimed at killing not only wild animals but also dogs, including stray, shepherd and hunting dogs.

After 1993, the illegal use of toxic pesticides in poison baits was intensified with a negative impact on vulture and mammal populations (Iliopoulos 2000, Skartsi et al. 2000). Up to the present day, highly toxic active substances, banned in EU but introduced illegally into Greece, are now also known to be used in baits as they have been recently identified by toxicological analysis carried out on samples taken from poisoned animals (Korbeti et al. 2012).

During 2000-2012, some laws were passed by the Greek parliament that included regulations that could serve to partially combat the practice of the illegal use of poisoned baits. In 2012, a law that regulated the prescription of pesticides⁷ was passed but has not yet been implemented, so it is impossible to identify the people who use pesticides outside their original and legally defined purposes. In 2003 and in 2012⁸ legally defined principals for good practices in the control of stray dogs were passed into law. Unfortunately few municipalities, which are the agents responsible for dealing with stray dogs, have either established kennels or systematically sterilize stray dogs. In 2010, a ministerial decision clearly described that the forestry services are responsible for public awareness and monitoring of the use of poisoned baits in SPAs⁹ but in reality they don't make any special effort to control this illegal activity or warn the public of the dangers.

Nowadays, farmers, livestock breeders and hunters are usually responsible for this human-wildlife conflict. Their reasons vary and depend not only on the level of damages and losses of crops, livestock and game but also involve exclusively human conflicts that arise between and within stakeholder groups. Although agricultural and stockbreeding cooperatives and hunting clubs are formally against the use of poisoned baits, the practice is still widespread among these groups.

The Egyptian Vulture has been one of the worst affected species in Greece. The national population of the Egyptian Vulture decreased from an estimated 250 pairs in the 1980s to only 13 territories (9 pairs and 4 single birds) recorded in 2014. In the period 2002-2013 at least 13 individuals were recorded as having been poisoned in Greece. Considering the small proportion of poisoned birds that are actually found, the number of birds that died from being poisoned is likely to be substantially higher and this suggests that the real impact of the illegal use of poisoned baits on the Greek population of Egyptian Vulture could be relatively high.

7 Law 4036/2012

8 Law N3170/2003 and Law 4039/2012 both related on privately-owned and stray pets and the protection of animals from exploitation or use for profit

9 Ministerial decision of Ministry of Environment 37338/1807/E.103/2010

Overview of the poisoning history in Bulgaria

In Bulgaria, the history of the use of poisoned baits is related to the carnivore-human conflict. Information on the use of poisoned baits in the country exists from the early 1930s when two vultures were non-intentionally poisoned by a Forestry Service agency and were sent to the King's Scientific Institutes for expert analysis (letter N0133/1.3.1933 of the King's Scientific Institutes). This practice became more systematic up to the mid 20th century when farming co-operatives were established (Boev 1985). These co-operatives kept stores with several poisons and these products were used in mass poisoning of carnivores in the country. This situation continued long after the beginning of the 1990s when the farm co-operatives were abolished. On the other hand the national campaign to poison wolves with strychnine in 1950s and early 1960s, which was carried out by the State Forestry Service, resulted in severe population declines of both vultures and large birds of prey (Hristov 1996, Iankov 2007). The prohibition of the use of poisoned baits in Bulgaria dates from the late 1960s within the Law for Nature Protection (1967-2002). The National Biodiversity Act (promulgated in 2002 and modified in 2005) currently prohibits the use of poison baits in Bulgaria.

Despite the prohibition of the use of poisoned baits in the late 1960s, non-intentional poisonings are still the main threat to vultures in Bulgaria because poison baits are still used illegally, although in a much lower frequency now than in the past (Dobrev and Stoychev 2013). A survey of the Griffon Vulture population in the Eastern Rhodopes (Demerdzhiev et al. 2014) showed that in the last 30 years, 42% of the adult and immature mortality ($n = 38$) and 35% of the fledgling mortality ($n = 17$) was due to poisoning. In 1996, 11 Griffon Vultures were found dead in the Eastern Rhodopes (Hristov 1997). For the Egyptian Vulture, 47% of the known mortality cases in the last 20 years ($n = 36$) were due to poisoning (Dobrev and Stoychev 2013). The biggest single poisoning event of Egyptian Vultures happened in 2003 in the Eastern Rhodopes when at least 5 individuals were poisoned after feeding on a dead sheep carcass which was used as poisoned bait for wolves (BSPB, unpublished data). In 2003 a pair of Egyptian Vultures was poisoned in the area of Borovitsa river valley, which is very close to "Zhenda" Hunting Reserve. In this case the bait was poisoned with strychnine and it was intended to kill wolves. Before the study period, in 1997 a pair of Egyptian Vultures from the area of Madjarovo was found poisoned in their nest and this was most probably as a result of spraying activity against insects in the area.

The main reason that causes livestock breeders and hunters to use poison is their conflict with wolves. Different conservation approaches have been used in Bulgaria to mitigate this problem (Dobrev and Stoychev 2013, Stoykov et al. 2014): These include providing stock breeders with good guard dogs; changes in the infrastructure for the management of livestock herds to reduce the number of wolf attacks; a free public anti-poison telephone alert system; the promotion of eco-friendly tourism connected with vultures that is beneficial for local communities; the creation of a Vulture Centre and communication campaigns to raise the institutional and public awareness of the status of vulture populations and the problems they experience. However, few of these approaches have been tested for their efficiency (Stoykov et al. 2014).

Study area

The study area consists of 27 Special Protected Areas (SPAs), 15 in Greece and 12 in Bulgaria (Map 3.1). The 15 Greek SPAs extend from the west to the eastern parts of northern Greece and are situated in the regions of Epirus, Thessaly, Central Macedonia and East Macedonia-Thrace. The 12 Bulgarian SPAs extend from the south to the northern parts of eastern Bulgaria and are situated in the Eastern Rhodopes, Sakar, Eastern Stara Planina, Provadiysko-Royaksko Plateau and Rusenski Lom regions. The relief is diverse ranging from high mountains to low hills and from gorges to small streams. Forest landscape dominates and is broken only by fields near villages and grasslands in plateau regions. Rock formations are impressive throughout the whole study area with the most characteristic being the granite formations in Meteora-Kalambaka, Thracian Meteora-Kompsatos and Rusenski Lom-Rousse and the limestone formations of Vikos-Aoos, Tzena-Pinovo, Paramithia Mts and others. The majority of the study area is located in remote rural regions with villages now inhabited mainly by old people. Livestock breeding, field cultivation and logging are the main occupations of villagers while ecotourism benefits the development of local communities and population growth of some villages in Epirus, Thrace or the Eastern Rhodopes. However in some areas, the intensification of these activities has caused a degradation or disturbance to the nesting and foraging habitats for Egyptian Vultures. Examples of this include intensive forestry activity, conversion of grasslands to arable fields, large-scale monocultures and mass recreational activities such as climbing, paragliding, camping alongside river banks etc. In other areas by contrast the abandonment of farming and livestock breeding has resulted in landscape homogenisation caused by forest encroachment and the subsequent decrease in food sources for Egyptian Vultures. The closure of refuse tips, especially where there was a regular disposal of offal from nearby official or unofficial slaughterhouses, has also resulted in low food abundance for the vultures.

Some other activities occur locally in the study area and their intensity is related to the level of negative impact on the nesting and foraging habitats of Egyptian Vultures. Examples include military activity (e.g. Dasos-Dadias Soufli, Notio Dasiko Symplegma Evrou), mining (e.g. Madzharovo, Notio Dasiko Symplegma Evrou) and treasure hunting activities. Wind farms have already been developed in some Greek SPAs (e.g. Koilada Deriou) and new ones are planned in other SPAs (e.g. Notio Dasiko Symplegma Evrou) or in neighbouring sites within the study area, which gives rise to an increased risk of vulture collisions with the wind turbines.

The Egyptian Vulture occurred as a breeding species in all the SPAs of the study area towards the end of the previous decade. Based on the data collected under the framework of this LIFE project, some pairs of Egyptian Vultures were found to have disappeared from certain SPAs (e.g. Koilada Deriou in Greece and Lomovete in Bulgaria), while in other SPAs, only single adults were recorded. In total 40 occupied territories were recorded in 2014 (13 in Greece and 27 in Bulgaria). Other vulture species such as Black and Griffon Vulture breed, winter or forage in the study area and a high concentration of these occur in the Greek and Bulgarian parts of the Eastern Rhodopes. Rare raptorial species also breed or winter in the study area and these include Golden Eagle, Imperial Eagle, White-tailed Eagle, Spotted Eagle, Bonelli's Eagle, Lesser Kestrel amongst others.

Methods

The survey was done between June 2012 and December 2013. Two different questionnaires were prepared for use with local people and agencies respectively (AP 4.1 and AP 4.2).

The first questionnaire (AP 4.1) was used to collect the information within face-to-face interviews with the target group consisting of farmers, livestock breeders and hunters. These groups were selected because they spend the most time in the countryside and have information about poisoning incidents. The topic of the use of poisoned bait is highly sensitive because its use is illegal in both Greece and Bulgaria. People are unwilling to discuss the use of poisoned baits and therefore cannot be approached in a direct way on this subject. Consequently, the interviews were done in the form of a semi-structured interview embedded in a casual conversation without the visual use of the questionnaire. This type of interview allowed the interviewer to gain the trust of the interviewee and increase the credibility of the answers given. Immediately after leaving the place where the interview was done the researchers themselves filled in the questionnaire. In the beginning researchers first introduced themselves and then structured a discussion based on the socio-economic situation of the farmer's work or the hunter's activity. They discussed current problems that may be faced during their work and the measures that authorities should take to solve them. The opinion of interviewees on changes in the natural environment was sought and most of them felt pleased and comfortable to share their knowledge. Subsequently the interview focused on the poisoning issue and information was collected in a discreet way. Any knowledge concerning the mortality of vultures and most specifically about Egyptian Vulture was sought. At the end of the interview suggestions to control the use of poisoned baits were discussed.

The majority of interviews with livestock breeders were carried out in the field either in the sheepfold or during pasture. If necessary researchers walked together with shepherds as they followed their herd. Interviews with hunters and farmers took place in cafes. A special effort was made to interview hunters of diverse professional background.

The second questionnaire (AP 4.2) was used in face-to-face interviews with representatives of forest authorities, municipalities, veterinary services, hunting federations, local NGOs, private vet clinics and personnel in pesticide stores. The questionnaire was visual and questions were filled out directly. After a short description of the LIFE project and the aim of this study, the discussion was focused directly on poisoning, on other mortality factors, on the authorities' responsibilities and finally on suggestions to control poisoned baits. In the following chapters of this report all of the authorities mentioned above are referred to as "agencies" (AP 2.2 and AP 2.3). One common questionnaire was used for all agencies despite their different backgrounds. If further relevant information was obtained during the interview it was noted and if needed this was used in the discussion chapter.

The aim was to interview a minimum of 20 and a maximum of 30 land users per SPA and as many agencies as possible. The land users were selected randomly from each target group of farmers, hunters and livestock breeders. All questions referred to a period of ten years (2003-2012).

In Greece, every interviewee received a poster (AP 5.1, AP 5.2). The text of the poster makes an appeal to induce them to call in any cases when they find an injured or dead Egyptian Vulture.

Constraints faced during the implementation of interviews were: (i) presence of a language barrier with older Pomak livestock breeders inhabiting the Rhodopes throughout the Greek and Bulgarian parts; (ii) with some of the interviewees no discussion was possible and therefore no questionnaires were filled; (iii) lack of knowledge on poison events in the case of the 6 representatives of municipalities in Thrace where only a general discussion took place but no questionnaires were filled out and (iv) in Greece, 6 representatives from among the agricultural and veterinarian directorates, municipalities, hunting associations and police who refused to complete the questionnaire.



Results - Questionnaires in land users

The number of questionnaires completed in both countries was 236 from Bulgaria and 368 from Greece (Table 1). Excluding 3 projects sites where less than 10 questionnaires were filled, the average number of questionnaires per site for the remaining sites was 24.61 (Appendix: Table AP 2.1). The distribution of face-to-face interviews covered adequately the extent of each project site (Appendix: Map AP 3.2, AP 3.3, AP 3.4, AP 3.5, AP 3.6, AP 3.7 and AP 3.8). Some villages within the SPAs were either in ruins or under populated, with few older people, so many questionnaires were completed with villagers from outside the border of the SPAs. However, these villagers hunt and maintain livestock or fields within the SPAs. In 314 villages, 119 in Bulgaria and 195 in Greece, land users such as livestock breeders, hunters and farmers were interviewed (Table 1).

Table 1: Overall presentation of questionnaires, SPAs and villages

Country	Partner	No of questionnaires	No of SPAs	No of villages
Greece	HOS	207	10	125
	WWF	160	5	70
Bulgaria	BSPB	236	12	119
TOTAL		603	27	314

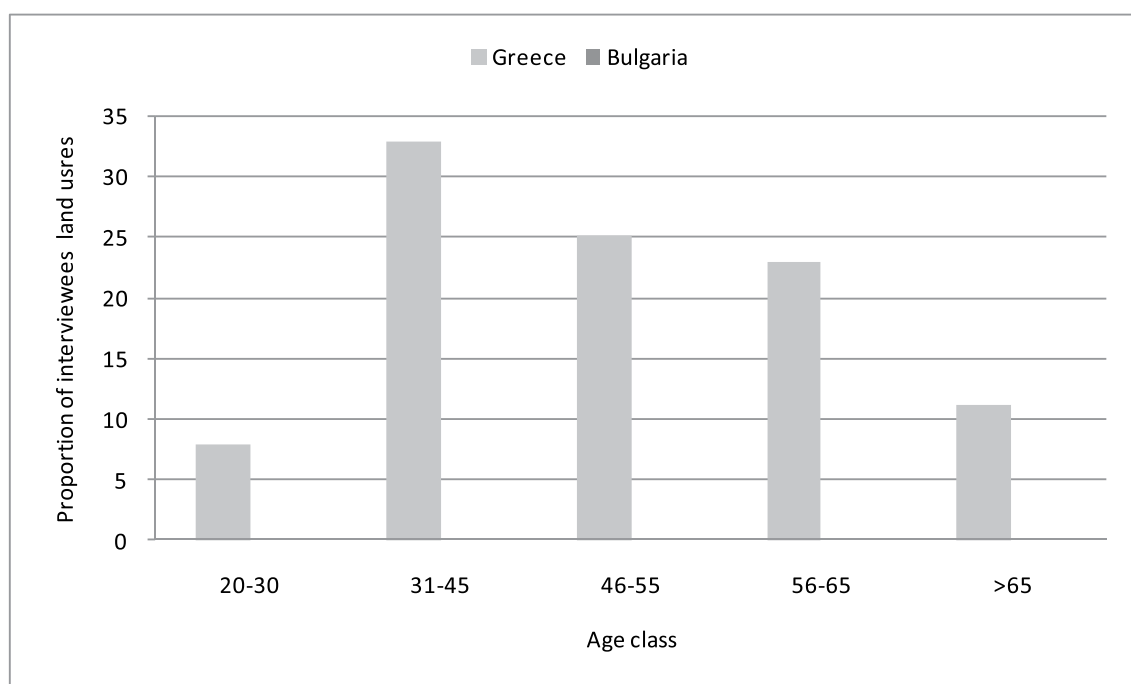
The three main categories of land users were livestock breeder, hunter and farmer. Four combinations among them were also recorded: livestock breeder/hunter; farmer/hunter; livestock breeder/farmer and livestock breeder/farmer/hunter but only a few interviewees were classified in more than one category (Table 2). As a category livestock breeders dominated because they were more accessible in the field. In the category of hunters more than 70% didn't work as farmers but as public servants (policemen, firemen, foresters and military personnel), or as private employers, tavern or café owners, merchants, loggers, accountants, auto electricians, agriculturists, plumbers, hair cutters, hotel owners and doctors.

Table 2: Classification of land users

Land user	Greece	Bulgaria
<i>Livestock breeder</i>	193	171
<i>Hunter</i>	113	23
<i>Farmer</i>	25	25
<i>Livestock breeder/hunter</i>	20	17
<i>Farmer/hunter</i>	16	0
<i>Livestock breeder/farmer</i>	5	2
<i>Livestock breeder/farmer/hunter</i>	2	1
Total	367	236

In Greece the majority of interviewees were between 31-65 years old, with 33% of participants aged between 31-45 years (Figure 1). Similarly in Bulgaria, the majority of interviewees were between 31-65 years old, with 30.5% between 31-45 years old. This represents the productive age of land users, and the data therefore appear to be representative of the general rural population.

Figure 1: Proportion (in %) of interviewed land users in each age class (nGR=367 and nBG=213)



The results of the questionnaires completed by the land users are presented below. From the 22 questions only 14 were analyzed because they represent the status of poison use, the opinion of land users on this subject, the reasons for illegal use of poisoned baits and suggestions to control their use. In some questions, land users selected more than one answer, thus in the relevant tables two samples are presented:

Abbreviations used in the tables:

nGR, nBG=number of land users that answered the question in Greece and Bulgaria respectively

na=number of answers for multi-answer questions

Losses in production and measures adopted to decrease losses

For the question *“Were there damages in your produce in the last ten years”*, out of a total of the 367 Greek land users, 185 claimed that they had incurred losses in their production, 46 didn’t have any losses and 23 didn’t answer at all. Among the different recorded losses wolf attack was the most frequently reported (62.7%) followed by bear attack (14.75%) and bad weather conditions (14.34%) (Table 3). It was mentioned that wolves caused damage to livestock, attacked mules/horses that carry wood, attacked hunting or mixed-breed shepherd dogs and in some cases destroyed vineyards or watermelons by biting the fruits. The production losses from bears were in livestock, fruit trees, beehives and vegetables and occurred in Central Greece. Snowfall or thunderstorms destroyed livestock settlements in a few cases. Bad weather conditions also damaged cultivations, for example by flooding from the Evros River in agricultural areas. The rest of the damages were reported very rarely. Examples of these included damage occurring in hencoops and cultivations of watermelons, vegetables, vineyards and corn that were caused by foxes, martens, dogs or wild boar. One farmer complained about blackbirds consuming grapes.

