

BALKAN DETOX LIFE

STUDY ABOUT THE ILLEGAL USE OF POISON IN THE ENVIRONMENT OF THE BALKAN PENINSULA

BALKAN DETOX LIFE: STRENGTHENING NATIONAL CAPACITIES TO
FIGHT WILDLIFE POISONING AND RAISE AWARENESS ABOUT THE
PROBLEM ACROSS SEVEN BALKAN COUNTRIES
(LIFE19 GIE/NL/001016)

Prepared by: Vulture Conservation Foundation

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Subject and purpose of the report

This document is prepared within the framework of the BalkanDetox LIFE project (LIFE19GIE/NL/001016) and relates to the deliverable “Study about the illegal use of poison in the environment of the Balkan Peninsula”, defined under *Action A.2: Preparation of the current review of the problem of illegal wildlife poisoning in the Balkan Peninsula*. This study is designed to provide a clear and up-to-date overview into the current circumstances regarding the illegal use of poisonous substances and the detrimental effects this illegal practice has on vulture populations and other wildlife species in Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Greece, the Republic of North Macedonia, and Serbia. Additionally, it represents a baseline for monitoring the impact that actions implemented within this project and other similar conservation initiatives towards diminishing the threat of illegal wildlife poisoning will have in the region, as well monitoring of the change in perception about this practice among key stakeholder groups and socio-economic impact.

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Geographical scope

This study reflects on the illegal practice of using poisonous substances in the environment and wildlife mortality induced by it in the following countries of the Balkan Peninsula: Albania, Bosnia and Hercegovina, Bulgaria, Croatia, Greece, the Republic of North Macedonia and Serbia, as well as different challenges related to prevention of wildlife poisoning that exist in these countries.

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About the project

The BalkanDetox LIFE project is a five-year endeavour with a €1.8 million budget, which aims to raise awareness and strengthen national capacities to fight the problem of wildlife poisoning across Albania, Bosnia & Herzegovina, Bulgaria, Croatia, Greece, the Republic of North Macedonia and Serbia. It received funding from the EU's LIFE Programme with a contribution of 1.004.792€ (54,82%) to the total project budget, and it is co-financed by the Vulture Conservation Foundation, the MAVA Foundation and Euronatur, as well as by the Whitley Fund for Nature and Environmental Protection and Energy Efficiency Fund for specific actions. Project partners are the Vulture Conservation Foundation as the coordinating beneficiary, and the Albanian Ornithological Society, Association BIOM, Bird Protection and Study Society of Serbia, Fund for Wild Flora and Fauna, Hellenic Ornithological Society, Macedonian Ecological Society, Ornitološko društvo NAŠE Ptice and the Protection and Preservation of Natural Environment in Albania as associated beneficiaries. Furthermore, this project is based on Spanish best practice experience and counts with the support from the Junta de Andalucía and the Spanish Ministry for the Ecological Transition and the Demographic Challenge.

Learn more at www.balkandetoxlife.eu



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Acronyms and abbreviations

BAPP	Balkan Anti-Poisoning Project
BAVP	Balkan Vulture Action Plan
BCTF	Bird Crime Task Force
BPPS	Birds of Prey Protection Society
BSPB	Bulgarian Society for Protection of Birds
CAWI	Computer Assisted Web Interviewing
CSO	Civil Society Organization
EU	European Union
FWFF	Fund for Wild Flora and Fauna
HOS	Hellenic Ornithological Society
MES	Macedonian Ecological Society
PAPI	Paper and Pen Interviewing
PID	Poison Incident Database
SOP	Standard Operational Procedure
VCF	Vulture Conservation Foundation
Vulture MsAP	Vulture Multi-species Action Plan

INTRODUCTION

The environmental effects of the illegal use of poison in the environment have been devastating and it has now become one of the main threats to biodiversity. The use of poisonous substances in the environment is one of the most commonly used predator eradication methods worldwide. Poison is used to kill wildlife and undesirable domestic animals considered to be harmful to certain human activities, in particular livestock farming and other agricultural practices, as well as game management for hunting and pigeon keeping. It is also not uncommonly used as a way of settling various feuds and disputes between people. The illegal use of poison is considered one of the most important issues regarding illegal killing of birds due to the serious conservation impacts it has on scavenging species and is confirmed to be among the most important direct threats to the vulture populations in Europe (Vultures MsAP).

The most common use of poison for the purpose of eliminating undesirable animals is placement of poison baits in the environment. The use of poison baits usually involves lacing a food item (most commonly a piece of meat, or an entire animal carcass) with a toxic compound, usually phytosanitary products like insecticides, rodenticides, fungicides, herbicides or molluscicides, and placing them in the environment so that they are accessible to the target animals, and often to other non-target species, which may also be affected. Intentional poisoning is therefore a non-selective and destructive method of eradicating animals deemed harmful for human activities and can even pose a serious risk to human health.

The illegal use of poison baits remains the single most important threat that vultures are currently facing in the Balkans and has contributed to the regional extinction or severe depletion of all the species in the region. The vulture populations of the Balkan Peninsula had been brought to the brink of extinction by the end of the 20th and beginning of the 21st century mainly because of illegal wildlife poisoning in the environment (Pantović & Andevski 2018). Of the four species that were once commonly spread throughout the region, the Bearded Vulture and Cinereous Vulture are now reduced to single, isolated populations. The last population of Bearded Vultures in the region is found in Crete (Greece), numbering around 6 breeding pairs and the Cinereous Vultures in Dadia-Lefkimi-Soufli Forest National Park, NE Greece, 28-35 pairs (Xirouchakis 2019). The number of Egyptian Vultures has declined by more than 50 % in the last ten years and continues to decline. This species stronghold in the region is in Bulgaria, while it is still in small numbers present in North Macedonia, Greece and Albania, totaling to less than 50 breeding pairs in 2021 for the entire Balkan Peninsula

(Valevski et al. 2015, LIFE16 NAT/BG/000874). The population of Griffon Vulture has also been significantly depleted and the species has disappeared from many countries of its former range (Albania, Bosnia & Herzegovina and Montenegro), whilst in continental Greece and Northern Macedonia isolated and small populations are still persisting, numbering 30-32 and 7 breeding pairs respectively in 2021. Strong populations are present in Serbia, numbering up to 230-233 breeding pairs, and up to 121 pairs in Croatia, while the populations in Bulgaria (up to 163) and Crete, with an estimated population of 280-350 breeding pairs (Xirouchakis 2019), are showing signs of increase in the last years.

This practice is illegal in Europe, including the Balkans, but it is still in use by local people as a quick and inexpensive method for resolving conflicts with predators and other wildlife. The main driver for such an intensive use of the poison is the conflict between livestock breeders, hunters, farmers and mammalian predators, mainly wolves, but also jackals, foxes and feral/stray dogs (Andevski 2013). Its widespread use has also been facilitated by the poor enforcement of the legislation, the black market of banned pesticides and the relative free availability of poisoning substances on the markets.

Wildlife poisoning is a serious conservation issue, which needs to be investigated in detail and actions need to be carefully planned and implemented to achieve desirable results. This study provides an overview of the situation with the illegal use of poison in the environment and its effects on wildlife in each of the target Balkan countries. Its objective is to collect and analyze the data from the Balkan region and identify regional aspects of the poisoning problem, but also recognize the particularities in each country and propose general actions. It directly builds on the “Balkan vulture poison study” (Review of the problem of poison use and vulture poisoning in the Balkan Peninsula), produced by the Vulture Conservation Foundation (VCF) in 2018.

This study fundamentally consists of two components. The first component entails compilation and analysis of data about poisoning and presumable poisoning events from the countries of the Balkan Peninsula dating from the year 2000 onwards and analysis of the scope, severity, root causes behind it and substances most used in the region. The study will highlight the collected data relevant to vulture poisoning incidents, as vultures, being obligatory scavengers, continue to be victims of poison and poison baits intended for other animals in the environment, primarily mammalian predators, and are a group of species most deeply affected by this practice. Additionally, this study will reflect in more detail on the incidents involving mortality of other wildlife species, especially of those with an unfavorable conservation status. Increasing and improving available information on the scope of this illegal practice in the Balkans is essential for better understanding of its drivers, conveying the message to the public and other target

audiences that it is a public hazard and that it has damaging effects to numerous wildlife, especially scavengers.

The second component of this action represents the conduction of a baseline evaluation of the perception and knowledge among relevant stakeholders about this illegal practice, their personal experience (number of cases investigated, number of cases processed and brought to trial, number of sentenced cases) in poisoning incidents in each of their respective countries, as well as a baseline for monitoring of the socio-economic impact of the project.

APPROACH AND METHODOLOGY

Information represented in this study about poisoning and presumable poisoning events that have occurred in the Balkan region during the study period was collected from relevant governmental institutions for environmental crime, as well as internal databases of the beneficiaries of the BalkanDetox LIFE project, who have been systematically recording all such incidents for many years. For this purpose, a questionnaire was prepared (Annex XXII), requesting information regarding: historical data about poisoning incidents, number of poisoning incidents recorded during the last 20 years (their location, species affected, main driver behind them and substances used), number of presumable poisoning incidents where official necropsies been conducted on wild animals which were suspected to have died from poisoning or ingesting poison baits, number of presumable poisoning incidents where toxicological analysis been conducted, either on dead animals or on poison baits, number of poisoning incidents that have officially been prosecuted by the public prosecutor's office and have reached court trials, and number of poisoning incidents for which court rulings been delivered.

The questionnaires about wildlife poisoning incidents were distributed by the BalkanDetox LIFE project beneficiaries among relevant governmental institutions, primarily within enforcement agencies, environmental inspectorates, and public prosecutors by means of formal requests for information, as this data represents information of public importance and therefore must be made available. Additionally, project beneficiaries have endeavored to obtain all publicly available data (official records and reports from relevant national institutions, published papers and project reports, internal databases of CSOs) relevant to wildlife poisoning incidents. The analysis of the collected data enables us to define the most significant gaps in the chain

of custody and enforcement mechanisms in each Balkan country. This will represent a baseline for implementing and monitoring the effectiveness of anti-poison actions in the Balkan region. It is important to highlight that not all countries have the information available in a structured form, so some of the replies received from the questionnaires were more complete and more informative compared to others.

Information obtained for the baseline analysis of the socio-economic drivers and perception of the illegal practice of wildlife poisoning focuses on the knowledge among relevant stakeholders from the Balkan countries about the motives behind wildlife poisoning, most common types of wildlife poisoning, most frequently used methods and poisoning substances, areas where wildlife poisoning regularly occurs (hotspots), period of year when this practice is mostly utilized, as well as their personal experience with poisoning events in each of their respective countries. This information derives from quantitative research conducted using a mixed methodology that combines desk research, and quantitative surveys of two main target audiences: target group of hunters, farmers, livestock breeders and target group of governmental services and institutions officials, law enforcement officials and veterinary services in Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Greece, North Macedonia, and Serbia.

Quantitative research towards measuring the awareness level of target groups (hunters, farmers, livestock breeders, rangers, veterinarians and policemen) about vultures, methods of poisoning and individuals or groups responsible for poisoning in their country, and measuring the current attitudes and practices of these target groups connected with illegal wildlife poisoning was conducted by face-to-face PAPI (Paper and Pen Interviewing) and CAWI (Computer Assisted Web Interviewing) techniques. Surveys for assessing the perception of wildlife poisoning in local communities were conducted in 2 areas defined as poisoning hotspots, according to the available data, in each country except Bulgaria. Research towards employees in relevant governmental institutions were conducted via online interviews in all Balkan countries. Employees were identified based on the information about their relevant job positions available at the webpages of their respective institutions. Questionnaires for both surveys were designed to be completed within 10 minutes. Desk research refers to the use of existing statistical data as well as other indicators from official available sources (Central Bureau of Statistics, Ministries for Environmental Protection, Veterinary Institutes, etc.) and to all other relevant available sources, such as studies and project reports for establishing a baseline for socio-economic impact analysis. This research was carried out by MASMI agency for Albania, Bosnia and Herzegovina, Bulgaria, Greece, North Macedonia and Serbia, while research in Croatia was carried out by DotPlot agency.

The aims of the research in local communities are: 1. Measuring awareness of target groups (hunters, farmers, livestock breeders) about endangered species (vultures), methods of poisoning and individuals or groups responsible for poisoning in their respective countries; 2. Measuring the current attitudes and practices of target groups connected with illegal poisoning of endangered species, such as vultures.

For relevant governmental authorities in this first phase, the aims of the research are: 1. Measuring awareness about vultures, methods of poisoning and individuals or groups responsible for poisoning on the territories of their respective countries; 2. Measuring of the current perceptions and attitudes of target groups related to aggravating circumstances and obstacles as well as capacities of the state institutions to prevent, investigate and sanction wildlife poisoning cases; 3. Measuring of the current perceptions of target groups related to legislations, procedures, documentation, and processing of wildlife poisoning cases.

Statistical significance helps us to determine whether the results obtained reflect real differences between target groups and survey categories and whether the obtained differences can be generalized to the entire sample population or should be treated as a consequence of chance. The usual significance levels of 0.95 were used in this study. This means that the finding (difference between groups) has a 95% chance of being true, and thus can be accepted as a reflection of realistically existing differences between groups.

The baseline report of the socio-economic study was produced by MASMI agency and it strives to provide an overview of the relevant institutional and legislative context and (currently) available socio-economic indicators in order to carry out monitoring in preparation for the socio-economic evaluation of the project impact that will be carried out in 2025. The aim of the socio-economic monitoring is to help identify and assess the impacts of the project and how they will change the attitudes of the relevant stakeholders towards the use of poison baits. For the purpose of the socio-economic monitoring and impact evaluation of the project the following indicators were proposed. A baseline overview will be provided for all the countries individually.

- Number of regulations and their content related to wildlife and pests poisoning, number of regulations in preparation and their content and compliance with EU regulations for countries outside of EU
- Fields of knowledge baseline level and new fields of knowledge introduction into the sector
- Target groups knowledge baseline level and level after the campaign: hunters, farmers, livestock breeders' knowledge and government services and institutions

officials, law enforcement officials and veterinary services employees' knowledge and expertise

- Number of stakeholders and key actors involved
- Feedback from stakeholders and key actors (follow up phase 2025)
- Understandable and straightforward information generated during the project aimed at target groups awareness (follow up phase 2025)
- Types of activities aimed at information and awareness raising of the general public (workshops and other local events, project website and social media, etc.) (follow up phase 2025)
- Estimated economic impacts of illegal poisoning of wild animals through continuation, replication or transfer of the project activities (follow up phase 2025)

In order to achieve the main goals of this baseline report, a mixed methodology will be applied. We will combine desk research using relevant legal documentation, as well as the results of previous research on this topic, with the quantitative results of the survey that will be conducted with the two relevant target groups of stakeholders – hunters, farmers and livestock breeders, and government services and institutions officials.

The situation with wildlife poisoning in general, of each Balkan country is presented in a different chapter in alphabetic order.

OVERVIEW OF THE SITUATION WITH WILDLIFE POISONING IN THE BALKAN COUNTRIES

Wildlife poisoning is an illegal practice that commonly occurs in the Balkan Peninsula even nowadays. The damaging effects that this practice has on many species, especially avian scavengers, are well documented throughout the region. Vultures, being almost exclusively obligatory scavengers, continue to be victims of poison and poison baits intended for other animals, primarily mammalian predators. Over the course of the last 50 years this practice has led to severe population declines of all vulture species and has brought the Bearded Vulture, Cinereous Vulture and Egyptian Vultures to the brink of regional extinction. The illegal use of poison baits is a deeply rooted and still quite common practice for resolving conflicts with wildlife, especially in rural areas, and continues to represent the most severe threatening factor for the remaining vulture

populations in the region and the biggest obstacle for their recovery towards their former distribution range.

Over the course of two decades, from 1998-2018, a total of 227 poisoning and presumable poisoning incidents were recorded, causing the death of 385 Griffon Vultures, 36 Egyptian Vultures, 12 Cinereous Vultures and one Bearded Vulture in the region (Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Greece, North Macedonia and Serbia). In most of these incidents more than one individual bird has been found poisoned. According to the data for that period it was estimated that up to 115 vultures are potentially being poisoned annually throughout the Balkans (Pantović & Andevski 2018).

This chapter of the study focuses on the current circumstances with the use of poison in the environment for each target country of the Balkan Peninsula and reflects on the use of this practice in the past. It provides a detailed overview of all available data relevant to wildlife poisoning events, including known drivers for poison use, toxic compounds mostly used (identified through conduction of toxicological analysis), and of the current legal framework in place in each country.

Table 1. Summary of available data about wildlife poisoning used in this study

Country	Total # poisoning incidents (# poisoning incidents since 2018)	Total # vultures killed (# vultures killed since 2018)	Main driver	Mostly used substance
Albania	17 (15)	0 (0)	Conflicts with predators	Methomyl (11,8%)
Bosnia and Herzegovina	6 (4)	GV: 1 (1)	Misuse of pesticides in agriculture	unknown
Bulgaria	88 (13)	GV: 60-90 (14-30) EV: 19 (2) CV: 1 (0)	Conflicts with predators	Carbamates (41%)
Croatia	40 (21)	GV:62-66 (6)	Conflicts with predators	Carbofuran (47%)
Greece	579 (74)	GV: 215 (42) EV: 24 (1) CV: 16 (6) BV: 1 (0)	Conflicts with predators	Methomyl (3,5%)
North Macedonia	29 (2)	GV: 102-125 (0) EV: 4 (0)	Conflicts with predators	Methomyl (7%)
Serbia	291 (45)	GV: 16 (0)	Conflicts with predators	Carbofuran (13%)

GV-Griffon vulture; EV-Egyptian vulture; CV-Cinereous vulture; BV-Bearded vulture

ALBANIA

Introduction

Until 2010, wildlife poisoning in Albania was regarded as a minor threatening factor for many wildlife species, confined to remote mountainous areas of the country, and attributed mainly to conflicts that livestock breeders have with mammalian predators. This was related to lack of knowledge on the extent and prevalence of the poison baits use in the country. There are almost no official records related to wildlife poisoning incidents among the relevant governmental institutions, which contributes to the overall picture that this conservation issue did not officially exist in the country until 2019, when the use of poison baits against wild animals was clearly stated in the law “On the protection of wild fauna” as an administrative violation.

On the other hand, Albania has experienced extinction of all its vulture species, apart from the remaining, dwindling population of around 5 breeding pairs of Egyptian Vultures. Disappearance of entire national populations of vulture species during the 20th century, as it was documented in many other neighboring countries, is associated with the use of poison baits in the natural environment, which is why we can reasonably suspect that similar circumstances existed or still exist in Albania.

Historical perspective

Although there are very few official records available related to wildlife poisoning, there is evidence that poison baits laced with *Strychnine* were regularly used in rural mountainous areas for elimination of wild predators (mainly wolves) during the 20th century as a part of governmentally sponsored actions for population control, like the rest of the countries in the region. While *Strychnine* was used mostly in mountainous areas, *Cyanide* was again used in an organized way in the coastal area, mostly in hunting reserves to control damage in game species from small carnivores like foxes, jackals, weasels, martens, etc. Nevertheless, poisoning with cyanide was not widespread (Jaupaj *pers. comm.*).

Current situation in the country

First comprehensive investigation of the practice of wildlife poisoning in Albania was conducted through the implementation of the Balkan Anti-Poisoning Project (BAPP), which was implemented from 2018-2021. Within this period, a lot of efforts were invested in determining the current scope of this practice on a national level, drivers behind it, substances most commonly used and areas in the country where it most often occurs, as well as being vigilant and recording all poisoning and presumably poisoning incidents.

The biggest obstacle relevant for this conservation issue is the fact that it was not precisely defined in the national legislation of the country until 2019, despite Albania having ratified the Bern Convention in the 90s. Unlike the other Balkan countries, where the deliberate poisoning phenomenon is well-incorporated and clearly defined as a prohibited action in the legislation over the years, the intentional wildlife poisoning in Albania has not been regarded as a prohibited activity in the national legal framework until July 2019. Since wildlife poisoning was not mentioned within existing national legislation as an illegal activity, no official records, documentation, or relevant database existed prior to this period, neither within governmental organizations nor nature conservation CSOs. Therefore, responsibilities of governmental institutions relevant to wildlife poisoning and other environmental crime (except illegal hunting-hunting prohibited on all species until July 2021) are still unclear on all levels of enforcement and there are no procedures or protocols related to reporting of poisoning incidents. Consequently, awareness of the severity of this conservation issue and the danger that it poses both to wildlife and human health is still low. It is important to note also that there is a notable lack of knowledge, capacities, and resources within governmental institutions, related to conduction of toxicological analyses of animals suspected to have died of poisoning.

Since 2018, information about 17 separate poisoning incidents, that occurred from 2007-2020, in Albania was compiled by the leading national nature conservation CSOs. According to the available data compiled for the purpose of this study, wildlife poisoning in Albania can mainly be attributed to:

- Intentional use of poison baits for the purpose of extirpating mammalian predators, (mainly foxes and wolves) and reducing the damages that these animals may inflict upon livestock and other agricultural practices.
- Unintentional poisoning, where improper use of phytosanitary products, especially for control of rodent populations, often leads to secondary poisoning.

In 59% of the cases poison baits were set with an aim to eliminate foxes, wolves, jackals and bears which can cause damages on people's livelihoods in rural areas (Figure 1.). In

23% of presumable poisoning incidents the actual motive behind this practice remains unknown, while the rest is attributed to misuse of pesticides and other phytosanitary products

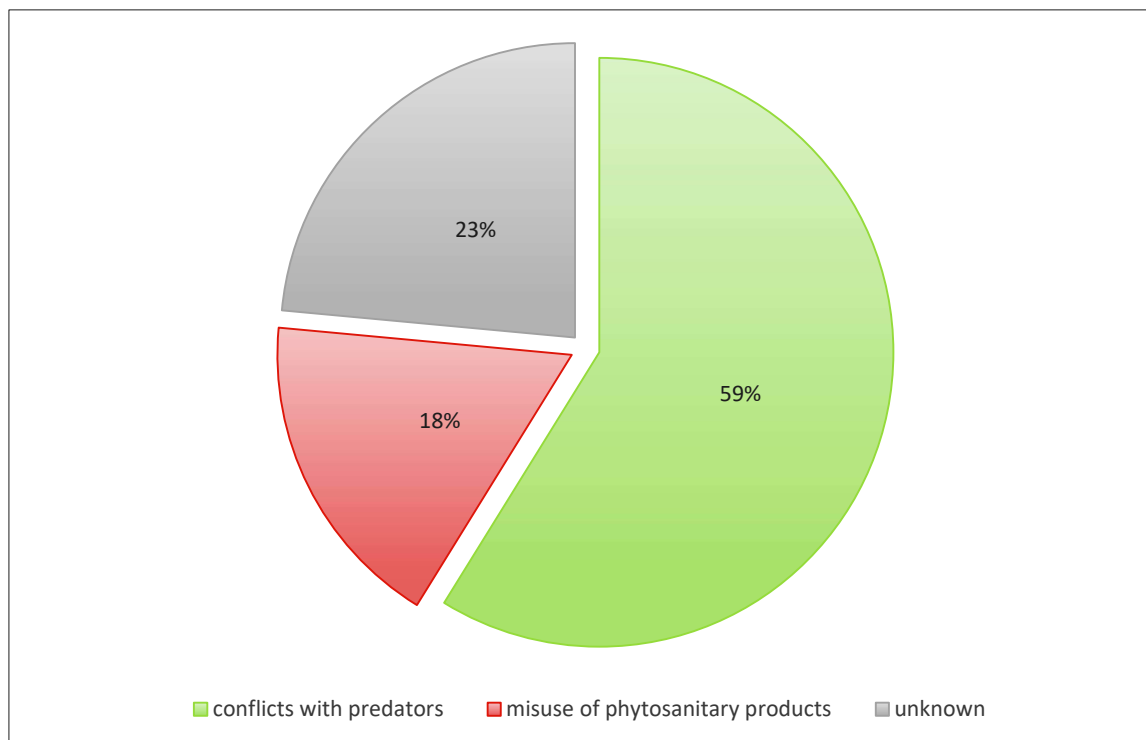


Figure 1. Motives behind wildlife poisoning in Albania

A total of 9 wild species of animals were recorded poisoned and presumably poisoned. Poisoning was confirmed in 29,4% of the recorded incidents (Annex I), and the most commonly used substances were pesticides: Carbamates (*Methomyl* in 2 cases) and Organophosphates (2 cases). The use of *Strychnine* was also registered in one poisoning incidents from 2007, where 6 wolves were poisoned. Information about the use of another phytosanitary product, "Selino" (2, 4 - Dinitrophenol) for wildlife poisoning was obtained during interviews with livestock breeders towards obtaining more information about wildlife poisoning practices in Albania during the implementation of the BAPP project, but further evidence is needed to confirm these claims.

According to the available data, most common victims of wildlife poisoning in Albania are mammalian predators such as Red Fox (7 individuals in 7 separate incidents) and Eurasian Wolf (9 individuals in at least 2 separate incidents). Other victims include

Eurasian Brown bear (4 individuals during 2019), Golden Jackal (1 individual in one poisoning incident), Beech Marten (1 individual in one poisoning incident), Rough-legged Buzzard (1 individual in one poisoning incident), Eurasian Magpie (3 individuals in one poisoning incident), House Sparrow (2 individuals in one poisoning incident). Additionally, 2 Eurasian Sparrowhawks were found presumably poisoned due to conflicts with pigeon fanciers and the damages they might inflict upon racing pigeons. This specific driver of illegal poisoning is recorded for the first time in Albania, although it has been well documented in other countries of the region, notably Serbia and Croatia. It is important to mention that one presumably mass poisoning incident dating from 2013 was obtained from the relevant authorities which indicates that 114 individuals from at least 3 different bird species probably died from poisoning.

There are indications from hunters that conflicts between wild predators (mainly wolves and jackals) and livestock breeders are becoming more frequent since the national hunting ban has been enforced in 2014. And, since there are no alternative official methods of population management enforced by relevant governmental institutions, it is believed that the populations of predators, as well as damages they inflict upon livestock, are increasing, which is why local livestock breeders often resort to poisoning as an easy and affordable method. In addition to this, there are no compensatory measures in place for damages inflicted by wildlife, which further deepens the conflict. However, additional data is needed to support these indications and efforts should be made to further investigate them, as they potentially represent the most significant threat that vultures might face in Albania.

Significant progress has been made in Albania in the struggle against illegal wildlife poisoning, chiefly towards amending the national legislation relevant to wildlife crime, as well as investigating the scope of illegal wildlife poisoning in the country. In synergy with the BAPP project supported by VCF and MAVFA Foundation, "Illegal Killing and Taking of Birds" supported by EuroNatur and MAVFA Foundation and the "Egyptian Vulture New Life project" (LIFE16 NAT/BG/000874) supported by Bulgarian Society for Protection of Birds (BSPB) and the EU, the Albanian Ornithological Society (AOS) lobbied in 2018 for the amendment of the Law No. 10 006, dated 23.10.2008 "On the Protection of Wild Fauna". In July 2019, the Albanian Parliament adopted these amendments, explicitly stating that poisoning and particularly the use of poison baits is by law a prohibited action, and that the use of agricultural chemicals, veterinary drugs and services is a potential threat to wild fauna in case they are used contrary to the current legislation covering agricultural chemicals, veterinary drugs and services. Furthermore, these amendments were incorporated also into the penal code. These amendments of the national legislation represent a pre-requisite for any further conservation work related to combating wildlife poisoning. Following this, nature conservation NGOs and the Ministry of Tourism and

Environment have currently developed an Anti-Poisoning Road Map which will orientate anti-poisoning policies in Albania. The adaptation of the legal national framework and the enhancement of the strategical framework is for sure a steppingstone in the right direction, but still significant efforts need to be made towards detection of poisoning incidents, awareness raising of both general public and relevant governmental institutions, from decision makers to enforcement bodies, and also towards capacity building. Training relevant to detection, reporting, sampling, and further processing of poisoning cases needs to be provided for police officers, environmental and veterinary inspectors and operational protocols developed so that they have the necessary tools to implement the newly amended legislation. Also, detailed training needs to be provided towards conduction of toxicological analysis, which is of crucial significance for further legal proceedings of poisoning incidents.

Legal framework

Existing national legislation relevant to wildlife poisoning in Albania:

- **Law No. 46/2019, dated 08.07.2019 "On some changes and additions to law no. 10 006, dated 23.10.2008 "On the protection of wild fauna":** According to Article 10: "On the protection of wild fauna from substances, hazardous waste, and services" the use and administration of hazardous substances and waste, agricultural and veterinary chemicals, and services is done in accordance with the provisions of the legal framework in force, relating to chemical substances and preparations, hazardous waste management, plant protection service, as well as taking into account specific issues related to the prevention of poisoning of migratory birds, in accordance with the obligations defined in the agreements to which our country is a party.

According to Article 19: "Prohibited Actions" of the same law, the use of poison baits for the extermination of wild fauna is punished with a fine in the amount of 100 000 ALL to 200 000 ALL.

- **Penal Code:** According to Article 202: "Harming of protected species of flora and fauna" of the Penal Code, killing, destruction, possession, acquisition or trade of specimens of protected species of wild flora and fauna or their parts or by-products, in breach of the requirements of specific national legislation or relevant permit, unless such a case has occurred over a negligible amount of these specimens from the biological point of view of the group belonging to the protected species, and has no significant impact on the conservation status of the species, constitutes criminal contravention and is punishable by a fine or imprisonment of two to seven years.

Relevant international treaties and conventions that Albania is parties to:

Convention on the Conservation of European Wildlife and Natural Habitats (Bern, 1979): Ratified by Albania in 1999, it prohibits the use of any non-selective means of capture or killing as well as of means that may induce local extinction or heavily disturb the populations of a species, namely means listed in Annex IV”, while in Annex IV of the same Law, which is entitled “Prohibited means and methods of hunting and other forms of exploitation”, “Poisons and poison or tranquilizing baits” are included.

Perception of the illegal practice of wildlife poisoning in local communities in Albania

The research included 100 respondents to the survey questionnaires. The majority of livestock/ cattle and agricultural production farmers, rangers, veterinarians and policemen in hotspot areas in Albania are not informed about the presence and breeding of key species of vultures in their country. 56% of respondents from the local communities believe that Albania can be a breeding ground for the Egyptian Vulture, the Griffon and Cinereous Vulture follow (42% and 31%, respectively); when it comes to other species of vultures that were mentioned, the number of respondents who state that they are familiar with their presence is considerably lower.