From the total of 236 Bulgarian land users, 85 claimed that they had incurred losses in their production, 119 didn’t have any losses, and 9 didn’t answer at all. As in Greece the highest percentage of losses in Bulgaria came from wolf attacks (57.69%) followed by bad weather conditions (16.67%), dog attacks (10.26%) and jackal attacks (7.69%) (Table 3). Wolves killed livestock or attacked other domestic animals. Dogs caused

damages to livestock or in hencoops. Jackals attacked hares or game birds. Bad weather conditions referred to the summer droughts that result in a reduction of grazing.

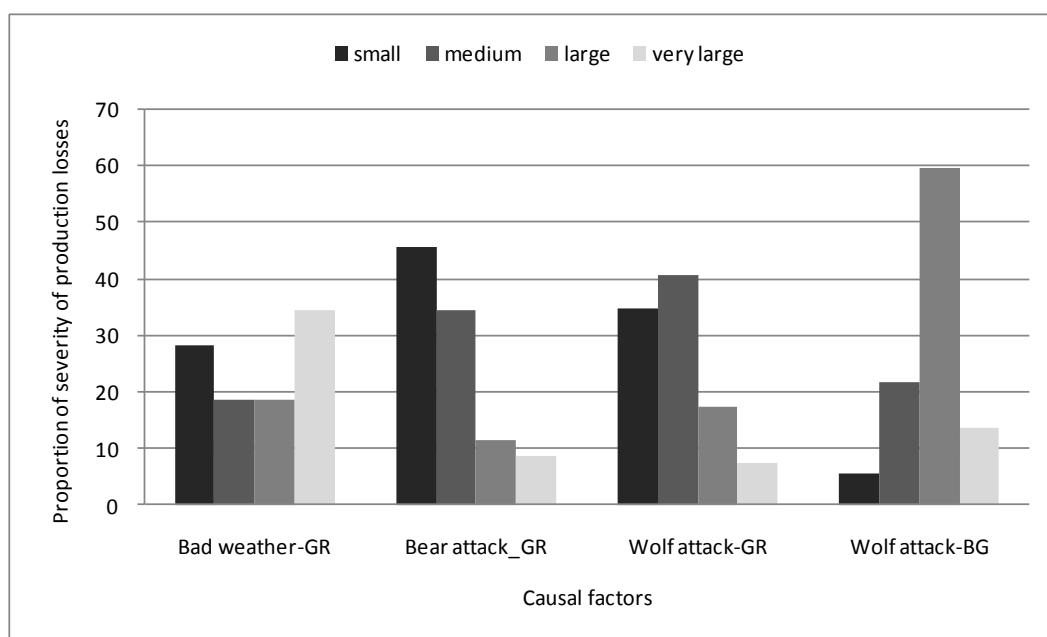
In both countries contagious diseases were reported infrequently even though during the reporting period in Greece there were events of such diseases. This included an outbreak of sheep-pox when large numbers of livestock were killed by vets within a framework of sanitary regulation.

Table 3: Relative frequency of occurrence of different causal factors leading to loss of production estimated by land users (nGR=244, nBG=78)

Damage type	Greece % na=244	Bulgaria % na=78
Wolf attack	62.7	57.69
Bear attack	14.75	
Wild boar attack	2.87	1.28
Fox attack	0.82	3.85
Badger attack	0.82	
Marten attack	0.41	
Jackal attack		7.69
Dog attack	0.82	10.26
Common blackbirds attack	0.41	
Bad weather conditions	14.34	16.67
Loss of livestock due to contagious disease	2.05	2.56

The question on the magnitude of losses in production was answered by fewer interviewees than was the case elsewhere because some didn't know or didn't want to make an estimate. Among the frequent causes of losses were those attributed to bad weather conditions and bear attacks in Greece and wolf attacks in both countries. For the remaining causes the number of responses was too low to be meaningful and representative. In Greece, bear attacks were evaluated as having a small (45.71%) to medium (34.29%) magnitude of loss. Wolf attacks were also predominantly considered to have a medium (40.67%) to small (31.67%) impact in Greece, but in Bulgaria interviewees judged that wolf attacks resulted mostly in large losses (59.46%).

Figure 2: Proportion (in %) of severity of production loss reported by interviewed land users for the four most causal factors leading to loss of productivity (nGR=173, nBG=37)



The land users were asked: *“If they had adopted any measures to avoid the damages they incurred”*. In Greece, from 129 land users who responded, 28.57% used trained shepherd dogs to protect their livestock from attacks and most of them spoke about a good breed of shepherd dogs but only a few insisted on training the dogs (Table 4). 26.37% guarded their animals more carefully during grazing either by using a better shepherd or by pasturing the animals themselves. 15.38% preferred to scare away predators by shooting in the air or by shooting directly at them and some said that hunters should kill wolves while they are hunting wild boar. 13.19% said that no measure is effective as wolf attacks take place when the animals are out grazing and it is too difficult to avoid. 9.34% improved the fence of sheepfolds but these were mainly small-scale livestock breeders and 3.30% increased their number of shepherd dogs. Three land users used electric fences, two livestock breeders fenced their sheepfold against bear and one logger fenced his mules against wolves. Two livestock breeders used bear traps and two others used poison bait against wolves, one in Thesprotia and one in Ioannina.

In Bulgaria, of the 29 land users who responded, all of who were livestock breeders the highest percentage (86.21%) used trained shepherd dogs to protect their livestock from attack by predators (Table 4). One said that livestock breeders should be permitted to shoot predators and one mentioned that wolves would be killed during hunting. One livestock breeder used a proper fence for the sheepfold.

Table 4: Relative frequency of measures adopted by land users to guard against frequently occurring causes of production loss (nGR=129, nBG=29)

Measures adopted	Greece % na=182	Bulgaria % na=29
Trained shepherd dogs	28.57	86.21
Proper guarding of livestock	26.37	3.45
Shooting predators	15.38	6.9
No measure	13.19	-
Proper fence of sheepfold	9.34	3.45
Increase number of dogs	3.3	-
Electric fence	1.65	-
Bear traps	1.1	-
Poisoning	1.1	-

Good shepherd dogs

For the question *“If they can find good shepherd dogs”* hunters were not included. In Greece, out of a total of 254 land users, 104 said they could find good shepherd dogs, 84 couldn't find such dogs and 66 didn't answer. They could find pure breeds of Greek shepherd dogs in several livestock areas in Greece and a few introduced Karakatsan dogs from Bulgaria. Most of those who could find purebred shepherd dogs said that they keep the breed themselves. One got a Greek shepherd dog from the NGO Callisto, which breeds purebred Greek shepherd dogs. One livestock breeder said that he was satisfied with his Sar Planina dog. One logger mentioned that his Collie dog was capable of protecting his mules in the forest. Some introduce Kangal or Caucasian dogs from Turkey which are very good defenders against wolf but also harm or kill other dogs, mainly hunting dogs. In consequence they have lost many of these dogs by poisoning. Most of those who cannot find suitable dogs believe that pure breeds of Greek shepherd dogs don't exist anymore. Some are happy with mixed breed dogs as they protect the livestock, are more quiet and don't harm other dogs. Two respondents from Thrace noted that they were for long time in a waiting list with the NGO Arcturos, which breeds purebred Greek shepherd dogs.

In Bulgaria, out of a total of 213 land users, 77 could find good shepherd dogs, 99 couldn't find any and 36

didn't answer. Some of those who could find dogs used Karakatsan dogs and others used Kangal dogs. Only one said that how the dog is trained is more important than the breed of a dog. The majority of those who answered that they couldn't find dogs said that they don't need them because people or livestock are afraid of them. One said that he doesn't have the capacity to use large shepherd dogs. Two said that they had Kangal dogs but that they were dangerous for both people and animals and they keep them at the farm (one Kangal dog was used to hunt wild hares). One livestock breeder noted that there is a conflict between hunters and livestock breeders because the hunters don't tolerate the presence of shepherd dogs.

Hellenic Agricultural Insurance Agency – compensation system

The Hellenic Agricultural Insurance Agency (hereafter ELGA) is a semi-public body financed mainly by an obligatory insurance fee paid by farmers. When damage is caused by wildlife, the affected farmer must file a claim for compensation to ELGA, accompanied by an inspection fee, within 48 hours of the incident. An inspector from ELGA decides whether damage was caused by a wild animal and if the damage should be compensated or not (Krabokoukis et al. 2011).

For the question "If they are satisfied with ELGA" hunters were not included. Out of a total of 254 Greek land users, 161 rated their satisfaction regarding the response of the national agency to their calls in the cases of losses, while 156 rated their satisfaction regarding the amount of compensation given (Table 5). A medium proportion (26.71%) of interviewees, among them 33 livestock breeders and 9 farmers, were completely satisfied with the timely response of the agency to send an expert to do an autopsy. However, a majority (52.79%) was not at all or only little satisfied (respondents included 78 livestock breeders, 4 farmers and 2 farmer/livestock breeders). The most frequent justifications for those who ranked their response as "not at all" to "moderately" satisfy were: (i) there was delay in response; (ii) difficult to come due to lack of fuel in public cars or the area was too remote and (iii) the public agency did not care.

Most interviewees were not satisfied with the level of compensation: most people (>65%) classified the compensation as either "not at all" (39.74%) or "a little" (29.49%) satisfactory (respondents included 57 livestock breeders, 3 farmers and 2 farmers/livestock breeders). Frequent justifications were: (i) the low amount of money compared to either the value of animals, the value of milk production, the level of bureaucracy or the application fee and (ii) the high threshold, depending on livestock species, before compensation is given. Few said that after all the paperwork was done the approved compensation was less than expected and the respondent never called again. Some complained that they never received the money.

Those who didn't respond regarding compensation mostly never called ELGA due either to difficulties in locating the dead animals or to the low level of loss, which were below the compensation threshold. Some knew that they were eligible to receive money but they never called ELGA.

The Bulgarian interviewees ranked this question but they were referred on subsidies rather than on compensation for production losses. In Bulgaria compensation is given for damages caused by attacks from bears but not from wolves. In the study area the compensation system is not well developed and land users were inadequately informed. Therefore the answers from the Bulgarian respondents weren't included.

Table 5: Percentages of 4 classes of satisfaction in response and compensation of National agency of agricultural compensation (n=number of land users)

Satisfaction in response and compensation	not at all %	a little %	moderately %	completely satisfied %
Response GR n=161	32.92	19.25	21.12	26.71
Compensation GR n=156	39.74	29.49	17.95	12.82

Poisoned baits for the extermination of predators

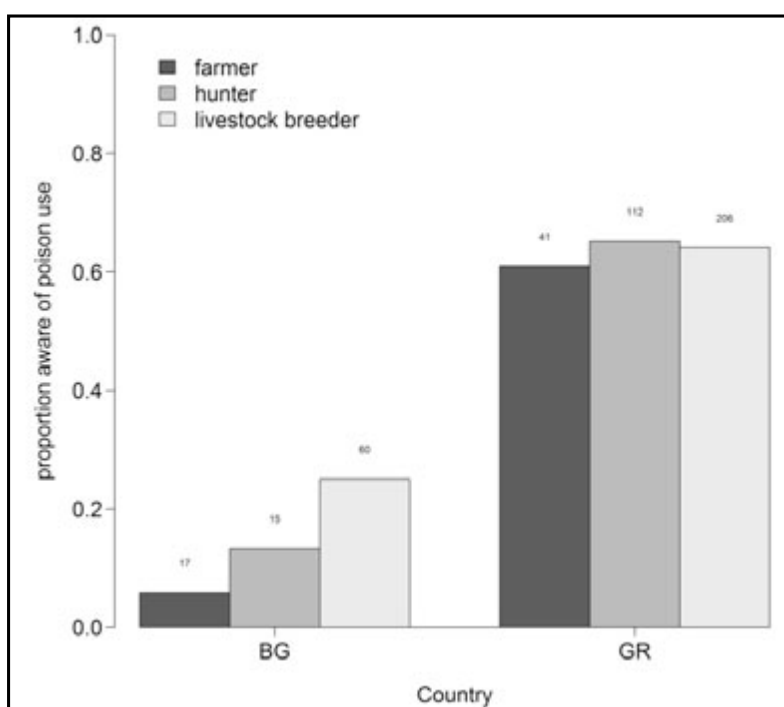
Out of a total of 367 Greek land users, 62.67% acknowledged that poisoned baits were used for the extermination of predators in the last decade in their area, 35.42% said that they weren't used and 1.91% didn't answer. Very few mentioned the source from which the poison was obtained. The older land users remembered that before the 1990s baits with poison (capsules of cyanide) were used previously by the Forestry Service and Hunting Clubs to control fox populations and 2 said that there are still stocks of cyanide, which is used either by individuals or by hunting clubs. The proprietary poison Lannate was also mentioned as being used (6 records) and it is illegally imported from Turkey (3 records) or Bulgaria (1 record). Banned insecticides that are nevertheless used in the production of tobacco are also used as poison (6 records). Tamaron, Aldrin as well as rodenticides were used as poisons in baits to kill predators. One respondent mentioned that there are still stocks of withdrawn pesticides that are available illegally in the market while another mentioned that old people might still keep strychnine.

From the 236 Bulgarian land users, 61.92% didn't answer, 31.35% mentioned that poisoned baits weren't used in their area for the extermination of predators the last decade and only 7.63% mentioned that they used poisoned baits.

The most frequent response of those who answered negatively was that in their villages no baits were used. Subsequently a few respondents said that baits were used some years ago but this no longer happened or were used in neighbouring villages. However the people who answered negatively in the first question answered the subsequent questions, therefore the sample in the data below is slightly higher compared to the sample for the first question.

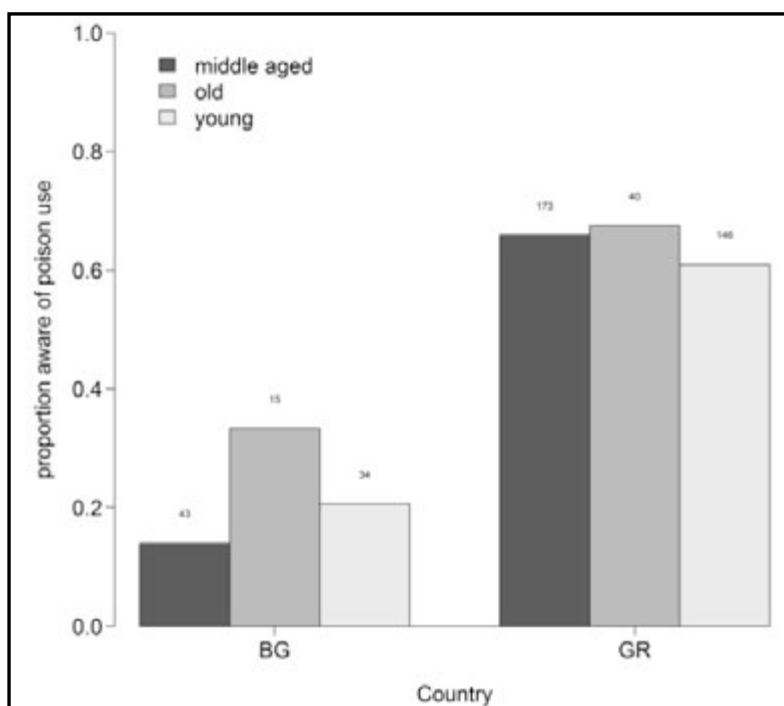
The perception about the use of poisoned baits was tested in relation to the interviewee category and age. The original 7 categories of interviewees (Table 2) were pooled into 3 categories to avoid having groups with unrepresentative sample sizes (farmer/livestock breeder, farmer/hunter, farmer/livestock breeder/hunter were pooled with farmer and livestock breeder/hunters were pooled with livestock breeder). In Greece, there was no significant difference among the farmers, livestock breeders and hunters in their awareness of the use of poisoned baits (Figure 3). However, in Bulgaria, livestock breeders were more aware of poisoning than were the other two categories (Table 2).

Figure 3: Proportion of land users aware of poison use in Greece and Bulgaria



The 5 age classes of interviewee (Figure 1) were pooled into 3 categories (20-30 and 31-45=young, 46-55 and 56-65=middle aged, >65=old). In Greece, there was no significant difference among the different ages in their awareness of the use of poisons but in Bulgaria, the old interviewees were more aware of the use of poisons than both the young and the middle aged (Figure 4).

Figure 4: Proportion of land users of 3 different age classes aware of poison use in Greece and Bulgaria



For the question *“Who do you believe has reasons to use baits”* 260 Greek and 48 Bulgarian land users answered. In Greece, hunters and livestock breeders were frequently mentioned (45.83% and 29.95% respectively) while in Bulgaria farmers 65.31% were pointed as the main responsible party (Table 6).

Table 6: Relative frequency of responsible social group in using baits as reported by land users (nGR=260, nBG=48)

Responsible group in poisoned baits	social using	Farmers %	Hunters %	Livestock breeders %	Village residents %
Greek land users na=384		14.06	45.83	29.95	10.16
Bulgarian land users na=49		65.31	4.08	14.28	16.33

The same question was tested in relation to interviewee category and age. In Greece, all respondents referred to hunters as being the main social group responsible for using poisoned baits. The second most indicated group was livestock breeders, which were selected especially by interviewees from the hunter and livestock breeder categories (Figure 5). The same pattern is apparent in Figure 6 where all the 3 age classes referred to hunters as being the main group responsible and secondly to livestock breeders; the latter were selected more by young interviewees. In Bulgaria, the farmer and hunter interviewees referred almost exclusively to farmers as being responsible for the use of poison baits while the livestock breeder interviewees declared that hunters, livestock breeders and villagers were users of poisoned baits (Figure 5). Farmers were selected as the group responsible for using poison baits mainly by young and middle-aged interviewees while the older interviewees also attributed a significant proportion of the use of poisons to villagers (Figure 6).

Figure 5: Proportion of perceived responsible group for poisoning as declared by 3 land users' categories in Greece and Bulgaria

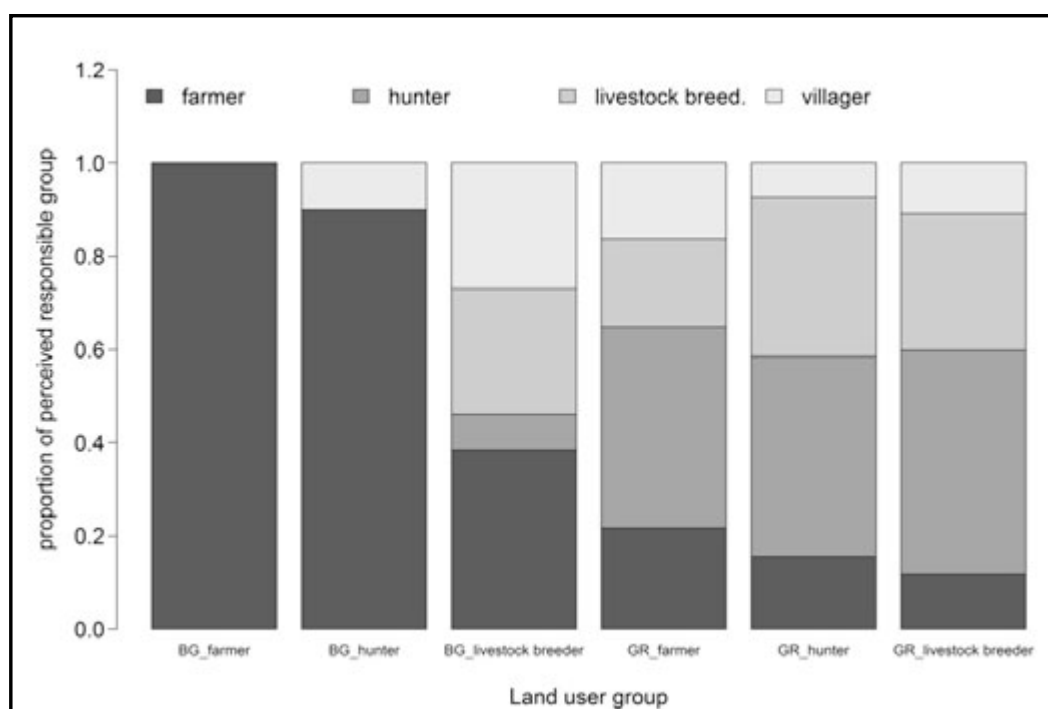
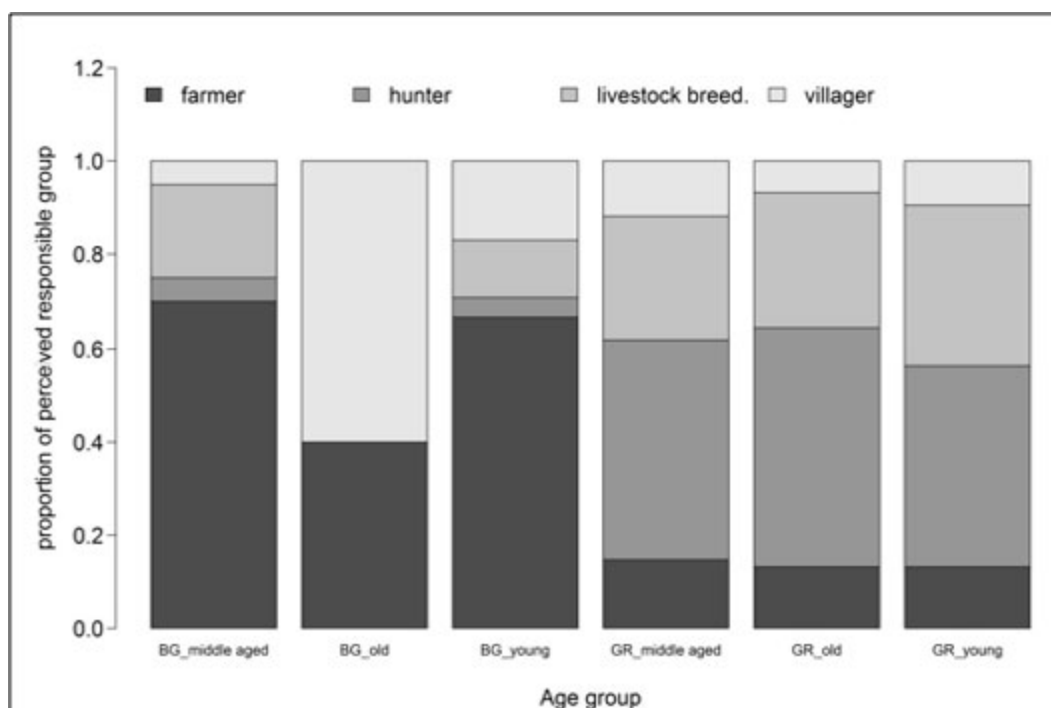


Figure 6: Proportion of perceived responsible group for poisoning as declared by 3 land users' ages classes in Greece and Bulgaria



For the next question *“Which animals are targeted”* for poisoning, 265 Greek and 62 Bulgarian land users answered. In Greece the most frequent target species for poisoning were dogs, foxes and wolves with proportions of 34.32%, 33.05% and 22.38% respectively (Table 7). The main dogs targeted were shepherd dogs (45.73%) and stray dogs (31.7%) followed by hunting dogs (18.9%) and undefined categories of dogs (3.66%).

Kangal dogs were mentioned as a target dog breed for poisoning but so were other large sized shepherd dogs. Stray dogs originate from abandoned shepherd dogs, hunting dogs or pet dogs and occur in around villages but also within the forest. A low percentage of interviewees and only those from Western Greece selected bear (5.65%) even though the percentage of land users (14,75%) who stated that they had losses arising from bear attack was higher (Table 3). All other species were noted only with a low proportion (less than 5% or 1% or 0,5%).

In Bulgaria, insects were the most frequently targeted species for poisoning (55.88%) but this occurred with pesticides and is connected directly with perceived insect pest activity. Livestock or other wildlife species such as rabbits, hares and game birds become accidental victims of this agricultural practice after they grazed or fed in contaminated fields. Less frequently mentioned target species were dogs (only shepherd dogs were mentioned) and wolves at 16.18% and 11.77% respectively (Table 8) but foxes, rodents and jackals were mentioned only rarely (Table 7).

The target species mentioned for poisoning was tested in relation to interviewee category and age. Target species were grouped into 5 categories: bears, dogs, foxes, wolves and others (where the remaining species of Table 7 were included). In Greece, there was no difference among interviewees who mentioned dogs and foxes as the main target species for poisoning (Figure 7). Hunters and livestock breeders reported wolves more than farmers. The same pattern was evident in the 3 age classes who reported dogs, foxes and wolves as the main species targeted for poisoning (Figure 8). In Bulgaria, jackal and rodents (grouped in category "other") were reported as the main target species for poisoning by the farmer and hunter categories of interviewees but dogs and wolves were reported as significant targets by interviewees of the livestock breeder category. Young and middle-aged Bulgarian interviewees said that jackals and rodents were targeted species for poisoning while the older interviewees reported various other species in addition. In contrast with Greece, fox isn't considered to be an important target animal for poisoning in Bulgaria.

Table 7: Relative frequency of species targeted for poisoning selected by land users (nGR=265, nBG=62)

Targeted species for poisoning	Greece na=478 %	Bulgaria na=68 %
Dogs	34.32	16.18
Fox	33.05	5.88
Wolf	22.38	11.77
Bear	5.65	-
Badger	1.46	-
Rodents	0.84	7.35
Moles	0.42	-
Martens	0.42	-
Corvidae	0.42	-
Cats	0.42	-
Wild cats	0.21	-
Jackal	0.21	2.94
Wild boar	0.21	-
Insects	-	55.88

Figure 7: Proportion of targeted for poison species charged by 3 land users' categories in Greece and Bulgaria

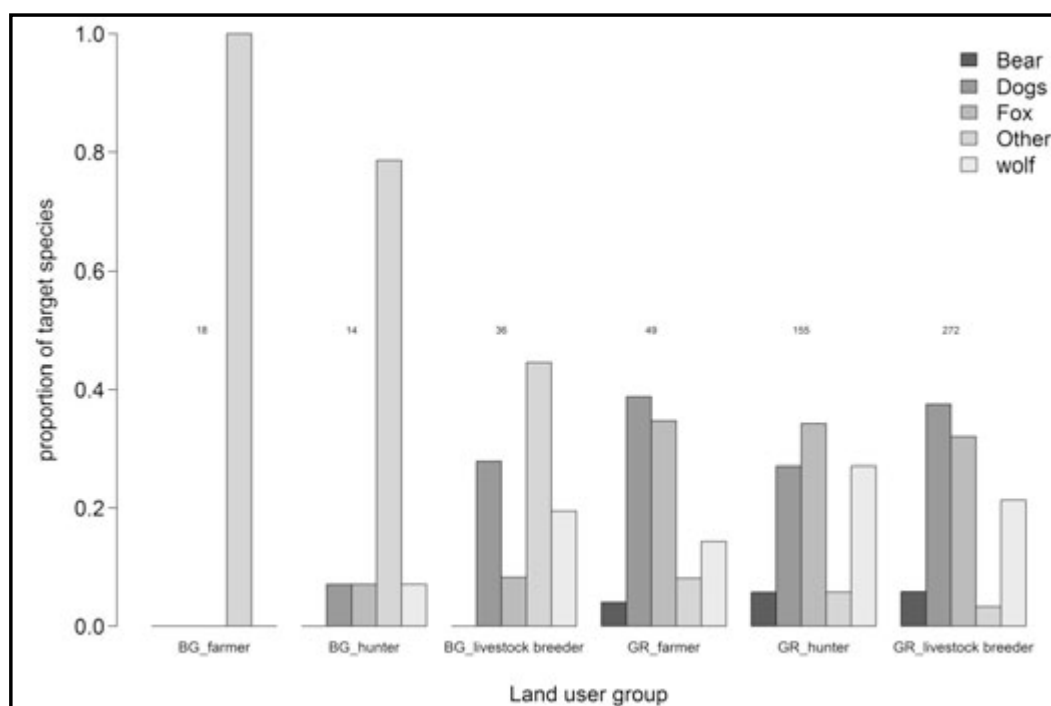
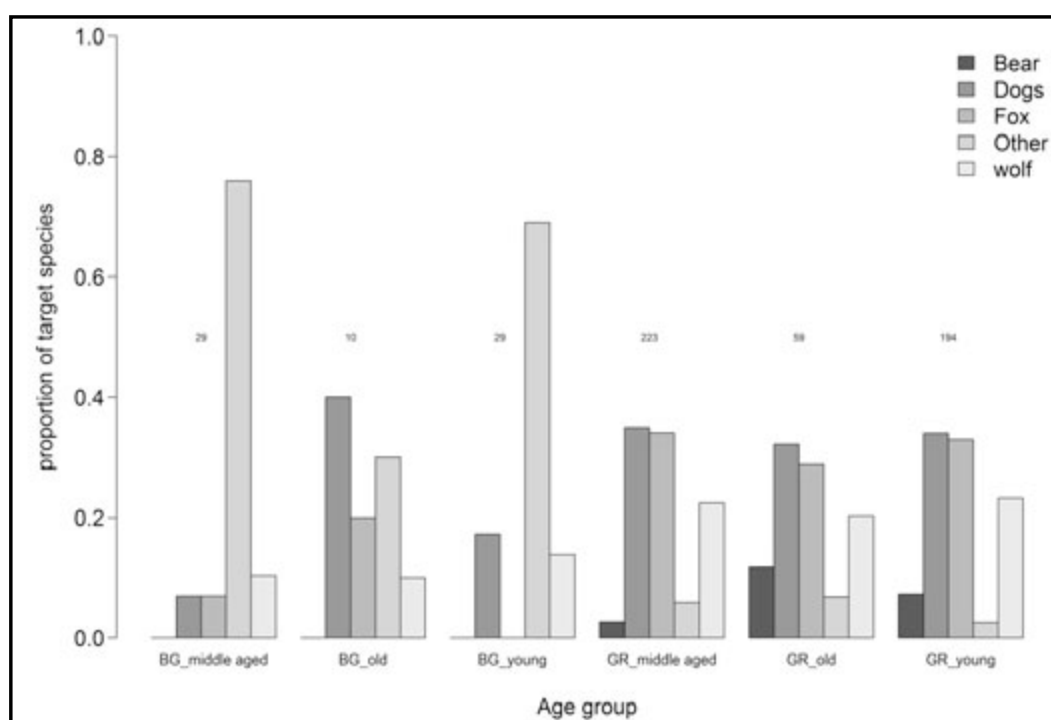


Figure 8: Proportion of species targeted for poison as reported by land users of 3 different age classes in Greece and Bulgaria



The next question *“What are the main types of damages caused by these animals”* concerned the animals mentioned in Table 7. Answers to this question were received by 249 Greek and 34 Bulgarian land users. In Greece, a reduction in game species (23.73%) and livestock losses (23.24%) were reported predominantly (Table 8). A reduction in game species was attributed mainly to predation by foxes and to a lesser extent

by wild cats. Livestock losses were attributed mainly to wolves and to a lesser extent by bears or jackals. Damages in several agricultural cultivations (13.32%) were also reported. In order of priority damages were mentioned in melon fields, vineyards, cornfields, allotments and fruit tree orchards and were attributed to dogs, wolves, foxes, badgers, wild boar and bears. Attacks on hunting dogs by shepherd dogs (12.35%) were reported especially in the case of Kangal dogs used by some shepherds. In the category of disturbances/personal differences (11.62%), a fear of shepherd or stray dogs near residential areas, and personal differences relating to claims about hunting or pasture grounds or the killing of good hunting dogs were mentioned. Distraction to the training of hunting dogs (11.14%) was cited as related to the poisoning of foxes before the hunting period. The intention of this action was to establish successfully an area that is free of foxes so that the dogs can be trained to follow only the tracks of hares. Low proportions were reported for the attack of martens and foxes in hencoops (3.63%), or rodent damage in granaries (0.48%) and bear attacks on beehives (0.48%).

In Bulgaria, two significant categories of damage were reported and these concerned losses of livestock due to wolves (45.71%) and damages in cultivations caused by rodents (45.71%). Damage caused by dogs and foxes in hencoops (8.57%) was also cited but at a much lower frequency (Table 8).

Table 8: Relative frequency of damages caused by targeted for poisoning animals reported by land users (nGR=249, nBG=34)

Damages caused by targeted for poisoning animals	Greece na=413 %	Bulgaria na=100 %
Decrease of game species	23.73	
Livestocks losses	23.24	45.71
Cultivations	13.32	45.71
Attacks on hunting dogs	12.35	
Disturbances/personal differences	11.62	
Distraction of hunting dogs' training	11.14	
Hencoops	3.63	8.57
Granaries	0.48	
Bee hives	0.48	

For the question *“Do you know the types of baits used in your area”* people were hesitant to provide an answer. 155 Greek and only 4 Bulgarian land users named the type of bait used. In Greece the most frequent bait was a “piece of meat with pesticides” (59.61%) and some described it as meatball, sausage, intestines, bones or even fish laced with pesticides. The next important bait was “capsules of cyanide” (20.20%) and these were used mainly for foxes but dogs or other wild mammals were also poisoned accidentally. Small sized pieces of meat with pesticides or strychnine were cited (7.88%) as being used mainly to poison dogs, foxes, martens and badgers but intestines can also be used to poison wolves. Dead livestock laced with pesticide (9.36%) or strychnine (0.49%) was used mainly for wolves. Only two interviewees mentioned dog food laced with either pesticides or just detergent alone (0.98%) that was used to poison dogs. Dead pigeons laced with pesticides (0.98%) were used to poison hunting dogs or foxes. A bowl of water laced with pesticide (0.49%) was used as bait for dogs. Poisoning of livestock after grazing in fields sprayed with pesticides was reported in the comments of questionnaires. Furthermore, meat laced with broken glass was used to kill dogs by causing internal lesions.

In Bulgaria four records of four different types of baits were reported including a piece of meat laced with strychnine, a slice of bread with antifreeze, a dead rabbit with pesticide and dead livestock laced with strychnine. Also reported in the comments of questionnaires were incidents where poisoning of livestock/hares occurred after they grazed in fields previously sprayed with pesticides or after they consumed seeds treated with pesticides. Further reports included needles placed in pieces of meat to kill dogs and poison put out in

a refuse tip to poison stray dogs (one reference).

Table 9: Proportion of different type of poisoned baits reported by land users (n=155)

Type of baits	Greece na=203 %
Piece of meat with pesticides	59.61
Capsule with cyanides	20.2
Dead livestock with pesticide	9.36
Piece of meat with strychnine	7.88
Dead pigeon with pesticides	0.98
Dogfood with pesticide/detergent	0.98
Dead livestock with strychnine	0.49
Water with pesticide	0.49

The type of poisoned baits used was tested with respect to interviewee category and age but this was done only for Greece as the Bulgarian sample was too low to test. The different baits shown in Table 9 were grouped into 3 types, cyanide, pesticide and strychnine. All 3 categories of interviewees highlighted pesticides as being the most frequently used poison in baits (Figure 9). In contrast to hunters and livestock breeders, farmers considered cyanide as being almost as equally used as pesticides as a frequent poison due to it being used mainly in farmland to poison foxes before the start of the dog training or hunting periods. There was no significant difference among the 3 age classes in their selection of which type of bait they thought was used (Figure 10). Older people, who were more familiar with strychnine because it was used widely many decades before, reported the use of strychnine more than did the younger age classes.