Target groups in local communities in Albania mostly possess limited information on the key threats to the vulture populations. While wildlife poisoning is identified as the biggest threat by less than 15% of respondents, the majority (35%) find reasons for the endangerment of vulture species in some other causes and 17% of respondents claim that they are not informed. Farmers, rangers, veterinarians, and policemen in our target communities in Albania also assess their knowledge of the issue of wildlife poisoning as below average (39%). The respondents’ knowledge related to the causes of vulture poisoning is limited and unclear, as the majority identify poison baits intended for other animals (29%) and consumption of poisoned animals (18%) as the key causes of vulture poisoning, which implies accidental poisoning, at the same time close to 50% of respondents believe that wildlife poisoning mostly occurs intentionally, with illegal poisons from the black market (36%) or by abuse of legal poisoning substances such as pesticides, insecticides, etc. (12%).



Figure 2. Perceived responsible groups for wildlife poisoning in Albania

Responsibility for vulture poisoning lies primarily with livestock breeders, farmers and people who intentionally poison animals out of aggressive and destructive impulses; hunters follow. The key motivations for poisoning animals are related to *protection from pests, protection of pastures and livestock from wild animals*, but also *protection from stray dogs and cats* and *conflicts among people about land use*. The majority of the respondents who witnessed/ heard of poisoning cases in the past 10 years believe that the incidents were the result of deliberate poisoning of any type of animal *within the settlements and inhabited areas* implying the need for better protection of property, cattle, and pets within human settlements. Although a smaller number of poisonings were attributed to intentionally poisoned wild animals outside of settlements because “they bothered someone”, this is still an issue to address in the communication with residents of hot spots in Albania.

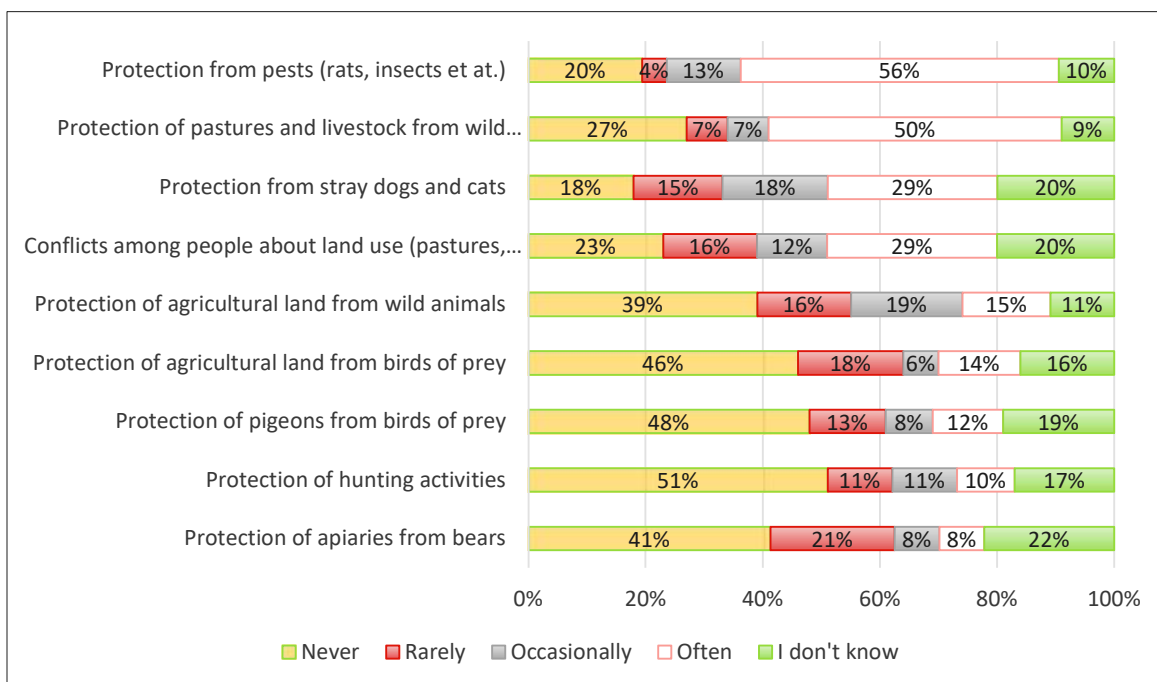


Figure 3. Perceived motives behind wildlife poisoning in Albania

On the other hand, responsibility for reporting poisoning incidents to the authorities is attributed to hunters and veterinarians, as well as the general population. Still, more than 70% of target groups believe that people who report someone for poisoning wild animals risk altercations and conflicts in their community, which is one of the important barriers for preventing and sanctioning these incidents (40% of respondents are concerned about the possible risks and claim readiness to report the incidents only if they personally wouldn't have negative consequences, while 1 in 5 stated that they would not report the poisoning). Apart from communicating the importance of the cooperation with the authorities in detection and prevention of these cases, research results show the need for communicating which are the proper institutions to report the poisoning to, especially as the authorities need this type of cooperation to detect the remote locations' poisoning cases, that are not easy to detect. Research results also show the importance of a public discussion about personal vs shared responsibility ("there are enough other people worrying about that"), and the importance of dealing with wildlife poisoning beyond the immediate effects that it has on individuals.

When it comes to the measures for prevention and combating wildlife poisoning, 80%-90% of respondents perceive that that the state/government should financially compensate the damage to livestock breeders and farmers caused by wild animals, and that additional resources should be invested in informing the general population about the problem of wildlife poisoning. Other relevant measures include addressing pasture

ownership issues, installing electric fences, controlling the export and import of legal toxic substances, creating more feeding grounds for vultures, but also stricter imposing of fines for animal poisoning.

Wildlife poisoning investigations are also identified as important police work by close to two thirds of the respondents. 16% of the target group on the other hand considers these investigations as mostly or completely unimportant.

A promising finding of the research shows that most of the residents in local communities in Albania recognize the importance of the vulture population for both humans and the environment (around 70%). Also, about 70% of the target groups residents realize that the Earth has limited space and resources, that it is challenging to maintain the natural balance, and that plants and animals have the same rights as humans.

However, the results of the research also imply the need for further communication of the dangers of wildlife poisoning, as around one third of the respondents consider controlled institutionally conducted poisoning of wild animals as a proper means to control pests, and also that poisoning of vultures is justified in certain situations. The most polarizing attitude is related to the dominance of man over nature – while 4 out of 10 respondents believe that people are the ones who have primacy, a similar number disagrees with the idea of human rule over nature.

Ordinary citizens in general are identified as the target group for the awareness campaign about the threats of wildlife poisoning; livestock breeders, farmers, hunters and game wardens, follow.

Perception of the illegal practice of wildlife poisoning within relevant governmental authorities in Albania

Online Interviews of the targeted groups of government services and institutions officials, law enforcement officials and veterinary service employees in Albania were carried out. The sample included 22 respondents in total out of 49 employees in targeted institutions.

Officials employed in relevant institutions in Albania are well informed that the Egyptian Vulture, the only vulture species breeding in Albania is present on the territory of their country. However, there is a certain lack of knowledge when it comes to the

conservation status of other species of vultures, as less than half of the respondents think that the Griffon Vulture still breeds in Albania and a small number of respondents consider that Cinereous Vulture and Turkey Vulture are also present in Albania.

Wildlife poisoning is perceived as the key threat to the vulture populations in Albania (by more than half of the officials employed in relevant institutions). Wildlife poisoning is considered to be both accidental and intentional, by using illegal poisons from the black market or legal poisoning substances such as pesticides or insecticides. On the other hand, poisoning of the vultures is mostly perceived as unintentional either from poison baits intended for other animals or from secondary poisoning by consuming poisoned animals.

The key target groups responsible for wildlife poisoning are identified as livestock breeders and farmers. These groups resort to wildlife poisoning to protect the pastures, agricultural land and livestock from wild animals and as protection from pests.

More than half of the government employees believe that Gjirokaštër is the region of Albania where wild animals are most frequently poisoned, while considerable number of officials (around one third) claim to be uninformed about the region(s) where wild animals are most often poisoned.

The key aggravating circumstances and obstacles for prevention and sanctioning of wildlife poisoning are *inadequate law enforcement* (although laws and regulations themselves are not assessed as unsatisfactory), *low penalties for wildlife poisoning* and *inadequate and unclear protocols for police action and limited police capacities*.

In terms of legislations and legal processing of poisoning incidents, officials additionally point to the rare imposing of fines (especially under the Hunting Act), and to the lack of public prosecutors' education for managing incidents related to the poisoning of wild animals. Regarding sanctions for various unlawful actions detrimental to animals and the environment, the majority of officials agree that all forms of mass and non-discriminative killing of animals (trapping, poisoning, explosives, etc.) should be severely punished and that fines for every type of poaching or illegal shooting should be increased. They also recognize the necessity for treating the possession of poison baits as a separate offense, regardless of whether it has been proven that an animal was killed and believe that the rangers should have the authority to arrest perpetrators, if they are caught in the act. On the other hand, there is no unanimous opinion whether the fines for animal poisoning should only be financial, or they should envisage imprisonment.

In general, there is very little knowledge about the existence of National action plan for combating wildlife poisoning, a protocol defining procedures and jurisdictions for

investigating wildlife poisoning and a database for poisoning incidents of birds amongst officials from relevant institutions. They also point out the inadequate cooperation between governmental institutions and civil society organizations regarding data collection about poisoning events, which is in line with the perception that the lack of coordination among relevant institutions and organizations is a bigger problem than a lack of resources.

Regarding the role of the Police in investigating wildlife poisoning incidents, respondents recognize the complexity of the investigations, assessing at the same time the capacities of the police as inadequate, both in terms of equipment and in terms of education and training of police forces. The majority of governmental employees surveyed identify the necessity for introduction of more people in the field for timely detection of poisoning incidents, introduction of specialized police units for environmental crime, including wildlife poisoning, and introduction of specialized canine units for detecting poisonous substances used for wildlife poisoning. Modern technologies and methods, as well as the cooperation with representatives of civil society in the investigation process are also identified as necessary. In addition, about two-thirds of respondents believe that additional effort is needed to change the attitude of the police towards a more serious understanding of the need for investigating wildlife poisoning incidents.

An additional obstacle in the work of Police is the lack of reporting of poisoning incidents to the police forces, which should be the responsibility of veterinarians and hunters in the first place, but also general population (every person). Still, close to two thirds of respondents perceive that reporting of such incidents can pose certain risks in the respective local communities for those who inform on the poisoning. An important barrier is also believed to be lack of information who to report animal poisoning incidents to.

Speaking of measures for preventing wildlife poisoning, almost all governmental employees believe that further raising of awareness among citizens in general and key stakeholders (livestock breeders, farmers, hunters, institutions), imposing a stricter control of the sales of legal poisoning substances and providing compensation to livestock breeders and farmers for the damages caused by wild animals are the key preventive measures that can help reduce wildlife poisoning.

Additional supplementary feeding sites for vultures and better protection of wild ungulate populations are the measures which are also perceived as important and beneficial.

Research results indicate a developed environmental consciousness among officials in Albania. They understand that plants and animals have an equal right to exist as humans and that the natural balance is very delicate and easily disturbed. Also, optimism for future actions is present in beliefs of the half of the respondents who dispute that humans are destined to rule over the rest of the nature, although one third agree with the domination of people over nature.

Conclusions

Wildlife poisoning in Albania is an evident environmental issue. The efforts invested into the research of this practice since 2018 provide preliminary insight into its scope and nature. We now know that people mostly resort to poisoning to resolve conflicts with wildlife, most often predators such as foxes, wolves and bears in order to reduce the damages that these animals may inflict upon livestock and other agricultural practices. For the better investigated poisoning events we can see that poison baits are mostly prepared using Methomyl and Organophosphates. A new potential driver of poison use registered in Albania is the deliberate use of poison due to conflicts with pigeon fanciers and the damages they might inflict upon racing pigeons. This specific driver of illegal poisoning is recorded for the first time in Albania, although it has been well documented in other countries of the region, notably Serbia and Croatia. It is important to mention that information about one presumably mass poisoning incident obtained from the relevant authorities indicate that misuse of pesticides used in agriculture could also be an important source for wildlife poisoning in the country. It is necessary to monitor and record all potential poisoning events in the country in order to more adequately determine the actual scope of this practice in the whole country and precisely define the areas where it most often occurs. This is particularly important for vulture conservation work, as these avian scavengers in the Balkan Peninsula are affected the most by wildlife poisoning.

Conservation work regarding wildlife poisoning in Albania resulted in creating conditions for legal sanctions against this practice. The recent changes in the national legislation now make it possible for poisoning to be treated as an illegal activity, punishable by law, which represents the basic foundation for combating this damaging practice. Since the change in national legislation is very recent, the jurisdictions and responsibilities of national law enforcement agencies need to be precisely defined. Additionally, a significant amount of specific training for combating wildlife poisoning, and environmental crime in general, is needed for enforcement agents from the relevant institutions in order to be able to adequately address potential poisoning events.

Poisoning in general is not perceived as a very significant threat for vultures or other wildlife by the general population inhabiting rural areas in Albania, and the majority of people are not well informed about this conservation issue. On the other hand, they perceive that livestock breeders and hunters are groups which might often resort to the use of poison baits as they most commonly have conflicts with wildlife. These groups are perceived as the main culprits behind wildlife poisoning also by relevant governmental authorities, which generally exhibit a significantly higher ecological awareness when it comes to poisoning and wildlife crime in general. Therefore, future anti-poison efforts in Albania should also integrate a significant educational and awareness raising component aimed at changing the perception about this practice and labeling it as a socially unacceptable behavior.

BOSNIA AND HERZEGOVINA

Introduction

The negative effect that the use of poison baits has on wildlife is well documented in Bosnia and Herzegovina. The first data about the effects of this practice on birds, especially on vultures, was noted in Othmar Reiser's works published in the end of 19th and first years of 20th century, when it was pointed out that it is necessary to regulate the use of poisons in the environment to prevent the killing of Bearded and Griffon Vultures. Vulture population in the country suffered the severest blow in the mid-20th century, when the use of poisonous substances for exterminating large carnivores, mainly wolves, was a legally sanctioned practice. This uncontrolled and unprecedented poisoning practice led to extinction of the Cinereous (1910), Bearded (1987) and Egyptian Vulture (1995) from Bosnia and Herzegovina. The last major poisoning event was observed at the beginning of the 1991 when the last breeding colony of Griffon Vultures in the country was poisoned in a single poisoning event. In the last 20 years the problem of poisoning is still present, although almost no records of massive poisoning incidents of wildlife have been officially reported to the relevant institutions. There are no systematic records or relevant database related to wildlife poisoning incidents in the country among the relevant governmental institutions. Since 2018. and the launch of the BAPP project in Bosnia and Herzegovina, information about potential poisoning incidents has been systematically recorded by Ornitološko društvo "Naše ptice", which enables us some insight into the current situation of the illegal poisoning in the country,

Historical perspective

There is very little available data related to wildlife poisoning in general, and even fewer data related to vulture poisoning from Bosnia and Herzegovina, although the use of poison baits for population control and extermination of various mammalian predators and other undesirable animals is a well-documented practice in the country. Therefore, avian scavengers could frequently encounter poisoned dead animals (either as bait or as victims of poisoning) in the environment. From the middle of the 19th to the middle of the 20th century *Strychnine* was extensively used for the control of wolf populations. The poisoning was not selective and was affecting many other different species as well. Another reason for using poison was the control of population of feral and stray dogs. Large, organized poisoning actions, with the use of strychnine and *Hydrogen cyanide* were carried out after the II World War.

It is estimated that around 220 vultures (mainly Griffon Vultures) were poisoned throughout Bosnia and Herzegovina during 1959 alone (Mardešić & Dugački *in* Marinković, 1999). The practice of illegal placing of poison baits in the environment for the same reasons continued throughout the 80s and 90s. During the period of 1980-1991, 97 Griffon Vultures were poisoned in eastern Herzegovina (Marinković *et al.* 2007). It was proven that in some incidents Furadan (Carbofuran) and hydrogen cyanide were used.

The last recorded incident of massive poisoning of vultures in Bosnia and Herzegovina was recorded on June 26th, 1991 in Blagaj, where the last breeding population of Griffon Vultures used to breed, on cliffs towering above the Buna River. Thirty Griffon Vultures were found poisoned after feeding on an animal carcass laced with Furadan, which was placed in order to eliminate stray and feral dogs from the vicinity of a local settlement, according to official reports. This single poisoning incident wiped out the last breeding population in the country and the species hasn't recovered since. Currently there are no vulture species breeding in Bosnia and Herzegovina, only vagrant individuals of Griffon Vultures, and recently of reintroduced Cinereous Vultures from Bulgaria, have been recorded flying across the country during the last 20 years.

Current situation in the country

First comprehensive investigation of the practice of wildlife poisoning in Bosnia and Herzegovina was conducted through the implementation of the BAPP project, which was implemented from 2018-2021. Within this period, efforts were mainly invested in

determining the current scope of this practice on a national level, drivers behind it, substances most commonly used and areas in the country where it most often occurs (or where conflicts with wildlife, especially predators, have recorded the most).

There is very little information regarding wildlife poisoning available in general, both from the relevant governmental authorities and media, and even less about poisoning incidents relevant to vulture mortality, the drivers behind it and the substances most frequently used. Based on the available data a total of 6 presumable poisoning wildlife incidents have been recorded in Bosnia and Herzegovina from 2000-2020, mainly due to misuse of pesticides in agriculture. The last massive poisoning incident was recorded in 2004 near Sarajevo, where 20 Common Buzzards were found dead on an agricultural field. The misuse of rodenticides for control of rodent populations was believed to be the cause behind this incident, like the one recorded in 2017, where 2 White Storks were found dead in Vrbaška.

Since 2018, 4 presumable wildlife poisoning incidents were recorded, with no information available about the motives behind them or poisoning substances used. In 2018 one Griffon Vulture was suspected to have died of poisoning in the recovery aviary in Blagaj. In 2020, 3 Western Marsh-harriers were found dead in Gacko most likely due to misuse of pesticides in agriculture. In the Canton of Sarajevo, the same year 1 Eurasian Brown bear and Peregrine Falcon were found dead, presumably poisoned. The necropsy conducted on the bear concluded that there were indicative signs of poisoning. However, since there are currently no referent toxicological laboratories in Bosnia and Herzegovina for conducting forensic toxicological analysis on wildlife it is not possible to conduct necessary analyses to validate if the cause of death was actually poisoning and what was the substance used. Additionally, the current legislation does not permit samples from wildlife, especially protected species to be transported for toxicological analysis in referent laboratories abroad, which further complicates the issue of officially confirming poisoning incidents in the country. Therefore, it is vital that future conservation efforts in Bosnia and Herzegovina relevant to wildlife poisoning focus on amending the current legislation in place and develop capacities within existing relevant national laboratories for conducting toxicological analysis on samples obtained from wild animals.

Since half of the recorded wildlife poisoning incidents in the last 20 years indicate that the animals most likely died from secondary poisoning, due to improper application of rodenticides in agricultural areas, it is important to note that this unintentional poisoning constitutes a significant factor in Bosnia and Herzegovina. Poisonous substances are mostly used by farmers, most of them insufficiently informed about proper usage and application. There are legal protocols that prescribe the proper manner and amount of use of these substances, however adequate enforcement of these protocols is completely lacking or is restricted to large, commercial farms. There is no control of the

application of these substances by small farmers and farmsteads. Furthermore, it is important to note that the procurement of banned substances is very much present in the country and is often conducted through social networks (Facebook), various web sites, indicating that a black market for these substances exists.

However, intentional use of poison baits for elimination of feral, stray cats and dogs is still frequently reported, both in rural and urban areas, and potentially poses a significant threat for vultures foraging in Bosnia and Hercegovina. Since 2004 a total of 13 incidents were documented where stray dogs were targeted. During 2011 within the city of Tuzla over 100 dogs were found poisoned. In 2 incidents the poison used was confirmed to be a rodenticide, while on one occasion a molluscicide was used to prepare poison baits. On the other hand, more recent data about the use of poison baits for elimination of wild predators is lacking and needs to be further investigated to assess if it poses a potential threat for vultures and other scavengers.

It is important to highlight that development and legal adoption of operational protocols for processing cases of wildlife poisoning in Bosnia and Herzegovina, which would also describe the responsibilities of each relevant authority, would lead to more effective enforcement of anti-poison legislation, as well as increased efforts of responsible authorities in early detection of poisoning cases. These actions would greatly facilitate the prosecution of these cases and their culprits and are crucial for long-term improvement. Bosnia and Hercegovina has a very complex bureaucratic apparatus, with often conflicting legislation in place on different levels of governance (federal level, entity level, cantonal level). Additionally, each level of governance has its own government, ministries, environmental inspectorates, and enforcement agencies, with joint actions and cooperation rarely being carried out. These circumstances are making it difficult to precisely define jurisdictions among these relevant stakeholders.

Legal framework

Wildlife poisoning and the use of poisonous substances is clearly defined in the existing legislation in Bosnia and Herzegovina as an illegal activity.

Existing national legislation relevant to wildlife poisoning in Bosnia and Herzegovina:

Federation of Bosnia and Herzegovina – Federal level.

- **Law on nature protection:** Article 119. of the Law on nature protection prohibits the use of all methods for capturing and killing of wild animal species which can

cause local extinctions or severe disturbance of populations of those species, which includes the use of poison baits.

- **Hunting law:** Article 29. of the Hunting law prohibits the intentional poisoning of game animals. Exceptionally, the Federal Minister, based on request from interested parties (inspectorate, hunting association etc.), may authorize the use of poison for elimination of certain species of game animals if they threaten human health, health of domestic animals or survival of protected species of game animals. This authorization must state the method, timeframe and persons responsible for placing poison baits. Article 84. determines the penalty of 1.000-1.500 KM for all citizen who violate Article 29. Furthermore, Article 52. of the same Law prohibits unethical methods of hunting, which among other means and methods includes the use of poison baits.

Republika Srpska – Entity level.

- **Law on nature protection:** Prohibits all activities which contribute to disturbance of the favorable condition of populations of wild species, destroying or damaging their habitat, litter, nesting or disturbing their life cycle, or favorable condition, among other things, by the use of poison baits.
- **Hunting law:** Article 16. of this law prohibits the use of poison baits as a method for hunting or control of populations of game animals.

District Brčko – Regional level.

- **Law on nature protection:** Prohibits all activities which contribute to disturbance of the favorable condition of populations of wild species, destroying or damaging their habitat, litter, nesting or disturbing their life cycle, or favorable condition, among other things, by the use of poison baits.
- **Hunting law:** Article 13. of this law prohibits the use of poison baits as a method for hunting or control of populations of game animals.

Relevant international treaties and conventions that Bosnia and Herzegovina is parties to:

Convention on the Conservation of European Wildlife and Natural Habitats (Bern, 1979): (“Official Gazette of Bosnia and Hercegovina No. 8/08 – 47 – annex). It prohibits the use of any non-selective means of capture or killing as well as of means that may induce local extinction or heavily disturb the populations of a species, namely means listed in Annex IV”, while in Annex IV of the same Law, which is entitled “Prohibited means and

methods of hunting and other forms of exploitation”, “Poisons and poison or tranquilizing baits” are included.

Perception of the illegal practice of wildlife poisoning in local communities in Bosnia and Herzegovina

The target group in the research were hunters, farmers and livestock breeders within the local communities of Blagaj and Kupreško polje, areas which Griffon Vultures occupied in the past and which are important for livestock breeding and potential conflicts with predators. Due to difficulties caused by COVID-19 pandemic, the sample included 27 respondents in total from a target population of 282 people.

Target audiences in local communities in Bosnia and Herzegovina are in general inadequately informed about the presence of vulture species and whether they breed in Bosnia and Herzegovina, as well as about the issue of wildlife poisoning in this country.

Wildlife poisoning is perceived as one of the three key threats to the vulture population in Bosnia and Herzegovina, apart from poaching and the lack of food (around 60% each). Vultures are however not perceived as primary targets of poisoning, but mostly as accidental fatalities from poison baits intended for other animals, because vultures themselves consume poisoned animals or because of unintentional pesticide poisoning. Only close to a quarter of respondents believe poisoning of vultures is intended and executed by poison baits prepared specifically for vultures.

An encouraging finding of the research implies that the majority (78% or above) of the respondents from the local communities in Bosnia and Herzegovina recognize the importance of vulture population for both humans and the ecosystem in its entirety, they do not justify poisoning of wild animals, while 70% disagrees that wildlife poisoning is only a problem when it poses a threat for humans. Also, about 70% of the respondents agree that the Earth has limited space and resources, that it is difficult to maintain the natural balance, and that plants and animals have the same rights as humans.

However, results of the research imply the need for further communication about the dangers of poisoning as slightly above 40% of respondents consider controlled institutionally conducted poisoning of wild animals as a proper mean to control the populations of pests and undesirable animals. A similar number of the respondents believe that people are the ones who have primacy over nature.

While close to 2 out of 3 respondents from our target groups perceive that wildlife poisoning mostly occurs intentionally (mostly by illegal poisons from the black market and to a somewhat lower percentage by abuse of legal poisoning substances such as pesticides, insecticides, etc.), around one third of respondents believe that wildlife poisoning most commonly occurs accidentally, by misuse of legal poisoning substances out of negligence or ignorance.

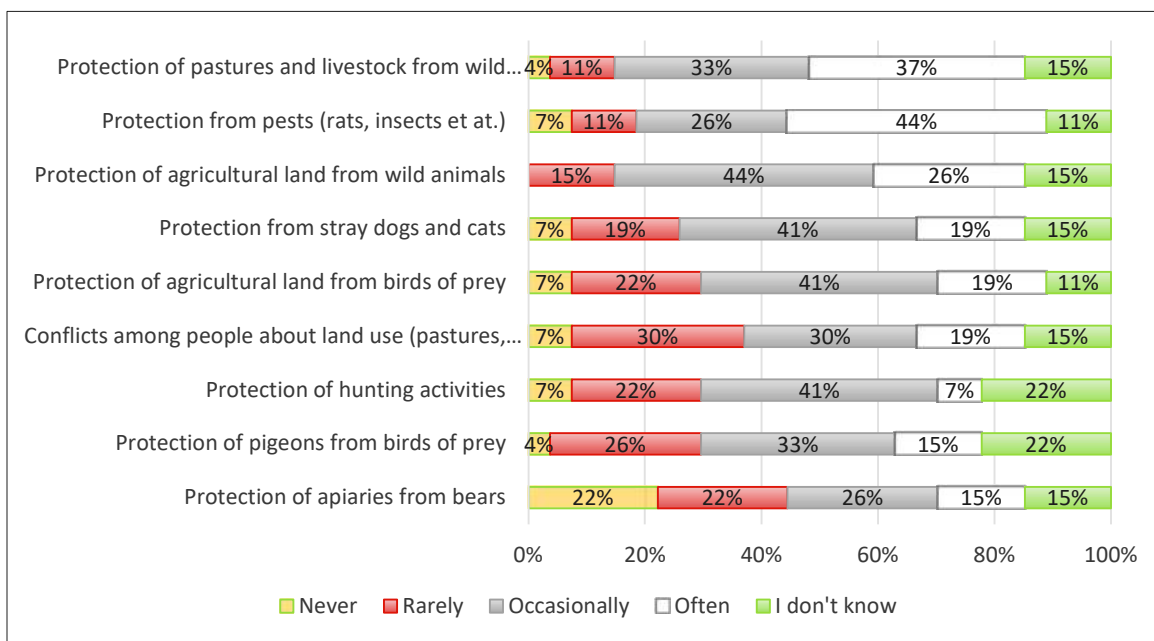


Figure 4. Perceived motives behind wildlife poisoning in Bosnia and Herzegovina

People from the local communities attribute the responsibility for wildlife poisoning mainly to hunters (around 75% of respondents), individuals who deliberately poison animals simply because they like killing things (63%) and livestock breeders and farmers (around 50%). In line with this, 70-80% respondents recognize hunters and veterinarians, but also the general public (*every person*) as the most responsible for reporting information/knowledge about wildlife poisoning to the police.

A key barrier for people to report wildlife poisoning cases are risks of negative consequences for those who report the poisoning incidents and conflicts with people from their communities. While one third of respondents would report the incident only if it wouldn't have negative consequences for them, 15% is undecided what they would do, while close to 1 in 10 stated that they would not report the poisoning. Another potential barrier for reporting animal poisoning incidents is the perception that citizens mostly do not know who to report these incidents to (Figure 5).

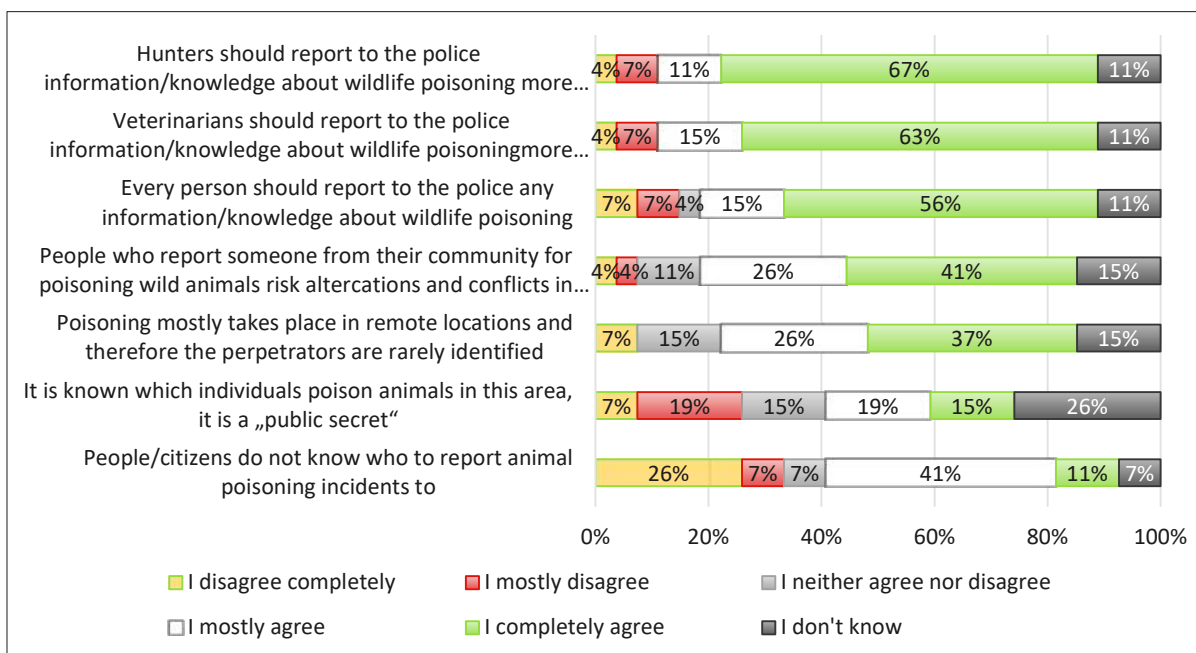


Figure 5. Personal attitudes towards reporting poisoning incidents to the relevant authorities in Bosnia and Herzegovina

All this implies that further standardization of the reporting procedures of poisoning incidents, as well as informing of the citizens to whom to report to is needed to help them participate in the identification of poisoning events and in the prevention of further occurrences.