Figure 9: Proportion of poison type in use reported by 3 land user's categories in Greece

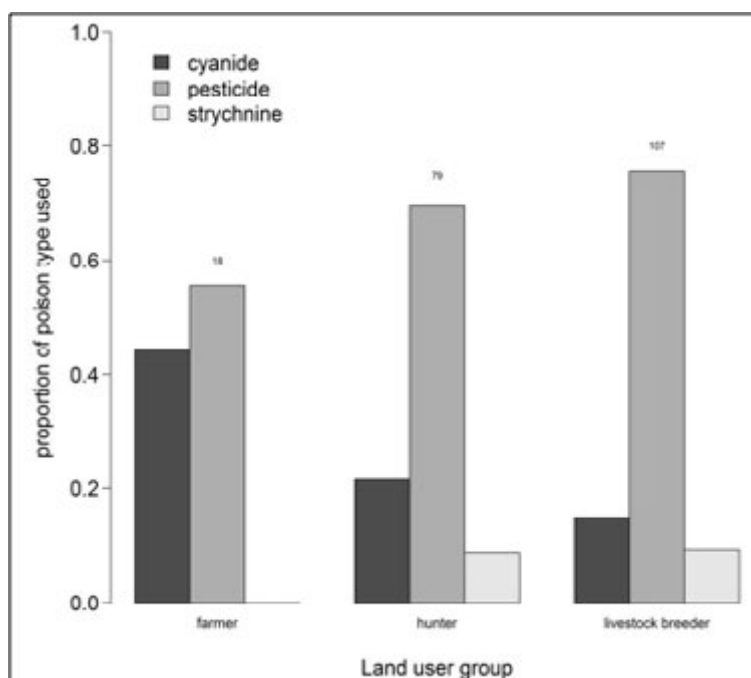
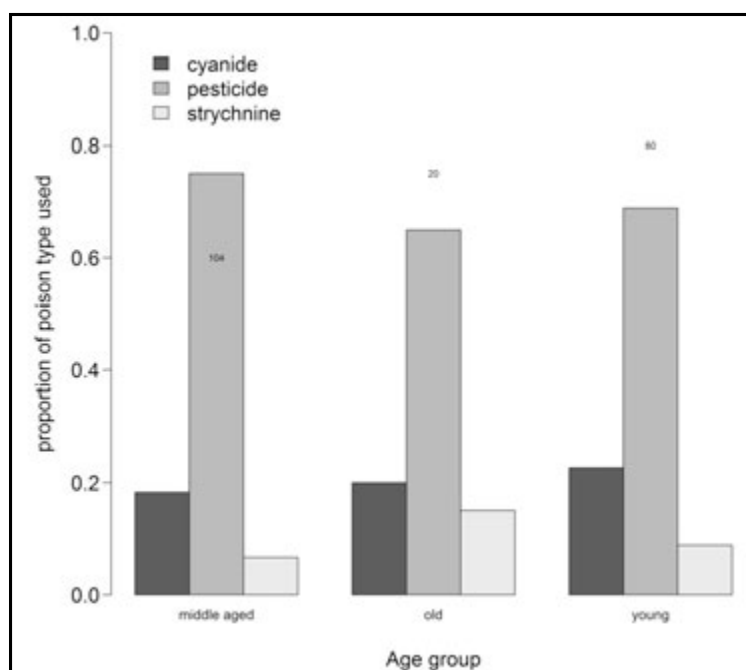


Figure 10: Proportion of poison type in use reported by 3 land user's age classes in Greece



Suggestions to increase abundance of game species

Measures to increase the abundance of game species were suggested by 95 of the total of 149 Greek hunters/livestock breeders and hunters/farmer-hunters. Common wild game species that are hunted by the interviewees were hares, wild boar, turtledove, woodcock and various waterfowl. Examples of measures from 43.62% of the answers include: increasing guards to achieve an adequate level of guarding; an intensification of the guarding schedule; the implementation of punishment for the illegal hunters (Table 10). Proposals from 24.16% of suggestions were in two classes: (i) improvement of game habitats (this included the cultivation of abandoned fields, creation of forest openings with the help of grazing animals and starting plantations with chestnut or walnut trees to increase the abundance of food for game) and (ii) improvement in game management (this included how game was released, the supplementary feeding or food provision for game, fencing of acacia plantations either to enclose and protect hares inside prior to releasing them after their population increases or to create more reserves where hunting will not be permitted). A ban in hunting for a period of 2 or 3 years was mentioned in 8.05% of the responses. A major training programme for hunters in order to change their way of thinking about wildlife management was proposed in 7.33% of the responses. A reduction in the number of hunting licenses issued per year to avoid having a high number of hunters was suggested in 5.33% of the responses and one interviewee added that the number of game harvested per hunter and per hunting period should be lowered (0.67%). A ban on access to forest roads during the breeding season of game species in order to reduce illegal hunting was suggested by 4.7% of interviewees. A few measures (4.03%) were suggested in relation to the shortening of the hunting season for both feathered and mammal game or the permission allowing daily hunting during the hunting period instead of the existing restriction of the 3 days per week to avoid high numbers of hunters in any one location. In a percentage of less than 1% suggestions referred to: (a) a ban on using GPS collars on hunting dogs during hunting of wild boar as this makes it almost impossible for the boar to escape; (b) the monitoring and estimation of the game populations in order to provide an evidence based approach to permissible harvest levels per species per year and (c) the control of pesticides due to their unintended but nevertheless negative impact on feathered game populations.

No Bulgarian interviewee suggested any measures to increase game numbers.

Table 10: Relative frequency of suggestions to increase the games proposed by hunters (nGR=95)

Suggestions to increase games	Greece na=149 %
Adequate guarding/control of illegal hunting	43.62
Habitat improvement/Game management	24.16
Ban hunting for few years	8.05
Training of hunters	7.38
Decrease of hunters/hunting licenses	5.37
Prohibit the use of roads during game breeding period	4.7
Change of hunting seasonal/weekly schedule	4.03
Ban GPS dog-collars on wild boar hunts	0.67
Game population monitoring	0.67
Limited game number	0.67
Control of pesticides	0.67

Measures taken to prevent the use of baits

The majority of the interviewees didn't answer the question *"Do you believe there are measures taken to prevent the use of baits"*. From a total of 367 Greek land users 188 said that no measures had been taken and 20 reported that measures were done and include examples such as the efforts of the Forestry Service, local animal association campaigns, the LIFE project activities of Arcturos and WWF local awareness activities. Some said that the impact of pesticides on human health was shown either on TV or in seminars for farmers carried out by Municipalities or other Organizations (not named). They also answered generally that measures had been taken and thus poisoned baits weren't used in their area.

From the total of 236 Bulgarian land users 17 said that no measures had been undertaken and 3 referred to measures such as the running public awareness campaigns.

Suggestions to stop the future use of poisoned baits

From a total of 367 Greek land users, 184 suggested measures to stop the future use of poisoned baits. At the top of the list of suggestions (Table 11) were "adequate guarding" (26.69%) and "awareness/education" (23.31%). The meaning of adequate guarding was explained in the text of Table 10. Awareness/education included both environmental education in schools and awareness campaigns in villages where discussions took place in cafes or talks were given by animal welfare organizations on the impact of poisoned baits on wildlife.

The "formal control of predators", which means the implementation of control by authorities and not by individuals was mentioned in 16.53% of the answers. Even though some people recognized the negative impact of poisoning, they mentioned it as the most effective method compared to other methods (shooting, trapping etc). They said that illegal poisoning was more dangerous than officially licensed poisoning where the poisoned animals should also be collected and subsequently buried.

A pessimistic answer was given by 15.25% of respondents who provided a "no solution" answer, saying that no one will change their way of thinking and that the authorities cannot control illegal activities. With the "self-awareness" (5.08%) response what was meant was that if the people cannot change their way of

thinking on their own then no wildlife protection could be achieved. A small proportion made suggestions about the following three topics: the “control of illegal traffic of banned pesticides” (3.39%); “the proper management of hunting” (3.39%) and “the improvement of compensation for wildlife damages” (2.97%). The following suggestions were made by the respondents at levels of less than 1% each: (a) “use of trained shepherd dogs”; (b) the “use of specific collars” (producing sound+electric shock) by which hunting dogs can be trained to not follow the scent of foxes; (c) the “control of stray dogs by implementing the relative law”¹⁰ by municipalities; (d) the “spatial planning of pasture” in order to avoid competition between hunters and livestock breeders and (e) the “re-opening of garbage places” to increase the food availability for Egyptian Vultures. It is strange to note that less than 1% mentioned the use of trained shepherd dogs while in Table 4 it can be seen that 28.57% of respondents mentioned that they adopted this measure against wolf attacks.

Two suggestions were proposed by two Bulgarian land users and were related to the “proper hunting management” and the “control of illegal hunting” respectively.

Table 11: Relative frequency of suggestions from land users to stop future use of poisoned baits (nGR=184)

Suggestions to stop poisoned baits	Greece na=236 %
Adequate guarding	26.69
Awareness/education	23.31
Formal control of predators	16.53
No solution	15.25
Self-awareness	5.08
Control of illegal traffic of banned pesticides	3.39
Proper hunting management	3.39
Improvement of compensation system	2.97
Trained shepherd dogs	0.85
Training collards for dogs	0.85
Formal control of stray dogs	0.85
Planning livestock breeding	0.42
Re-open garbage dumps	0.42

The suggestions were tested in relation to interviewee category and age but this was done only for Greece since the Bulgarian sample was too small. The suggestions were grouped into five categories: adequate guarding, awareness, formal control of predators, no solution and other. Adequate guarding was suggested mostly by hunters and livestock breeders while awareness was suggested mostly by farmers (Figure 11). Hunters and livestock breeders considered adequate guarding to be more useful than did farmers. In contrast to the two previous interviewee categories farmers gave local awareness as their main suggestion. Farmers and hunters believed more in the formal control of predators than did livestock breeders. More pessimistic were livestock breeders, especially the younger ones, who believed that a change in mentality was too difficult to make (Figure 12). Hunters were more open minded and suggested several solutions that were grouped in the category “other”.

All the 3 age classes gave priority to adequate guarding and awareness. Older interviewees showed a preference for the formal control of predators to a greater degree than did the other two age classes. Finally, the young were more open minded and proposed several suggestions, which were grouped in the category “other”.

¹⁰ Law 4039/2012 with the title: For privately-owned and stray pets and the protection of animals from exploitation or use for profit.

Figure 11: Proportion of solutions suggested by 3 land user's categories in Greece

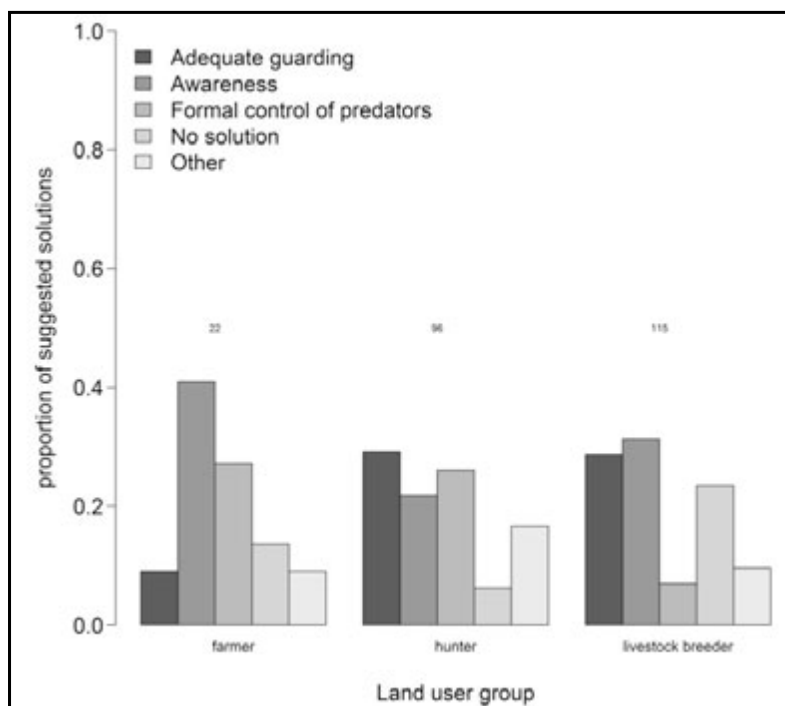
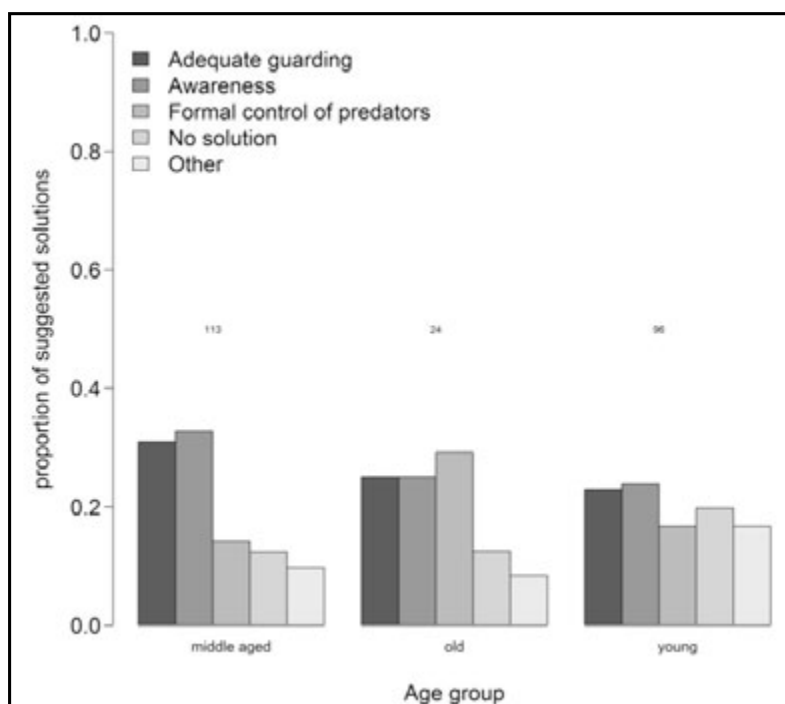


Figure 12: Proportion of solutions suggested by 3 land user's age classes in Greece



Found Egyptian vultures

For the question "Have you ever found a dead Egyptian Vulture" only eight Greek land users answered yes and there was only one response from Bulgaria. In Greece, four events took place prior to the reporting period (before 2003) and four occurred during the reporting period; two events with poisoned individuals,

one event where a chick fell from the nest and one event where 2 individuals died from unknown reasons. In Bulgaria, 4-5 poisoned Egyptian Vultures were found in the area of the village of Metlika in 2004-2005.

The rest of the interviewees either didn't answer or had never found a dead Egyptian Vulture. Most said that they don't know the species or they had not seen it in their region for many years.

In favor or against the use of poisoned baits

At the end of the questionnaire we checked if the interviewees were in favour or against the use of poisoned baits as a formal control method as was the case before 1993. From the total of 367 Greek land users 236 responded. Of these 158 were against the use of poisoned baits and these included 84 livestock breeders, 44 hunters, 10 farmers and 20 mixed land user categories. In favour of the use of poisoned baits were 78 land users including among them 37 livestock breeders, 29 hunters, 3 farmers and 9 mixed land user categories. The latter sample (78) is higher than the sample (39) of interviewees who proposed the formal control of predators (meaning mainly poisoning) in the Table 11.

From the total of 236 Bulgarian land users only 27 responded. Of these 23 were against the use of poisoned baits and these included 7 farmers, 6 livestock breeders and 10 hunters. Only 4 respondents were in favour of the use of poisoned baits and these included one farmer, one livestock breeder, one hunter and one farmer/hunter. One person from the latter group said that it was impossible to stop the practice of poisoning and two admitted to using strychnine to kill dogs, cats and wolves.

Results - Questionnaires in agencies

In both countries 153 questionnaires were completed by agencies, 110 of these in Greece and 43 in Bulgaria. Researchers visited authorities based in the capitals of every prefecture of the study area as well as in their departments located in smaller towns/villages. The agencies included Forest and Veterinary authorities, Regional Environmental directorates, National Park agencies, Hunting federations and Hunting clubs. They also visited private stores for holding pesticides, private veterinary clinics and nationwide or local environmental and animal welfare organizations. A description of the agencies involved in filling out questionnaires for both countries is presented in the Appendix (Tables AP 2.2 and AP 2.3). All of these authorities/organizations/private-offices are hereafter referred to as agencies.

The professional background of interviewees is shown in Table 12. In both countries most respondents were veterinarians, 33 from Greece and 22 from Bulgaria, as they are the ones that deal with poisoned animals whether these are either alive or dead. The sample of veterinarians is large because it also includes vets from both private and public practices. Foresters (18) and policemen (12) for Greece and hunting (10) and forest guards (8) for Bulgaria were the next most important participants in the questionnaire as they are responsible for certifying a poisoning event. Agriculturists were an important target group in Greece as they are involved in the control and or sale of pesticides.

Table 12: Number of agencies' interviewees per professional background in both countries

Professional background	Greece	Bulgaria
veterinarian	33	22
forester	18	
agriculturist	14	
policeman	12	
forest guard	8	8
public employer	8	3
hunting guard	2	10
fireman	2	
other occupations	13	
Total interviewees	110	43

Detailed results from the questionnaires answered by representatives of the agencies are presented below. From 11 questions in the questionnaire 9 were analyzed as they concerned the status of poison use, the opinion of agencies on this subject, the reasons for illegal using of poisoned baits and suggestions to control their use. In some questions, individuals from the agencies selected more than one answer, thus in the relevant tables two samples are presented:

Abbreviations used in the tables:

nGR, nBG=number of agencies that answered the question in Greece and Bulgaria respectively

na=number of answers for multi-answer questions

Poisoned baits for the extermination of predators

From a total of 110 Greek interviewees, 80.91% answered that poisoned baits were used for the extermination of predators within the previous decade in their area and 19.09% said that they weren't used.

The Greek Forestry Services had little data themselves and what they had was mainly that reported by NGOs because their employees rarely report such events. They also believed that the phenomenon was more frequent prior to 2008 than it was in the last few years either because after that time several pesticides were banned or because people became more sensitive to the use of poisons. Some estimated an occurrence of 1-2 events in every 5-year period. Police Departments also had few or no data. They estimated that 2-3 events a year might take place but this was an informal estimate as they thought people avoided making complaints for social or economical reasons (people have to pay 100 euro to file a complaint with the police).

Some interviewees, including those from both from hunting clubs and hunting guards, estimated the occurrence of poisoning to be 2 events per 10 year period, others estimated it to be 1-2 events a year and yet others mentioned 1-2 events every 5 to 10 years.

Some of the vets from public veterinary authorities estimated the occurrence of poisoning to be 1-2 events a year and others estimated it to be 2-4 events a year. The highest estimation was given in the region of Soufli at 20 events per year against dogs. In contrast to the public vets, vets from private clinics presented a different estimation of the level of poisoning. Most said that 5-15 events occurred each year. Four exceptional reports include: (i) in 2011 when 30 hunting dogs were poisoned near Iasmos (ii) that 20-50 dogs are poisoned yearly in Sapes (iii) 50 dogs were poisoned yearly before 2008 and 10 are poisoned yearly the recent years in Soufli region and (iv) 80 dogs are poisoned yearly in Alexandroupolis.

Interviewees from animal welfare associations estimated the level of poisoning to be 10 dogs per year. However they gave two exceptional examples including a report of 50 dogs poisoned per year in Alexandroupolis (Kivotos dog welfare Centre) and an average of 150 dogs poisoned per year in Komotini (Komotini Municipality Animal Centre), in both cases the majority of which were stray dogs.

Finally agriculturists belonging to privately run stores for pesticides mentioned an estimate of the number of people who ask directly for strong poisons or pesticides that can be used in baits to be on average 10-15 people per year and one said it was 20-40 people in Xanthi. Some said that more people (10-15 per year) asked for these products in the first decade of 2000 but after the ban of highly toxic pesticides this number gradually decreased. Another said that after highly toxic pesticides were banned, people used pesticides that have a low concentration of active ingredients and consequently the affected animals die slowly from a gradual degeneration of their internal organs.

The 43 Bulgarian respondents gave an opposite result to that of Greece. A majority of 72.1% (n=31) answered that poisoned baits weren't used for the extermination of predators during the previous decade in their area while 27.91% (12) said that poisoned baits were used. The latter group mentioned that this was done mainly for the control of rodents but in a few cases the inappropriate use of rodenticides also caused the poisoning of some other mammals. Sporadic poisoning of dogs was reported in settlements and these occurred because of conflicts among neighbours or a dislike/disturbance caused by animals. Among those who said that poisons aren't used, 3 respondents said that some people, especially livestock breeders who wanted to kill wolves, searched for poison but found that there was nowhere from which they could be acquired. During the reporting period, three events of mass poisoning occurred, including that of wild hares in Vetrino, 20-30 sheep in Provadia and 25 sheep in Pirogovo, which all resulted from the consumption of seeds that had been coated with pesticides. A few more events involving lower numbers of sheep were reported in Ivanovo and Koshov.

For the question "*Which social group do you believe is responsible for the use of poisoned baits*", 97 Greek respondents ranked village and urban residents (27.8%), livestock breeders (26.34%), hunters (24.88%) and

lastly farmers (18.54%) as being the social groups responsible for the use of poisoned baits (Table 13). One record each for beekeepers, ecologists and persons with psychological problems were also reported.

The social groups responsible for using poisoned baits in Bulgaria were ranked by 20 respondents as being farmers (47.6%), livestock breeders (28.57%), urban and village residents (19.05) and lastly hunters (4.76%) (Table 13).

Table 13: Percentages of the social groups responsible for using poisoned baits in Greece and Bulgaria as estimated by agencies (nGR=97, nBG20)

Responsible social group in using poisoned baits	Farmers %	Hunters %	Livestock breeders %	Village/urban residents %	Beekeepers %	Ecologists %	Psychos %	Unknown %
Social group naGR=205	18.54	24.88	26.34	27.8	0.49	0.49	0.49	0.97
Social group naBG=21	47.6	4.76	28.57	19.05	-	-	-	-

For the question *“Which species are targeted”*, 97 Greek interviewees selected dogs as the most frequently targeted species (43.62%), followed by foxes (18.52%) and wolves (18.11%) (Table 14). Within dogs the individual groups were ranked as being predominantly stray dogs (49.06%), followed by both hunting dogs (20.75%) and shepherd dogs (18.87%) and lastly pet dogs (2.83%) but there was a category of undefined dogs (8.49%).

In Bulgaria, 22 interviewees selected rodents (35.29%) and dogs (32.35%) as being the main species targeted followed by foxes (14.70%), wolves (11.76%) and insects (5.89%).

Table 14: Proportion of targeted species for poisoning in Greece and Bulgaria estimated by agencies (nGR=97, nBG=22)

Targeted species for poisoning	Greece na=243 %	Bulgaria na=34 %
Dogs	43.62	32.35
Fox	18.52	14.70
Wolf	18.11	11.76
Bear	4.94	
Badger	3.29	
Rodents	3.29	35.29
Sheep/goats	0.82	
Martens	2.47	
Corvidae	0.41	
Cats	2.88	
Horses	0.41	
Pigeons	0.82	
Wild boar	0.41	
Insects		5.89

For the question *“Describe the reasons behind the extermination of targeted species”*, 83 Greek respondents mentioned the main reasons as being livestock losses (23.86%), damages to cultivations (22.16%), disturbances/personal differences (15.91%), reduction in game species (13.07%) and damages in hencoops (12.50%). Private agriculturists said that stray dogs had increased a lot and because they were starving they even entered hencoops to attack chickens in villages and the outskirts of cities or damaged cultivations of watermelons and vineyards. As they didn’t consider foxes to be important target species (Table 14), they gave

lower ranking to “decrease of game abundance” and “distraction of hunting dog training” as being reasons related to poisoning of foxes.

Twelve Bulgarian respondents selected 4 reasons for the extermination of target species: damage in cultivations (9 answers); damage in hencoops (1); damage in cultivations of vegetables (1) and livestock losses (1).

Table 15: Relative frequency of damages caused by targeted for poisoning animals in Greece estimated by agencies (nGR=83)

Damages caused by targeted for poisoning animals	Greece na=176 %
Livestocks losses	23.86
Cultivations	22.16
Disturbances/personal differences	15.91
Decrease of game species	13.07
Hencoops	12.50
Distraction of hunting dogs' training	8.52
Attacks on hunting dogs	2.81
Granaries	0.57
Bee hives	0.57

For the question *“Do you know what types of baits are used for poisoning in your area”*, 75 Greek interviewees selected predominantly a “piece of meat laced with pesticide” (64.6%). Several versions of a piece of meat were mentioned including for example meat, meatball, bones and sausages. The category “dead livestock laced with pesticides”, which included the use of dead horse/mule/donkey, was reported less frequently (11.51%) as there were only two entries for these. The agencies didn’t consider fox to be an important target species (Table 14) so they gave a lower proportion to the use of “capsule with cyanide” in bait (Table 16), which is a recognised method used for fox control.

Only 4 Bulgarian interviewees responded to this question and selected 3 types of baits: piece of meat laced with pesticide (2 answers), dead livestock with unknown poison (1) and seeds coated with pesticides (1).

Table 16: Proportion of different type of baits in Greece estimated by agencies (nGR=75)

Type of baits	Greece na=113 %
Piece of meat with pesticides	64.60
Dead livestock with pesticide	11.51
Capsule with cyanides	9.73
Piece of meat with strychnine	5.31
Rodenticides	3.54
Piece of food with pesticide	2.66
Meat with pieces of crashed glass	1.77
Vegetable pulp with pesticide	0.88

For the question *“Where are the poisons sourced from”*, the majority of Greek respondents mentioned stores with pesticides where people buy pesticides that are permitted in EU and mix them to produce a strong poison. Pesticides mixed with rodenticides were also used as a strong poison. Nine respondents from a variety of professional backgrounds (such as vet, forester, policeman, agriculturist, hunting guard) reported that illegal chemicals including pesticides, strychnine and cyanide were imported illegally from Turkey and also in one case from Bulgaria. Pesticides including Methomyl, Parathion, Endosulfan, Forat and various Carbamates and Organophosphates were used in poisoned baits. A plastic bag with a strong poison (Methamidophos) commonly referred to as “barouti” was illegally traded in Greece.

For the question *“Have you had any secondary raptor mortality incidents due to poisoned bait use”* 21 Greek respondents answered. Poisoning events involving Griffon Vultures, a Golden Eagle and a Common Buzzard occurred in the Nestos gorge in 2011¹¹, a Black Vulture was poisoned Loutros, South Evros¹² in 2012 and the Egyptian Vulture known as “Lazaros” (was poisoned near Serres in 2013)^{13 14} and these were reported mainly by the agencies closest to the event. Some more poisoning events included a hawk poisoned by rodenticides in the region of Drama, one buzzard was poisoned in Grevena region, one Black Vulture was poisoned in the Sidiro-Soufli region in 2003 and 3 buzzards, 1 eagle-owl and 1 barn owl were poisoned in the Komotini region. Two respondents one each in the regions of Soufli and Didimoticho said that they were aware of poisoned raptor/vulture incidents from WWF documents.

Three respondents in Bulgaria referred to incidents involving the poisoning of one unidentified raptor in the Kardzhali region, one hawk in the Koshov region as well as incidents of poisoned jackals, foxes and magpies following rodent control measures taken in the Shtrakevo- Ivanovo region.

Measures taken to prevent the use of baits

For the question *“During the last decade have there been any measures taken for the control of poisoned bait use in your jurisdiction”*, the 69 Greek interviewees said that no measures have been taken but 26 referred to measures such as:

- Animal welfares organization campaigns against the poisoning of stray dogs in the Aridea region and subsequent prosecutions with penalties
- Mass media cover of a poisoning event in the Nestos river valley area combined with campaigns by the local animal welfare organisation in Stavroupoli region worried the residents of the area
- A workshop on the impact of poisoning and surveillance in the Grevena region organized by the staff of the Vikos-Aoos & Pindos National Park
- Workshops for local people and hunters in the Kalabaka region organized by Arcturos within the LIFE project against poisoned baits¹⁵
- Awareness measures organized by WWF in the Evros region
- Campaigns by Kivotos animal welfare sanctuary for schools and local people in the Alexandroupolis region
- Intensive surveillance by the Soufli Forestry Service during periods of increased occurrence of the

11 http://www.ornithologiki.gr/page_cn.php?aID=1422

12 <http://www.econews.gr/2012/08/17/dilitiriasmenos-mavrogupas-evros/>

13 http://www.ornithologiki.gr/page_cn.php?aID=1507

14 <http://lifeneophron.eu/en/news-view/150.html>

15 http://www.arcturos.gr/en/index.php?option=ozo_content&perform=view&id=43&Itemid=44

phenomenon

- Information campaigns done by Hunting Clubs in the Alexandroupolis region
- Compensation for losses of livestock with a satisfactory amount of money
- Campaigns against the poisoning of stray dogs in the Komotini region

In terms of the how effective were the measures mentioned above, some said that complaints, punishments or media cover were effective because people were afraid of being arrested. The awareness campaigns could be effective if they addressed systematically all target groups and were supported by a continuous physical presence of authorities and NGOs. One respondent from the Forestry Service said that the conflict between hunters and livestock breeders couldn't be stopped despite the measures.

In Bulgaria, 3 interviewees said that no measures had been taken and 10 said that after both the implementation of rules in the use of agricultural pesticides and the ban on the use of poisoned baits at the end of '60s people could no longer find strychnine, which was once found commonly in stores. Thus the ban of toxic poisons was an effective measure. However even despite the ban on the use of poisoned baits some poisonous substances could be obtained easily either from cooperative farms, which existed up to the 90s, or from the black market.

Suggestions to stop the future use of poisoned baits

The 89 Greek interviewees made 5 main suggestions (Table 17) under the following headings: (i) "awareness/education" (22.35%), which meant the awareness of local people and environmental education in schools concerning the impact of poisoned baits on wildlife; (ii) "use of trained shepherd dogs" (12.35%) to prevent attacks by shepherd dogs on hunting dogs and to be better guards of livestock from attack by wolves; (iii) "adequate guarding" (11.76%), which meant the provision of an adequate number of guards, proper infrastructure, equipment and consumables and furthermore the implementation of strict prosecutions and punishments; (iv) "formal control of predators" (11.76%) in order to avoid the secondary poisoning of raptors (under this heading a few people also specified the use of poisons with prerequisite controls and in one case proposed that in collaboration with hunting clubs specific bait stations should be established for the control of rodents, foxes etc in every region) and (v) "formal control of stray dogs" (11.17%), where everyone mentioned the implementation of the rules of the law 4039/2012¹⁶, which few municipalities or private persons actually followed.

Additional suggestions proposed by the agencies included the "use of electrified fences" around beehives (9.40%) and this included the suggestion by two respondents for the proper fencing of hencoops and sheepfolds. Agencies also mentioned an "improvement of the compensation system" (8.23%) and the "control of the illegal traffic of banned pesticides" (5.29%). Other suggestions were less common and included: (i) "self-awareness" (3.53%); (ii) "proper hunting management" (1.18%), an example of which was to decrease the number of wild ungulates permitted to be hunt by each hunter to allow their population to improve and (iii) "proper shepherding" (1.18%) or in other words that shepherds should do their work more responsibility. Final suggestions made once each were: "habitat management" (0.59%), meaning to increase the natural population of prey species for predators; "collaboration among authorities" (0.59%), meaning to effectively control the use of poison baits and lastly "increase public authority annual budgets" (0.59%), which would mean being able to implement the laws and provide adequate guarding of wildlife.

One Bulgarian respondent replied and proposed environmental education in schools.

¹⁶ Law 4039/2012 with the title: For privately-owned and stray pets and the protection of animals from exploitation or use for profit.

Table 17: Relative frequency of suggestions proposed by agencies to stop poisoned baits in Greece (nGR=89)

Suggestions to stop poisoned baits	Greece na=170 %
Awareness/education	22.35
Trained shepherd dogs	12.35
Adequate guarding	11.76
Formal control of predators	11.76
Formal control of stray dogs	11.17
Electrified fences	9.40
Improvement of compensation system	8.23
Control of illegal traffic of banned pesticides	5.29
Self-awareness	3.53
Proper hunting management	1.18
Proper shepherding	1.18
Habitat management	0.59
Collaboration among authorities	0.59
Increase public authorities' annual budget	0.59



Discussion - Greece

Poisoned baits for the extermination of predators

The use of poisoned baits in Greece was confirmed by 62.67% of land users and 80.91% of agencies. Among the land users only two admitted that they personally used baits against wolves. Even though a high percentage of agencies mentioned the use of poisoned baits a lack of knowledge by them concerning the reporting events was noticeable. Apart from public veterinarian authorities, animal welfare groups and NGOs almost no one kept records of poisoning events. Public veterinary services keep records of animals that died from poisoning when samples of these were sent to laboratories for toxicological analysis. However these were either pets or privately owned working animals where a concerned citizen or a NGOs requested the analysis. Records of all other cases of either dead or rescued poisoned animals were never archived. Korbeti et al. (2012) reported both the lack of a systematic and authorized approach to reporting incidents and the failure of certain protocols for veterinary and toxicological tests to deal adequately with such incidents as representing an important administrative gap.

Accordingly the number of poisoning events reported by the land users group was higher than that reported by agencies. Events reported by land users were characterised as being informal because the majority of them never reported these to the authorities even if they had lost their own dogs. This resulted in a very low number of events that forestry services or police had to report. This is also the reason why these agencies couldn't estimate the phenomenon reliably as the representatives from the forestry services and police who responded to the questions actually based their answers on informal knowledge.

Most state authorities are based in towns and cities and they tend to have more information on poisoned stray dogs than on wolves, foxes, bears, vultures and raptors. In the majority of cases information about the poisoning of wildlife originates from environmental NGOs and hunting organizations. Inadequate staffing and poor infrastructure within the public services combined with their heavy bureaucratic workload has led to their staff being relatively distant from the concerns of rural life. This explains why people from the forestry services underestimated the phenomenon in comparison with people from the public veterinary services or even private veterinary clinics and those from pesticide stores. Forest and hunting guards may know more but relatively few of these were interviewed. Nevertheless, their opinion didn't differ from that of their employers. As they know that poisoning events aren't officially recorded they generally kept or expressed a conservative attitude towards these as dictated by the priorities of life.

Both land users and agencies suggested that hunters and livestock breeders were the main social groups that use poisoned baits while agencies also suggested villagers/urban residents as additional users (Table 6 & 13).

Dogs and foxes were mentioned almost equally by land users as being the main species targeted for poisoning while wolves were considered as being secondary targets (Table 7 & 14). Shepherd dogs were at the top of the list of target dog categories and this indicates that one reason why poisoning events happen is because of the conflict between hunters and shepherds resulting from the killing or injuring of hunting dogs by shepherd dogs. Shepherd dogs are also killed for other reasons but these are of lesser importance, for example because they eat grapes, disturb or scare residents etc. The conflict between hunters and shepherds was also reported to occur by livestock breeders in Grevena (Central Greece) where the main reason for poisoning events (40%) was to kill shepherd dogs and this takes place before the commencement of the hunting period (Tragos et al. 2010). In Oiti National Park (Sterea Ellada) 9 of the 18 livestock breeders who lost their shepherd dogs did so due to a conflict with hunters (Iliopoulos & Petridou 2012).

Dogs and to a lesser extent foxes and wolves, were pointed out by agencies as being the main species targeted for poisoning. Stray dogs were at the top of the list of dog categories and were followed by hunting and shepherd dogs. The overpopulation of stray dogs is of concern to many agencies and NGOs and the fact that

these dogs are regularly poisoned reflects negatively on the public. One reason that stray dogs were highlighted as a major category was due to the larger sample of vet interviewees who are themselves involved in handling poisoning events involving stray dogs. Moreover vets receive less information about the poisoning of hunting or shepherd dogs because these dogs usually don't survive and instead die in the mountains.

Foxes have always been regarded as a target for control measures for several reasons but it seems that the main one is because they feed on hares. This was confirmed by land users who estimated "fox attack" as being one of the lowest causal factors in production losses (Table 3). In fact illegal hunters still actively poison foxes. Usually they follow the old practice that was used officially before 1993. They place out poisoned baits during the night and they collect the baits early the following morning. However, as a result of this practice other mammals are also poisoned during the night or in the following days especially if baits aren't collected due to neglect or because of a fear of being seen. Shepherd dogs are the category of dogs that suffer most due to fox poisoning activity. Fatality was recorded at 50.8% for shepherd dogs due to poisoned baits placed out to control foxes in Central Macedonia and Central Greece during 1998-2000 (Iliopoulos et al. 2000).

Some land users wish to kill wolves but they prefer to shoot them directly rather than poison them because they are afraid of losing their own animals from their own poisoned baits or they believe that poisoned bait is not so effective as it doesn't always attract wolves. Nevertheless even a single poisoning event intended to kill wolves can result in bird fatalities and this happened with the loss of a Griffon Vulture colony in the Nestos valley in 2012 (Korbeti et al. 2012). This was a poisoning event of severe consequences for the Griffon Vultures, which was first reported by the agencies.