The most frequent motives behind poisoning of wild animals imply the need for better solutions for *protection from pests, protection of pastures, livestock and agricultural lands from wild animals, stray dogs and cats and protection of agricultural land from birds of prey* (Figure 4.).

In the past 10 years, around half of the respondent claim encountering mostly intentional case(s) of poisoning in their community. Apart from wildlife poisoning, witnesses claim poisoning of guard or shepherd dogs, pets or domestic animals as accidental occurrences. Amongst the regions of Bosnia and Herzegovina, Krajina (33%) is perceived as the region where wild animals are most frequently poisoned, Hercegovina (15%) and Posavina (11%) follow as the “hot spots”.

When it comes to the measures for prevention and combating wildlife poisoning, 75% of the respondents believe that it is important to enforce a stronger control of import and trade of legal poisoning substances, to increase administrative fines for wildlife poisoning, to work more on informing the general public about the problem of wildlife

poisoning, and that the state/government should financially compensate the damage to livestock breeders and farmers, caused by wild animals. Wildlife poisoning investigations are also identified as important police work by close to two thirds of respondents.

Citizens in general are identified as the target group for the awareness campaign about the threats of wildlife poisoning, hunters (30%), livestock breeders (26%) and farmers (22%) follow.

Perception of the illegal practice of wildlife poisoning within relevant governmental authorities in Bosnia and Herzegovina

Due to difficulties caused by the COVID-19 pandemic, the sample included 9 respondents in total out of 29 employees in targeted institutions. Employees of relevant governmental institutions in Bosnia and Herzegovina show a certain lack of information and knowledge about the degree of endangerment of the vulture populations, and the fact that there are almost no vultures in the country apart from rare and isolated sightings of passing Griffon vultures.

The key perceived threats to the vultures in Bosnia and Herzegovina are extensive usage of legal toxic compounds (pesticides, insecticides, rodenticides) and wildlife poisoning. Vultures are however perceived as both primary targets and accidental fatalities, poisoned by baits intended for other animals, by consumption of poisoned animals or consumption of poison baits intended specifically for them. These findings imply the need for vigilance regarding wildlife poisoning in general.

Amongst the regions of Bosnia and Herzegovina, Herzegovina stands out as the region where wild animals are most frequently poisoned, especially in the spring and autumn periods of the year, although half of the institution employees perceive they are not informed about the regions affected by wildlife poisoning or the periods of the year posing the biggest risk for vulture population.

In addition to persons who deliberately poison animals out of aggressive or destructive instincts, livestock and agricultural production farmers have been identified as a specific group with interest in protection of pastures, livestock and land from pests and wild animals through the practice of poisoning. These findings suggest that the field of action regarding prevention of wildlife poisoning should be twofold: the institutions should mobilize in the protection of livestock, crops, and land, but also in the education of citizens about the harmful effects of wildlife poisoning.

Governmental employees participating in the research recognize the relevance of police work in wildlife poisoning, stressing that the Police should take these types of investigations seriously, while citizens should be informed about the importance of reporting poisoning incidents to the police. They also emphasize the importance of strengthening of the police force capacities by equipping the police with specialized canine units for detecting poisonous substances, increasing the number of agents in the field (including environmental inspectors, rangers etc.) for timely detection of poisoning incidents, forming specialized police units for environmental crimes, including wildlife poisoning, and equipping the police forces with expensive and sophisticated technology. On the other hand, they recognize that the police forces are currently not sufficiently equipped, as well as not sufficiently educated to investigate wildlife poisoning.

Other key aspects in the further protection of biodiversity, wildlife and vulture populations in Bosnia and Herzegovina as perceived by the government employees relate to enforcement of the existing laws (which are mostly found as sufficient but inadequately implemented), imposing the fines (i.e. under the Hunting Act), but also application of strict punishments for all forms of mass and non-discriminatory killing of animals, higher penalties for all forms of poaching, and declaring animal poisoning a criminal offense in general and not just if it occurred in a protected area (i.e. nature or national parks). In line with the better enforcement of existing laws, there is also a need for imposing a stricter control over the trade of legal poisoning substances (pesticides, rodenticides, etc.). These two factors - enforcement of the laws and control over the sales and usage of legal poisons have been identified as key barriers to preventing and sanctioning wildlife poisoning incidents.

It was highlighted by the representatives of the relevant governmental institutions that rangers in protected areas should have the authority to arrest persons who poison animals if they are caught in the act, and that possession of poison baits should be a separate offense, regardless of whether it has been proven that an animal was killed.

The research results also identify the need for improving the coordination among relevant institutions, which is perceived as a bigger challenge than the lack of resources. In line with this, there is a need for better coordination of efforts and capacities, inclusion of representatives of civil society organizations in the police investigations, as well as the cooperation between governmental institutions and civil society organizations i.e. regarding data collection about poisoning events.

There is also an evident lack of data about the sales of legal poisonous substances (pesticides, insecticides, rodenticides ...), and of databases on poisoning incidents, as well as of a national action plan to combat poisoning or a protocol defining procedures and responsibilities in investigations into wildlife poisoning. Raising awareness of the

general public and key stakeholders (livestock breeders, farmers, hunters, institutions), a larger number of supplementary feeding sites for vultures, better protection of wild ungulate populations, resolving the issues of pasture ownership and the right to use them, ensuring free electric fences and state/ government financial compensation for the damages caused by wild animals to livestock breeders and farmers, have a key place in the prevention of wildlife poisoning incidents.

According to the respondents, all citizens need to be better informed to whom they should report cases of poisoning of wild animals. Also, it is necessary to promote the protection of vultures and inform the citizens about the dangers of poisoning to create a climate in which citizens are not afraid of risks and conflicts in their environment if they report poisoning cases.

The sensitivity of the natural balance and the possibility of it being easily disturbed, as well as the limited resources and space on Earth, were unanimously recognized by target group of employees in the institutions of Bosnia and Herzegovina. On the other hand, although plants and animals are recognized as equal in terms of the right to life and existence, the presence of the attitude that people are destined to rule over nature is still evident.

Conclusions

Although efforts have been made in the past several years to determine the actual scope of wildlife poisoning in Bosnia and Herzegovina by national CSOs, there has been very little data available about this occurrence in the country during the last 20 years, although it has been a deeply rooted practice until the 1990s. Almost no available data about animal poisoning exists among the relevant governmental authorities in the country, despite the fact that the practice of using poison baits to eliminate undesirable animals has been illegal for more than 30 years. Existing data almost exclusively relates to poisoning of pets, mostly dogs, in urban environments. The lack of a referent national laboratory where it would be possible to conduct forensic toxicological analysis, to confirm if a wild animal has indeed died as a consequence of poisoning, further complicates the issue. Most presumable poisoning events involving wildlife relate to unintentional poisoning mainly due to inadequate use of pesticides or other plant protection products used in agriculture.

On the other hand, wildlife poisoning is perceived as one of the three key threats to vultures in Bosnia and Herzegovina by the general population in rural areas, apart from poaching and the lack of food. Vultures are not perceived as primary targets of

poisoning, but mostly as accidental fatalities from poison baits intended for other animals. However, further educational and awareness raising actions about the dangers of illegal poisoning of animals, and the importance of reporting these incidents to the relevant authorities, need to be implemented as almost half of the surveyed people in rural areas consider controlled institutionally conducted poisoning of wild animals to be an adequate measure for control of populations of pests and undesirable animals. Additionally, a great majority of surveyed people in Bosnia and Herzegovina perceive that wildlife poisoning mostly occurs intentionally (mostly by illegal poisons from the black market and to a somewhat lower percentage by abuse of legal poisoning substances such as pesticides, insecticides, etc.). Therefore, it is very probable that a significant number of intentional poisoning incidents remains unnoticed and unreported. People from the local communities perceive that the responsibility for wildlife poisoning mainly rests on hunters, individuals who deliberately poison animals simply because they like killing things and livestock breeders and farmers.

Although Bosnia and Herzegovina has a complicated political and administrative setting, the existing legislation in place clearly prohibits the use of poison baits and any similar means of non-selective extirpation of animals. Relevant law enforcement institutions in the country are inexperienced in dealing in poisoning incidents, and significant efforts need to be invested to build up their capacities in order to be able to tackle this specific type of environmental crime. The lack of coordination and cooperation among relevant governmental institutions, lack of clear operational protocols, and the possibility of conducting toxicological analysis on wild animals are recognized as the main gaps that result in poor engagement and performance of the relevant authorities with wildlife poisoning in the country.

BULGARIA

Introduction

During the middle of the 20th century the use of poisoned baits was widely and systematically used to control populations of wild predators in Bulgaria, much like other neighboring countries of the Balkan region. The effects of this legal, governmentally sponsored initiative back then are well documented. The Bearded Vulture is considered to have been extinct since the 1970s when the last individual was found poisoned in the

Eastern Balkan Mountains. Since then, only single vagrant individuals have been irregularly observed in southern Bulgaria. The Cinereous Vulture has been extinct from Bulgaria since 1993. The last breeding pair of the species was confirmed in 1993 in the Eastern Rhodopes. Decades of work on vulture conservation in the country conducted by the national CSOs, and in particular through the recent reintroduction efforts within Vultures back to LIFE project (LIFE14 NAT/BG/000649) have created favorable conditions for the species to breed again. In 2021 first breeding attempts of the Cinereous Vultures have been documented after nearly 20 years. The Griffon Vulture population in Bulgaria rapidly declined throughout most of the 20th century and was thought to be extinct in the country in the 1960s mainly due to wildlife poisoning and changes in animal husbandry practices.

In the beginning of the 90s Bulgaria ratified the Bern Convention and the practice of using poison baits was finally banned. Additionally, the establishment of the Natura 2000 network in Bulgaria and hence the incorporation of the Birds and Habitats Directive further reinforced national legislation. However, although randomly distributed spatially and temporally, the illegal use of poison baits is still practiced as a common method for extirpation of wild predators, birds of prey, feral and stray dogs, and any other unwanted animals (e.g., wild boar, horses etc.).

Detection of poisoning incidents very much depends on the efforts invested in field searches for signs of poisoning or poisoned animals. Recently, through implementation of several Life projects, significant progress has been made in detection of poisoning, proper processing of poisoned animals, development of anti-poison awareness campaigns and judicial processing of poisoning incidents. Since the beginning of the 21st century systematic records and documentation of poisoning incidents have been kept, especially those related to vulture mortality, by national CSOs working on bird conservation in the country.

Historical perspective

Historical data relevant to wildlife poisoning in Bulgaria dates from the very beginning of the 20th century, when *Cyanide* and *Arsenic* were commonly used to kill indiscriminately any mammalian predators and birds of prey deemed undesirable or harmful to human activities. During the middle of the 20th century *Strychnine* was introduced and widely and systematically used by forestry officers, veterinary officers and hunters for such purposes in a nationalized and centralized economy of the country. After 1962 vultures were listed as protected species in Bulgaria, but the main reason for their population decline – the use of poison baits was not officially banned.

No specific survey on poisoned wildlife animals was conducted, nor records of such incidents kept, until the 90s, when BSPB project members in the Eastern Rhodopes started to conduct toxicological analyses of dead vultures. However, this practice was intensively introduced in wildlife conservation in Bulgaria since 2003 with the appointment of National working group on poisoning incidents which was coordinated by Fund for Wild Flore and Fauna (FWFF) within the Balkan Vulture Action Plan (BVAP). The FWFF, Green Balkans, BSPB, Birds of Prey Protection Society (BPPS), Balkani Wildlife Society and others work on their own projects and in co-ordination against poison baits use in the natural environment.

Current situation in the country

Nature conservation organizations in Bulgaria have been very active in addressing the issue of wildlife poisoning, as it is one of the main threats that national population of vultures and other scavenger species are facing, and are managing their own databases about this practice, such as FWFF. Additionally, under the scope of LIFE+ project “The Return of the Neophron” (LIFE10NAT/BG/000152), BSPB has established together with other project partners the Poison Incident Database (PID), where available data about poisoning incidents that occur in Bulgaria are stored. A unified national database for recording and storing information regarding wildlife poisoning incidents is key for conducting adequate spatial analysis, determining the scope and severity of poisoning, and defining hotspots for poisoning in the country and subsequently directing conservation actions and effort where they are most needed.

Ministry of Environment and Water in 2021 approved the National Action plan to combat the illicit use of poisons in the wild, developed by BSPB. This plan represents an extremely important tool for combating one of the biggest threats to biodiversity in Bulgaria. The entry into force of this strategic document is a key step in the conservation of wildlife and a number of endangered species in the country.

Available information about wildlife poisoning in Bulgaria indicates that 88 poisoning and presumably poisoning events have occurred in the country during the period 2000-2020. According to the data compiled and analyzed in this study the most common driver behind the use of poison in Bulgaria are livestock losses, inflicted by mammalian predators, predominantly wolves (identified in 38% of registered poisoning events where mammalian predators were the target), but also jackals, foxes, and bears. In 2 poisoning events where bears were targeted, honey mixed with toxic compounds was used as a bait. The second most numerous cause of poisoning of wildlife in Bulgaria is misuse of pesticides in agriculture, which is responsible for 26,1% documented events (Figure 6.).

Although this type of poisoning is unintentional, banned pesticides, such as Carbofuran, have been used for preparation of poison baits against rodents. Conflicts with birds of prey, that may often inflict damages to racing pigeons, and conflicts with shepherd dogs, unwanted by hunters because of conflicts with their dogs, as well as conflicts with stray dogs are also identified as motives for using poison in Bulgaria.

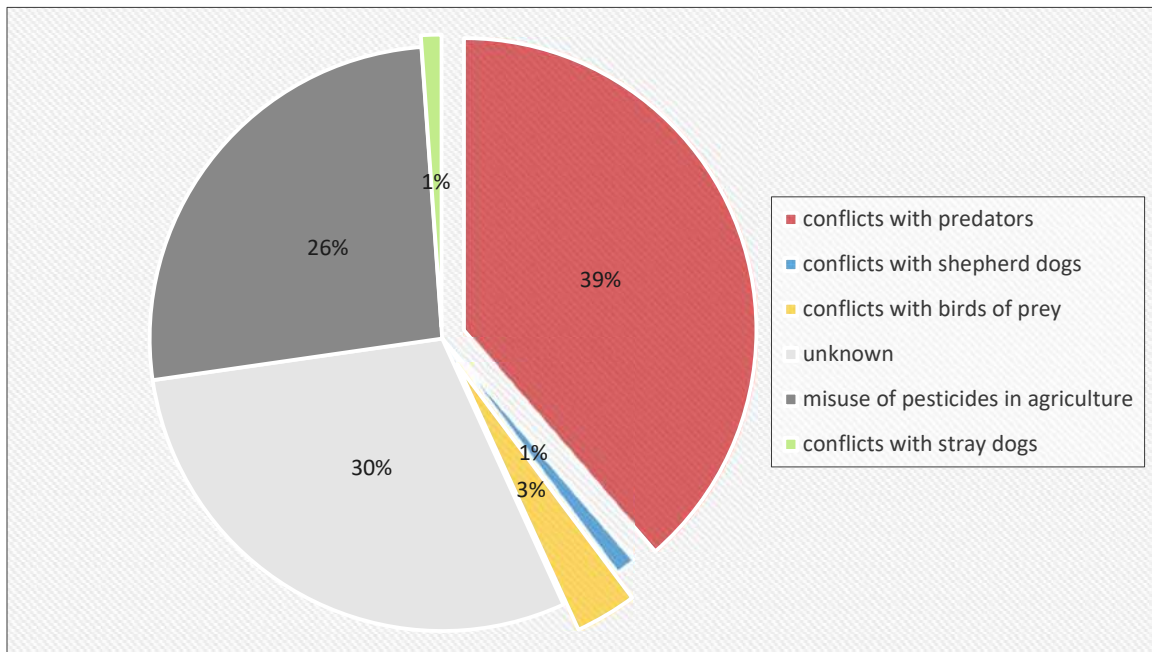


Figure 6. Motives behind wildlife poisoning in Bulgaria

Depending on the drivers behind poison use, there are several different groups of the society that most frequently use poison to kill wildlife, domestic animals or livestock: hunters, game keepers, livestock breeders, dove and pigeon keepers, farmers. The situation with poison use is very much dynamic and incidents may appear randomly in space and time. The most important areas however (hotspots for poisoning) are those in which large carnivores (wolf, jackal, bear) are frequently present and especially areas with extensive animal husbandry. It is more efficient to focus anti-poison actions to areas where certain conservation dependent species are present. However, a national anti-poison campaign covering all target groups is crucial for combating this issue long-term. There is no restriction to season when it comes to wildlife poisoning, but the vultures are usually affected in March-May, when the livestock is about to be moved to summer pastures.

According to the available data compiled for this study, toxic compounds that were used for poisoning were identified in 54% of wildlife poisoning events. The most frequently used toxic substances for wildlife poisoning are Carbamates, most notably *Methomyl* and *Carbofuran*, and Organophosphates. The last poisoning incidents where *Strychnine* was used was registered in 2003. Toxicological analysis also confirmed the use of Zinc phosphate for poisoning animals, and Lindane, which is often used both as an agricultural insecticide and as a pharmaceutical treatment for lice and scabies.

Stricter control of legally used pesticides and their application in agriculture should be enforced as well, where conservation dependent species may be poisoned in arable areas where these substances are applied legally. These actions should be planned species by species and site by site because substances that are lethal for one species may not be too dangerous for others (related to the way of application and introduction in the food chain) and vice versa.

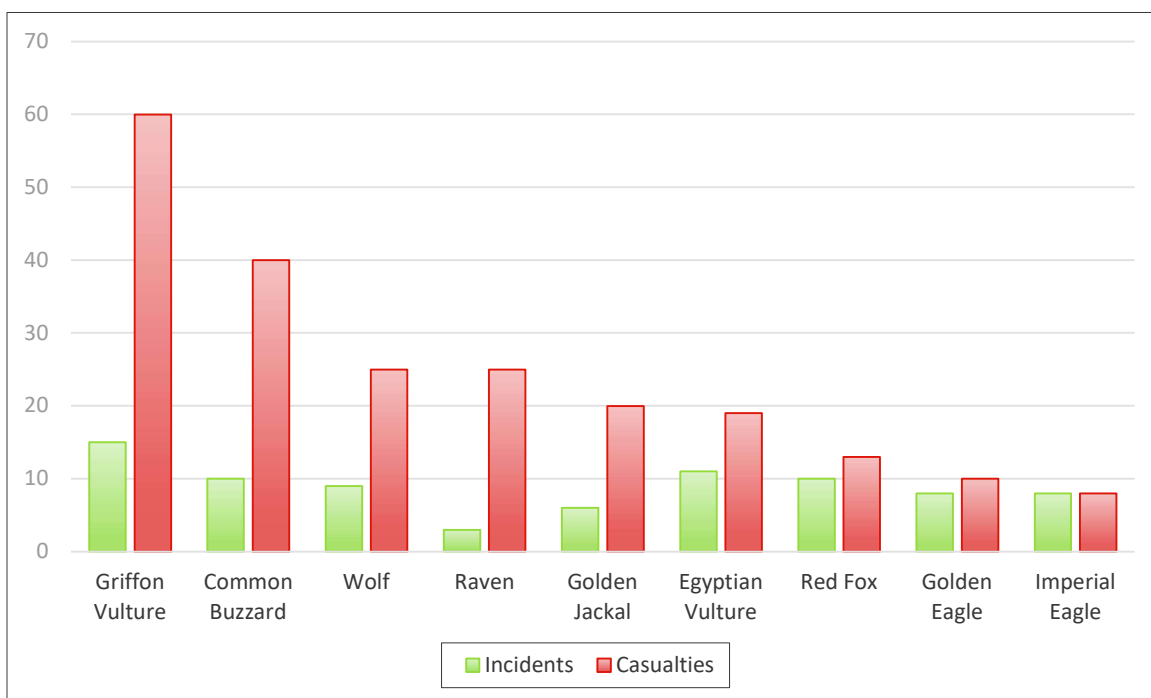


Figure 7. Common victims of wildlife poisoning in Bulgaria

A total of 30 species of wild animals have been found poisoned or presumably poisoned during the period from 2000-2020. The most common victims were Griffon Vultures, appearing in 17% of poisoning and presumably poisoning events (Figure 7). Sixty vultures in total we found poisoned and presumably poisoned within 15 separate incidents, but it is estimated that up to 90 birds ultimately might have perished from this practice. The most devastating poisoning event during this period occurred in March

2017 in the area of Kresna gorge (Peshev et al. 2018). The number of dead birds discovered amounted to 18, and it was estimated that at least 30-40 birds might have died, which was a significant blow to the local population, which had been restored there after years of conservation work. The Griffon Vultures found dead constituted the bulk of the local breeding population. The relevant authorities confirmed that the substance used for poisoning was Carbofuran and it is proved that the motive behind this incident was conflicts with wolves. The second most common victim of poisoning events according to the available data in Bulgaria (Figure 7.) is the Egyptian Vulture (19 individuals in 11 separate incidents), followed by the Common Buzzard (40 individuals in 10 separate incidents), Red Fox (13 individuals in 10 separate incidents) and Wolf (25 individuals in 9 separate incidents). Other victims of wildlife poisoning include Cinereous Vulture, Golden Eagle, Imperial Eagle, Long-legged Buzzard, Peregrine Falcon, Saker Falcon, Goshawk, Hen Harrier, Raven, Black Stork, White Stork, Common Starling, Partridge, Barn Owl, Tawny Owl, Goldfinch, Greater White-fronted Goose, Golden Jackal, Wild Boar, Brown Bear, Marbled polecat, Stone Marten, Badger, Hedgehog and Hare. The most numerous victim during this period was the Common Starling, as 244 individuals were found presumably poisoned within 3 separate events, from which 224 individuals in a single probable poisoning event due to misuse of pesticides in agriculture.

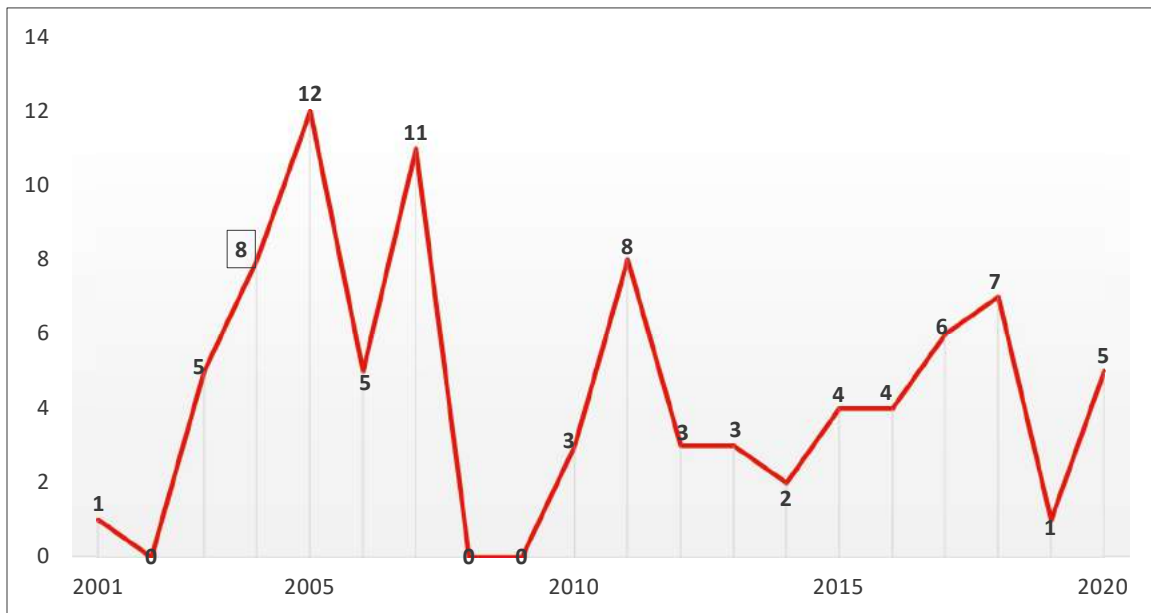


Figure 8. Number of poisoning events in Bulgaria within the research period

Available data indicates that wildlife poisoning in Bulgaria is still a common practice, showing no signs of significant decrease of occurrence during the past 20 years. The frequency of occurrence of poisoning events in Bulgaria is highly irregular and further

efforts are needed to investigate the annual differences in the number of recorded events and if they truly reflect the actual scope of wildlife poisoning in the country.

Legal framework

National legislation of Bulgaria strictly prohibits the use of poison baits to kill hunting and protected species. The action of setting poison baits on its own is forbidden, but poorly described and addressed in existing legislation and thus differently interpreted and often not applicable. In the Criminal Code, owning highly toxic substances without permission is considered illegal. However, all these measures are not enough, and additional explanatory texts and justifications should be included in existing legislation.

Existing national legislation relevant to wildlife poisoning in Bulgaria:

- **Biological Diversity Act** (State Gazette No. 77/9.08.2002): Article 44. prohibits the use of poison, poisoned or anesthetic baits (Annex 5) for capturing or killing any species listed in Annex 4 of the Biological Diversity Act. Relevant EU legislation - Directive 79/409/EEC of the Council of April 2, 1979, on the conservation of wild birds and Directive 92/43/EEC of the Council of May 21, 1992 on the conservation of natural habitats and wild fauna and flora were integrated into the above mentioned national legislation.
- **Law for hunting and protection of game** (SG. 78/26 Sep 2000, amend. SG. 26/20 Mar 2001, amend. SG. 77/9 Aug 2002, amend. SG. 79/16 Aug 2002): Article 65. prohibits the use of poisonous or anesthetic substances, as well as baits with such substances as a means or method in hunting.
- **Penal Code:** According to article 237. (Amend., SG 28/82; SG 89/86; SG 86/91; SG 85/97; amend., SG 92/02) who kills or catches such game in time of prohibition, in a prohibited place or by prohibited means, shall be punished by corrective labor for up to six months or by a fine of one hundred to three hundred levs, as well as by revoking of rights according to art. 37, item 7.

Relevant international treaties and conventions that Bulgaria is parties to:

Convention on the Conservation of European Wildlife and Natural Habitats (Bern, 1979): Ratified by ratified by Bulgaria on 25.01.1999, in force for Bulgaria since 01.05.1991 (State Gazette ¹ 23/1995). It prohibits the use of any non-selective means of capture or killing as well as of means that may induce local extinction or heavily disturb the populations of a species, namely means listed in Annex IV", while in Annex IV of the

same Law, which is entitled “Prohibited means and methods of hunting and other forms of exploitation”, “Poisons and poison or tranquilizing baits” are included.

Perception of the illegal practice of wildlife poisoning within relevant governmental authorities in Bulgaria

Research about the perception of key audiences in local communities, as well as relevant governmental institutions in Bulgaria, was not the target for the scope of this study. However, efforts were made to obtain information from relevant institutions through the online survey, while we did not have sufficient capacities to conduct the surveys in local communities where wildlife poisoning is frequently registered.

Employees of relevant institutions in Bulgaria are mostly well informed about the presence of certain species of vultures on the territory of Bulgaria today, such as the Griffon Vulture and Egyptian Vulture.

Wildlife poisoning is not acknowledged as the most important threat to the existence of vultures in Bulgaria. The key perceived threats to the vulture population in Bulgaria are accidental electrocution from electric cables or fences, excessive and negligent use of legal poisons (pesticides, insecticides, rodenticides) and accidental consumption of poisoned animals by vultures. On the other hand, wildlife poisoning is recognized as to certain extent accidental, but to certain extent also intentional, using illegal poisons from the black market.

The main responsibility for wildlife poisoning lies with hunters, livestock breeders, farmers, and people who deliberately poison animals to kill them, while the key reasons for the poisoning of vultures are protection of pastures and livestock from wild animals and protection of hunting grounds. Other important reasons are conflicts between people over land use (pastures, hunting grounds), protection from pests (rats, insects, etc.), protection of pigeons from birds of prey, protection of agricultural land from wildlife and birds of prey and even protection from stray dogs and cats.

The responsibility for reporting incidents of poisoning to institutions in charge thus lies with citizens, hunters, and veterinarians while citizens in general and livestock breeders have been singled out as the key target groups for awareness-raising campaigns on wildlife poisoning. However, officials also recognize that the reporting process of the incidents of poisoning remains challenging because those who report someone risk conflicts in their communities.

The valleys of the Struma, Rila and Pirin rivers are perceived as the key areas most often affected by animal poisoning. The Forebalkans, Stara Planina, Trans-Balkan fields, the valley of the river Mesta and the Rhodopes have been identified as well.

The key obstacles for the prevention and sanctioning of wildlife poisoning have been identified as the complexity of the investigation, difficulties with evidence in the court, the insufficient education of public prosecutors for handling cases related to poisoning of wild animals, the insufficient or rare application of penalties based on the laws governing hunting grounds, and the black market for illegal poisons on the Internet.

Respondents are mostly uninformed or believe that there are no databases on poisoning incidents, that there is no national action plan to combat poisoning or protocol defining procedures and responsibilities in investigations of wildlife poisoning. The cooperation between governmental institutions and civil society organizations regarding data collection about poisoning incidents, is also mostly perceived as inadequate, or respondents state they are undecided and cannot evaluate it.

Low penalties for wildlife poisoning, the quality of the legal framework for punishing animal poisoning and whether the existing legislation regulates biodiversity protection well enough, as well as inadequate law enforcement are also perceived as important obstacles in the prevention, detection and sanctioning of wildlife poisoning.

The role of the Police and the investigation of wildlife poisoning are recognized as relevant police work, pointing to the need to introduce specialized police units that would deal with the crimes of wildlife poisoning. Respondents have divided opinions regarding the sufficiency of police force education and training to investigate wildlife incidents, the need to introduce modern technology and methods, and the extent of the problem of not reporting incidents to police. Regarding the investigation of animal poisoning incidents, important solutions include the need for specialized police units for environmental crimes, including wildlife poisoning, police reinforcement with specialized canine units for detecting poisonous substances used for wildlife poisoning, and the need to put more agents in the field (police, environmental inspectors, rangers, etc.) for timely detection of poisoning incidents.

Imposing of a stricter control of the trade of legal poisoning substances (pesticides, rodenticides, etc.), raising awareness of the general public and key stakeholders (livestock breeders, farmers, hunters, institutions), enforcing severe punishments for all forms of mass and non-discriminatory killing of animals, as well as higher penalties for every form of poaching/ illegal shooting, resolving issues of the ownership of pastures and rights to use them and state / government financial compensation for the damage

caused by wild animals to livestock breeders and farmers are identified as having a key place in the prevention of wildlife poisoning incidents.

Respondents recognize that rangers in protected areas should have the authority to arrest persons who poison animals if they are caught in the act, and if poisoning of wild animals occurs in a commercial hunting area, the concessionaire should be deprived of the concession.

Increased number of supplementary feeding sites for vultures, and better protection of wild ungulate populations also have a key place in the prevention of wildlife poisoning incidents in the opinion of the employees from relevant governmental institutions.

Ecological awareness among the respondents employed in institutions in Bulgaria is evident in their attitudes about the sensitivity of the natural balance and the possibility of it being easily disturbed, as well as the fact that plants and animals have the same right to exist as humans. Some of the respondents, however, still believe that people are destined to rule over nature, and they fail to recognize that the Earth is like a spaceship, with very limited space and resources.

Conclusions

The practice of wildlife poisoning in Bulgaria is still an evident threat for many wild species in Bulgaria, especially for avian scavengers inhabiting the country such as vultures. The most common motive behind intentional use of poison and poison baits remains to be conflicts with mammalian predators, which often inflict damages to livestock and other types of agricultural production. Wolves are identified as the primary targets of poison baits, but also jackals, foxes and bears are specifically targeted. The increase in numbers and expansion of the distribution of jackals throughout Bulgaria, and wolves in certain areas, are potentially a cause of concern as it might lead to the more frequent conflicts with livestock breeders, hunters and game keepers, which are identified as groups of society that most often use poison to kill animals. Carbamates, most notably Carbofuran and Methomyl, are most often used for preparation of poison baits in Bulgaria, which indicates that an illegal market, or stockpiles of these substances exist in Bulgaria, similar to other countries from the region.

Vultures continue to be the most common victims of illegal wildlife poisoning in Bulgaria, appearing as victims in every third poisoning event. Griffon Vulture population suffered the most from this practice during the last 20 years, as 60 individuals in total

were found poisoned and presumably poisoned, but it is estimated that up to 90 birds ultimately might have perished from this illegal practice during this period.

Non-governmental organizations in Bulgaria have been very active in combating illegal wildlife poisoning, as the main threat for vulture populations since the beginning of the 21st century. Implemented actions that range from awareness raising among key stakeholders and general public, applying preventive measures in local communities where conflicts with predators occur regularly, providing specific training to relevant governmental institutions, setting up databases to record all potential poisoning incidents, and using GPS tracked birds as sentinels for poisoning have significantly impacted the perception about this practice and is indeed responsible for periodical decreases in the number of recorded poisoning events in Bulgaria. Bulgaria's Ministry of Environment and Water recently approved the country's National Action Plan to combat the illicit use of poisons in the wild, which is a key step towards creating a functional system for combating this environmental issue. Further specific training for law enforcement agents is crucial for reinforcing this action plan and ensuring its successful implementation in the long run.

CROATIA

Introduction

The first known organized and governmentally sponsored poisoning campaigns in Croatia started after the II World War, but such practices were present since the turn of the 20th century, as a legal method that hunters used to extirpate mammalian predators, primarily wolves and foxes. *Strychnine* was commonly used for the preparation of poison baits in an attempt to resolve the issue of wolf predation on sheep and other livestock. Although the use of poison baits for predator control was banned in 1972, the practice lingered on among livestock breeders, having a detrimental effect on primarily on vulture populations in the country.

Griffon Vulture used to be widespread along the Croatian coast and it was also regular in some part of continental Croatia until end of 19th century. Throughout the 20th century its breeding area in Croatia was constantly shrinking and in late 20th century it remained only in the Kvarner islands. The Cinereous Vulture went extinct in Croatia during the 1950s, while the Egyptian Vulture was registered as a breeding species for the last time

in 1987. The Bearded Vulture is believed to have gone extinct in 1910. Reasons behind severe population declines of vultures in Croatia are loss of traditional farming practices and the widespread practice of poisoning, especially after the II World War.

Concerning vulture populations, the biggest problems started during the second half of 1980s, when hunters introduced Wild Boars as a game species to the Kvarner Islands. During the same period an increasing number of Golden Jackals and Brown Bears started to cross from the mainland to islands and to inflict damages on livestock, especially lambs. When the Ministry of Environmental and Nature Protection issued the order to hunters to eliminate all introduced species from all islands in Croatia, hunters refused to remove them. Wild boars, jackals and bears killed thousands of sheep (not only lambs) and shepherds became desperate, and the easiest way for them to eliminate this threat was to place poison in sheep carcasses. Although poison use has been prohibited in Croatia by the National Hunting Act of 1972, it is still practiced, especially after the failure of the government to enforce the legislation related to removal of introduced and invasive game animals from the Kvarner islands. Furthermore, different banned substances (notably Carbofuran) can still easily be acquired on the black market from neighboring countries.

Historical perspective

The practice of wildlife poisoning is a well-documented practice in Croatia. Systematic records related to mortality of wildlife, and especially vultures, have been kept by CSOs, while a centralized database within relevant governmental institutions is still lacking.

The extent of wildlife poisoning in Croatia can be easily perceived from several well-documented records. For example, in Gorski kotar (small part of Croatia – 1.273 sq.km), where during the 40-year period (1946-1985) 26 brown bears and 177 wolves were found poisoned, while during 1961-1972 3.6 wolves/year were poisoned (Frković in Sušić 2000). These poisoning incidents were a part of the governmental sponsored poisoning campaigns, which started after the II World War, similar to other countries in the region.

In the period from 1996-2013, in the Rescue Centre for Griffon vultures, 157 Griffon vultures arrived, 31 of which died, and 12 of them had significant neurological symptoms. In the same period, 59 dead vultures were found (of which 17 in one incident of poisoning on the island of Rab in 2004), and 23 specimens (39%) were analyzed. Toxicological analysis conducted in that time period concluded that poisonous substances used for poison baits were from the group of Carbamates and Organophosphates (*Carbofuran*, *Methomyl*, *Deltamethrin*) (Sabočanec et al. 2005, Ćurić

et al. 2008) were used. Some analyses had shown that Organochlorine hydrocarbon residues such as DDT and its isomers and PCB congeners were determined in muscle and liver of dead Griffon Vultures (Međugorac et al. 2001).

Based on the available data it was estimated that some 300-500 Griffon vultures have been poisoned during the period of the last 50 years, as there are 159-190 recorded in the period 1985-2013 alone (Sušić 2000, Sušić 2002, Lukač 2004). Therefore, we can say with certainty that wildlife poisoning is one of the most probable causes for extinction of the Egyptian and Cinereous Vulture from Croatia.

Current situation in the country

Systematic compilation of information relevant to wildlife poisoning, as well as documentation of poisoning incidents began in 2018 with the launch of the BAPP project. Information about wildlife poisoning incidents in Croatia for the past 20 years indicate that 40 separate poisoning and presumably poisoning incidents have occurred in the country. More than 50% of incidents were documented from 2018 onwards, which indicate once again that if more efforts are invested into investigating the scope of poisoning, more poisoning events will be discovered. According to the available data gathered for the purpose of this study, the main drivers behind wildlife poisoning in Croatia are:

- Intentional use of poison baits, to kill mammalian predators (jackals, wolves, martens)
- Intentional use of poison baits, to eliminate introduced game animals (wild boars) and predators (jackals) on island ecosystems

Although the motives behind most wildlife poisoning incidents remain unknown, the majority of better investigated incidents indicate that the main driver behind the use of poison baits in Croatia is conflicts with predators, predominantly jackals, (27%), followed by conflicts with introduced game animals (wild boars) in island ecosystems (Figure 9). A significant component of poisoning incidents recorded during the last 20 years in Croatia can be defined as unintentional poisoning, which occurred most likely due to misuse of pesticides in agricultural practices, or improper application of preventive measures against pests, such as rodents and gastropods.

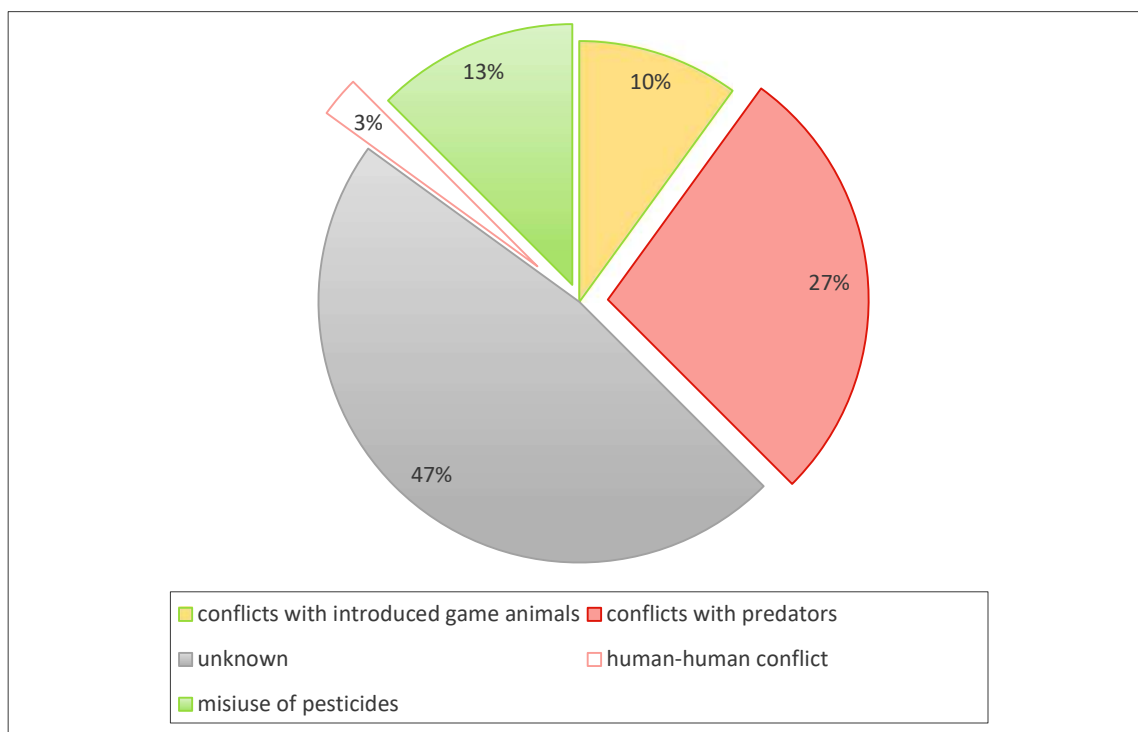


Figure 9. Motives behind wildlife poisoning in Croatia

Forensic toxicological analysis has been conducted in 62,5% of registered potential poisoning incidents in Croatia, which represents the highest percentage in comparison to other countries in the region. Carbamates are the most dominant group of toxic substances used, where *Carbofuran* was the most frequently used substance for poisoning wildlife in Croatia, responsible for 76% of known poisoning incidents in the country. Toxicological analysis also confirmed the use of *Methomyl*, *Methiocarb*, *Metaldehyde* and *Chlorophacinone*.

A total of 12 species of wild animals have been found poisoned or presumably poisoned during the last 20 years. The most common victims were Griffon Vultures, appearing in 45% of poisoning and presumably poisoning incidents within this period (Figure 10). 52 vultures we found poisoned and presumably poisoned in 18 separate incidents. The last case of mass poisoning of Griffon Vultures occurred in December 2004 when 17 individuals were found poisoned from Carbofuran in a single poisoning incident on the island of Rab, due to conflicts local livestock breeders have with introduced wild boars, and the damages they inflict upon their sheep, especially lambs. Second most numerous victim of poisoning events in Croatia is the Common Buzzard (18 individuals in 6 separate events).

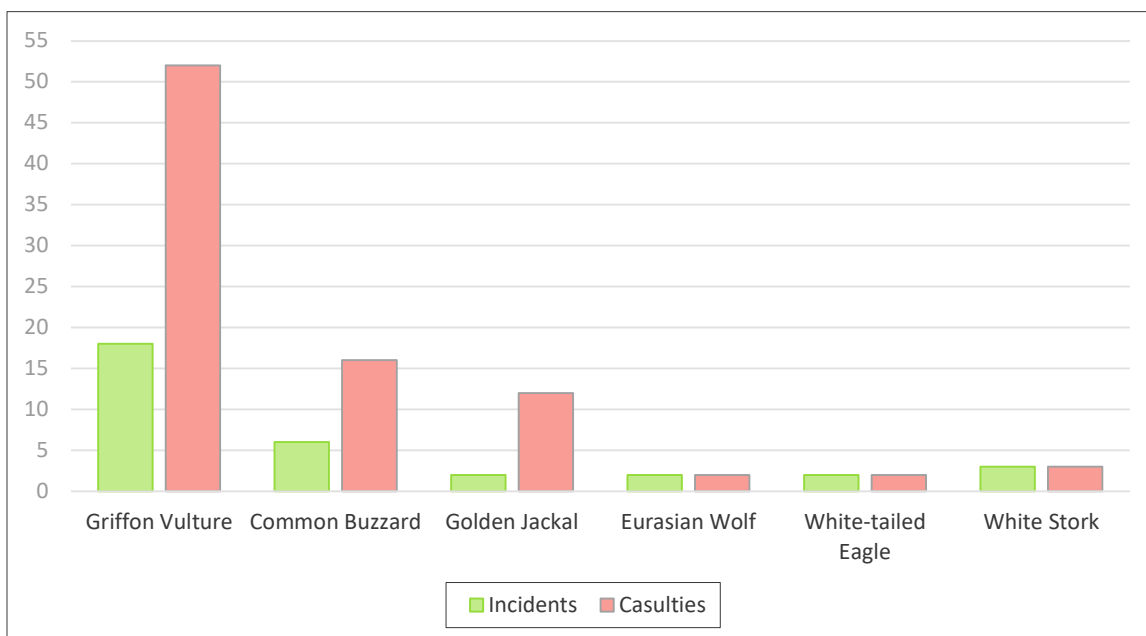


Figure 10. Most frequent victims of poisoning events in Croatia

Insufficient evidence exists related to unintentional poisoning due to veterinary products used for treatment of livestock, especially sheep which are the main food source for the breeding Griffon vulture population, and lead poisoning. Therefore, it is difficult to determine if these products could have a significant impact on avian scavengers in Croatia.

The conflict between livestock breeders and introduced wild boars as game animals on island ecosystems, where existing Griffon Vulture population breed and mostly forage, seems to represent the most important potential threat for poisoning to occur in the natural environment. There are reports that shepherds on Kvarner Islands are sustaining heavy losses, especially of lambs, due to predation by wild boars and jackals. Another problem could also arise with wolf packs, as their number is increasing in other areas of Croatia, which are inside of the foraging area of Griffon vultures. Further investigation of the scope of these damages sustained by the local shepherds would be very relevant for implementation of preventive actions against potential poisoning incidents.

It is important to mention that poison baits are also documented to be used for eradicating stray and abandoned domestic animals, most commonly dogs and cats, both in rural and urban environments in Croatia. Two incidents of poisoning of stray dogs with Carbofuran were recorded by the relevant veterinary institutions in the country, and several other presumably poisoning incidents.

According to the available information obtained from the State's Attorney Office of the Republic of Croatia about a total of 6 wildlife poisoning incidents have been prosecuted since the year 2000. In 2 cases the investigation was able to identify the potential perpetrators and bring charges against them. In the case from 2004 from the island of Rab the accused was found not guilty of the charges brought against him for poisoning a Griffon Vulture and Common Buzzard, while in the case from 2020 where on two separate occasions 1 wolf, 1 fox and 1 Golden Eagle were found poisoned is still ongoing. In other investigated cases either the perpetrators could not be identified, or the investigation concluded that the poisoning incident was not a criminal offense.

Legal framework

Existing national legislation relevant to wildlife poisoning in Croatia:

- **Nature Protection Act:** Published in Official Gazette of the Republic of Croatia 80/13, 15/18. Nature Protection Act transposes the Birds Directive into Croatian legal system and represents a general framework for the protection of wild birds in Croatia. Nature protection Act prohibits the use of all means, arrangements or methods that can cause the local disappearance or a significant decline in population numbers of a species. In particular, use of poisons and poisoned baits is prohibited (Article 66) and is an infraction punishable by fine not to exceed 500,000.00 HRK for legal entity or 50,000.00 HRK for natural persons (Article 227). Deliberate killing or capture by any method, if not in accordance with the Nature Protection Act, is also an infraction punishable by fine not to exceed 200,000.00 HRK for legal entity or 30,000.00 HRK for natural persons (Article 228).
- **Hunting Act:** Published in Official Gazette of the Republic of Croatia 140/05, 75/09, 153/09, 14/14, 21/16, 41/16, 67/16, 62/17 it prohibits large-scale or non-selective means and methods, including poison, for hunting game (Article 64) which are punishable by fine not to exceed 100,000.00 HRK (Article 96).
- **Criminal Code:** Destruction of protected natural values, game poaching and killing or torture of animals are felonies according to the Croatian Criminal Code (Official Gazette of the Republic of Croatia 125/11, 144/12, 56/15, 61/15, 101/17). The following articles are relevant to vulture poisoning:

According to the Article 200 paragraph 1 of the Criminal Code whoever, contrary to regulations, kills or destroys a specimen of a protected species of an animal shall be

punished by imprisonment not exceeding three years. According to the paragraph 2 of the same Article whoever commits the same offence against a strictly protected wild species of an animal shall be punished by imprisonment from six months to five years.

According to the Article 204 paragraph 2 of the Criminal Code whoever hunts game in such a manner or by such means that cause their massive destruction or by using prohibited accessory equipment, shall be punished by imprisonment not exceeding three years.

According to the Article 205 of the Criminal Code whoever kills an animal without a justified reason or severely maltreats it, inflicts unnecessary pain on it or puts it through unnecessary suffering, shall be punished by imprisonment not exceeding one year, or two years if the offence is committed out of greed.

Relevant international treaties and conventions that Croatia is parties to:

Convention on the Conservation of European Wildlife and Natural Habitats (Bern, 1979): Ratified with the Act on Ratification of the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) (Official Gazette of Republic of Croatia - IT 6/00). It prohibits the use of any non-selective means of capture or killing as well as of means that may induce local extinction or heavily disturb the populations of a species, namely means listed in Annex IV", while in Annex IV of the same Law, which is entitled "Prohibited means and methods of hunting and other forms of exploitation", "Poisons and poison or tranquilizing baits" are included.

Perception of the illegal practice of wildlife poisoning in local communities in Croatia

Surveys of relevant stakeholders in local communities in Croatia were conducted within three counties: Ličko-senjska, Primorsko-goranska and Splitsko-dalmatinska županija. Among the respondents were 119 farmers, 50 cattle breeders and 42 hunters. We generally measured the environmental awareness of the respondents with an abbreviated version of the questionnaire known as NEP (New Ecological Paradigm). In general, respondents are predominantly "pro-environmental", yet do not have a clear departure from anthropocentrism (roughly every other respondent agrees with the statement that humans are destined to rule the rest of nature). Those involved in livestock farming are less likely than two other groups to agree that plants and animals have the same right to exist as humans, and hunters are less likely than two other

groups to agree with the statement that "humans are destined to rule over the rest of nature."

When it comes to respondents' knowledge of vulture species native to their country and continent, most respondents answered all questions correctly, but at the same time a considerable number of respondents answered incorrectly, which indicates the need for education. When it comes to respondents' attitudes about vultures and poisoning, most respondents recognize that vultures play an important role in the ecosystem (this is the question with the highest average agreement). On the other hand, it is certainly negative that a significant proportion of respondents agree with the statements "Animal poisoning is sometimes justified" and about a fifth of respondents agree (summed up answers "mostly agree" and "strongly agree") and "Poisoning Animals are a problem only when they pose a danger to humans ", with which more than a third of respondents agree. A comparison of the three groups shows that hunters are more inclined to attitudes that recognize the importance of vultures, and on the other hand cattle breeders and farmers are more inclined to perceive wildlife poisoning as sometimes justified.

Respondents rate their knowledge of poisoning on average 2.7 on a scale of 1 (where 1 is very poor and 5 is excellent). Accordingly, large proportions of respondents answered that they do not know when poisoning most often occurs in a year (20.6%) and in which county (54.1%). Compared to the current actual situation, of the three counties most affected by the problem of poisoning, respondents are the least aware of animal poisoning in the Primorje-Gorski Kotar County.

In total, just over 60% of respondents believe that poisoning of wild animals occurs intentionally, and most often through the abuse of legal toxic substances (pesticides, insecticides, etc.). Respondents estimate that individuals who deliberately poison animals because they simply like to kill are most often responsible for poisoning, followed by farmers, then hunters and cattle breeders. At the same time, hunters are significantly less likely than farmers to estimate that they themselves are often responsible for poisoning wild animals.

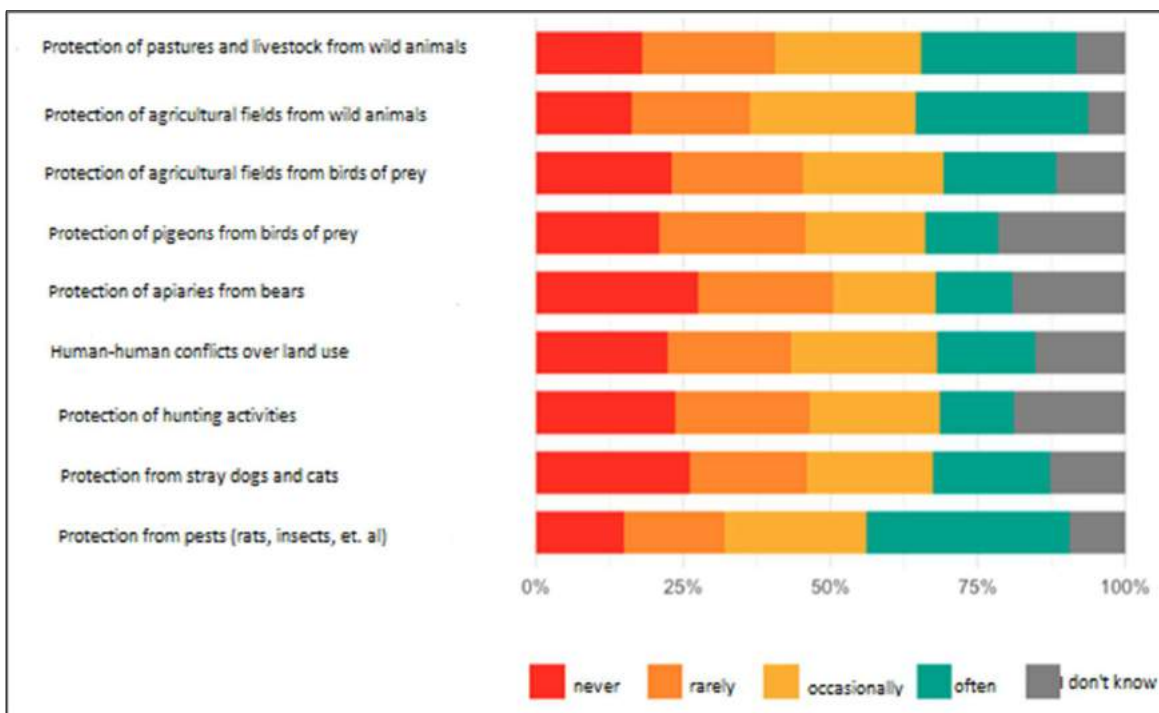


Figure 11. Perceived motives behind wildlife poisoning in Croatia

When respondents are asked to assess how often certain reasons are behind the poisoning of wild animals, they put the protection of pests (rats, insects, etc.) in the first place in terms of frequency, the protection of agricultural areas from wild animals in the second place and protection of pastures and livestock from wild animals in the third place. At the same time, we did not find that there was a statistically significant difference in estimates between cattle breeders, farmers and hunters (Figure 11).

Approximately one in four respondents has known of at least one case of animal poisoning in their environment (excluding rodent control) ten years ago. Of those who know of such cases, most know of cases of intentional poisoning, most commonly in populated areas. Respondents themselves or people in their environment were most often informed about poisoned pets or sheepdogs or guard dogs.

When it comes to the attitudes of respondents on reporting cases of poisoning to the competent institutions, there are very few respondents who would not agree that poisoning should be reported by hunters, veterinarians and anyone who has knowledge of such cases. On the other hand, almost 80% of respondents agreed with the statement that people who report someone from their environment for animal poisoning risk quarrels and conflicts in their community. Slightly fewer of them, but still more than half of the respondents believe that due to the fact that the perpetrators are unknown

because the poisoning takes place in remote locations and people do not know who needs to alleviate animal poisoning. The comparison of livestock breeders, farmers and hunters did not reveal any differences.

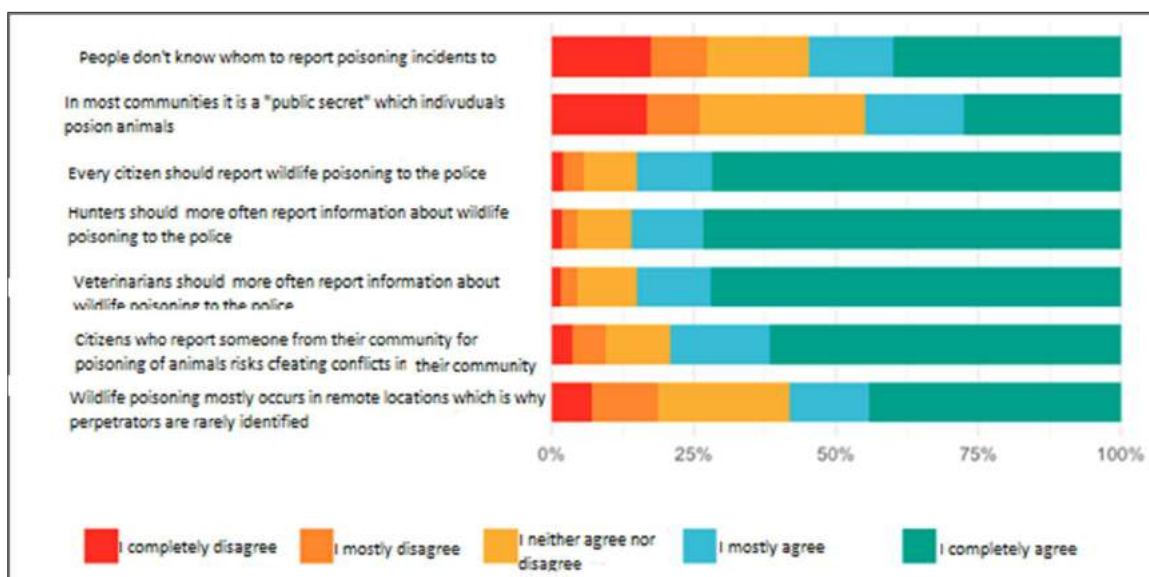


Figure 12. Personal attitudes towards reporting poisoning incidents to the relevant authorities

Approximately one-fifth of the respondents said that they would not, or did not know, report the poisoning to the police, while it is encouraging that 45.7% of them said that they would report it if it could have negative consequences for them. Of those who are unwilling to report, in almost two-thirds of cases it is because they do not come into conflict with people from their environment (Figure 12).

The majority of respondents (57.6%) consider the investigation of wildlife poisoning important, and at the same time only 14.5% of them know about a specific case of police investigation of poisoning.

By far the largest number of respondents (61.7%) believe that the most important thing is to raise awareness about animal poisoning among citizens in general, with no statistically significant difference between livestock, farmers and hunters. Of the necessary preventive measures, respondents are most inclined to the state to compensate livestock and farmers for wild animals, followed by a measure to inform the public about the problem of wildlife poisoning, followed by measures to control the import and trade of legal toxic substances and raising fines for wildlife poisoning. At the same time, livestock breeders are more inclined to agree with the statement about the need for the state to compensate farmers and farmers for the damage caused by wild

animals, while hunters are more likely to detect the need to build more feeding grounds for vultures.

Perception of the illegal practice of wildlife poisoning within relevant governmental authorities in Croatia

A total of 62 employees of relevant governmental institutions in Croatia were surveyed during this research. The largest share of respondents are in lower or middle status in relation to the organizational hierarchy in the institution. 17.7% of respondents in their work are in direct contact with the issue of poisoning of wild and domestic animals, while slightly less than a quarter of them have been in contact with this issue at least once in their work. Only every tenth respondent has received at least one training related to the detection and processing of wildlife poisoning cases. Cooperation between government institutions and non-governmental organizations is rated 2.6 on average.

When it comes to respondents' knowledge of vultures, most respondents answered all the questions correctly. In general, the shares of respondents who answered questions incorrectly in this whole are still slightly lower than those in the survey of livestock farmers, farmers and hunters. For example, half of the respondents in the latter survey believe that vultures feed on captured large mammals, rodents and domestic animals, while in this survey these shares are significantly lower.

Respondents rate their knowledge of poisoning on average 2.6 on a scale of 1 to 5 (where 1 is very poor and 5 is excellent). Even a higher proportion of respondents, compared to those in the survey of cattle breeders, farmers and hunters, answered they do not know when poisoning most often occurs in the year (33.9%). Also, representatives of institutions from the three counties that are most affected by the problem of poisoning best recognize that it is a problem in Lika-Senj County, and least recognize this problem in Split-Dalmatia County.

Unlike respondents in the survey of livestock farmers, farmers and hunters, who believe that wildlife poisoning most often occurs intentionally, the largest share of respondents in the survey of representatives of institutions (38.7%) believe that it happens by accident, misuse of legal toxic pesticides, insecticides, etc.) substances, out of ignorance. Respondents in a survey of representatives of institutions estimate that farmers or cattle breeders are most often responsible for poisoning, followed by individuals who deliberately poison animals because they simply like to kill.

When respondents are asked to assess how often certain reasons are behind the poisoning of wild animals, they on average put protection against pests (rats, insects, etc.) in the first place in terms of frequency, second protection of pastures and livestock from wild animals, and protection of agricultural areas from wild animals in the third place. In this regard, it can be generally noted that the assessments of the main reasons are similar to those in the survey of livestock, farmers and hunters, with representatives of the institutions more often answering "I don't know" and less often answering that some of these reasons never stand out.

When it comes to respondents' attitudes about reporting poisoning cases to the competent institutions, respondents mostly believe that poisoning should be reported (more often) by veterinarians, hunters and anyone who has knowledge of such cases. Let us remind you that the respondents from the survey among cattle breeders, farmers and hunters mostly agree with the same three statements. However, we see an interesting difference in the statement "People do not know to whom to report animal poisoning": a larger share of respondents in the survey of livestock, farmers and hunters disagree with this statement (27.4%, compared to 12.9% of respondents from the ranks of representatives institution).