Reductions in game species, livestock losses, damages in cultivations and disturbance/personal differences were mentioned by both land users and agencies as being caused by or arising from the species targeted for poisoning; although there was a little difference on how these were prioritised between land users and agencies (Table 8 & 15). Apart from these four reasons, land users also mentioned attacks on hunting dogs and the distraction of hunting dogs while training but the agencies also mentioned damage in hencoops. Livestock losses were highlighted as being important by both groups to the same extent.

A piece of meat impregnated with pesticide was the main type of bait in use according to both land users and agencies (Table 9 & 16). Capsules with cyanide were the second most frequently mentioned type of bait and this was connected with foxes being one of the main target animals according to land users. By contrast, capsules with cyanide were mentioned much less frequently by the agencies.

After 1993 the use of pesticides as a poison in baits remained common. Based on the estimation of agriculturists, the demand for highly toxic pesticides for use in baits decreased near the end of study period (from around 2008 and thereafter) as they were banned by EU regulations. However farmers were familiar with those products and people imported them illegally from Turkey especially as pesticides for use on tobacco, which is a widespread crop in Thrace. Trafficking of large quantities of illegal pesticides can be controlled by Customs officials at border crossings but the smuggling of small quantities by single individuals can easily elude Customs controls. A concern about the illegal importation of these products was expressed by respondents from both agriculturists and pesticide stores workers, which added that pesticides are much cheaper in Turkey than in Greece. One agriculturist from the Soufli region pointed out that 70% of farmers import small quantities of pesticides from Turkey while a lower proportion of between 3-5% of people are involved in the large scale importation of illegal products. The use of pesticides that are on lists of banned products was confirmed during the study period by vets and agriculturists who mentioned Methomyl, Parathion, various Carbamates, Endosulfan and Methamidophos as common substances that are used in poisoned baits. These active ingredients were detected in both poisoned mammals and vultures following toxicological analysis during the period 2000-2012 (Korbeti et al. 2012, Xirouchakis et al. 2011, Skartsi et al. 2010, Xirouchakis 2000) and are continued to be found (HOS and WWF 2014 LIFE NAT/BG/000152, unpublished data). Korbeti et al. (2012) recorded Methomyl as occurring in 73% of substances detected. Based on the experiences of vets and agriculturists, authorized pesticides are also used but due to lower toxicity they act slowly and ani-

imals suffer before they die. An example is the product Storm, which is an herbicide with active ingredients comprising the sodium salts of bentazon & actifluofen. Rodenticides such the product Brodifacoum (an anti-coagulant related to Warfarin but with greater persistence) are also used as poisons in baits and these may be mixed with authorized pesticides or used alone.

Capsules with cyanide were often referred to by interviewees as being a selective poisoning method that doesn't affect vultures but this belief lacks credibility (Giannatos & Grivas 2004). The salt of potassium cyanide (KCN) when placed in a container with fat is converted to and hydrocyanic acid (HCN), which also occurs in the stomach by the action of hydrochloric acid (HCl). Hydrocyanic acid is a gas that rapidly affects the animal, causing severe and rapid poisoning symptoms occurring over a matter of several seconds. In a corpse both hydrocyanic acid and potassium cyanide deteriorate rapidly and consequently the detection of these substances in putrefying cadavers is difficult using simple laboratory methods. In addition a secondary danger arises because certain organs such as the liver and kidneys can contain dangerous levels of toxins for a period of several hours after the death of a poisoned animal (Giannatos & Grivas 2004). The source of KCN to those who use it in poisoned baits isn't known; a few said that stocks are still to be found in warehouses. People said that the preparation of these baits is dangerous for humans and it is likely that very few people are involved and that they possibly charge a fee for this service. In many cases, due to the careless use of cyanides in poisoned baits foxes, shepherd dogs and hunting dogs are poisoned and this was confirmed by some of the respondents in this study.

The general perception of land users regarding the issue of poisoning didn't differ significantly among farmers, hunters and livestock breeders. Two exceptions were: (i) farmers who mentioned capsules with cyanide as being the second most important type of bait, which contrast to the opinion of hunters and livestock breeders and this can be explained because foxes are controlled mainly in farmland and semi-forest areas and (ii) hunters who, more than farmers and livestock breeders, pointed out that the wolf was the species that livestock breeders poisoned and this resulted in collateral losses to their hunting dogs. The general perception concerning the poisoning issue also didn't differ significantly among different age groups including the young, middle-aged and older land users.

This study indicates that the attitude and practice of poisoning is deeply ingrained in rural communities. It is also a complicated process as it is not always clear if people wish to kill predators because: (a) predators cause intensive damages at specific times; (b) predators must be killed to prevent any damages or (c) tolerance to damages from predators is very low. Only large-scale farmers and livestock breeders stated a partial tolerance to damages but there were few of these groups in the study area. The majority of farmers and livestock breeders in this study area had small to medium size holdings or herds of animals and they usually take an initiative to kill animals thought to be damaging because even small-scale losses are highly detrimental to their income.

The control of damaging and troublesome animals by means of poisoning remains a common practice as it is considered to be effective and moreover it is difficult for the perpetrator to be identified.

Prevention measures against the illegal use of poisoned baits

Although the wolf was not the main target species for poisoning, wolf attack was actually considered to be the main causal factor (Table 3). Bear attacks and bad weather conditions were considered equally to be the next most important causal factors. The main measures adopted by livestock breeders to prevent damages included having trained shepherd dogs, proper guarding of livestock during pasture, shooting predators and proper fence of stockyards, while some said that no measure was possible to prevent wolf attack during pasturing (Table 4). Just over half (55%) of the livestock breeders could find good shepherd dogs but some kept breeds such as Caucasian and Kangal dogs, which attack hunting dogs and are consequently poisoned in retaliation. Due to the conflict between hunters and livestock breeders the later may frequently lose their

experienced dogs. As a result of this and because it takes a long time to raise new pups their livestock remain temporarily unguarded. From those who answered that they could find good dogs, the majority of them didn't pay attention to training their dogs but on searching for specific breeds. Furthermore they changed breeds of dog until they found ones that suited them but at no time did they take care to keep their dogs as pure breeds. Many livestock breeders keep a large number of dogs relative to their herd size and most of the dogs are of mixed breed origin.

Pure breeds of Greek shepherd dogs have been provided most systematically in certain SPAs within the study area, notably where the NGOs Arcturos and Callisto are permanently present as for example in Antichasia-Meteora/Koziakas and in Grevena. The availability of good shepherd dogs has been shown to be effective at the local level in successfully reducing losses due to wolves and even farmers and owners of both small allotments and hencoops tend to use them (Krabokoukis et al. 2011). In the framework of this Life project shepherd dogs are being donated to livestock breeders within the anti-poisoning network established in Epirus.

In addition to shepherd dogs an experienced shepherd is an important factor in the effective guarding of livestock. Unfortunately most livestock owners don't actually pasture their herds themselves. Instead they hire part time shepherds for several reasons including: (i) the need to have a second occupation to increase income for small scale operators (ii) the need for help required by older livestock owners who cannot do all the tasks themselves and (iii) the time needed by large scale operators for paper work and the need to cultivate their fields to produce their own fodder. In all cases the hard daily work of being a herdsman is a secondary priority. The resulting situation is difficult to manage and in areas where this is especially intensive both livestock losses and the problematic behaviour of shepherd dogs are recorded as being due to the indifference of part time shepherds. The problem of poor herdsmen is more pronounced with goatherds. Goats are known to be more vulnerable to wolf attacks, which seem to be associated with an overlap between the wolf breeding habitat (woodland) and goat grazing patterns (Iliopoulos and Petridou 2012).

Adequate fencing of the stockyard is one of the most important factors in successfully protecting animals from wolf and bear attacks but few livestock breeders adopt this measure. Moreover electric fences were mentioned by only a very few land users who effectively protected their animals from wolf attacks. The use of electric fences around apiaries, stockyards and small crop fields indirectly assists bears as well as the general conservation of wildlife by preventing damage caused by wildlife attacks (Krampokoukis, 2011). Fortunately, an award scheme to purchase and install electric fences has been included recently in state agri-environmental measures¹⁷. The effectiveness of electric fences and associated agri-environmental measures should be promoted actively and widely.

Farmers and livestock breeders had a low level of satisfaction with the compensation system provided by ELGA for damage caused by wildlife to crops and livestock (Table 5). The majority of those disappointed with the amount of compensation were livestock breeders. However, the compensation system has essentially been viewed as an alternative to other preventative measures (such as appropriate fencing), which could be implemented for protection against the damage from wolf and bear attacks. The compensation system is financed mainly by the obligatory insurance fees paid by farmers, livestock breeders and beekeepers. In reality livestock breeders require a compensation of the real value of each animal lost instead of having to suffer losses that at least matches the minimum threshold that ELGA requires for each livestock species before compensation is made. Moreover the owners of goat herds don't take advantage of the compensation provided by ELGA because dead goats cannot usually be found. These drawbacks mean that the compensation system for livestock loss does not work as a measure to prevent the use of poisoned baits even though this was never the direct intention of the scheme. In contrast to the situation with livestock, damage caused to beehives from bear attacks are fully compensated (Karamanlidis et al, 2011). However, a drawback of this system of compensation, apart from relying on a minimum threshold, is that there is no specific management goal to reduce those damages (Giannatos & Grivas 2004). If ELGA could develop an evolving system of com-

17 8512/ΦΕΚ1060/29.04.2013: «Aid scheme under Action 1.1 "Purchase and installation of electrified fence"

compensation that relates compensation levels to good livestock practice, including that of having preventative measures to reduce livestock losses caused by wild animal attacks then the scheme could serve effectively as a preventative measure against the use of poisoned baits.

The control of stray dogs based on the proper use of the recent law¹⁸ could serve in effectively preventing the poisoning these dogs but the law is implemented inadequately by both municipalities and dog owners. Municipalities have made little progress in either sterilizing stray dogs or organizing kennels to house the dogs. On the other hand there are inadequate controls on owners who are obliged to place an identity chip in their dogs and to sterilize them if necessary to avoid uncontrolled reproduction. The irresponsibility of dog owners is surely increased by the current economic crisis and many respondents confirmed this. The lack of these controls can be seen in the increasing number of stray dogs present in cities or villages and the associated periodic occurrence of mass poisoning events.

Concerning measures to increase the diversity and abundance of game species, hunters said that adequate guarding was the main method following by habitat improvement and game management schemes (Table 10). If these measures were implemented properly and systematically they could also serve in helping to prevent the use of poisoned baits. It is interesting to note that no hunter mentioned the control of predators (i.e. foxes) as being a measure to increase game even though they said that foxes were responsible for reducing the number of the hares in the wild.

All of the above mentioned measures are poorly implemented and much work is still needed by the state and responsible target groups to improve the current situation.

Suggestions to control the use of poisoned baits

Agencies and land users had almost the same approach to what measures are necessary to be taken to control the illegal use of poisoned baits. Actions to increase awareness and provide education have been suggested as being important measures by both land users and agencies (Table 11 & 17). Adequate guarding was rated more highly as being useful by land users while agencies focused more on the control of stray dogs. Implementing measures to control predators was rated more highly as being useful by land users than by agencies.

All the interviewees believed that it is important to persuade people to change their attitudes towards the use of poisoning by having educational campaigns and activities. In previous years, such activities were done mainly by environmental NGOs under LIFE or other projects that were aimed at the protection of rare species of wildlife. Those activities were done regionally or locally and stopped with the end of the projects. Few respondents mentioned these projects or their activities. Perhaps the studies had been forgotten or they didn't involve the agencies that were interviewed during the study period or it is possible that ultimately the results of these campaigns were not effective. Hunting federations also provide information to the public and they condemn poisoning events in the media. Local animal welfare organizations provide constant awareness information in the media concerning pet welfare and protection and these actions were more familiar to respondents than were the actions of the NGOs. In a previous study done in 1999 awareness/education was proposed by 65 authorities who responded to similar questionnaires within a small-scale campaign against the use of poisoned baits in Greece (Skartsi et al. 2000). However, after 15 years, the relevant or knowledgeable authorities have not yet embraced these actions in order to communicate anti-poisoning campaigns to a wider audience. Some respondents said effective awareness relies on having the continuous presence of authorities and NGOs either in the media or as a physical presence in rural areas. This measure could be done if it was combined in an effective way with measures to provide adequate guarding so that authorized guards could also play an essential role in raising awareness of land users and thereby help to prevent the

use of poisoned baits.

Nevertheless, in the absence of essential measures to prevent damages, awareness and adequate guarding aren't sufficient measures by themselves. Aggrieved land users will continue to illegally control the damaging and troublesome animals. Unfortunately, measures that require a change of attitude such as doing proper shepherding, having trained shepherd dogs, following proper management and planning of hunting activities, undertaking active management of wildlife and game species as well as carrying out habitat improvement were suggested by interviewees that included only a few land users and even fewer agencies. Some hunters mentioned a few of these measures in their proposals to increase game populations (Table 10).

Egyptian vulture

The Egyptian Vulture was not a well-known species for the majority of land users except in areas where it is still breeding or in other areas such as Epirus where the species is really symbolic for shepherds because of its impressive appearance, arrival in spring and by living near their sheepfold it is considered to bring luck to their production. For those who didn't know it, when they understood that it is a scavenger species some stated that these birds had disappeared due to the decrease in their food (a decrease in livestock) but the majority stated that it was due to poisoning!

Discussion - Bulgaria

Losses in production

The present study revealed a much lower problem with the use of poisons in Bulgaria, compared to Greece. In the few cases reported information on poisoning came from land users and the main reasons for using poisons was related to reducing losses in production, which were primarily loss of livestock due to the actions of carnivores and damage to cultivations by rodents. However, most (50%) of the interviewed land users in the Bulgarian SPAs claimed that they do not suffer from losses in production. The land users (36%) who suffered from losses in their production recognized wolf attacks on livestock as being the main problem (amounting to 58% of the losses). To a lesser extent, feral dogs, jackals and fox were also recognized as being predators that cause damages to livestock, in hencoops and to wildlife (hare and game birds).

The problem with wolf attacks on livestock is an issue predominantly in southern part of the country (i.e. the Eastern Rhodopes), which is more densely forested than are the plains of the northern parts of Bulgaria. The population of wolves in the Eastern Rhodopes is high and livestock breeding is widespread. In the Eastern Rhodopes, livestock used to consist of local breeds of cattle, such as short-horned and grey Bulgarian cattle, which are managed and grazed over widespread areas and therefore could easily become victims of wolf attack. During meetings with hunters and livestock breeders in Madzharovo in 2013 (under action D4 of this project), the local people claimed that they suffer about 10% of losses annually in their livestock from wolf attacks. ***The main issues related to the human-wolf conflict in Bulgaria are that livestock breeders receive subsidies based on the number of individuals belonging to local breeds of cattle they maintain, and that there are no direct compensations for the losses from wolf attacks in the country (in contrast to the situation with wolf attacks there is however compensation for damage caused by bears in Bulgaria).***

The losses to livestock caused by wolves may be exaggerated. A study done by the NGO Green Balkans (based on interviews with Forestry Departments in the country) revealed that the damage caused by wolves to livestock was exaggerated. In addition, contemporary and systematic studies on the diet of the wolves showed that the percentage of the domestic animals consumed is site-dependent (National Action Plan for the Wolf, in prep.). In the Western Rhodopes ungulates were found to be the main prey (80% of the diet) amongst wild animals consumed by the wolf. Domestic animals represented less than 20% of the wolf's diet and the highest fractions comprised horse (4%) and dog (3%) as well as sheep, goats and cattle (2% each). Similar results were also obtained also for the Eastern Rhodopes (H. Hristov, unpubl. data). In other areas, such as the Pirin mountains, where livestock graze over both rough and well vegetated terrains and are consequently vulnerable to attack by wolf, damages to domestic animals are estimated to be higher (47%), with mostly goats (21%) and dogs (13%) as prey (National Action Plan for the Wolf, in prep.). A systematic study done during 2002-2005 in south-western Bulgaria (Balkani, unpubl. data) demonstrated that there were annual damages of 1.5-3.8% caused by wolves to the wide-ranging grazing animals (the main prey was goats and sheep, followed by cattle and dogs).

Despite the small percentage of livestock that makes up a part of the wolf's diet, the real problem is the actual number of livestock killed by wolves because it is well known that this top predator kills more animals than it consumes. Hence, the key to solving the conflict between man and wolf is to establish a sustainable compensatory system that will cost the state far less than that it has to pay due to the eventual casualties resulting from the use of poison against wolves.

The use of poison against rodents was not highlighted as being a significant problem by land users but rodents were identified as comprising the main target group for poisoning by the authorities. Use of rodenticides seems to be the reason for the loss of Egyptian Vulture territories in northern Bulgaria in 2012-2013 (the last two pairs in Lomovete SPA). The male birds disappeared during the incubation period in April (and this occurred subsequently in both years), which is a period known to be appropriate for chemical treatment against rodents and other crop pests. Moreover, during this period crops are still low in height and vultures

looking for food could easily see even small sized dead animals. Although no official data on the use of rodenticides in the area during the last 5 year exists in the register of the Regional Agency for Safety of the Food, problems arising from the use of chemicals in cultivated fields was confirmed by the Office of the Rusenski Lom Natural Park (they claimed that besides the Egyptian Vulture, many other species of raptors declined in the area including Lesser Spotted Eagle and Long Legged Buzzard among others). The Office of the Park also mentioned the use of so-called “red” and “blue” seeds (i.e. treated with pesticides) in the region combined with incidents of poisoned sheep and goats, which had consumed these seeds. This corresponds with the information collected from the authorities during the present study and was also verified in the field during April 2014 by the BSPB team (Gradinarov & Difova 2014). Therefore, the problem with the use of rodenticides and other chemicals in agriculture and their impact on the Egyptian Vulture population in Bulgaria should not be underestimated, especially in the northern part of the country.

So far, no measures have been suggested to mitigate the problem arising from the use of rodenticides in the country. Therefore, a strong lobby should be made on the basis of Bulgaria being a member state of the EU to follow the Guidelines to Prevent the Risk of Poisoning of Migratory Birds. These guidelines were developed by a Convention for Migratory Species (CMS) Working Group coordinated by BirdLife (RSPB) and are expected to be adopted by the CMS in November 2014. Once adopted, these guidelines will provide an important opportunity to address the issue of poisoning arising from five priority category areas: insecticides, rodenticides, poison-baits, veterinary pharmaceuticals and lead ammunition at the level of the EU Member States, including Bulgaria.