Regarding the methods that need to be applied in poisoning investigations, the representatives of the institutions put toxicological analysis in the first place, although it is interesting that one third of the respondents did not recognize such analysis as important. Since the list of offered answers is based on the experience of Spain, where all the above methods are used in interdisciplinary teams, the fact that respondents rarely recognized the relevance of many of these methods suggests the need for education on good practices in other countries.

Regarding the capacities for processing poisoning cases, it is generally possible to note that a large part of the respondents could not determine themselves according to the allegations in the questions asked. Representatives of the institutions at least agree with the statement "Public prosecutors are sufficiently educated to handle cases related to wildlife poisoning." On the other hand, they are mostly inclined to agree on average that they rarely impose penalties under the Hunting Act.

Regarding the punishment of various illegal acts that harm animals and nature, the general impression is that the respondents who participated in the survey of representatives of institutions support strict punishment. Of all the allegations offered, they strongly agree with "All forms of mass and non-discriminatory killing of animals (traps, poisoning, explosives, etc.) should be severely punished", and immediately afterwards that more punishments are needed for all which forms of poaching. Also, over two-thirds of respondents agreed with the statement that conservationists

(rangers) should have the authority to arrest people who poison animals if they are caught in the act.

Regarding resources for poisoning investigations, respondents mostly agree with the statement "We need more people in the field (police, conservationists, etc.) to be able to detect poisoning cases in time", while the least agree with the statement "There are enough in Croatia laboratories that have the capacity for the necessary toxicological analysis". In general, attitudes about the need for greater resources for poisoning investigations dominate, but it is interesting that almost a fifth of the respondents do not recognize search dogs for the detection of poisons used against wild animals as a relevant resource.

Regarding the capacity of the police to investigate poisonings, the main problem is the non-reporting of poisoning cases to the police. But the second statement according to the level of average agreement is "Police do not take seriously the need to launch investigations into wildlife poisoning", while respondents least agree with the statement that the police are sufficiently equipped and educated to investigate wildlife poisoning. We can summarize that the attitudes of the respondents suggest that there is room for better capacity building of the police for wildlife poisoning investigations, but also for raising awareness of the importance of these investigations.

Approximately a quarter of respondents are aware of the fact that in Croatia there is no database on animal poisoning incidents, a national action plan to combat animal poisoning or a protocol that will define procedures and responsibilities in investigations into wildlife poisoning. However, the answers of the participants in the research indicate that it is possible that some institutions or their organizational units still have internal protocols and a database of poisoning cases.

Respondents working in state institutions, as well as those surveyed from the groups of cattle breeders, farmers and hunters, put in the first place raising awareness of wildlife poisoning among citizens in general, ie the general public. Respondents, on average, consider the most important work to raise awareness of the general public and key stakeholders (livestock, farmers, hunters, institutions), followed by the introduction of stricter control over the import and trade of legal toxic substances. We find it interesting to point out that, comparing the average answers to the offered claims, respondents from state institutions give less priority to state monetary compensation for livestock and farmers, compared to respondents from the survey of cattle breeders, farmers and hunters, who support this measure.

We also asked the interviewed representatives of the institutions to assess how important certain aggravating circumstances are, which make prevention and

sanctioning more difficult. Respondents estimate that these are first of all difficulties with evidence in court, followed by insufficient and unclear protocols for police actions and too low penalties for animal poisoning, while they perceive the black market of prohibited poisons over the Internet as the least important problem.

Respondents, like those from the survey of cattle breeders, farmers and hunters, are predominantly pro-environmentally oriented, but with a slightly different emphasis. Respondents from the ranks of representatives of institutions thus strongly reject anthropocentrism (whose indicator is agreement with the statement "People are destined to rule over the rest of nature") and put the problem of limited resources in the first place.

Conclusions

Efforts invested during the last couple of years towards assessing the scope of wildlife poisoning and its effects on populations of species of conservation concern in Croatia have resulted in the increase of the number of recorded poisoning incidents in the country, making it very evident that this illegal practice represents a serious conservation issue. The main driver behind the use of poison baits in Croatia are losses to livestock due to conflicts with predators, especially jackals, but also with wild boars, which have been introduced to the Kvarner islands for hunting purposes, and which inflict significant damages to local shepherds. Wildlife poisoning in Croatia had the worst effect on Griffon Vultures, as these scavengers appear as casualties in every second poisoning event. Over the course of the last 20 years a total of 52 individuals perished in poisoning and probable poisoning events.

Anti-poison activities implemented in Croatia by national CSOs resulted in establishing good cooperation with relevant governmental institutions, which led to their increasing engagement in managing wildlife poisoning incidents. This is mostly evident with those institutions responsible for conducting forensic necropsies and toxicological analysis on presumably poisoned wild animals. Since 2018 toxicological analysis have been conducted in over 85% of potential poisoning events, which is unprecedented compared to other countries from the region. Carbofuran is the most frequently used substance for poisoning wildlife in Croatia.

Livestock breeders, farmers and hunters in Croatia perceive that poisoning of wild animals occurs mostly intentionally, and most often through the abuse of legal toxic substances (pesticides, insecticides, etc.). Individuals who deliberately poison animals because they simply like to kill are perceived to be most often responsible for poisoning,

followed by farmers, then hunters and livestock breeders. Protection of agricultural land and production is perceived as the biggest motive for poisoning of wild animals, followed by protection of pastures and livestock.

Unlike people who live in rural areas, who believe that wildlife poisoning most often occurs intentionally, the largest share of respondents in the survey of representatives of relevant governmental institutions believe that it occurs mostly by accident, due to misuse of legal toxic (pesticides, insecticides, etc.) substances, out of ignorance. Also, they perceive that farmers and livestock breeders are most often responsible for poisoning, followed by individuals who deliberately poison animals because they simply like to kill. Similar to other countries in the Balkans, one of the biggest gaps in dealing with potential poisoning incidents in Croatia is the unwillingness of citizens to report these cases to the police, as well as low capacities of enforcement agencies to respond and actively investigate them. Additional efforts are needed for raising awareness about the importance of reporting poisoning events and the impact of this practice on wildlife and human health, as well as for providing specific training for investigation of poisoning incidents to the relevant law enforcement institutions in the country.

GREECE

Introduction

The use of poison baits as a method of population control for predators (mainly mammals such as foxes or wolves, but occasionally also birds, insects, etc.) has been illegal in Greece since 1993. However, in the following years after its banning, deliberate poisoning for the same purpose continued illegally in most regions where conflict with predators were still present. Moreover, poison was used not only to kill wild animals but also dogs (feral, stray, shepherd, hunting dogs). The use of poison baits is still a deeply rooted practice in rural areas of Greece and national populations of vultures, large avian scavengers, raptors and mammal predators continue to be seriously affected by the perpetuation of this practice. This practice is well documented, and the CSOs from Greece have been very vigilant in documenting and monitoring poisoning incidents.

Conflicts with wildlife, which often result in damages to crops, livestock and game animals are the most common drivers behind the use of poison baits in the environment. However, a very significant driver of poison use are also human conflicts among

different stakeholder groups. Farmers, livestock breeders and hunters usually stand accountable for these human-wildlife and human-human conflicts and the use of poison baits that usually follows. Although agricultural and stockbreeding cooperatives and hunting clubs are formally against the use of poison baits, the practice is still widespread among these groups. The extensive use of poison baits in Greece was the main reason for population declines of all vulture species in the country and is currently the biggest restrictive factor for their recovery, especially in mainland Greece.

The absence of a clear-cut and comprehensive legal framework addressing the illegal use of poison baits greatly hinders the resolution of the problem, although a step in the right direction was initially made in 2018 with the endorsement of a Ministerial Decision on Local Action Plans against wildlife poisoning. Further progress is expected in 2022 once it becomes a Joint MD, involving other relevant authorities and law enforcement agencies

Historical perspective

The use of poison baits was a common practice in Greece since the beginning of the 20th century. Since 1939 the use of *Strychnine* to cull foxes and other wild species regarded as “vermin” was regulated with annual circulars published by the Ministry of Agriculture. As from 1969 and until 1981, the Forestry Services oversaw the culling of wild animals and systematically used baits made of strychnine that were placed during the night and collected in the morning. After this, strychnine was substituted with *Potassium cyanide*, in order to avoid secondary poisoning, which had already been observed to have severely affected populations of avian scavengers, raptors and other species that often scavenge. Literature records for instance state that 75 jackals were killed in October 1931 in Samos, while 5108 wolves and jackals were culled in the whole country between 1933-1939 (most of them believed to be killed with the use of poison baits). According to the Ministry of Agriculture, during the period 1971-1979, 700-800 wolves were culled each year, while the numbers of foxes ranged from 40.000 to 74.000 individuals per year from 1974-1981.

Following the pressures exerted by national environmental associations and Nature protection policies defended in the European Union, the use of poison baits was finally completely banned in Greece in 1993. However, people in rural areas were so accustomed with the practice that despite its prohibition, and owing to the lack of law enforcement, the use of poison baits endured as a traditional practice for resolving conflicts with wildlife and continues to take its toll on their populations.

The survival of many protected species has been directly threatened by the use of poison baits. Many avian scavengers went extinct in different areas of Greece or declined significantly in numbers due to this practice. The Bearded Vulture went extinct from continental Greece at the turn of the 21st century, when the last individual on the continental part of the Balkan Peninsula, in the mountains of Almopia in the Greece-North Macedonia border area, disappeared in 2004. Currently the only population of this species in the whole Balkan Peninsula can be found on the island of Crete, where 6-7 breeding pairs still endure (Xirouchakis 2019). The Cinereous Vulture was relatively widespread in Greece. Following a severe population decline dating since the 1950s, the species became resident only to the Dadia-Lefkimi-Soufli Forest National Park (Xirouchakis & Tsiakiris 2009; Skartsi *et al.* 2010). A second breeding group of Cinereous Vultures that was discovered in the mountain Olympos in the 1980s collapsed in 1989 due to secondary poisoning (Tucker and Heath 1994). The Egyptian Vulture used to be very common and widespread, breeding across all continental Greece and on many islands. By the beginning of the 20th century though, numbers had started to decrease, and although still considered common, in the 1980 the species had disappeared from all islands and southern Greece. In 2020 the population is reduced to only 5 territories, or 4 breeding pairs and one solitary individual (Egyptian Vulture New Life project LIFE16 NAT/BG/000874). The species main threat, particularly in the present time, is the illegal use of poison baits. The population of the Griffon Vulture in mainland Greece, once widespread in all mainland massifs and semi- mountainous areas in Greece, has crashed, mostly because of the poison baits, and has been reduced to 23-35 breeding pairs, or 165 – 240 individuals in total (Xirouchakis 2019).

Current situation in the country

National nature conservation organizations in Greece have invested significant efforts towards combating the illegal practice of wildlife poisoning. Illegal poisoning of wildlife in Greece is very common and has forced several species to the brink of extinction. These circumstances conditioned the creation of the Anti-Poison Task Force, which was formed in 2012 and consists of environmental CSOs (ARCTUROS, Hellenic Society for the Protection of Nature, Hellenic Ornithological Society (HOS), Callisto, WWF Greece and Hellenic Wildlife Care Association ANIMA) and the Natural History Museum of Crete. Since 2014, under the framework of LIFE+ project “The Return of the Neophron” (LIFE10 NAT/BG/000152), HOS is coordinating the Task Force and managing the Poison Incidents Database. The main objective of the Task Force is to promote proposals and institutional changes to eradicate the killing of wildlife by poison baits and to make known the extent of this conservation problem at local and national level. The

continuous efforts of the Task Force members to collect as much information as possible is supporting the further development of the database and provides a better perception of this practice's characteristics, as well as its underlying reasons.

A regularly updated database represents an extremely valuable tool for combating wildlife poisoning and can lead to the identification of hot spots for poisoning and consequently to a better prioritization and more efficient utilization of the relevant authorities' already limited resources. Until now, poisoning incident data collection is carried out mainly by the members of the Task Force and secondly by the public authorities. Under the scope of the "Return of the Neophron" Life project, the Anti-Poison Task Force produced a very detailed technical report on the illegal use of poison baits in Greece (Ntemiri & Saravia 2016). This document provides insight into the current situation with use of poison baits in the country. Significant amount of information available from this report, as well directly from the PID was integrated in this study.

From the year 2000 to 2020 a total of 579 poisoning and presumably poisoning incidents have been recorded in Greece which resulted in mortality of wildlife and domestic animals, most notably dogs. Every poisoning and potential poisoning incident where at least one individual of a wild species was found dead was considered as a wildlife poisoning incident. Additional 346 incidents have been recorded during this period where only domestic animals were casualties of poisoning and were therefore not analyzed in detail for the purpose of this study.

Although the motives behind the great majority of wildlife poisoning incidents remain unknown, according to the data compiled from more successfully investigated cases most common drivers behind the use of poison baits are conflicts with mammalian predators which inflict damages to livestock (33 poisoning events) and to populations of game animals in hunting areas, which was the motive behind 26 poisoning events that occurred within this period (Figure 13).

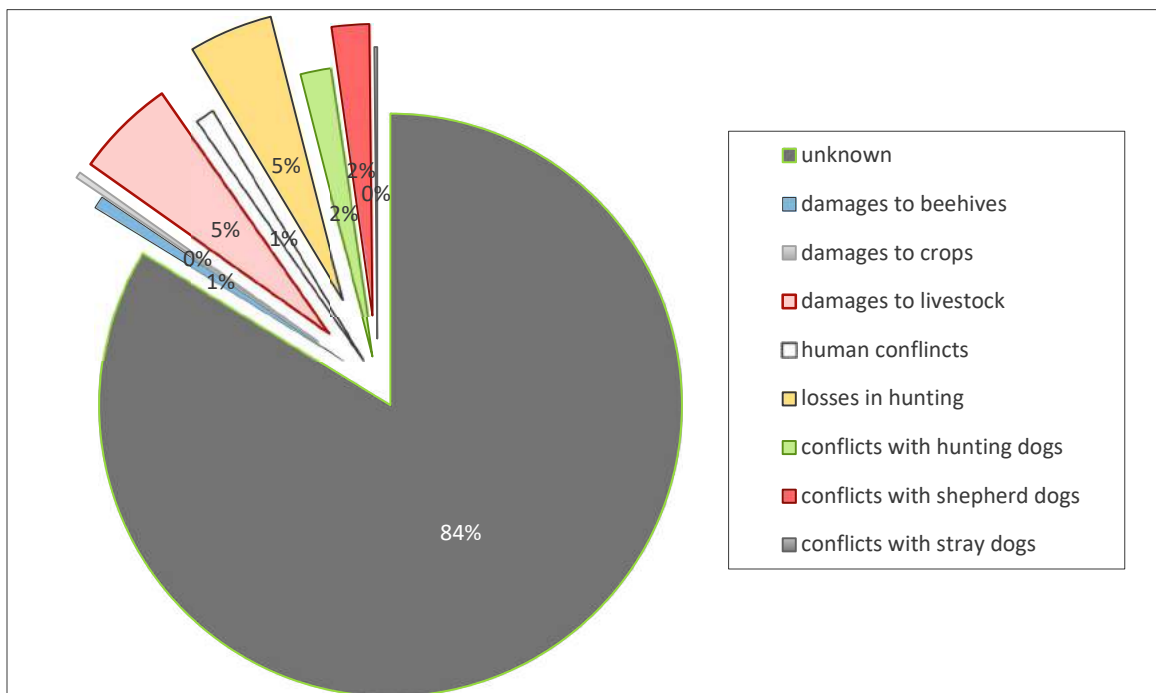


Figure 13. Motives behind wildlife poisoning in Greece

Forensic toxicological analysis has been carried out for 58 (9,9%) potential wildlife poisoning incidents. The low number of toxicological analyses is mainly due to the following reasons: specimens were in advanced state of decay and difficult for conducting toxicological analysis; civilians who reported poisoning incidents are unwilling to proceed with official complaints or have already buried or destroyed the specimens and as a result, no samples could be taken for toxicological analyses; In some cases, the referent services due to lack of operational capacities and funds were unable or unwilling to handle poisoned animals and take or send samples for analysis (difficulty in finding the culprit/extra bureaucracy). The procedure for conduction of toxicological analyses is also hindered by the fact that to date there is no clear legislative framework to define the competent services, as well as lack of operational capacities, for the proper handling of animal poisoning incidents (animal removal, extraction of samples and delivery to specialized labs for analyses, operational capacities of referent toxicological laboratories).

According to the available data, a total of 11 toxic compounds were used for setting up poison baits in Greece during this time period, and these are *Carbofuran*, *Potassium cyanide*, *Methomyl*, *Methamidophos*, *Fenthion*, *Sulphur*, *Methyl-Parathion*, *Endosulfan*, *Cyproconazole*, *Metribuzin* and *Phorate*. The most widespread type of poison baits in Greece is the use of a piece of meat, often a liver or a sausage, laced with an approved

or illegal pesticide. For large carnivores, like the wolf, whole carcasses of livestock laced with poison are commonly found to be used. The results of the conducted toxicological analyses showed that phytosanitary products from the group Carbamates are most frequently used for wildlife poisoning. These include approved and legally available products but also products banned at national, European or international level. The most frequently used substances for wildlife poisoning, identified during the investigation of poisoning events, was *Methomyl*, registered in 20 poisoning events. The use of Methomyl in powder form was banned in Greece in 2008 but its use was reappraised in liquid form in early 2013. Another commonly used Carbamate for preparing poison baits is *Carbofuran*, which was registered in 10 poisoning incidents. Carbofuran was banned in Greece since 2008 but is still regularly used for wildlife poisoning.

Potassium cyanide, registered in 16 poisoning events, is the second most used toxic substance (Figure 14). Poison baits with Cyanide are frequently found as a capsule covered with wax. This type is different to the others in that it doesn't cause secondary poisoning, meaning an animal feeding on a poisoned animal will not be poisoned itself. Cyanides are extremely toxic and when the capsule breaks, they can cause instant death though inhalation, digestion, or skin contact. Apart from Metamidophos, which was registered in 5 poisoning events, all other toxic substances were registered in single poisoning incidents. This insecticide has not been approved for use in the EU since 2008.

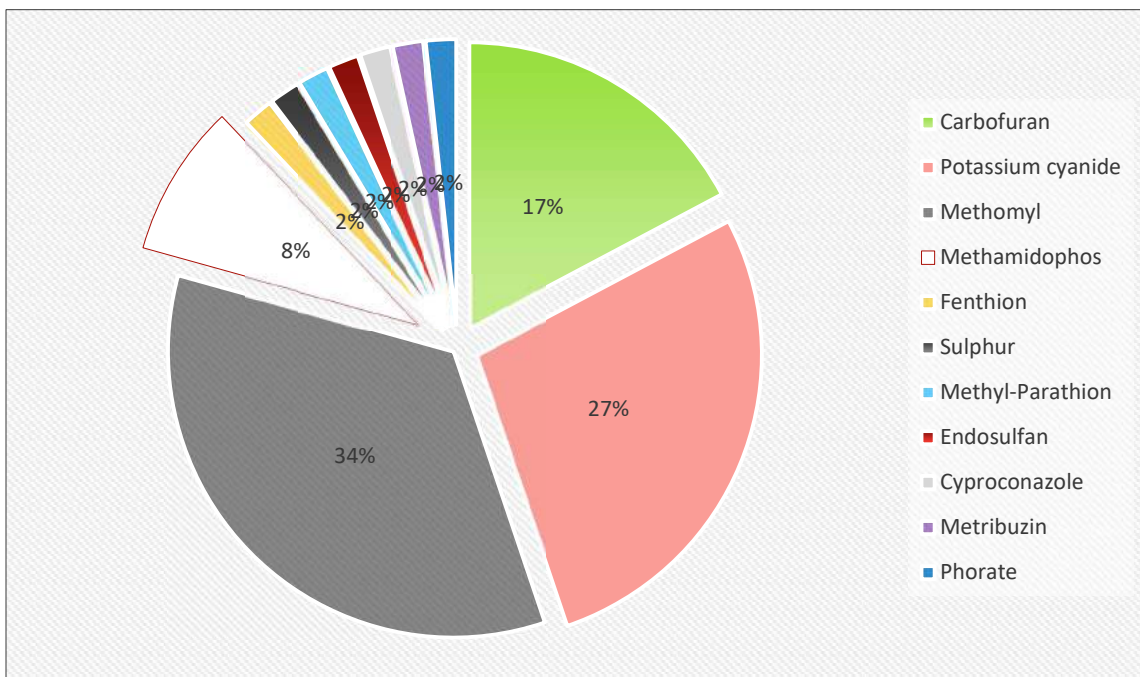


Figure 14. Registered toxic compounds used for wildlife poisoning in Greece from 2000-2020

Poisoning in Greece during the period from 2000-2020 caused the mortality of 29 species of wild animals. According to the available data, this practice had the worst effects on the group of vultures, primarily Griffon Vultures, causing the death of 213 individuals within 169 separate poisoning and probable poisoning incidents, and other avian scavengers, such as the Common Buzzard, which was recorded in 94 incidents with 109 individuals found poisoned or presumably poisoned. Additionally, a total of 19 Cinereous Vultures were found dead within 15 separate incidents, and 19 Egyptian Vultures within 12 poisoning and probable poisoning incidents. The single most numerous species that was recorded in poisoning incidents in Greece was the Red Fox, suffering 348 casualties within 110 separate events (Figure 15).

Other recorded casualties include Bearded Vulture, Golden Eagle, Short-toed Eagle, Marsh Harrier, Honey Buzzard, Common Kestrel, Peregrine Falcon, Saker Falcon, Eleonora's Falcon, Long-eared Owl, Eagle Owl, Barn Owl, Scops Owl, Dalmatian Pelican, Magpie, Beech marten, Pine marten, European badger, European hedgehog, Brown bear, Golden jackal, Wolf, Wildcat and Wild boar.

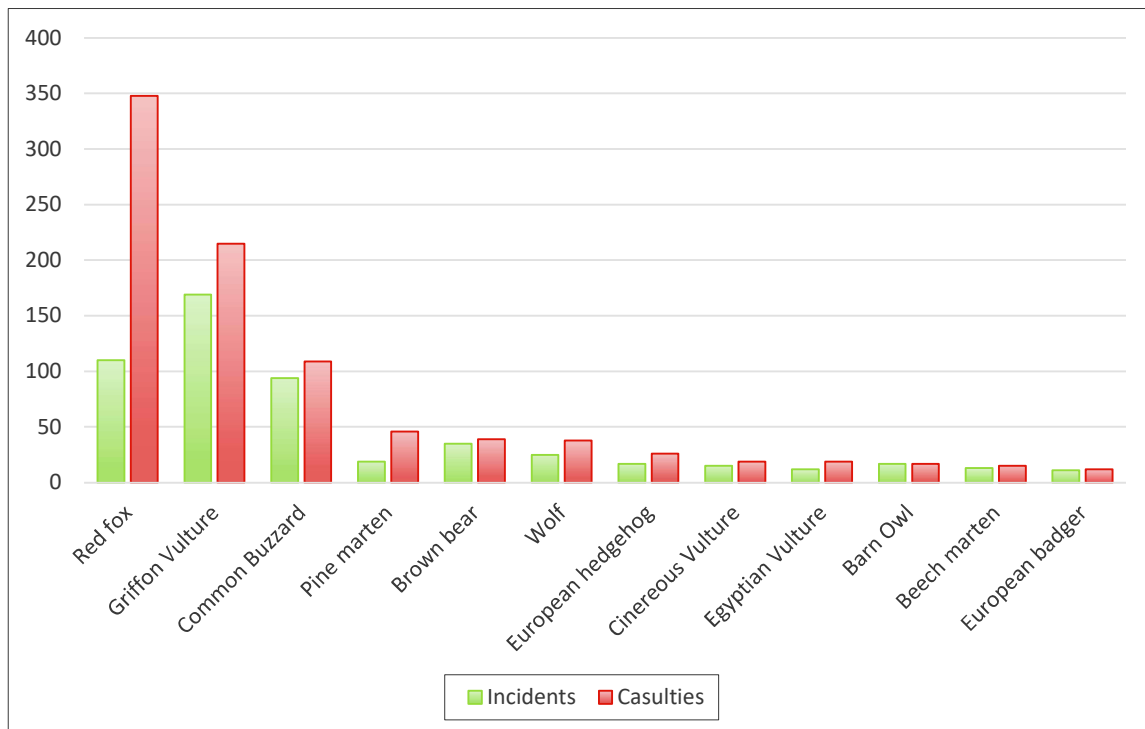


Figure 15. Common victims of poisoning in Greece (2000-2020)

Poison baits are often placed by individual hunters for the control of the fox population. The fox is considered to be the main factor limiting hare populations, a prized game species, and it is also poisoned to facilitate hunting dogs to train and chase hares, as they may chase foxes instead of the desired quarry. Apart from hunters, farmers may also place poison baits if bears, wild boars or even smaller mammals, like badgers and martens, inflict damage to their crops.

Available data indicates that the use of poison baits in Greece is still a common practice, showing no signs of significant decrease in occurrence during the past 20 years. The Anti-poison Task Force in Greece has been vigilant in recording and actively searching potential poisoning events in the countryside and in systematically storing the data in the Poison Incident Database.

The anti-poison efforts in Greece were significantly reinforced with the establishment of two Canine Teams (Anti-poison dog units) in 2014 which greatly facilitated their work in combating wildlife poisoning. Apart from being a preventive means, the Canine Teams contribute to the dissemination and increase of awareness regarding this conservation problem, and they also assist the competent authorities in their pre-trial work, collecting findings that can be used as evidence during the investigation and the judicial procedure. For example, From March 2014 till May 2021 the two teams carried out 440 patrols, covering 1057 km and detecting 212 poisoned animals and 227 poison baits in 102 poisoning incidents. During the two years that the Canine Teams were active (2014-2015), 28% of the total poisoning events recorded in the database were detected thanks to the use of the Teams, proving just how effective these units can be and underlining the importance of having such a tool in the fight against poison. It is important to highlight that the Ministry of Environment has acknowledged the usefulness of this teams and will start operating seven of them across Greece in 2022.

The sudden decline in recorded potential poisoning events in 2020 may be attributed to a general reduction of activities in the field from many relevant stakeholders due to the outbreak of the Covid19 pandemic, but this can only be validated with new data in the years to come.

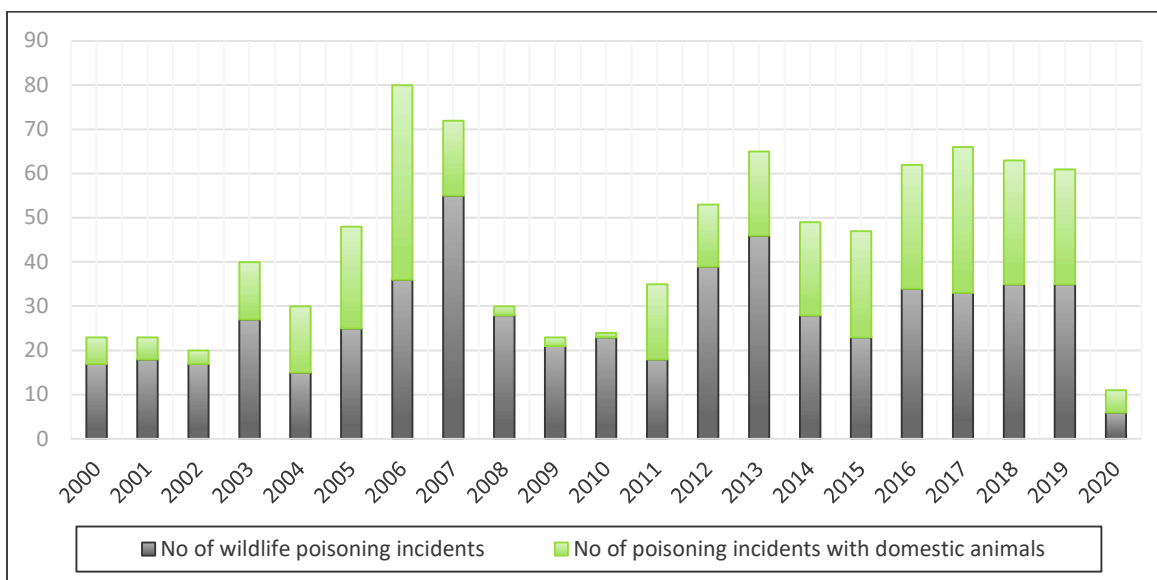


Figure 16. Number of poisoning events in Greece within the research period

The use of poison baits for extirpation of undesirable domestic animals outside of settlements is a common practice on Greece. A total of 346 poisoning and potential poisoning events have been recorded during the period 2000-2020 in Greece where the casualties were only domestic animals (Figure 16). In this case, this practice frequently aims to reduce the presence of abandoned hunting, shepherd, or pet dogs. However, significant and frequent motives for using poison baits are also human conflicts, namely local disputes, and land use conflicts. These conflicts most often result in intentional use of poison baits, targeting specifically shepherd and hunting dogs. Poisoning has been confirmed in 39 events (9,35%) that cause mortality of domestic animals. The most commonly used toxic compounds for these poisoning events by far is *Methomyl*, which is responsible for 66,67% of confirmed poisoning incidents with domestic animals. Other compounds that have been identified during toxicological analysis include *Carbofuran* (6 poisoning incidents), *Potassium cyanide* (4 poisoning incidents), *Endosulfan* (2 poisoning incidents), *Methamidophos*, registered in only 1 poisoning incident.

Table 2. Distribution of poisoning events by counties in Greece

County	Wildlife poisoning incidents	Poisoning incidents with domestic animals
ACHAIA	1	0
AITOLOAKARNANIA	7	1
ANATOLIKI ATTIKI	5	2

ARGOLIDA	2	1
ARKADIA	6	1
ARTA	7	1
CHALKIDIKI	2	0
CHANIA	23	19
DRAMA	2	0
EVROS	27	40
EVRYTANIA	7	24
EVVOIA	4	4
FLORINA	9	11
FOKIDA	1	0
FTHIOTIDA	8	6
GREVENA	35	14
IMATHIA	2	6
IOANNINA	17	8
IRAKLEIO	212	47
KARDITSA	0	7
KASTORIA	6	2
KAVALA	1	4
KEFALLONIA	0	3
KENTRIKOS TOMEAS ATHINON	6	1
KERKYRA	1	0
KORINTHIA	2	1
KOZANI	4	1
LAKONIA	2	3
LARISA	6	2
LASITHI	44	37
LEFKADA	1	4
LESVOS	4	0
MAGNISIA	3	2
MESSINIA	1	0
PELLA	8	4
PREVEZA	0	1
RETHYMNO	34	10
RODOPI	11	9
RODOS	7	5
SERRES	2	1
SYROS	2	0
THESSALONIKI	0	4
TRIKALA	40	54

VOIOTIA	13	1
XANTHI	3	6

Legal framework

The use of poison baits is strictly prohibited in Greece under national legislation due to the extensive negative consequences to wildlife, especially to rare and endangered species. There are special provisions that regulate everything about poison use (special procedures, terms, prerequisites and criteria that would allow this practice).

Existing national legislation relevant to wildlife poisoning in Greece:

The present legal framework for the fight against poison baits is determined by the provisions of **Presidential Decree 67/1981** "On the protection of indigenous Flora and Wild Fauna and on the determination of the coordination procedure and the Control on their Research" (OGG 23/v. A'/30.01.1981) », which was issued under authorization of article 16 of Law 998/79. Article 9 of P.D. 67/1981 provides that "Toxic substance or any other poison use for the elimination of identified harmful species is prohibited, as these substances endanger protected species of wild fauna and indigenous flora".

- **Penal code:** Refers to "Poisoning of livestock fodder", according to which any person who intentionally poisons pastures, meadows, lakes or other sites of livestock watering is sentenced to a minimum of six months imprisonment. If this act caused deaths or serious and permanent damage to livestock of another person, then the maximum sentence is ten years incarceration. 2. Any person who is unintentionally found guilty of the criminal act of par. 1 is sentenced to a maximum of two years imprisonment or to pay a fine.
- **Law 1300/1982-On preventing and suppressing animal stealing and animal killing:** animal killing is punished under the provisions of article 1 par.2 Law 1300/1982 with a minimum sanction of a two (2) year imprisonment and a fine (OGG 129/v. A'/13.10.1982).
- **Joint Ministerial Decision 37338/1807/E.103/01.09.10** - Definition of measures and procedures on the conservation of wild birds and their habitats, in compliance with the provisions of Directive 79/409/EEC, "On the conservation of wild birds" of the European Council of April 2nd 1979, as codified by Directive 2009/147/EC.. », (OGG 1495 / v. B' / 06.09.2010): Article 8, par. 1 (Prohibited hunting gear/means) states that during hunting, capturing or killing birds, the use of any means, installation or method of mass and non-selective capturing or

killing that may cause local extinctions of a species is prohibited, especially these means, installations or methods cited in Annex III (case 1) of article 14. Poison bait or tranquilizer use is among these methods. According to article 11 par. 2.a.c., offenders of the aforementioned article are sentenced to a fine of 100 to 300 Euros. Moreover, according to article 11 par. 2.b.c., offenders of the aforementioned article are sentenced to up to a year imprisonment and a fine.

Relevant international treaties and conventions that Greece is parties to:

Convention on the Conservation of European Wildlife and Natural Habitats (Bern, 1979): Ratified by Greece under Law 1335/1983 "Ratification of International Convention on the conservation of European wildlife and natural habitats" (OGG 32/v. A'/14.03.1983). It prohibits the use of any non-selective means of capture or killing as well as of means that may induce local extinction or heavily disturb the populations of a species, namely means listed in Annex IV", while in Annex IV of the same Law, which is entitled "Prohibited means and methods of hunting and other forms of exploitation", "Poisons and poison or tranquilizing baits" are included.

Perception of the illegal practice of wildlife poisoning in local communities in Greece

Survey included a total of 42 respondents from communities of Meteora and Mesolonghi, which are one of the key areas for Egyptian and Griffon vultures in Greece, and also areas where wildlife poisoning incidents are frequently recorded. People from local communities in Greece are relatively well informed about the presence and breeding of different vulture species in the country. They are most familiar with the presence of the Griffon Vultures, as well as the Egyptian Vulture, while further informing is needed for Cinereous Vulture.

Wildlife poisoning is perceived as a key threat to the vulture populations in Greece. Respondents perceive that vultures are killed mostly by accident from eating poisoned animals or from ingesting poison baits intended for other animals, that is, that they are not killed intentionally.

People from local communities in Greece recognize the importance of the vultures for both humans and the environment. Also, the majority of respondents display some environmental awareness by agreeing that it is difficult to maintain the natural balance (84%), while about two thirds agree that plants and animals have the same rights as

humans and that the Earth has limited space and resources. However, at the same time they put human interests first (i.e., by believing that wildlife poisoning is only a problem when it poses a threat for humans) and advocate for government-controlled activities in regulation of pests, including poisoning of wild animals (98-100%).

Members of local communities in Greece believe that livestock breeders and hunters are mainly responsible for wildlife poisoning (77% and 67% respectively). They are followed by farmers (around 60%) and individuals who deliberately poison animals simply because they like killing things (Figure 17). Also, the majority of respondents (nearly 90%) recognize veterinarians, hunters, as well as the general public (every person) as key groups responsible for reporting information about wildlife poisoning to the police.

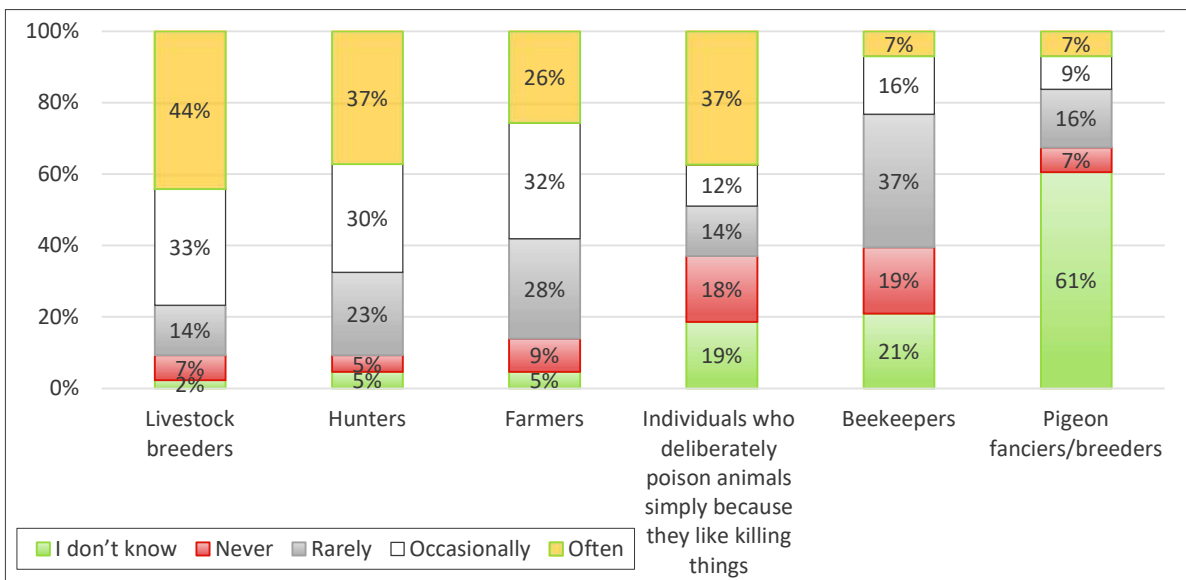


Figure 17. Perception of groups responsible for wildlife poisoning in Greece

About 80% of respondents perceive that wildlife poisoning commonly occurs intentionally, mostly by misuse of poisoning substances (every other respondent) or by illegal poisons from the black market (23%). 1 out of 10 believes that wildlife poisoning most commonly occurs accidentally, by misuse of legal poisoning substances out of negligence or ignorance.

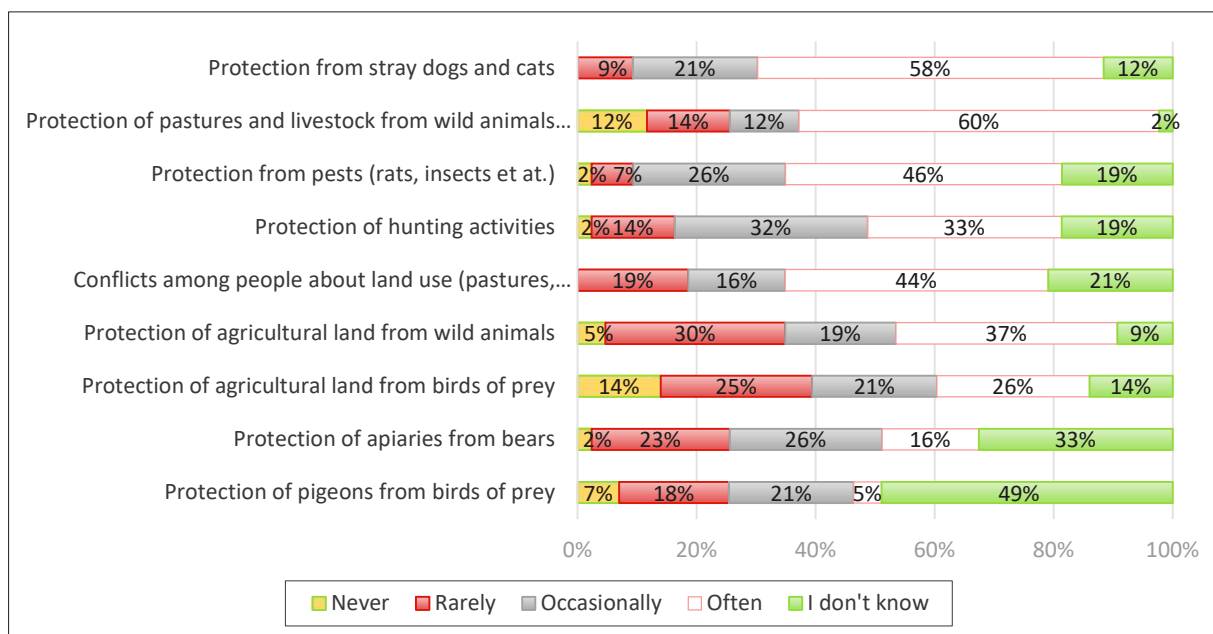


Figure 18. Perceived motives behind wildlife poisoning in Greece

Almost 80% of respondents would report information about poisoning to the police, but 42% of respondents claim that they would report it only in the case if it wouldn't have negative consequences for them, while 1 in 10 stated that they would not report the poisoning at all. The main obstacle for reporting poisoning is the risk of conflicts with people from their communities. Also, nearly two thirds of respondents claim that a potential barrier for reporting incidents is that they do not know whom to report animal poisoning incidents to.

The results indicate that it is necessary to further communicate and inform the citizens about the possibilities of reporting wildlife poisoning, (i.e., to whom to report potential poisoning events), as well as to point out the importance of the contribution of each individual to the process of reducing the occurrence of illegal wildlife poisoning.

Protection from stray dogs, cats and pests, as well as protection of pastures and livestock are the most frequent motives for poisoning wild animals, so it is necessary to work on solutions to these problems in order to a reduction of this practice (Figure 18).

In the past 10 years, 8 out of 10 respondents claim to have heard of at least one poisoning incident in their community. Half of the witnesses are knowledgeable about intentional poisoning of any type of animal in settlements or inhabited areas, while 1 in 5 claims to know about accidental poisoning of vultures.

Western Greece and Thessaly are the regions of Greece identified as wildlife most frequent poisoning “hot spots” (near one fourth of respondents mention each region), while Eastern Macedonia and Thrace follows (12%).

The key measure for prevention and combating wildlife poisoning, identified by almost all respondents, is raising awareness of the general public about wildlife poisoning. Also, 9 out of 10 respondents believe that it is important to enforce a stronger control of import and trade of legal poisoning substances, to increase administrative fines for wildlife poisoning, as well as that state/government should financially compensate the damage to livestock breeders and farmers caused by wild animals.

The target groups for the awareness campaign about the threats of wildlife poisoning are citizens in general (44%), as well as livestock breeders (37%). 1 out of 10 respondents claims that hunters also need to become more aware of this problem.

Perception of the illegal practice of wildlife poisoning within relevant governmental authorities in Greece

Employees of relevant governmental institutions from Greece are relatively well informed about the species of vultures that nest in their country. They are unanimous in acknowledging the presence of the Egyptian Vulture, and most of them believe that both the Cinereous and Griffon Vulture breed in their country. The sample included 17 respondents in total out of 42 employees from targeted institutions.

Wildlife poisoning is highlighted as the most prominent threat that endangers the vulture populations in Greece. Vultures are not perceived as the primary targets of poisoning, but mostly as accidental casualties, that perish either due to ingesting poison baits intended for other animals or eating animals that died from poisoning. Respondents believe that poisoning is mostly done intentionally, and that it occurs primarily by misuse of legal toxic substances such as pesticides or insecticides, etc. and to a lesser extent with illegal poisons from the black market.

Employees from relevant institutions in Greece (somewhat less than three quarters of them) identify Eastern Macedonia and Thrace as the region in Greece where wild animals are most frequently poisoned. Other regions that are identified as areas where wildlife poisoning occurs often are Crete (every other respondent), Western Macedonia (6 respondents) and Central Macedonia (5 respondents).

Respondents attribute the responsibility for wildlife poisoning mainly to livestock breeders and hunters, followed by farmers. This is mostly in line with the key perceived motives behind wildlife poisoning - *protection of pastures and livestock from wild animals, protection of agricultural land from wild animals* and *protection of hunting activities*. This implies the need for preventive and sanctioning measures aimed at these groups. *Conflicts about land use* (pastures and hunting areas) are also perceived as a significant motive behind the occurrence of wildlife poisoning, and as such they dictate the need for legal intervention in order to resolve these issues.

When it comes to key obstacles for the prevention and sanctioning of animal poisoning, institutions officials from Greece are unanimous in the belief that the *complexity of the investigation* is the greatest obstacle faced. *Bad law enforcement, difficulties with evidence procedures in court, low penalties for wildlife poisoning, poor reporting of information from witnesses* and *inadequate and unclear protocols for police action* are also perceived as relevant. These findings suggest, among other things, that it would be beneficial to analyze/evaluate existing protocols and procedures in investigative processes, to optimize the process.

The respondents believe that it is the shared responsibility of all citizens (every person) to report information about wildlife poisoning to the authorities. Nevertheless, most of them also believe that people who report someone from their community for the poisoning of wild animals, risk altercations and conflicts in their community, which presents an important barrier for reporting poisoning incidents. This highlights that it is crucial to communicate the significance of reporting wildlife poisoning to the general public, and to encourage witnesses and everyone who has information to come forward.

Livestock breeders are singled out as the most important target for awareness raising campaigns, which is in line with the perceived responsibility of this group for wildlife poisoning.

In order to make progress in the prevention, detection and sanctioning of wildlife poisoning, institutions officials believe that it is necessary to introduce *specialized canine units in the police for detecting poisonous substances used for wildlife poisoning*, to *assign more agents to the field* (police, environmental inspectors, rangers etc.), as well as to *delegate specialized police units for environmental crime*.

One of the key barriers for successful combating and prevention of wildlife poisoning is that the existing laws are not enforced sufficiently. Half of the respondents believe that the legal framework for punishing poisoning is good, but the problem is in law enforcement. Another potential obstacle identified by one half of the respondents, is that public prosecutors are not sufficiently educated for managing incidents related to the

poisoning of wild animals. The opinions are similarly divided when it comes to the existing legislation concerning biodiversity. 2/5 of the respondents do not believe that it is adequate and the same number of them are indecisive, which implies that the current legislation should be revised.

Regarding their awareness about existing protocols and plans - the majority of institutional employees are informed regarding the existence of a protocol defining procedures and jurisdictions for investigating wildlife poisoning, and a national plan for combating wildlife poisoning, but they are relatively uninformed about the existence of a database for poisoning incidents.

The majority of surveyed governmental employees also consider the collaboration between governmental institutions and civil society organizations regarding data collection about poisoning cases to be inadequate. Half of the respondents also endorse the inclusion of civil society representatives in wildlife poisoning investigations, further highlighting the need for cooperation of government officials and members of civil society organizations. When it comes to the investigations themselves, most of the institutions employees also consider the *lack of coordination among institutions to be a greater problem than a lack of resources*. These results indicate that working on improving communication and coordination among institutions and between institutions and civil society organizations, can lead to a higher probability of identifying responsible perpetrators and preventing further poisoning of wild species.

Employees from governmental institutions in Greece are in favor of enforcing the strictest punishment for all forms of mass and non-discriminatory killing of animals, including imprisonment. They believe that having poison baits should be treated and sanctioned as a separate offense. Most of them believe that fines should be higher and that rangers of protected areas should have additional authority in wildlife poisoning cases.

Regarding the engagement of police authorities in wildlife poisoning incidents, the key barriers for successful detection and prevention of wildlife poisoning are reflected in the perceived lack of knowledge and adequate equipment of police representatives, but on the other hand, such incidents are not sufficiently reported to the authorities in the first place. Half of the respondents believe that modern technology and methods are necessary to carry out this type of police work, and close to half of the respondents advocate that it is necessary to introduce specialized police units for environmental crime.

A potentially significant reason for not reporting wildlife poisoning incidents is that citizens are not sufficiently informed to whom such cases should be reported, as well as

a certain fear that such a reporting could have harmful consequences for them. These results point to the need for raising awareness of the importance of each individual's contribution in the prevention of wildlife poisoning. On the other side, the importance of reducing wildlife poisoning should be promoted within whole communities, in order to reduce people's concerns about negative reactions in the immediate environment, that could be reduced as a result of a general shift of public opinion. In addition, the relevant information for reporting wildlife poisoning cases should be made widely available to all citizens.

Representatives from relevant governmental institutions in Greece consider that for achieving success in investigation of wildlife poisoning incidents, it is necessary to introduce the following measures: *canine units, toxicological analysis, fingerprint analysis, and using the records of sale of legal poisoning substances.*

When it comes to preventive measures - more supplementary feeding sites for vultures, free shepherd and guard dogs, resolving problems related to pasture ownership and improved protection of wild ungulate population are also recognized as important measures that could lead to better protection of wildlife species and prevention of poisoning.

Employees from relevant institutions in Greece share a common belief that plants, and animals have an equal right to exist just like humans, and they recognize the fragility of the natural balance. In addition to this, the prevailing belief among them is that the Earth has limited space and resources. The majority of them do not believe that humans are destined to dominate over the rest of nature.

Conclusions

Wildlife poisoning in Greece is a very common practice, one which has devastating effects on many wild species, primarily those that resort to scavenging as a source of food. Vultures are the group of species which are affected the most by the illegal use of poison baits, appearing as casualties in every third wildlife poisoning event in the country. Griffon Vulture is the most common species of vultures, and wildlife in general, to get poisoned in Greece. The practice of setting poison baits has caused mortality of 213 individuals over the course of the last 20 years and has crippled the population inhabiting mainland Greece to the point of extinction. Wildlife poisoning continues to be the most significant threat for vultures inhabiting mainland Greece, and also poses a threat for populations of neighboring countries, as birds from Bulgaria, Croatia and Serbia have also been found poisoned there. CSOs in Greece have been very diligent in

recording all potential poisoning events in their national database and making it publicly available to all interested parties. From the data used for the purpose of this study it is evident that the most important drivers for the use of poison baits are damages which mammalian predators inflict on livestock and game animals in hunting areas as well as conflicts between different land users groups.

Conduction of toxicological analysis is a big gap in the overall management of poisoning events, as there is only one referent national laboratory in the country (Athens Veterinary Centre), operating with only one staff member responsible for conducting forensic toxicological analysis. On the other hand, these analyses have confirmed that numerous toxic compounds have been used for preparation of poison baits, unlike in other countries where only 2-3 substances are usually used for poisoning. The most commonly used compounds are Carbamates (52%), primarily Methomyl, followed by Potassium cyanide. Additionally, the diversity of baits used for poisoning in Greece, often prepared to target specific species, suggest that the practice of wildlife poisoning is still a deeply rooted one and commonly practiced.

According to the results from the interviews carried out, wildlife poisoning is perceived as a key threat to vulture populations in Greece by people from rural areas. They perceive that vultures are killed mostly accidentally from eating poisoned animals or from ingesting poison baits intended for other animals. Livestock breeders and hunters as perceived as groups mostly responsible for wildlife poisoning. Same perception about the effects of wildlife poisoning on vultures, drivers and responsible groups for poisoning have employees of relevant governmental institutions. Livestock breeders are singled out as the most important target group for awareness raising actions. Additionally, law enforcement agencies in Greece are perceived of having insufficient capacities, as well as engagement, for investigating poisoning incidents. Therefore, specific training towards these stakeholders would be crucial for building up capacities and achieving better results in the investigation of this practice.

NORTH MACEDONIA

Introduction

Earliest records of wildlife poisoning from North Macedonia relate to organized poisoning campaigns primarily against wolf populations. The use of poison baits started

to take their toll among vultures and other scavenger species in the country since 1947. Although the use of poison baits for predator control was banned in 1985, the practice is deeply rooted, especially in rural areas. Poison baits continued to be used by livestock breeders and are usually placed after wolf packs inflict major damages to livestock. Poisoning of stray dogs is also common in and around most of the rural and urban settlements, and some of their carcasses are occasionally available for vultures on the settlements dumping sites.

As a result of the practice of poison use, which is most frequent in the period between February and April, an estimated number of 1000-3000 Griffon Vultures have been poisoned since 1947 till today. Poison use is likely one of the underlying causes for extinction of the Bearded and Cinereous Vultures from North Macedonia. Although both species last bred in the country in the 1980s, the last individuals of these species remaining in the country in 2002 were lost in 2005–2006. In the same period, the populations of both Griffon and Egyptian Vulture declined strongly mainly because of the illegal use of poison baits for the control of predators and feral dogs, but also as a result of food shortage, habitat loss and disturbance, which may lead to their extinction as well (Velevski *et al.* 2013; Grubač 2014).

Historical perspective

The effects of the practice of using poison baits in the environment on wildlife is well documented in North Macedonia, especially on scavengers such as vultures, which are mostly affected by this practice. The first recorded poisoning event with Griffon Vultures in North Macedonia is from Shar Planina Mountain, where hundreds of birds were poisoned in the period 1947-1954 (mostly on the territory of Kosovo, Naumov 1981). Since then, such practice has been often documented in North Macedonia, and Grubač (2000) mentions poisoning of about 100 vultures and other avian scavengers around Prilep in 1979. Reasons for the use of poison in the past were almost exclusively related to governmentally sponsored nation-wide poisoning actions against wolves and other mammalian predators.

Apart from this, it is very important to note that a single case of misuse of rodenticides for pest control is responsible for the loss of an entire pre-migratory flock (60-70 individuals) of Egyptian Vultures in 1992, which practically crippled the population that continued to decline since. This incident highlights the threat that improper use of such, and similar toxic compounds can have on scavengers and other wildlife, and the importance of enforcing better control of the application of pesticides and rodenticides in agriculture. Other motives for poison use identified in the past include intentional use

of poison baits, to eliminate feral and stray dogs from local communities, use of poison (insecticides) to reduce damages to beekeepers - mainly targeted at martins, and intentional use of poison to resolve human-human conflicts between neighbors.

Even though the use of poison and poison baits has been prohibited in 1985 with the change in national legislation, the practice still endured as an affordable and effective method for elimination of undesirable animals and wildlife in both rural and urban areas, especially after different pesticides become readily available on the market in high concentrations for low prices. By then, the Cinereous and Bearded Vulture became extinct as breeding species in the country and only individual vagrant birds were occasionally recorded. A single pair of Bearded Vultures endured in the country until 1985 when the solitary female died from poisoning, and with her the species practically became extinct from the Balkan Peninsula (except the island population on Crete).

Current situation in the country

The practice of wildlife poisoning in North Macedonia has been generally well documented since the beginning of the 21st century onwards. Relevant governmental institutions keep records of all wildlife poisoning cases that were investigated and prosecuted, while national non-governmental nature conservation organizations, such as Macedonian Ecological Society (MES), remain vigilant in documenting all poisoning and presumably poisoning events that occur and mortality induced by it. Most available records relate to poisoning events that cause mortality of vultures, eagles and similar emblematic species which are of a higher conservation concern. Generally, incidents with these species are more often reported to the authorities by citizens, and therefore it is very likely that mortality of other species goes unrecorded.

During the period of 2000-2020 a total of 29 poisoning and presumable poisoning events were documented in North Macedonia. Although the motives behind most poisoning events remain unknown, the most common drivers behind the use of poison baits identified within this period were conflicts with predators in rural areas, predominantly wolves and jackals (Figure 19). These conflicts are responsible for 31% of all poisoning events documented. Other drivers of poison use identified include conflicts with stray dogs.

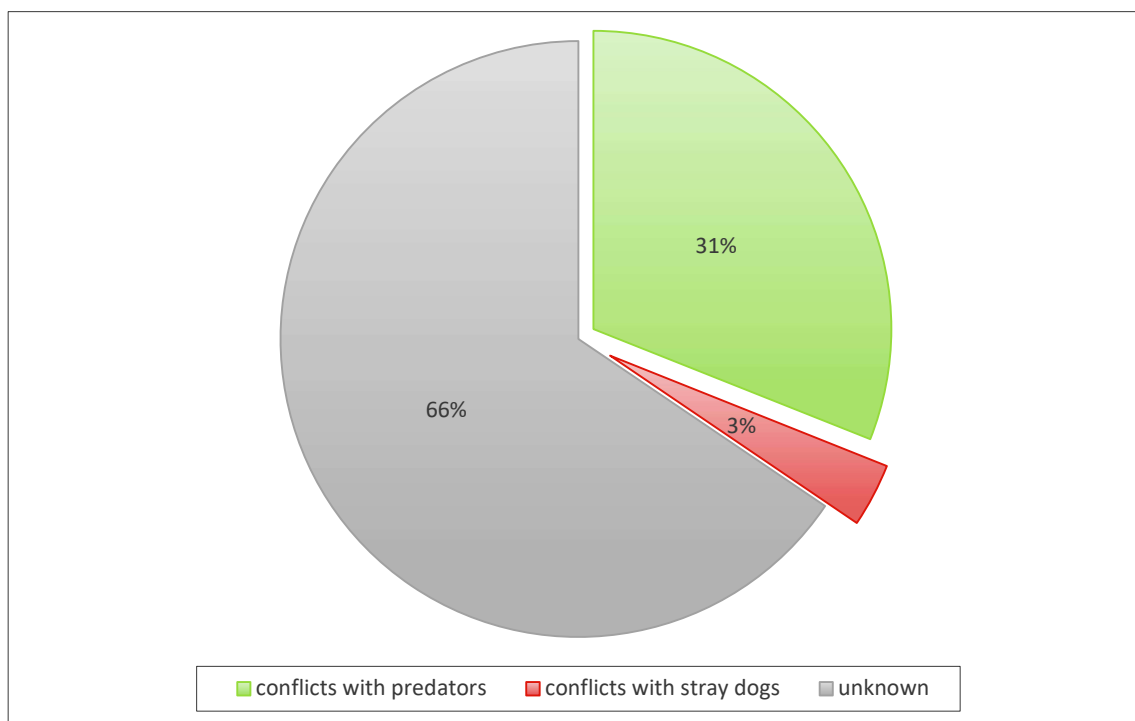


Figure 19. Motives behind wildlife poisoning in North Macedonia

Forensic toxicological analysis has been conducted in only 2 events and remains the biggest gap in conducting proper investigation of poisoning incidents in North Macedonia. In both cases *Methomyl* was identified as the substance used for poisoning. Relevant national laboratories are lacking operational capacities and equipment to conduct analysis of samples from wild animals and this issue should represent one of the priorities in future actions concerning combating wildlife poisoning in the country.

A total of 6 species of wild animals have been found poisoned or presumably poisoned during the period from 2000-2020 in North Macedonia. According to the available data, the most common victims by far were Griffon Vultures, with mortality recorded in 75,8% poisoning and presumably poisoning incidents. A total of 102-125 individuals were found poisoned and presumably poisoned within 22 separate events. The Griffon Vulture breeding population reached its lowest number in 2006 (12 breeding pairs), followed by a slight recovery but has fallen again, numbering up to 14 pairs in 2019. Several events of mass poisoning of Griffon Vultures have been recorded during this period. In 2001 12 individuals were found dead in Mariovo, 14 individuals in 2003 in St. Nikole, 7-15 individuals the same year in Demir kapija, and 5-7 individuals in Mariovo in 2014. The second most numerous victim of poisoning events in North Macedonia is the Egyptian Vulture (4 individuals in 2 separate incidents), followed by Imperial Eagle (3 individuals in

2 separate incidents). Other species affected by this practice include Golden Eagle, Common Buzzard, Golden Jackal and Hooded Crow.

Based on the available data about wildlife poisoning, the use of poison and poison baits in the recent period seems unevenly distributed, being more frequent in the regions of Mariovo, Tikves, Ovce Pole and likely Plackovica Mt. These areas are one of the most important agricultural areas in the country, which could be the reason for more frequent conflicts with various wildlife, especially predators.

There is some overlap and uncertainties with jurisdiction between legal bodies regarding prevention, control, and investigation of illegal poisoning. Firstly, the proper procedure for reporting wildlife poisoning incidents is unclear, mainly which institution needs to be contacted first. Therefore, more efficient, clear-cut legal protocols for describing responsibilities in reporting, investigating and processing cases of wildlife poisoning need to be developed and distributed within all responsible institutions to precisely define jurisdiction of each one within national legislation and avoid overlaps. Also, communication and information exchange between responsible institutions and sectors related to jurisdiction, responsibilities need to be enhanced. Apart from this, clear-cut protocols and Standard Operational Procedures related to duties and responsibilities of existing governmental laboratories about processing poisoned animals, as well as accredited protocols and security measures in sampling are lacking and need to be developed to facilitate their work.

According to the data that we were able to obtain from the State Environmental Inspectorate and State Hunting Inspectorate, criminal charges against unknown perpetrators were brought up in two wildlife poisoning cases, in 2007 when 19 Griffon Vultures were found most likely poisoned in the area of Mariovo, and in April 2011, when 2 Egyptian Vultures, 1 Common Buzzard, 1 Raven, and 2 dogs were found poisoned. No court rulings were made in either case.

Legal framework

The Republic of North Macedonia overall has good legislation in place related to the use of poison substances in the natural environment, where wildlife poisoning is clearly defined as an illegal activity, punishable under Criminal law.

Existing national legislation relevant to wildlife poisoning in North Macedonia:

- **Hunting law:** Article 54. states that hunting is prohibited by any means which can lead to massive losses to populations of game animals, including the use of poisonous substances.
- **Law on nature protection:** Article 43. prohibits the use of non-selective means of capturing and shooting of wild species, as well as use of substances that may cause local exhaustion or serious disturbance of the populations of those species, in accordance with the international agreements ratified by the Republic of North Macedonia, and in particular: poison and tranquilizing substances and poison and tranquilizing baits.
- **Law on plant protection products:** Although this law does not particular refer to wildlife poisoning, it is relevant because it describes the legal use and application of toxic substances in agriculture. Inadequate use and application of these phytosanitary products are often a source of unintentional poisoning of various wildlife.
- **Criminal law:** Article 230. refers to persons who store, disintegrate, or keep hazardous waste that has traits of explosiveness, reactivity, inflammability, extravagance, toxicity, infectivity, carcinogenicity, mutagenicity, teratogenicity, ecotoxicity or toxicity release property through chemical reactions and biological reproduction. Under the Criminal law they are liable to be penalized by prison sentence from one to five years.