Measures to reduce losses in production and prevent the use of poison baits

The information collected by the interviewed livestock breeders in Bulgaria concerning measures to reduce losses in production showed there to be a much lower diversity of applied measures and a lower level of knowledge on potential measures to reduce losses compared to that in Greece. The situation with Bulgarian hunters was similar in that none of the interviewees suggested any measures to increase the abundance of game species but there were however suggestions for “proper management of hunting” and the “control of illegal hunting”. The results from the present study also demonstrated that only a few of the interviewed people were aware about measure to prevent the use of poison baits. This indicates that there is a significant gap in the level of awareness in local communities on possible measures to mitigate the human-predator conflict, as a wide range of measures have been proposed so far in the country to reduce the depredation of livestock by wolves. For instance, the measures proposed in the National Action Plan for the wolf in Bulgaria (in prep.) are related mainly to the application of traditional practices such as: (i) permanent presence of a shepherd with the herd; (ii) use of good quality shepherd dogs; (iii) use of enclosures; (iv) use of electric fences and (v) others (e.g. inclusion of donkeys in the herds, use of sounds, etc.). A recent study on how to avoid the loss of livestock caused by wolves in south-western Bulgaria (Stoynov et al. 2014) confirmed that (i) the risk of loss increases with the number of the animals in the herd; (ii) the number of guard dogs negatively affects the risk of loss; (iii) mixed herds are exposed to a higher risk of loss; (iv) goats are more at risk of attack than sheep; (v) improving the quality of night corrals eliminates the risk of extreme cases of loss and (vi) herds grazing on rough terrain and bushy pastures are more susceptible to attacks by wolves.

In general, the use of well-trained shepherd dogs is recognized as being the most effective measure in the country as it has been shown to reduce wolf attacks by 80% (National Action Plan for the Wolf, in prep.). However the use of shepherd dogs has related problems as shown by the results of the present study, which include: (i) good quality dogs being expensive and difficult to find and (ii) some of the dogs (e.g. the Kangals breed) are aggressive and may attack people. In consequence many herds are not protected with good shepherd dogs because owners don't want to spend money on keeping dogs. It is also known that shepherd dogs can damage game species in the area and this is why these dogs need to have “stoppers” (as required by the National Law on Hunting and Game Management) and is also why hunters do not like them. Many of

the shepherd dogs are subject to being shot, poisoned or to other methods of direct persecution and only about 50% survive to be more than 5 years of age. The conflict between hunters and shepherd dogs need to be investigated further and with greater depth in a social context. This combined with better controls by the authorities is needed to prevent it developing in a negative way and be a repetition of the bad example of the farmer-hunter conflict in Greece.

Use of poison baits against predators

The use of poison baits was in the past a widely used method for the extermination of predators and other “pests” but it currently still has severe consequences. The use of poisoned baits began with the cooperative farming movement as well as with hunters and foresters but unfortunately it didn’t stop even after it was prohibited at the end of cooperative farming period during the 1990s. Long after that time it was still possible to find poison in what remained of what were called “cooperatives” at that time. Most probably this has contributed to vulture poisoning during the 1990s when the state was still developing from a market-led economy into a planned economy. It is very likely that some people might still hold reserves of poisons bearing in mind that some Greek interviewees mentioned the importation of strychnine from Bulgaria into Greece.

Even though the sample of respondents regarding the use of poison baits in Bulgaria was low, it seems that in the study area land users were not aware of poisoning, or alternatively they did not feel comfortable to discuss the issue. However, livestock breeders were mostly aware about poisoning and that the older interviewees were worried more about poisoning than were the young and middle aged interviewees. An interesting fact regarding this issue is that a sociological study done in the Eastern Rhodopes during 2014 (under action E4 of the current LIFE project) revealed that there is exchange between hunters in Bulgaria and Greece concerning their experiences with using poisoned baits to solve problems with wolves (BSPB, unpubl. data).

Results from the present study demonstrated that the most common opinion was that farmers and livestock breeders were the most frequent users of poisons and insect pests were recognized as being the most frequently target species for poisoning (56%), which was done with pesticides (Table 6, Table 13). However, a clear difference should be made between the use of pesticides, against either insects or rodents, and the use of poisoned baits against predators such as the wolf, jackal or dog. A north–south geographical division exists between two cases; the first involves both spraying against insects and distributing poisoned seeds for rodents and the second involves the use of poisoned baits for wolves. In the first case the two issues are more or less common practice in northern Bulgaria and a solution for this requires a totally different approach to that needed in the second case (Gradinarov & Difova 2014). The contrast between the two cases is evident in the Rhodopes where poisoning is linked to the intentional use of poisoned baits to exterminate mostly in this case wolves, which cause losses to livestock breeders. Also noticeable was a difference between the interviewed social groups concerning the species targeted (jackal and rodents were the main targets for poisoning by both farmers and hunters but dogs and wolves were the main target for livestock breeders). Due to its widespread occurrence the secondary poisoning of wildlife resulting from the systematic use of insecticides and rodenticides should be considered as the most significant current problem related to poison use in Bulgaria. However, because of the lower numbers involved, any accidental affect on wildlife arising from the use of poisoned baits for specific predators is currently considered to be of secondary importance in Bulgaria.

The role of authorities

In contrast to Greece, the majority of respondents from the Bulgarian authorities claimed that poisoned baits weren’t used to exterminate predators during the previous decade in the study area. This information contradicts both the data collected by BSPB (unpublished data from the current LIFE project and other projects)

and the information provided by land users. This discrepancy could result from a possible unwillingness to discuss this method of control in the field or from a lack of knowledge about it. The information obtained from the authorities confirms the need to work with both farmers and the Ministry of Agriculture and Food Supply to prevent the use of poisons and other illegal substances in agriculture. In addition one of the biggest challenges will be to lobby for a change in the political will to create better controls on the use of pesticides and poisons than exists now. The lack of a political will to introduce efficient controls was previously recognized as being one of the main problems in relation to nature conservation in the Eastern Rhodopes (Shindler et al. 2011).

Egyptian vultures and other scavengers

Even though the questionnaires didn't obtain much data on the hazardous use of poisons in Bulgaria, it is still considered to be the main threat to vulture species in the country (Dobrev & Stoychev 2013). Currently the population of Griffon Vulture is recovering slowly and reached a total of 70 pairs in 2014 (BSPB, unpubl. data). It seems that the lack of any large-scale poisoning events combined with an increase in the numbers of the livestock have positively affected its population size. However, this is not the case with the Egyptian Vulture, which in contrast to the Griffon Vulture, uses alternative sources of food such as food found on refuse sites and from road kills or it preys on small animals (Cramp & Simmons 1980). Hence, the hazardous use of poisoned baits against shepherd dogs (there were 2 cases in the Eastern Rhodopes in the last 3 years), wolves or other carnivores (see Tables 7 & 14) and especially the "secret" campaigns done against rodents in crops within northern Bulgaria (during autumn and spring) are all undoubtedly serious threats for the Egyptian Vulture.

Data collected during the present study confirms that the Egyptian Vulture is a victim of non-intentional poisoning done by local land users. Considering both the current widespread and non-systematic use of poisons in the country and the very low population size of the Egyptian Vulture (only 27 occupied territories in 2014), any effect on local sub-populations caused by poisoning could be considerable. In the Eastern Rhodopes, where the core population is located, the threat is related mainly to poisoned baits used by hunters and livestock breeders in the context of the human-carnivore conflict. In north-eastern Bulgaria farmers could support the otherwise negative trend of this Egyptian Vulture sub-population (only 7 occupied territories are left in 2014) by reducing or managing more effectively the commonly used pesticides, insecticides and rodenticides.



Conclusions - Greece

The use of poisoned baits is a practice known among land users and agencies but it is difficult for them to estimate its extent due to the fact that it is illegal.

An inadequate and insufficient staffing level combined with the poor infrastructure of public services and their resulting bureaucratic workload has led to a significant distancing of these employers from rural life and consequently to their difficulty in estimating the extent of the poisoning issue.

Land users avoid officially reporting poisoning events to authorities due to negative feelings such as fear, disappointment in the potential lack of reaction or unwillingness to spend money and proceed with a complaint.

Among agencies, only private veterinary clinics and animal welfare organizations reported having knowledge of poisoned animals (mainly dogs) in relatively high numbers while private agriculturists provided information on there being a high demand of pesticides for use allegedly in poisoned baits.

Both land users and agencies suggested that hunters and livestock breeders were the main social groups that were regularly and illegally using poisoned baits for the extermination of foxes and wolves respectively.

Dogs, foxes and to a lesser extent wolves are the main species targeted for poisoning. Among dogs, shepherd dogs and stray dogs are the main target groups in the countryside and urban areas respectively.

A piece of meat laced with pesticide is highlighted as being the main type of poisoned bait while capsules with cyanide are used to a lesser extent. Both poisonous substances (pesticides and cyanides) are illegal products that are trafficked illegally into the country. Control of the illegal importation into the EU of pesticides and other poisonous substances should be enforced by the customs authorities at border crossings.

The Greek Agricultural Compensation System (ELGA) could serve effectively in developing preventative measures against the use of poison baits. This could be done if it develops an evolving system that relates compensation levels to good livestock practice, including that of having preventative measures (such as adequate fencing) to reduce livestock losses caused by wild animal attacks.

Livestock breeding practices should be improved by promoting the use of suitable breeds of shepherd dogs and the construction of proper fencing of stockyards. Livestock breeders should be persuaded to put additional emphasis on the training of their dogs. Shepherd dogs should be promoted widely as a prevention measure not only by NGOs but also by governmental services. Any constraints on implementing the agri-environmental scheme for donating Greek shepherd dogs should finally be overcome.

Measures to increase populations of game species were highlighted by hunters as including the provision of adequate controls against illegal hunting as well as implementing habitat and game management schemes. In contrast, doing only checks was proposed as a measure to control poisoning. According to the hunter stakeholder group, sustainable game management and abundant populations of both predators and game aren't related directly to the prevention of poisoning. They see the culling of predators as being a necessity and thus poisoning is the easiest way for it to be achieved. A strategic change in hunting policy and planning should be promoted as a way to solve this conflict between hunting activities and predators.

Adequate checking of countryside by the forestry service and the enforcement and implementation of the law are very important measures that should be taken to control the illegal use of poisoned baits.

Public awareness and specifically the training of land user and agency staff on the impact that poisoning has on wildlife should be done continually and not happen under short term projects.

The formal control of predators was suggested by land users but this is highly unlikely to happen as the killing of predators that are protected species isn't permitted. On the other hand shooting of foxes is permitted under specific conditions but shooting this species isn't the preferred practice of hunters.

Municipalities should systematically promote campaigns to control stray dogs by raising awareness of the problem, introducing sterilization programmes, establishing public rehabilitation centres and developing a network of citizens willing to facilitate the adoption of stray dogs.

Conclusions - Bulgaria

A relatively small percentage of land users and agencies confirmed the use of poisons against wildlife in Bulgaria in contrast to that seen to Greece.

Farmers and livestock breeders are indicated as being the main social groups responsible for using poisons in Bulgaria.

There are two different ways that pesticides are used in Bulgaria: (i) the legal use of pesticides, including rodenticides to reduce losses in crop production and (ii) the illegal use of using pesticides in baits to control wolves, jackals and dogs to reduce livestock losses. Irrespective of the way they are used the impact of pesticides on the secondary poisoning of scavenger vultures is important.

The illegal use of poisons against wildlife in Bulgaria is not a common practice and in contrast to Greece any hazards that arise from this are accidental in character.

However, considering that even a single poisoning event in the main areas for vultures in the country could have a devastating effect on their populations. The following measures are needed to minimize the risk of illegal use of poison baits in Bulgaria: (i) introduction of a compensatory system by the state to cover livestock damages caused by large predators (especially wolves) as a corner-stone for the solution of the problem of setting out poisoned baits for predators; (ii) Increasing and encouraging the use of local breeds of shepherd dogs and (iii) Doing campaigns for local stakeholders to increase awareness about the consequences of the illegal use of poisons.

A multifaceted approach is needed to solve the problem of the intensive use of pesticides in agricultural practices in northern Bulgaria including measure such as: (i) More research on the magnitude and effects of this agro-environmental problem; (ii) Promote communication and cooperation among various experts, NGOs and authorities; (iii) Campaigns to increase awareness among farmers and relevant authorities and (iv) Improvement of the national policy aims to control better and more effectively the use of chemicals in agricultural practices.

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APPENDIX 1 - Abbreviations

Art.: article

BSPB: Bulgarian Society for the Protection of Birds

CMS: Convention for Migratory Species

ELGA: Hellenic Agricultural Insurance Agency

EC: European Community

EU: European Union

EVS: European Voluntary Service

HOS: Hellenic Ornithological Society

NAPTF: National Anti-Poison Task Force

NGOs: Non Governmental Organizations

Par.: paragraph

RSPB: Royal Society for the protection of Birds

SPAs: Special Protected Areas

WWF: World Wide Fund for Nature

APPENDIX 2 - Tables

Table AP 2.1: Detailed presentation of the number of land users and villages that contributed questionnaires per SPA code

Country	Partner	SPA code	No of questionnaires	No of villages
Greece	HOS	GR2130010	21	13
		GR2130009	18	8
		GR2130011	16	11
		GR2120009	15	10
		GR2120008	20	14
		GR1310004	19	14
		GR1440005	24	18
		GR1440006	19	15
		GR1140008	25	11
		GR1240007	30	11
	WWF	GR1110002	45	13
		GR1110009	22	12
		GR1110010	33	12
		GR1130011	34	21
		GR1130012	26	12
Bulgaria	BSPB	BG0002012	29	11
		BG0002013	30	19
		BG0002014	20	4
		BG0002019	21	15
		BG0002021	45	17
		BG0002025	6	4
		BG0002029	8	6
		BG0002038	19	10
		BG0002044	7	4
		BG0002071	16	8
		BG0002073	19	14
		BG0002106	16	7
TOTAL			603	314

Table AP 2.2: List of authorities, agencies, NGOs and private institutions that contributed questionnaires in Greece

GREECE			
Prefecture	Municipality	Village	Agency/organization
Thesprotia	Igoumenitsa	Igoumenitsa	Veterinary Departement
Ioannina	Ioannina	Ioannina	Pogoni Hunting Club
			Veterinary Agency
			Ioannina Hunting Association
	Zagori	Kipoi	Kipoi Police Department
		Aspraggeloi	Management Body of Northern Pindos National Park
			Municipality of Zagori
	Pogoni	Delvinaki	Delvinaki Police Department
	Konitsa	Konitsa	Konitsa Police Department
Grevena	Grevena	Mavranei	Vikos-Aoos & Pindos National Park Agency
		Grevena	Forestry Department of Grevena
			Police Station of Grevena
Trikala	Kalabaka	Kalabaka	Arcturos NGO
			Private veterinary clinic
			Local Veterinarian office
			Municipality of Kalabaka
			Forestry department of Kalabaka
			Kalabaka Hunting club
	Trikala	Trikala	Forestry department of Trikala
Pella	Almopia	Aridea	Almopia Hunting Society
			6th Hunting Federation Macedonia - Thrace
			Aridea Forestry Service
			Aridea Forestry Service
			Pet Shop
			Aridea Veterinary Centre
			Aridea Police Department
			Private store with pesticides
			Veterinarian Medical Shop
		Foustani	Aridea Forestry Service
			Foustani Veterinary Centre
		Exaplatanos	Municipality of Almopia
		Aetochori	Animal Welfare
Drama	Drama	Drama	Hunting Association of Drama
			Veterinarian Practitioner
			Agricultural Economy and Veterinary Medicine Directorate
			Drama Forestry Service
			Private veterinary clinic
			Drama Forestry Service
	Paranesti	Paranesti	Paranesti Border Police Department
			Drama Forestry Service
			Ecotouristic Business - Café
			Paranesti Police Department
			Rhodopi Mt Range National Park Authority
		Mesochori	Peliti
		Nikiforos	Public Veterinary Office of Nikiforos

GREECE			
Prefecture	Municipality	Village	Agency/organization
Xanthi	Stavroupoli	Stavroupolis	Private store with pesticides
			Animal Welfare Society
			Stavroupoli Forestry Service
Rodopi	Iasmos	Iasmos	Private veterinary clinic
			Iasmos Forest Office, Rodopi Forest Directorate
			Iasmos Hunting Federation
			Iasmos Cultural Club
			Iasmos Police Station
			Private store for pesticides
	Komotini	Komotini	Private veterinary clinic
			Department of Vet of the Rodopi Agriculture and Vet Department
			Komotini Ecological Association
			Municipality Animal Center
	Sapes-Maronia	Sapes	Private veterinary clinic (2 clinics)
			Sapes Forest Department
			Rodopi Prefecture Veterinarian Service/veterinarian district of Sapes
	Arriana	Arriana	Private veterinary clinic
Evros	Alexandroupolis	Alexandroupoli	Department of Environment, Evros Regional Department (2 questionnaires)
			Private store for pesticides (2 stores)
			Alexandroupolis Forest Service (2 questionnaires)
			Evros Forest Directorate (2 questionnaires)
			Private veterinary clinic (5 clinics)
			Department of veterinary, Evros Regional department
			Alexandroupolis Veterinary Office-Evros Regional Department
			Alexandroupolis Farmers' Cooperative
			Alexandroupolis Mayor
			Directorate of Agriculture (2 questionnaires)
			Evros Ecological Association
		Kirki	Alexandroupolis Forest Service/Kirki district
		Loutros	Evros Delta National Park Agency
			Evros Delta National Park Agency
			Evros Delta National Park Agency
			Kivotos, Animal Friends Society
			Traianoupolis Municipality Departement
		Feres	Private veterinary clinic
			Private store with pesticides
			Alexandroupolis Forest Service/Feres district
			Feres Veterinary Office
			Feres Police Station
			Feres Municipality Departement
	Soufli	Soufli	Soufli Forest Service (4 questionnaires)
			Soufli Police Station
			Evros Veterinarian Department/Soufli Veterinarian District
			private veterinary clinic
		Dadia	Local office of Evros regional department
		Tychoero	Private store with pesticides
			Tychoero Municipality Department
			Tychoero Police Office
	Didimoticho	Didimoticho	Didimoticho Forest Service
			Veterinary Center of Didimoticho, Orestiada/Evros Regional
			Private veterinary clinic
			Voluntary animal center