Relevant international treaties and conventions that North Macedonia is parties to:

Convention on the Conservation of European Wildlife and Natural Habitats (Bern, 1979): Ratified with the Law on Ratification ("Official Gazette of the Republic of North Macedonia no. 49/97) and entered into force in 1999. It prohibits the use of any non-selective means of capture or killing as well as of means that may induce local extinction or heavily disturb the populations of a species, namely means listed in Annex IV", while in Annex IV of the same Law, which is entitled "Prohibited means and methods of hunting and other forms of exploitation", "Poisons and poison or tranquilizing baits" are included.

Perception of the illegal practice of wildlife poisoning in local communities in North Macedonia

Surveys in North Macedonia were carried out in communities of Mariovo and Vithacevo, which have a population of 550 inhabitants. The sample included 31 respondents in total, most of which (52%) are livestock breeders and farmers. Respondents from local communities are relatively knowledgeable about the vultures that inhabit their country, but with a significant number of them are undecided or do not have information about vultures and factors that threaten their populations in North Macedonia.

Wildlife poisoning stands out as the most important factor endangering the vulture population in North Macedonia (71%). Poison baits intended specifically for vultures are in the second place among the key reasons that lead to the significant decrease of the population of these species (23%), while the first are also poison baits, but intended for other animals (42%).

The results of the research imply that people from local communities in North Macedonia are aware of the importance that vulture species have for the entire ecosystem, but also for human activities, and they believe if vultures were left alone, without interfering, their numbers would increase (75% to 80% of respondents agree with this). Also, close to two-thirds of farmers and hunters who took part in the survey share the opinion that the natural balance is very delicate and easy to disturb, and that people, plants, and animals should have equal rights to exist.

On the other hand, it seems that despite the awareness of the importance of vultures, they, like wild animals, are generally placed in a subordinate position in relation to humans. Two thirds of respondents cite attractiveness for tourists as the vultures' main value, while 4 out of 10 respondents believe that people dominate nature, and the same number believe that wildlife poisoning is a problem only when it is endangering people.

Respondents believe that the poisoning of wild animals is the result of intentional actions, mostly by using illegal poisons from the black market (55%), and in a smaller percentage by misuse of legal poisoning substances (19%). The groups that are recognized as mainly accountable for wildlife poisoning are livestock breeders and individuals who deliberately poison animals simply because they like killing things (58% and 45%, respectively). Hunters, veterinarians, and citizens in general (every individual) are on the other hand perceived as primarily responsible for reporting cases of wildlife poisoning to the relevant authorities (if they have any information about them).

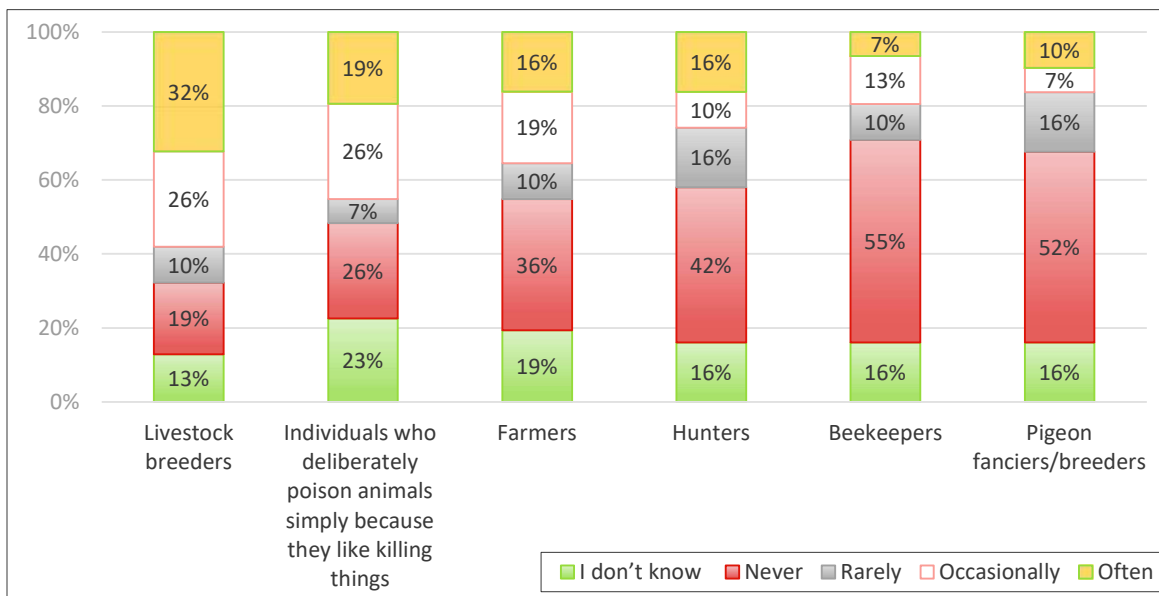


Figure 20. Perception of groups responsible for wildlife poisoning in North Macedonia

One of the most important obstacles for reporting wildlife poisoning events to the police is the concern about potential negative personal consequences, as well as the possibility of disapproval or inconvenience within their community. While four out of ten respondents would report the incidents regardless of these consequences, every third shows concern about the negative impact reporting would have on them, while one fourth wouldn't report such cases at all because among other things, they do not receive any personal benefits from such actions.

According to the results of the survey, about two-thirds of respondents from targeted occupational fields believe that people do not have enough information about the institutions to which they can report incidents to. This can also be considered as a barrier that reduces the likelihood of identifying those responsible for wildlife poisoning. All this points to the importance of further communication and raising the awareness of citizens about endangered species, problems of wildlife poisoning, referrals to relevant institutions and government officials who have a significant role in solving these problems, as well as in emphasizing the importance of the contribution of each individual to reducing wildlife poisoning.

The key motives behind the poisoning of wild animals are protection of pastures and livestock from wild animals and protection from pests, implying the need for improving existing measures for the protection of economic goods (Figure 21).

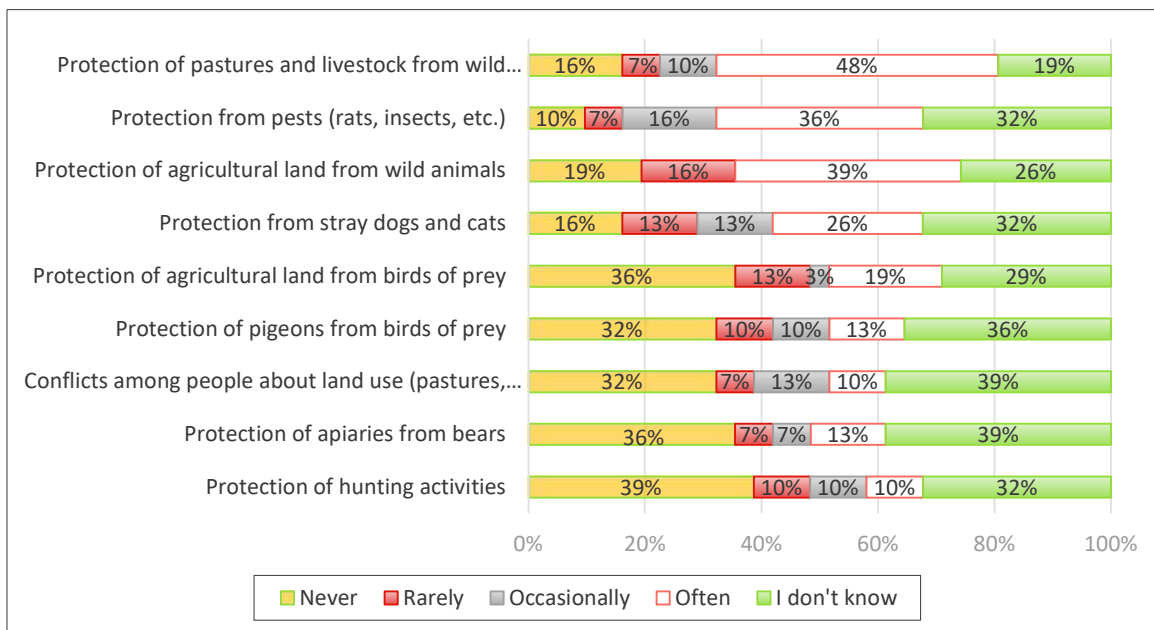


Figure 21. Perceived motives behind wildlife poisoning in North Macedonia

About two-thirds of respondents claim they knew at least one poisoning incident with animals in the past 10 years. These were mostly the intentional cases of poisoning inside the settlements and inhabited areas (67%), but intentional poisoning cases outside of settlements because of conflicts with animals cannot be overlooked either (48%). Also, 80% of respondents in North Macedonia claim that they encountered incidents in terms of pet and hunting or guard dog poisonings in their households or community.

Southwest and Western Macedonia are perceived as regions in this country where the poisoning of wild species most often occurs (16% both), while around 40% of respondents claim not knowing what the key “hot spot” areas are.

Respondents, in general, agree that different measures should be undertaken in order to reduce wildlife poisoning and protect endangered species. About two-thirds of them consider necessary setting up additional supplementary feeding sites for vultures and increasing administrative fines for cases of wildlife poisoning, better information and more intense public campaigns about wildlife poisoning, and financial compensation to livestock breeders and farmers for the damages caused by wild animals. Half of the respondents believe that wildlife poisoning investigations are an important part of police work.

Campaigns related to raising awareness of the negative consequences of wildlife poisoning should primarily be aimed at citizens in general (32%), as well as livestock breeders and game wardens (16% each).

Perception of the illegal practice of wildlife poisoning within relevant governmental authorities in North Macedonia

Officials employed in relevant institutions in North Macedonia are well informed about vulture species inhabiting their country. They are familiar that Griffon Vulture and Egyptian vulture are present and breed on the territory of the country.

Wildlife poisoning and extensive use of legal toxic compounds (pesticides, insecticides, rodenticides) are perceived as the key threats to the vulture populations in North Macedonia (by around half of the officials). Wildlife poisoning is considered to be both accidental and intentional, by misuse of legal poisoning substances such as pesticides or insecticides or by using illegal black-market poisons. On the other hand, poisoning of vultures is mostly perceived as unintentional secondary poisoning by consuming poisoned animals or poison baits intended for other animals.

The key target groups responsible for wildlife poisoning are identified as livestock breeders, hunters and individuals who intentionally kill animals out of aggressive impulses. These groups mostly resort to wildlife poisoning to protect the pastures, agricultural land and livestock from wild animals and birds of prey, to protect hunting grounds, and as a protection from pests, stray cats and dogs.

Officials are not well informed about the regions of North Macedonia where wildlife poisoning most frequently occurs. They most often mention Eastern and Central Macedonia (around one third of respondents) as affected areas.

In terms of legislation and legal processing intended to sanction poisoning incidents, representatives for the governmental institutions emphasize *inadequate law enforcement* (even though they perceive the legal framework for punishing the practice of poisoning animals as good), *lack of coordination among relevant institutions*, *low penalties for wildlife poisoning* and *sporadic imposing of fines* (i.e. under the Hunting Act). They however mostly trust public prosecutors and their level of education for managing incidents related to the poisoning of wild animals.

Considering sanctions for various unlawful actions damaging to animals and the environment, majority of officials endorse severe punishments for all forms of mass and non-discriminative killing of animals (trapping, poisoning, explosives, etc.), as well as increase of fines for every type of poaching or illegal shooting. They also acknowledge the need for treating the possession of poison baits as a separate offense, regardless of whether it has been proven that an animal was killed and believe that the rangers in protected areas should have the authority to arrest perpetrators, if they are caught in the act. Similarly, majority of them would advocate imprisonment sentences for poisoning of animals as opposed to only administrative (financial) sentences.

The majority of representatives from relevant institutions in North Macedonia are not informed about the existence of National action plan for combating wildlife poisoning, a protocol defining procedures and jurisdictions for investigating wildlife poisoning and a database for poisoning incidents of birds. They also caution of inadequate cooperation between governmental institutions and civil society organizations in collecting data about poisoning incidents, which is in line with the perception that lack of coordination between relevant institutions and organizations is a bigger problem than the lack of resources.

Among the key aggravating circumstances and obstacles for prevention and sanctioning of wildlife poisoning they highlight the difficulties with evidence procedures in court, and lack of control over the prescribed use of legal poisons, such as pesticides, rodenticides, etc.

Considering the role of the Police in investigating wildlife poisoning incidents employees of relevant governmental institutions recognize the complexity of the investigations, assessing at the same time the capacities of the police as inadequate in terms of human capacities and in terms of education and training of police forces. Majority of officials believe that the Police should be strengthened by introducing of additional forces (people) in the field for timely detection of poisoning incidents and to deal more effectively with the situation where most incidents occur in remote locations (posing a serious barrier for identifying of the perpetrators). Strengthening would also imply introduction of specialized police units for environmental crime, including wildlife poisoning, and introduction of specialized canine units for detecting poisonous substances. They are however uncertain or divided in opinion about the level of equipment of the police for investigating wildlife poisoning and the need for expensive and sophisticated technology.

All respondents state that toxicological analyzes are necessary in police investigations of wildlife poisoning, but that their expensiveness also poses significant barrier to

effective investigations. In addition, almost all respondents recognize the necessity for the records of the sales of legal poisoning substances.

Two-thirds of respondents believe that there is a necessity for additional efforts to change the attitude of the police towards a more serious understanding of the need to investigate wildlife poisoning. An additional obstacle in the work of the police is the failure to report cases of poisoning to the police force, which should be the responsibility of veterinarians and hunters, but also the general population (every person). However, most officials believe that the lack of information to whom incidents of animal poisoning should be reported is an important impediment.

Considering measures for preventing wildlife poisoning, almost all institutional employees believe that further raising of awareness among citizens in general, livestock breeders and game wardens, imposing a stricter control of the sales of legal poisoning substances, creating additional supplementary feeding sites for vultures and better protection of population of wild ungulates are the key preventive measures that can help reduce wildlife poisoning.

The results of the research indicate a developed environmental consciousness among officials in North Macedonia. They understand that plants and animals have an equal right to exist as humans, and that the natural balance in a closed system such as the Earth, with very limited space and resources, is very delicate and easily disturbed. Also, optimism for future actions exists in the beliefs of two thirds of respondents who doubt that humans are destined to rule over the rest of nature.

Conclusions

The practice of wildlife poisoning during the last 20 years in North Macedonia had the worst effects on populations of vultures inhabiting the country. Griffon Vultures are by far affected the worst by poisoning, appearing in over 70% of all recorded incidents. Up to 125 individuals perished from this illegal practice from 2000 to 2020, making it evident that it represents the most important threat for the dwindling national population, and one of the biggest obstacles for their recovery in the country. Circumstances are similar for the Egyptian Vulture as well. Although only 4 individuals were recorded to have perished from poisoning, it is still a heavy blow to the small and decreasing national population. Conflicts with mammalian predators, mainly wolves and lately jackals, which inflict damages to livestock are the main reason why people in North Macedonia resort to poisoning. Only 7 wild species have been recorded as victims of potential poisoning within 30 separate incidents, which likely indicates that only

incidents with those large and more emblematic species, such as vultures, eagles, wolves, and bears, which are usually of higher conservation concern, are mainly reported to the authorities and investigated. Therefore, it would be recommendable that further efforts are invested into researching the full scope of illegal poisoning and its effects on other species in North Macedonia. Additionally, awareness raising activities about the damaging effects of wildlife poisoning on the environment and human health, and especially about the importance of reporting potential poisoning events to the relevant authorities should be implemented on a larger scale in rural areas of the country.

Currently the biggest gap in the management of poisoning incidents is the lack of a national toxicological laboratory which would conduct forensic toxicological analyses on wild animals. Therefore, this should be one of the priorities to resolve within future anti-poisoning initiatives in North Macedonia

Wildlife poisoning is perceived to be the most important factor endangering vulture populations in North Macedonia by inhabitants of rural areas. They believe that the poisoning of wild animals is the result of intentional actions, mostly by using illegal poisons from the black market, and in a smaller percentage by misuse of legal poisoning substances. The groups that are recognized as mainly accountable for wildlife poisoning are livestock breeders and individuals who deliberately poison animals simply because they like killing things. The key motives behind wildlife poisoning are perceived to be protection of pastures and livestock from wild animals and protection from pests, implying the need for improving existing measures for the protection of economic goods derived from agriculture.

Serbia

Introduction

Poisoning and the use of poison baits was identified as the main culprit behind the disappearance and decline of vulture populations in Serbia from the late 19th to the early 21st century, but poisoning incidents were poorly documented and investigated by the relevant authorities. Vultures and other avian scavengers were most often recorded as victims of poisoning events, being collateral damage of poison intended for some other species regarded as vermin, while birds of prey are common victims of intentional and non-intentional poisoning.

Since the beginning of the 21st century, poisoning and suspected poisoning events in Serbia have been better documented and recorded by both responsible governmental institutions and relevant national CSOs. Bird Protection and Study Society of Serbia (BPSSS) has compiled and analyzed all available data relevant to illegal killing or harming of birds, including poisoning, within the Report on illegal shooting, poisoning, trapping, possessing and trade of wild birds in the Republic of Serbia for the period 2000-2017 (Ružić *et al* 2017), making this data publicly available. Excessive and inadequate use of legal, but also illegally sold pesticides like *Furadane* (Carbofuran) and *Kreozane* is still a common practice in the country, and intentional use of poison baits, as well as misuse of these toxic compounds in agriculture continues to take its toll on wildlife.

Placement of poison baits in the environment with the goal of reducing the population numbers of various mammalian predators, primarily jackals, wolves, foxes and feral dogs is highlighted in the Red book of fauna of Serbia (reference) as one of the main factors that negatively affects many birds of prey, causing the greatest damages to populations of eagles (White-tailed Eagle, Golden Eagle) and vultures. Although the use of poison baits is strictly prohibited by law in Serbia, this practice still endures, especially in commercial hunting areas and/or their vicinity, and avian scavengers are regular casualties, either directly by consuming poison baits or indirectly by eating other poisoned, dead animals. In addition, inexpert placement of poison baits, as a measure of population control for rodents in agriculture and forestry, takes a great toll on wild birds that primarily feed on these animals.

Historical perspective

Wildlife poisoning was a deeply rooted practice in Serbia, and its effects on many species have been well documented, especially on vultures, being one of the most common victims of poisoning events in the past. First cases related to the use of poison for eliminating wildlife in Serbia were recorded during the end of the 19th and beginning of the 20th century in Vojvodina and some parts of Eastern Serbia, when *Strychnine* was used for culling wolves. A period of massive organized, government sponsored legal poisoning actions against wolves and other carnivore populations followed. Poisoning actions were carried out throughout the country after the II World War, during the period 1947-1976, which led to massive poisoning and disappearance of Griffon Vultures and other vulture species in Serbia, similarly to other countries in the region (Grubač 1998, 2000). Apart from strychnine, *Hydrogen cyanide*, was also commonly used. Results of

these actions were obvious to measure with the catastrophic decline, range constriction and complete disappearance of vultures and other scavenger species from the country.

Poisoning of wolves and other mammalian predators was the main reason for extinction of the Griffon Vulture from the majority of its former breeding range in Serbia (Marinković 1999, Grubač 2000). It is estimated that around 700 vultures were poisoned in Serbia during poisoning actions in 1959 (Mardešić & Dugački in Marinković, 1999). Since 1975 the poisoning of wolves and other carnivores was officially made illegal with the changes to the national legislation. By then the local communities, especially in rural areas became accustomed to the use of poison and poison baits to resolve conflicts with wildlife and the practice, although significantly less frequent than in the past, is still very much present and causes significant losses to populations of many species. Since 1980 the illegal practice of poisoning of stray dogs, wolves and other wildlife was continued and caused mortality of numerous Griffon Vultures and other avian scavengers.

Current situation in the country

Wildlife poisoning is still very much present and a well-documented practice, especially those poisoning events that cause mortality of birds, in numerous regions in Serbia. Poisoning events recorded since 2000 until the end of 2020 in Serbia occurred mostly in the vicinity of commercial hunting grounds and on outskirts of rural areas. Relevant governmental authorities keep records of all wildlife poisoning cases that were investigated and prosecuted, while national non-governmental nature conservation organization remain vigilant in documenting all poisoning and presumably poisoning events that occur and mortality induced by it. BPSSS has established a Bird Crime Task Force (BCTF) for several years which works actively at detecting and reporting all incidents associated to illegal killing and harming of wild birds, both to the relevant authorities and general public. Also, they have developed a database for keeping records of individual poisoning incidents, their associated legal proceedings and penal administrations, which makes analysis of the scope and severity drivers and stakeholders associated with wildlife poisoning possible.

According to the available data, during this 20-year period a total of 293 poisoning and probable poisoning events have been recorded. Based on the analyzed data wildlife poisoning in Serbia can be mostly attributed to:

- Intentional poisoning with poison baits:

Poison baits discovered are very diverse, and they range from carcasses of entire animals (usually sheep, pigs, goats, but also ducks, geese, feral pigeons, dogs) laced with a toxic substance, to small pieces of meat, boiled eggs laced with poison. A few poisoning events have been documented where fish laced with poison have been used as baits. Poison baits are used to eliminate any kind of undesirable wild and domestic animals that cause or might inflict damages to human activities mainly in rural areas. Although the motives behind most documented poisoning events remain unknown (70,1%), from those events that have been better investigated we can see that the main driver behind the use of poison baits in Serbia are conflicts with predators (14,1% of total registered poisoning events), mainly jackals and foxes, followed by conflicts with stray dogs (5.5% of total registered poisoning events) and conflicts with birds of prey (Figure 22). Intentional poisoning of birds of prey is associated with conflicts that pigeon fanciers have with birds of prey and the damages they can inflict to racing pigeons. Poison is usually smeared over live pigeons which are then released in the vicinity of nests of breeding birds during the rearing period, increasing the chances that the poisoned food also reaches the clutch. Goshawks, Peregrine and Saker falcons are the primary targets for this type of poisoning. These incidents are also frequent during winter period, when wintering birds from other populations arrive and the number of conflicts with pigeon fanciers increase.

➤ Misuse of phytosanitary products in agriculture:

Misuse of pesticides and other toxic compounds in agriculture is a common cause of mortality for many species in Serbia, and it is responsible for 7,9% of all documented poisoning events in the country. There are two main types that can be distinguished based on the documented poisoning events so far. Unintentional poisoning due to inadequate placement of poison baits for rodents (baits are placed outside of rodent holes, on the surface of agricultural fields) is a common occurrence. Baits for rodents usually consist of corn seeds treated with rodenticides or other toxic compounds. Other type of poisoning related to the misuse of phytosanitary products is intentional poisoning, where poison baits, mostly corn seeds treated with Carbofuran, are used to eliminate various undesirable animals, such as Corvids, pheasants, feral pigeons, wild boars and badgers. These baits are usually placed on agricultural fields, but also within rural and urban settlements.

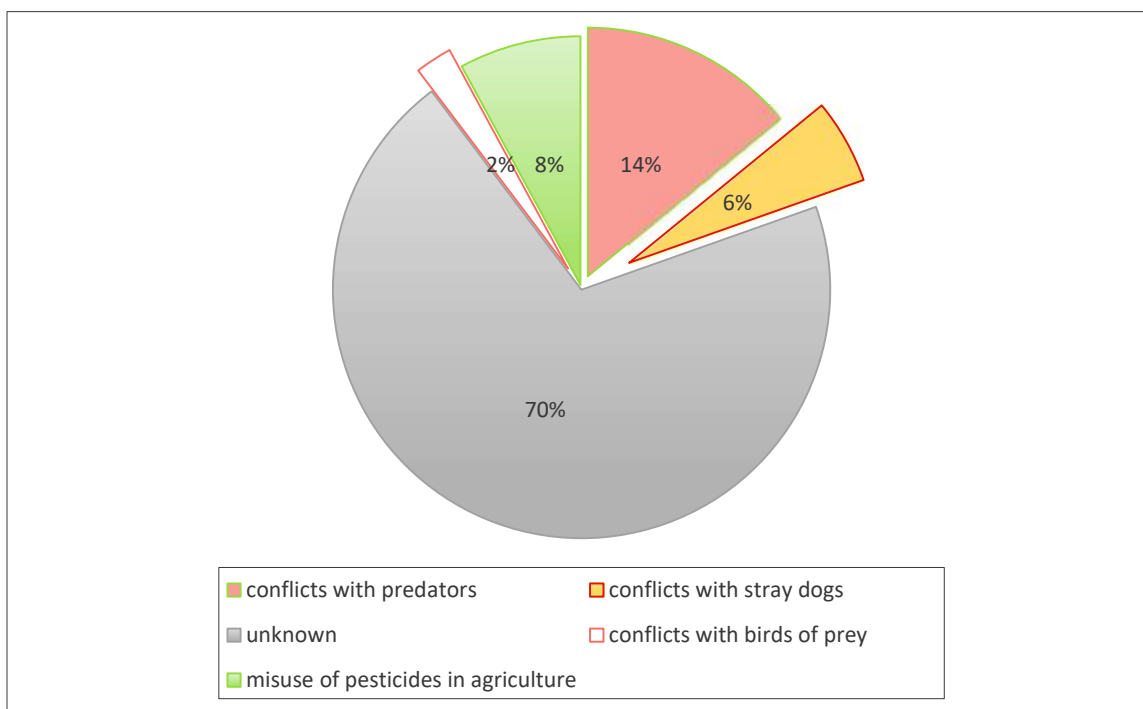


Figure 22. Motives behind wildlife poisoning in Serbia

Forensic toxicological analysis has been conducted in 15% of documented poisoning events that occurred from 2000-2020. Most available records relate to poisoning events that cause mortality of vulture, eagles and similar emblematic species which are of a higher conservation concern. Generally, incidents with these species are more often reported to the authorities by citizens, and therefore it is very likely that mortality of many other species caused by poisoning goes unrecorded and unconfirmed. According to the available data, *Carbofuran* is by far the most dominant toxic compound used for wildlife poisoning in Serbia. This banned pesticide has been used in more than 90% of poisoning events. Two types of *Carbofuran* were documented to have been used for the preparation of poison baits, purple granulated form, and pink liquid form. Other compounds used for poisoning include *Kreozan* (Dinitro-o-cresol), which was registered in 5 poisoning events, while traces of *Arsenic* were discovered in victims of one poisoning event. It is important to note that over 30% of toxicological analysis conducted on potentially poisoned wild animals have been conducted from 2017 onwards, which indicates that relevant authorities in Serbia have invested more efforts in investigating wildlife poisoning incidents, but also national nature conservation organizations, which have a crucial role in monitoring, recording and raising awareness among the general public and other key stakeholders about this conservation issue. First organized efforts towards monitoring and combating wildlife poisoning and other bird crime related issues in the country were made by BPSSS in 2014, with the establishment

of their BCTF within the organization. Since then, annual surveys have been conducted in the northern part of the country (Vojvodina Province) during winter period when wildlife poisoning most frequently occurs. However, it is important to note that many poisoning cases reported to the relevant authorities by BPSSS are based on information received from concerned citizens.

Wildlife poisoning in Serbia caused the mortality of 51 species during this period. According to the available data, this practice had the worst effects on birds of prey. The most common victim of poisoning is the Common Buzzard, recorded in 88 poisoning events with a total of 246 individuals found poisoned or presumably poisoned (Figure 23). The second most common victim is the White-tailed Eagle, recorded in 73 poisoning events with a total of 109 individuals, followed by Marsh Harrier, recorded in 29 poisoning events with 85 individuals found poisoned or presumably poisoned.

Other recorded casualties include Goshawk, Sparrowhawk, Peregrine Falcon, Red-footed Falcon, Common Kestrel, Black Kite, Red Kite, Imperial Eagle, Hen Harrier, Montagu's Harries, Rough-legged Buzzard, Long-legged Buzzard, Graylag goose, Grey Heron, Great Egret, Long-eared Owl, Eagle Owl, Little Owl, Tawny Owl, Ural Owl, Jackdaw, Common wood-pigeon, Common Crane, Griffon Vulture, Great Bustard, House Sparrow, Tree Sparrow, Turtle Dove, Collared Dove, Song Thrush, Common Starling, Roe deer, Stone marten, Wild boar, Badger.

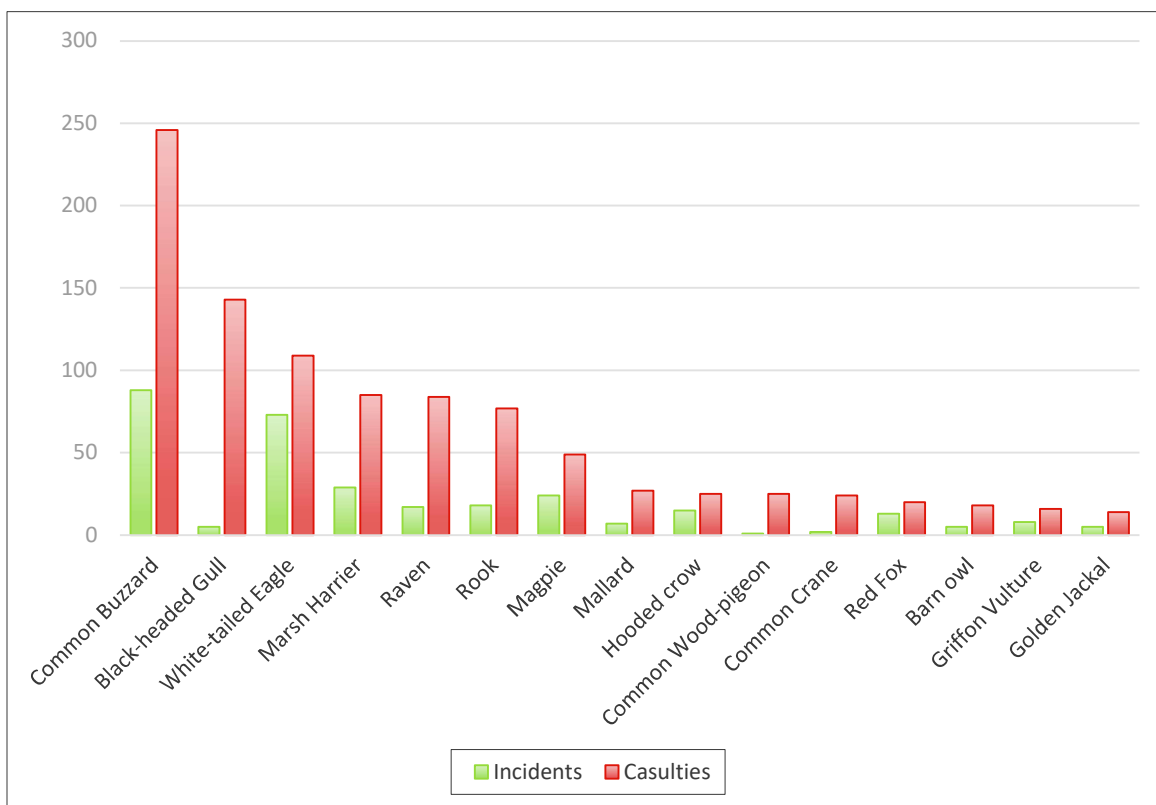


Figure 23. Common victims of poisoning in Serbia

The last known probable event of vulture poisoning (6 poisoned Griffon Vultures) in the country was recorded in 2008 in Trešnjica gorge, near the breeding colony of the species. Governmental engagement in preservation of the last breeding colonies of Griffon Vulture in Serbia which were facing extinction due to illegal wildlife poisoning during the 80s and 90s was crucial for the survival of the species. Special nature reserves were created, providing safe food within supplementary feeding stations, public awareness campaigns and monitoring has been conducted by both governmental and CSO sector, which greatly contributed to eliminating poison bait use in the region of the country where vultures were still present. Additionally, depopulation and the consequent reduction in population of livestock reduced the conflicts with wild predators, and with it the use of poison for resolving those conflicts. However, as poisoning remains a common practice in many other regions in Serbia, it still represents potentially the greatest threat for the populations of these avian scavengers in the country.