Table AP 2.3: List of authorities, agencies, NGOs and private institutions that contributed questionnaires in Bulgaria

BULGARIA			
Prefecture	Municipality	Village	Agency/organization
Haskovo	Haskovo	Haskovo	Bulgarian Food Safety Agency - Haskovo
	Ivaylovgrad	Ivaylovgrad	National Forestry - Ivaylovgrad
	Madzharovo	Dolni Glavanak	Veterinarian Practitioner
		Borislavtsi	Veterinarian Practitioner
		Madzharovo	Bulgarian Food Safety Directorate - Haskovo
	Stambolovo	Silen	Veterinarian Practitioner
Kardzhali	Chernoochene	Zhenda, Bolyartsi, Komuniga, Sokolite, Murga	"Zhenda" Hunting Reserve
		Komuniga	Veterinarian Practitioner
	Kardzhali	Kardzhali	Regional Food Safety Directorate -Kardzhali
			"Zhenda" Hunting Reserve
			Veterinarian Practitioner
			Bulgarian Food Safety Agency - Kardzhali
		Perperek	Veterinarian Practitioner
	Krumovgrad	Avren	Veterinarian Practitioner
		Krumovgrad	Veterinarian Practitioner
			National Forestry - Krumovgrad
			Regional Directorate of Forestry
			Bulgarian Food Safety Agency - Krumovgrad
		Potochnitsa	Veterinarian Practitioner
		Tokachka	Veterinarian Practitioner
	Momchilgrad	Momchilgrad	Regional Food Safety Directorate -Kardzhali
			Veterinarian Practitioner
		Nanovitsa	National Forestry - Momchilgrad
			Veterinarian Practitioner
		Zvezdel	Veterinarian Practitioner
Kurdzhali	Kurdzhali	Konevo	Veterinarian Practitioner
Russe	Ivanovo	Ivanovo	"Dunav" Hunting Reserve
		Shtraklevo	Regional Food Safety Directorate -Russe
			"Dunav" Hunting Reserve
		Ivanovo, Trastenik, Koshov, Cherven and Tabachka	Regional Food Safety Directorate -Russe
	Russe	Russe	Hunting Society "Philip Totyu"
Shumen	Smyadovo	Smyadovo	"Dunav" Hunting Reserve
			National Forestry - Smyadovo
Sliven	Kotel	Kotel	Hunting Society "Gradets"
			Bulgarian Food Safety Directorate - Sliven
			National Forestry - Kotel
Varna	Dolni Chiflik	Goren Chiflik	"Sherba" Hunting Reserve
	Dalgopol	Dalgopol	Regional Food Safety Directorate - Varna
			"Kamchia" Hunting Reserve
	Provadia	Provadia	Regional Food Safety Directorate - Varna
			National Forestry - Provadia
	Vetrino	Vetrino	National Forestry - Provadia

APPENDIX 3 - Maps

Map AP 3.1: The 27 SPAs of the study area in Greece (1-15) and Bulgaria (16-27)



 GREECE

1. GR1110002 DASOS DADIAS-SOUFLI 2. GR1110009 NOTIO DASIKO SYMPLEGMA EVROU 3. GR1110010 OREINOS EVROS-KOILADA DEREIOU 4. GR1130011 KOILADA FILIOURI 5. GR1130012 KOILADA KOMPSATOU 6. GR1140008 KENTRIKI RODOPI KAI KOILADA NESTOU 7. GR1240007 ORI TZENA-PINOVO 8. GR1310004 ORI ORLIAKAS KAI TSOURGIAKAS 9. GR1440005 ANTICHASIA ORI KAI METEORA 10. GR1440006 KORYFES OROYS KOZIAKA 11. GR2120008 "ORI PARAMYTHIAS, STENA KALAMA STENA ACHERONTA" 12. GR2120009 ORI TSAMANTA, FILIATON, FARMAKOVOUNI, MEGALI RACHI 13. GR2130009 OROS TYMFI (GAMILA) 14. GR2130010 OROS DOUSKON, ORAIOKASTRO, DASOS MEROPIS, KOILADA GORMOU, UMNI DELVINAKIOU 15. GR2130011 KENTRIKO ZAGORI KAI ANATOLIKO TMIMA OROUS MITSIKELI

 BULGARIA

16. BG0002012 KRUMOVITZA 17. BG0002013 STUDEN KLDENETS 18. BG0002014 MADZHAROVO 19. BG0002019 BYALA REKA 20. BG0002021 SAKAR 21. BG0002025 LOMOVETE 22. BG0002029 KOTLENSKA MOUNTAIN 23. BG0002038 PROVADIYSKO-ROYAKSKO PLATEAU 24. BG0002044 KAMCHYISKA MOUNTAIN 25. BG0002071 ARDA BRIDGE 26. BG0002073 DOBROSTAN 27. BG0002106 IVAILOVGRAD RESERVOIR

AP 3.2: Distribution of questionnaires within 8 SPAs in Central Greece and Epirus in Greece



Map AP 3.3.: Distribution of questionnaires within 2 SPAs in Central Macedonia in Greece



Map AP 3.4: Distribution of questionnaires within 5 SPAs in Thrace in Greece



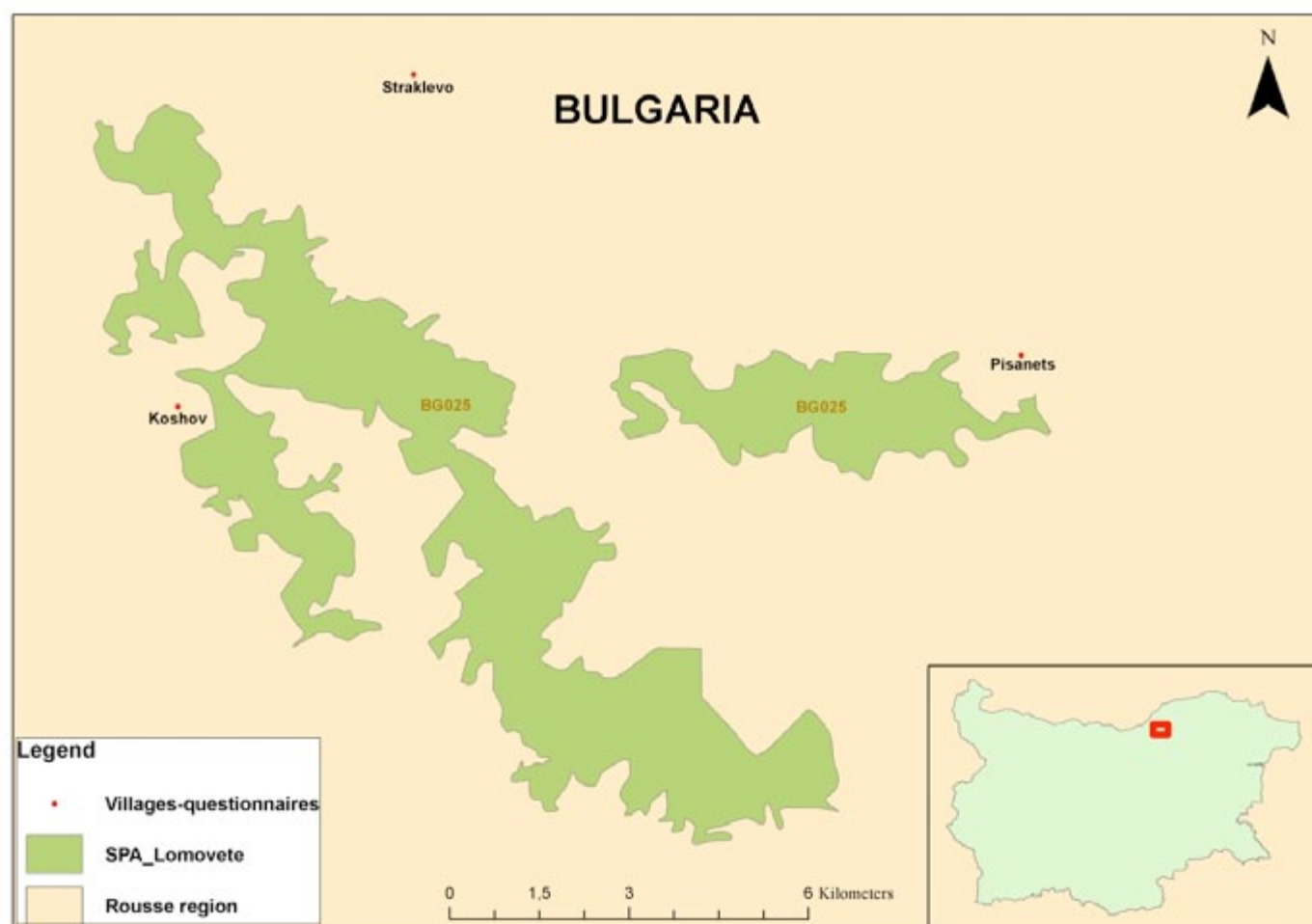
Map AP 3.5: Distribution of questionnaires within 7 SPAs in the Eastern Rhodopes in Bulgaria



Map AP 3.6: Distribution of questionnaires within 1 SPA in Sakar and Strandja in Bulgaria



Map AP 3.7.: Distribution of questionnaires within 1 SPA in Russe in Bulgaria



Map AP 3.8.: Distribution of questionnaires within 3 SPAs in NE Bulgaria



APPENDIX 4.1 - Questionnaire-land users

QUESTIONNAIRE FOR THE ESTIMATION OF POISONED BAITS USE DURING THE PERIOD 2003-2012

ACTION A3 (LIFE NAT/BG/000152)

QUALITATIVE DATA: FOR LIVESTOCK BREEDERS, FARMERS AND HUNTERS

A. Interviewee's personal information

Date: Name and age:

Occupation:

Agency/Organization:

Village/Municipality: SPA code:

QUESTIONS

1. How many years do you reside in the area? Have you been working for many years in this line of work? *How many years have you been hunting in the area?

.....

2. Are you satisfied with your job and income? * Are you satisfied with the number of game in the area?

3. Do you have a lot of animals under your care?

4. Is there sufficient water and pastureland in the area for your animals? Is there any infrastructure for watering the animals? If yes, is it in good condition?

.....

5. Do you believe your children or young people in general will continue this work? Why?

.....

6. (H)¹⁹ Have you observed any changes in the presence of wild birds or mammals during the last ten years? If yes, in which species and which could be the reasons for these changes?

.....

7. Were there damages in your produce the last ten years? Grade them according to their volume (1. Small, 2. Medium, 3. Large, 4. Very large) Wolf attack..... Bear attack..... Destruction of fruit tree by bear..... Bad weather conditions..... Other

8. In the case of damages due to animals, like bear and wolves, what measures did you adapt?

.....

9. Is it possible to find good shepherds dogs in your area?

10. Do you feel satisfied from the support you have from the «national agency of agricultural compensation» regarding their response to your situation and the compensation given? For each one grade: 1. Not at all, 2. A little, 3. Not quite, 4. Completely satisfied

Response Compensation

Justification

11. What are the changes needed in the system of state compensations?

.....

19 (H): Questions common for farmers, livestock breeders and hunters

12. (H) Do you know if poisoned baits are used for the extermination of predators?

Yes..... No.....

13. (H) Who do you believe has the reasons to use baits? Grade each group: 1. Very important, 2. Important, 3. Medium, 4. Insignificant.

Livestock breeders Agricultural farmers..... Hunters..... Other (describe).....

14. Which animals are targeted? Foxes..... Wolves..... Bears..... Dogs.... Rodents Insects Other.....

15. (H) Which are the main types of damages caused by these animals? Describe them and give an estimation of their size in the last decade (1. Small, 2. Medium, 3. Large, 4. Very large)

16. (H) Could you locate and name the areas with the biggest percentage of bait incidents?.....

17. (H) Do you know the types of baits used in your area? Describe them and grade them according to the extent of their use: 1. Small, 2. Medium, 3. Large, 4. Very large.

Fat with cyanide..... Meat with pesticide..... Meat with strychnine..... Fallen livestock/rabbit/pigeon..... Other.....

Where the poisons sourced from?

18 (H) Have you lost any guard-dogs/hunting-dogs due to poisoned baits? How many in the last decade?

19.*²⁰ What suggestions do you have to increase prey in the region?

20. (H) Do you believe there are measures* taken to prevent the use of baits? If yes, which ones?

*legal measures or measures implemented within specific projects like educational, compensations, campaigns etc.

21. (H) What suggestions do you have in order to stop the future use of baits?

22. (H) Have you ever find a dead Egyptian vulture? If yes, do you have any idea about the reason of its death?

At the end of the interview, try to understand whether the interviewees are in favor or against the use of baits as a formal control method and note it.

APPENDIX 4.2 - Questionnaire agencies

QUESTIONNAIRE FOR THE ESTIMATION OF POISONED BAITS USE DURING THE PERIOD 2003-2012

ACTION A3 (LIFE NAT/BG/000152)

QUALITATIVE DATA: FOR AGENCIES, HUNTING CLUBS AND ORGANIZATIONS

Interviewee's personal information

Date of interview: Name and age:

Occupation:

Agency/Organization:

Village/Municipality: SPA code:

QUESTIONS

1. Have you had any poisoned baits placed in the area of your jurisdiction? Yes.....
No.....

If yes, can you estimate the volume of this phenomenon during the last decade?

None ... Small.....Medium.....Large

Clarifications, like number of incidents per year:

2. Which social group do you believe is responsible for the use of poisoned baits? Grade the importance of each team: A. 0-30%, B. 30-75% C. >75%

Livestock breeders..... Cultivators..... Hunters..... Other (specify).....

3. Which are the species targeted? Foxes..... Wolf..... Bear..... Dogs..... Rodents Insects Other.....

4. After you specify the targeted species, in order of significance, describe the reasons behind their extermination, i.e. damages in fruit trees or vegetable cultivations, sheep losses, decrease of game species etc. and estimate the volume of each in the last decade (1. Small, 2. Medium, 3. Large, 4. Very Large)

5. Can you pinpoint and name the areas with the most poisoned baits incidents in your jurisdiction?

.....

6. Do you know the types of baits used in your area? Describe them and grade them according to the extent of their use: 1. Small, 2. Medium, 3. Large, 4. Very large.

Fat with cyanide..... Meat with pesticide..... Meat with strychnine..... Fallen livestock/rabbit/pigeon.....
Other.....

Where the poisons sourced from?.....

7. After a poison incident is made known to your agency/organization which is the procedure you follow for addressing such a case?

8. Have you had any secondary raptor mortality incidents due to poison bait use? Yes..... No.....

If yes, name the species you remember?

9. During the last decade have there been any measures* taken for the control of bait use in your jurisdiction? Yes..... No.....

If yes, can you name them?

*legal measures or measures implemented within specific projects like educational, compensations, campaigns etc.

10. *Do you believe these measures helped? Do you believe the inhabitants acknowledged the effort and responded positively?*

.....

11. *if you believe that the use of baits is a serious issue, what solutions do you believe could possibly address the damages inflicted by the animal species that are mostly targeted in your jurisdiction?*

Educated shepherd dogs..... Electrified fences..... Formal control of predators.....

Other.....

APPENDIX 5 - Posters

AP 5.1: Poster shared to all interviewees in the HOS study area (in Greek)

Αυτός είναι ο **Ασπροπάρης**, ένας μικρός γύπας που απειλείται με εξαφάνιση.

Σε Ελλάδα και Βουλγαρία, ζουν οι περισσότεροι Ασπροπάρηδες των Βαλκανίων. Οργανώσεις και από τις δυο χώρες, ένωσαν τις δυνάμεις τους για να προστατεύσουν τα τελευταία ζευγάρια.



Κάθε προσπάθεια να σώσουμε έναν Ασπροπάρη ή να μάθουμε την αιτία θανάτου του θα συμβάλει στην προστασία του.

Μπορείτε να βοηθήσετε!

Αν βρείτε κάποιο τραυματισμένο ή νεκρό Ασπροπάρη, ειδοποιήστε άμεσα την Ελληνική Ορνιθολογική Εταιρεία στο: **210 8228704**

Πρόγραμμα LIFE+ Φύση «Επείγοντα μέτρα για την εξασφάλιση της επιβίωσης του Ασπροπάρη (Neophron peronopterus) στη Βουλγαρία και την Ελλάδα» LIFE10 NAT/BG/000152

Φωτ.: Πανα Βασιλίου, WWF/Π. Μπουλντακί

AP 5.2: Poster shared to all interviewees in the WWF study area (in Greek)

Αυτός είναι ο **Ασπροπάρης**, ένας μικρός γύπας που απειλείται με εξαφάνιση. Σε Ελλάδα και Βουλγαρία, ζουν οι περισσότεροι Ασπροπάρηδες των Βαλκανίων. Οργανώσεις και από τις δυο χώρες, ένωσαν τις δυνάμεις τους για να προστατεύσουν τα τελευταία ζευγάρια.



Κάθε προσπάθεια να σώσουμε έναν Ασπροπάρη ή να μάθουμε την αιτία θανάτου του θα συμβάλει στην προστασία τους. Μπορείτε να βοηθήσετε! Αν βρείτε τραυματισμένο ή νεκρό Ασπροπάρη,

ειδοποιήστε άμεσα στο: 2554032210

Έπείγοντα μέτρα για την εξασφάλιση της επιβίωσης του Ασπροπάρη (Neophron peronopterus) στη Βουλγαρία και την Ελλάδα» LIFE10 NAT/BG/000152

APPENDIX 6 - Pictures



Picture 1: Interview in Dasos Dadia-Soufli SPA (A. Bonnetti/WWF)



Picture 2: Interview in Koilada Komsatou SPA (E. Kret/WWF)



Picture 3: Interview in Ori Tzena-Pinovo SPA (E. Navarrete/HOS)



Picture 4: Interview in Dobrostan SPA, Eastern Rhodopes (V.Dobrev/BSPB)