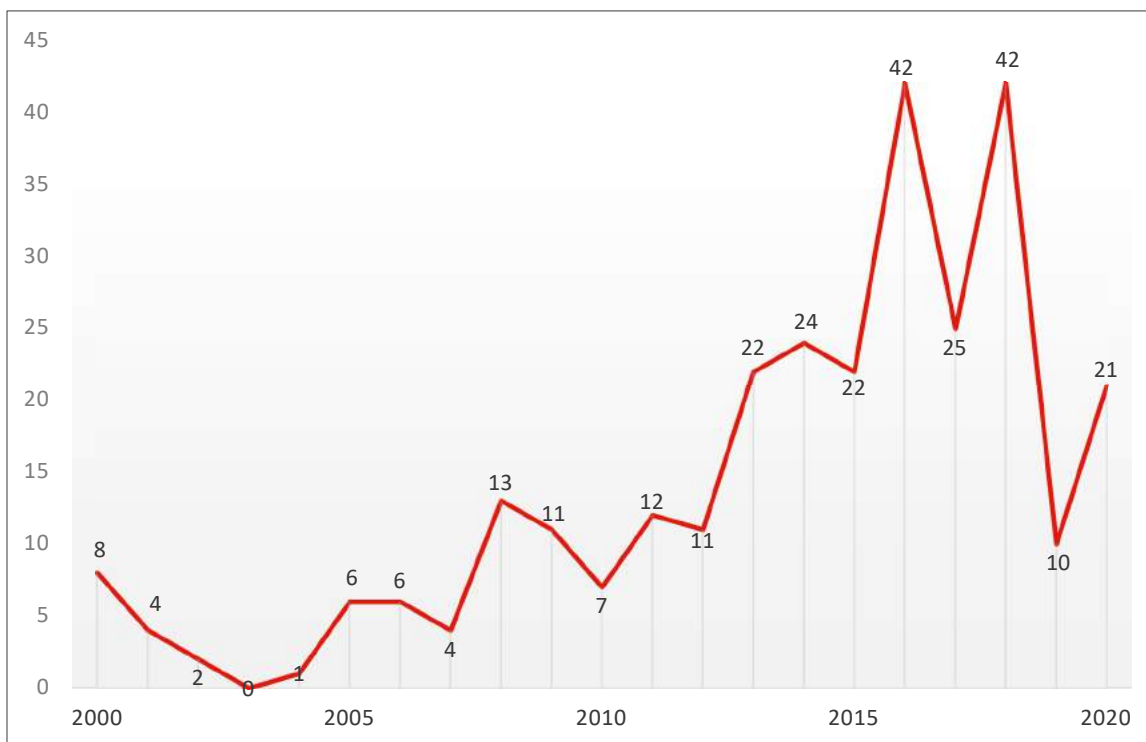


Figure 24. Number of poisoning events in Serbia within the research period

Available data about wildlife poisoning from Serbia indicates that this practice is still very common, showing clear signs of increase during this 20-year period. This annual increase in the number of recorded poisoning and presumable poisoning events can mostly be attributed to the growing investment of efforts by the BCTF in combating this illegal practice, ranging from raising awareness about this important conservation issue among general public, enforcement agencies and other relevant authorities to active search for poison baits and potential poisoning events in the field, especially in those areas where this practice is more common. This resulted in a significant increase of alerts and reports from citizens over the years about potential poisoning incidents both to the relevant authorities and BPSSS. The significant decline in recorded potential poisoning events in 2019 may be attributed to an overall reduction of activities in the field from many relevant stakeholders due to the outbreak of the Covid19 pandemic, but this can only be validated with new data in the years to come.

Table 3. Distribution of poisoning events by regions in Serbia

County	Wildlife poisoning incidents	Region
Severnobanatski	22	Vojvodina
Severnobački	50	
Zapadnobački	34	
Južnobanatski	36	
Južnobački	51	
Srednjobanatski	12	
Sremski	38	
City of Belgrade	8	Belgrade
Zlatiborski	8	Šumadija and Western Serbia
Mačvanski	11	
Moravički	3	
Kolubarski	1	
Raški	2	
Pomoravski	2	
Borski	2	Southern and Eastern Serbia
Braničevski	5	
Podunavski	2	
Pirotski	2	
Pčinjski	1	
Toplički	1	
Zaječarski	1	
Jablanički	1	

The great majority (83%) of all recorded poisoning incidents in Serbia during this period originate from the region of Vojvodina. Such spatial distribution of poisoning and potential poisoning events is somewhat biased and represents primarily the result of intensive field work that BPSSS has conducted in the region towards detection of potential poisoning events, where they are based, and where most of their members, volunteers and supporters are located. The reality of wildlife poisoning is that if one invests more time and effort in looking for wildlife poisoning, the more potential poisoning events will be recorded. Therefore, it is expected that the region of Vojvodina would have the highest concentration of poisoning incidents compared to the rest of the country, where very few efforts are invested in detection and prevention of poisoning. The main driver of poison use in this region of Serbia are conflicts with jackals and stray dogs which can often cause damages to game animals in commercial hunting areas, and to livestock in rural areas. Additionally, Vojvodina is the most intensively farmed

region in Serbia which is why cases of misuse of pesticides and other phytosanitary products are mostly recorded here as well. Therefore, it is highly probable that the current distribution of poisoning events does not reflect the realistic situation and scope of the illegal use of poison in the whole country.

Reducing the threat that wildlife poisoning poses to many wild species in Serbia primarily depends on much stricter enforcement of existing legislation by relevant governmental authorities, especially legislation related to the control of production, trade and application of pesticides and similar chemical compounds used in agriculture. Banned substances are relatively available on the existing black market and were even recorded to have been advertised through social networks such as Facebook, various internet adds and freely sold on local fairs and markets in rural areas.

There are uncertainties with responsibilities and jurisdiction of relevant institutions regarding prevention, control and investigation of poisoning incidents. Therefore, more efficient and clear-cut legal protocols for describing responsibilities in reporting, investigating, and processing cases of wildlife poisoning need to be developed. Also, communication and information change between responsible institutions and sectors related to jurisdiction, responsibilities need to be enhanced. Apart from this, the development of organized systems and protocols related to reporting, collecting and disposal of dead animals would also be very useful in reducing the amount of unsafe food available for scavengers, thus reducing the probability of poisoning to occur.

According to the data we were able to obtain, there is only one poisoning incident that occurred in the last 20 years where the culprit was successfully identified, prosecuted and sentenced, while in several other incidents where protected wildlife species were poisoned, charges were brought up against unknown perpetrators. The case dates to April 2020 when 5 dead Common Cranes were found poisoned in an agricultural field from corn seeds laced with Carbofuran, which were inadequately set as baits for rodents.

Legal framework

Serbia has good national legislation in place related to the use of poison substances in the natural environment, where wildlife poisoning is clearly defined as an illegal activity, punishable under Criminal law.

Existing national legislation relevant to wildlife poisoning in Serbia:

- **Law on nature protection:** Article 79. prohibits the use of certain means of catching and killing wild species animals endangering and harassing their populations and/or habitats, disrupts their well-being and can cause their local disappearance, which include the use of poison or tranquilizing baits.
- **Law on hunting and game animals:** Article 22. prohibits the use of phytosanitary substances and other chemical substances in quantities and dosages that can cause damages to game animals, as well as intentional poisoning of game animals.
- **Criminal law:** According to article 269, whoever, by violating these regulations, kills, hurts, tortures or otherwise abuses animals, shall be punished by a fine or imprisonment not exceeding one year. Additionally, according to article 276, whoever hunts game animals whose hunting is forbidden or who hunts without a special permit a particular game animal for which hunting requires such a permit or who hunts in a manner or means that inflicts mass destruction of game animals, shall be punished by imprisonment for a term not exceeding three years.

Relevant international treaties and conventions that Serbia is parties to:

Convention on the Conservation of European Wildlife and Natural Habitats (Bern, 1979): Ratified with the Law on Ratification ("Official Gazette of the Republic of Macedonia no. 49/97) and entered into force in 1999. It prohibits the use of any non-selective means of capture or killing as well as of means that may induce local extinction or heavily disturb the populations of a species, namely means listed in Annex IV", while in Annex IV of the same Law, which is entitled "Prohibited means and methods of hunting and other forms of exploitation", "Poisons and poison or tranquilizing baits" are included.

Perception of the illegal practice of wildlife poisoning in local communities in Serbia

Surveys in Serbia were carried out in communities of Svilojevo and Pešter, and the sample included 45 respondents in total. Respondent from the local communities in Serbia are generally well informed about the presence of Griffon Vultures in their country. However, they are inadequately informed when comes to the presence of the other vulture species and whether they breed in Serbia. They are also not sufficiently informed about the issue of wildlife poisoning in Serbia and its impact on wildlife.

Wildlife poisoning is perceived as the biggest threat to the vulture population in Serbia. However, awareness needs to be additionally raised and become more widespread

since only a third of respondents (29%) perceive it as the greatest danger that vultures face. Poisoning is followed by electrocution as a result of collision with electric cables (18%). Lack of food and disturbance are both seen as the third most important threat to vultures in Serbia (13% each), this is followed by poaching (11%).

Vultures in Serbia are considered to be victims of unintentional poisoning, as they are perceived to perish due to eating poisoned animals, or poison baits intended for other animals. Only a small number of respondents believe that vultures are the targets of intentional poisoning (7%).

Nearly 70% of respondents acknowledge the important role that vultures have in the ecosystem and 60% of them believe that their existence is important for humans as well. These findings indicate a prevailing positive attitude towards vultures and their role in the environment. In line with this are the respondents' general attitudes towards nature – they believe that the Earth has limited space and resources, that plants and animals have the same right to exist as humans do and that the balance of nature is very delicate and easy to disturb.

Further informing about the risks and consequences of intentional poisoning of animals is necessary, as about one third of respondents believe that governments should organize controlled campaigns of poisoning as a means to control populations of feral animals and pests, and around one quarter of them find that occasionally poisoning of wildlife is justified. However, it should be noted that respondents are divided when it comes to this question. 40% of them believe that it is not justified and one third is undecided. In addition to this, they are similarly divided when it comes to whether humans have the right to rule over nature - 36% of them believe that it is the destiny of humans to rule over nature while 40 % consider this not to be true.

A little less than 60% of respondents from the targeted local communities in Serbia believe that wildlife poisoning happens intentionally – approximately in equal measure either through the abuse of legal poisoning substances such as pesticides and insecticides, or through the intentional usage of illegal poisoning substances from the black market. About one quarter of respondents are of the opinion that wildlife poisoning most often happens accidentally, through the misuse of legal poisoning substances out of negligence or ignorance.

Respondents from local communities in Serbia (Figure 25) perceive the following groups to be the most responsible for wildlife poisoning: farmers (62%), livestock breeders (49%) and hunters (34%). When it comes to the responsibility for reporting information/knowledge about wildlife poisoning to the police, the majority of

respondents (71%) believe that this should be the responsibility of all citizens in addition to hunters and veterinarians.

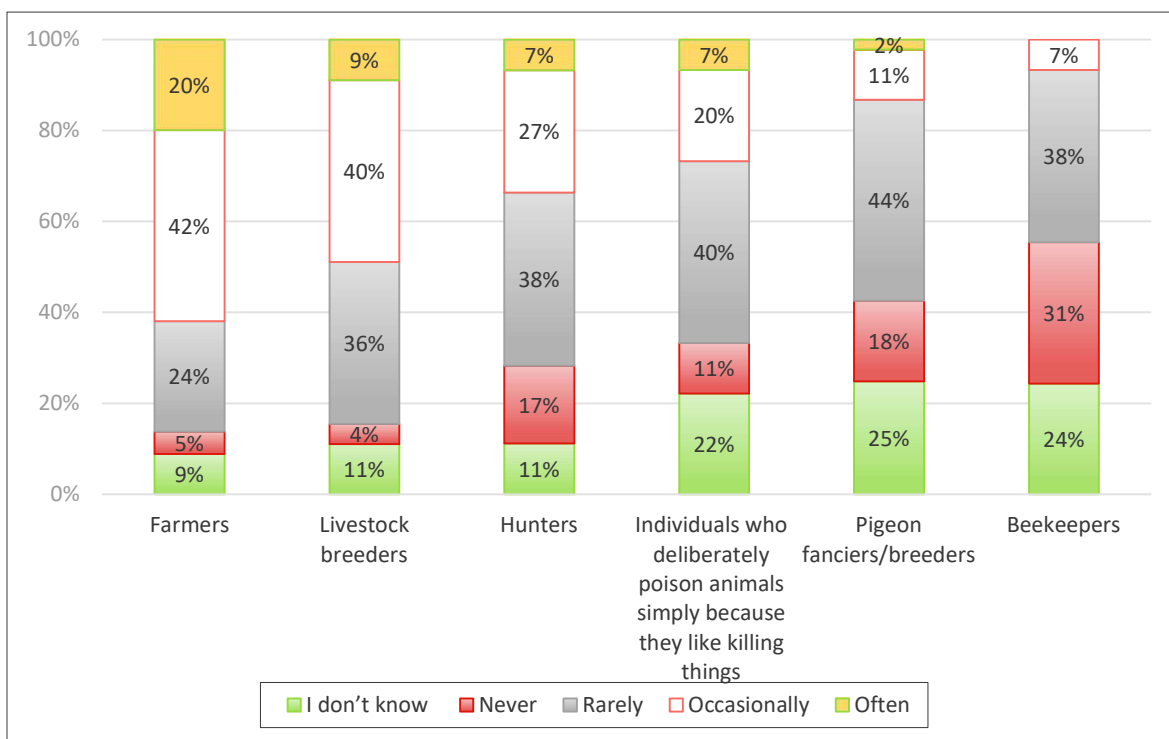


Figure 25. Perception of groups responsible for wildlife poisoning in Serbia

For the majority (60%) the most important barrier for reporting incidents of wildlife poisoning is avoiding coming into conflict with members of their community. Nearly 40% of respondents state that they would report the incident only if they knew that there would be no negative consequences for them, 13% of the respondents would not report it and nearly 10% are undecided. In addition to this, there appears to be somewhat of a diffusion of responsibility, as one fifth of the respondents believe that that are enough people who are already dealing with the issue of wildlife poisoning and their involvement is not necessary.

Another key barrier is the perception that citizens do not know who to report these incidents to – nearly 70% of respondents share this attitude and on the other side only 10% disagree with this statement. These findings imply that it is necessary to provide citizens in affected communities with important information concerning whom they can report wildlife poisoning cases to, but also to work on shifting public opinions in the direction of normalizing the reporting of these cases and additionally empowering citizens to participate in the identification and prevention of poisoning incidents.

The most frequently highlighted motives for wildlife poisoning are *protection from pests*, (76%), *protection from stray dogs and cats* (51%), *protection of agricultural land, pastures and livestock from wild animals* (27% each). These findings imply that there is a need to raise awareness about alternative solutions to these issues that could be offered and applied with less detrimental effects on the environment (Figure 26).

Around half of the respondents claim to know of at least one case of poisoning in their community/environment in the past ten years. The majority of these are cases of intentional poisoning. Nearly 70% of them claim to have encountered cases of intentional poisoning in settlements, whereas more than one fifth of report encountering incidents when someone intentionally poisoned wild animals outside of settlements. The majority of poisoned animals were pets, followed by bees and guard dogs.

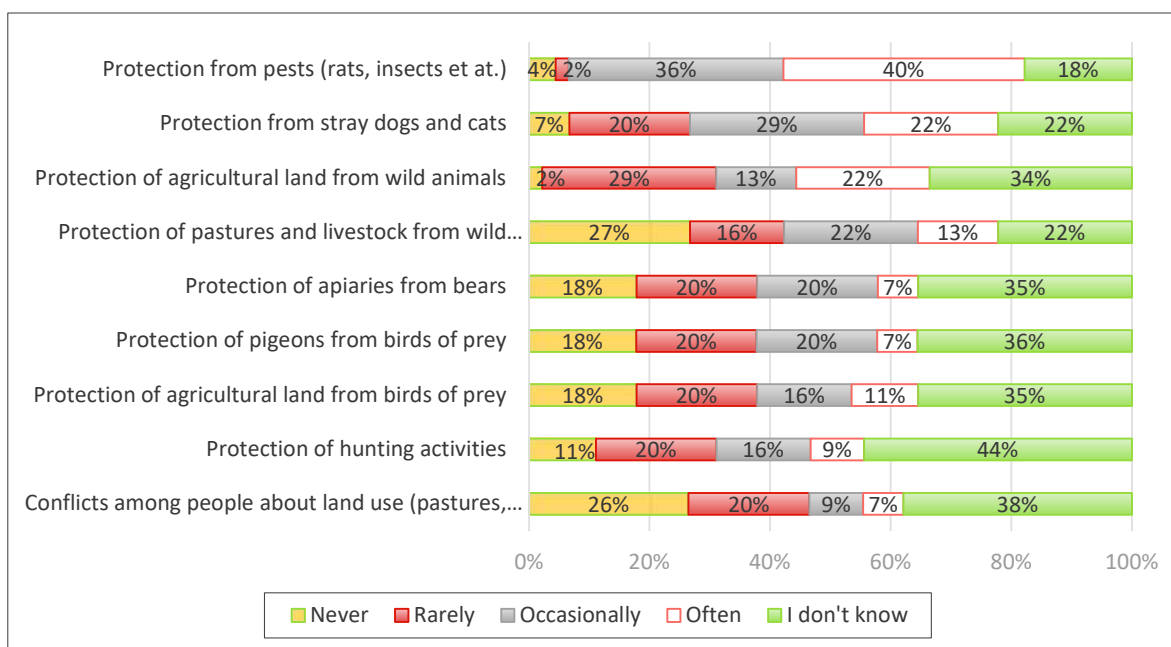


Figure 26. Perceived motives behind wildlife poisoning in Serbia

When it comes to regions where poisoning occurs, approximately one third of the sample believes that Vojvodina is the region where poisoning occurs most often. It is followed by East and South Serbia, West Serbia and Šumadija, and Belgrade (11%, 9% and 9%, respectively), which are all identified as problematic areas regarding wildlife poisoning.

Regarding measures for prevention and combating wildlife poisoning, the one that is singled out as the most important is that the state/government should financially compensate the damage to livestock breeders and farmers caused by wild animals

(82%). It is closely followed by increasing administrative fines for wildlife poisoning (78%), increased informing of the general public about wildlife poisoning (76%) and stronger control regarding import and trade of legal poisoning substances (67%). Additionally, 44% of respondents consider wildlife poisoning investigations to be important police work.

One third of the sample believes that awareness about the issue of wildlife poisoning needs to be raised among citizens in general. They are followed by farmers (25%), livestock breeders and hunters (9% each).

Perception of the illegal practice of wildlife poisoning within relevant governmental authorities in Serbia

Representatives of relevant governmental institutions in Serbia are well informed about certain species of vultures, such as the presence of the Griffon Vulture in their country. However, there is somewhat of a lack of knowledge when it comes to the conservation status of other species of vultures, as one third of the respondents think that the Egyptian Vulture still breeds in Serbia and a little less than one fifth believe the same for the Cinereous Vulture.

Wildlife poisoning is acknowledged as the most important threat to the existence of vultures in Serbia (by around half of the officials), but the usage of legal toxic compounds (pesticides, insecticides, rodenticides) is also amongst top identified dangers that leads to poisoning of wild animals (approximately every fifth respondent).

While the majority of the respondents believe that the key cause of vulture poisoning is accidental, either through ingestion of poison baits intended for other animals or by eating animals that died of poisoning, opinions of respondents are divided when it comes to the question of whether wildlife poisoning occurs accidentally or intentionally. Close to half of institutions employees believe that wildlife poisoning happens accidentally by misuse of legal poisoning substances and negligence, while the other half believes that wildlife poisoning happens mostly intentionally, by using illegal poisons from the black market or through abuse of legal poisoning substances.

Farmers, and to a lesser extent hunters, but also individuals who deliberately poison animals out of aggressive and destructive impulses are perceived as the most responsible groups for wildlife poisoning. This is partially in line with what respondents consider to be the most important motives for the poisoning of wild animals. Above two thirds of officials from relevant institutions consider *protection from pests* and

agricultural land from wild animals, protection of pastures and livestock from wild animals and protection from stray dogs and cats to be the key motives behind wildlife poisoning that should be addressed by joint institutional efforts. Conflicts among people about land use (pastures, hunting areas) should also be legally addressed in this process.

Vojvodina and Western Serbia and Šumadija are the regions of Serbia, that should be paid special attention in the fight for wildlife protection according to the opinion of employees of relevant governmental institutions.

Inadequate enforcement of the laws, low penalties and rare imposing of the fines for wildlife poisoning, inadequate and unclear protocols for police action, complexity of the investigations, difficulties with evidence procedures in court, inadequate education of public prosecutors to handle the incidents related to poisoning of wild animals, lack of control over the prescribed use of legal poisons, such as pesticides, and online black market for banned poisons are all perceived as important aggravating circumstances and obstacles for the prevention and sanctioning of wildlife poisoning in Serbia.

Poor reporting of poisoning events from witnesses is also perceived as an important obstacle, and the responsibility for reporting information about wildlife poisoning to the police is allocated to all members of the population (every person), as well as hunters and veterinarians. This is hindered by perceived risk of altercations and conflicts in local communities that people who report poisoning events face, but also by the lack of information to whom to report animal poisoning incidents to. Therefore, citizens in general, and specifically farmers, are identified as the most important target groups for awareness raising actions.

The respondents are mostly uninformed about the existence of database for poisoning incidents in Serbia, National action plan for combating wildlife poisoning and protocol defining procedures and jurisdictions for investigating wildlife poisoning. Although a few of the respondents claim that they use the data from the existing database for poisoning incidents of birds for carrying out work within their jurisdiction, the small number of officials informed about the database are divided about the clarity of protocol for documenting poisoning incidents and they mostly agree that the existing database is not adequately used for informing the public and raising their awareness about the problem of wildlife poisoning. At the same time, results of the research indicate the need for improvement of the cooperation between governmental institutions and civil society organizations regarding data collection about poisoning incidents.

Representatives from the relevant governmental institutions in Serbia emphasize the important role of police work in investigation of wildlife poisoning incidents. Several

aspects regarding the capacity of the police that need improvement have been identified, from the need to introduce specialized police units for environmental crime, specialized canine units for detecting poisonous substances, to introducing additional agents (police, environmental inspectors, rangers etc.) in the field, training and capacity building for police forces, to the need to involve representatives of civil society organizations in wildlife poisoning investigations. Insufficient education of the police forces for investigating these incidents and lack of coordination among relevant institutions is perceived as a bigger problem than the lack of resources and equipment. Respondents are indecisive and not completely sure about the need for expensive and sophisticated technology in police investigations of wildlife poisoning.

When it comes to measures for preventing wildlife poisoning, respondents are in agreement in recognizing the importance of the following measures: *raising awareness among key stakeholders* (livestock breeders, farmers, hunters, institutions) as well as the *general public, imposing a stricter control of the trade of legal poisoning substances* (pesticides, rodenticides, etc.), *financial compensation from the state/government for the damages to livestock breeders and farmers caused by wild animals, creating more supplementary feeding sites for vultures, and better protection of wild ungulate populations.*

Respondents are in favour of enforcing the most severe forms of punishment for all forms of mass and non-discriminative killing of animals (trapping, poisoning, explosives et al.), and they believe that higher fines are needed for every type of poaching/illegal shooting. The majority of them also believe that the possession of poison baits should be considered a separate offence, regardless of whether it has been proven that an animal was killed. Officials mostly agree that rangers of protected areas should have the authority to arrest persons who poison animals, if caught in the act, and that the concessionaire should be deprived of the concession if poisoning of wild animals occurs in a commercial hunting area. They also consider that poisoning of animals should not only be a criminal offense if it occurs in a protected area (nature park or national park) and that the sentences should correspondingly include imprisonment (as opposed to solely administrative sentences) for not only affecting the humans but also endangering the animals.

The vast majority of representatives for governmental institutions from Serbia believe that plants and animals have an equal right to exist just like humans and that the natural balance is very delicate and easy to disturb. Majority of respondents also perceive the Earth to be like a spaceship, with very limited space and resources. Close to three fourths of the sample believe that humans aren't destined to rule over the rest of nature.

Conclusions

Poisoning of wildlife continues to be a common occurrence in Serbia, having the worst effect on species who often resort to scavenging as a potential food source, such as the White-tailed Eagle, Common Buzzard and Marsh Harrier, which are the usual victims of poisoning in the country. Unlike all the other countries from the region, wildlife poisoning currently does not appear to be a serious threatening factor for the national vulture population. Incidents with vulture mortality are rarely recorded, and with vulture poisoning even rarer, with the last one being recorded in 2008. However, apart from the existing protected areas which were created primarily for the purpose of protecting the remaining population of Griffon Vultures in Serbia, very little efforts have been invested to assess the scope of wildlife poisoning in the rest of the country and to determine to what extent it potentially threatens the country's vultures. Therefore, future conservation efforts should focus on investigating the scope of human-wildlife conflicts, especially conflicts with predators, such as wolves and jackals, which often inflict damages to livestock and game animals. These conflicts are currently the biggest known drivers of poison use in Serbia, followed by the misuse of plant protection products in intensively farmed landscapes in the country's northern province.

Conservation efforts invested by CSOs during the last decade into diminishing the threat of wildlife poisoning in Serbia have resulted in better engagement of relevant governmental authorities with this specific type of environmental crime. During the last 5 years, for every third poisoning event toxicological analysis was conducted, which is a significant step forward towards better management of potential poisoning events. Designating additional toxicological laboratories with sufficient capacities for conducting forensic analysis on wildlife would further improve this situation. Additionally, these invested efforts also resulted in somewhat better engagement of relevant law enforcement institutions in Serbia. Although this engagement mainly relates to investigation of incidents which involve mortality of emblematic species which are of a higher conservation concern, such as eagles, it is a significant progress, which resulted in several investigated cases being brought to court. Further specific training of law enforcement agents, public prosecutors and other relevant stakeholders is necessary in order to improve the overall management of poisoning incidents.

Wildlife poisoning is perceived as the biggest threat to the vulture population in Serbia by people from rural areas. The majority of them believes that wildlife poisoning happens intentionally, equally through the abuse of legal poisoning substances such as pesticides and insecticides, or through the intentional use of illegal poisoning substances from the black market. They perceive farmers, livestock breeders and

hunters as the groups most responsible for wildlife poisoning in Serbia. The same groups are identified by the representatives of relevant governmental institutions, who believe that wildlife poisoning happens accidentally by misuse of legal poisoning substances and negligence, while the other half believes that wildlife poisoning happens mostly intentionally, by using illegal poisons from the black market or through abuse of legal poisoning substances.

CONCLUSIONS

Status of wildlife poisoning in the Balkan Peninsula

Wildlife poisoning continues to represent one the most dominant threats for many wild species in the Balkan Peninsula. It also affects numerous domestic animals, and because of its common and frequent use in various forms it represents a severe threat to human health as well. The analysis of effects of poisoning on domestic animals was not the subject of this study, although it is important to mention that poisoning events with domestic animals, primarily dogs (hunting, shepherd dogs, stray dogs and pets) are more common, especially in urban environments, and are more frequently reported to the authorities.

The most common type of wildlife poisoning in the Balkan Peninsula is the intentional placement of poison baits for the purpose of killing wild, feral or in some cases domestic animals. Poison baits in the Balkans come in all shapes and sizes, from entire carcasses of dead animals (mostly livestock, but also game animals, poultry), individual body parts, pieces of meat of various sizes, sausages, boiled eggs, fish, honey laced with toxic compounds, and also wax capsules with Cyanide. Presently, the use of poison baits or poisoning of animals in general is illegal in each country of the Balkan Peninsula, but it is a deeply rooted practice, still commonly practiced by people as a quick and relatively affordable method for resolving conflicts with wildlife.

Within the period of 2000-2020 a total of 1046 poisoning and presumable poisoning wildlife poisoning events have been recorded throughout the Balkan Peninsula. More than half (55%) of all poisoning and presumable poisoning events that occurred in the region during this period originate from Greece. The diversity of poison baits and toxic compounds used for poisoning of animals additionally contribute to the perception that this type of environmental crime is indeed much more frequent in Greece than in other

countries of the Balkan region. On the other hand, the issue of illegal use of poison baits has been the focus of conservation efforts of national CSOs in Greece for the past 10 years, which have invested significant efforts and resources in documenting this illegal practice compared to other countries. The reality of wildlife poisoning is that if more efforts are invested into research of its scope, more poisoning incidents will be detected. This is true as well for spatial distribution of poisoning incidents, and therefore those areas in which more efforts were invested in monitoring usually show a higher number of poisoning incidents. Therefore, it is highly likely that the current status of wildlife poisoning in the Balkan region and in each country individually, which was the subject of this study, does not reflect the realistic situation and that a great number of potential poisoning events remains unrecorded.

Apart from Greece, high numbers of poisoning incidents can be found in Serbia, where more than a quarter (28%) of all poisoning and presumable wildlife poisoning events that have been recorded in the region originate from. Similar to the situation in Greece, CSOs from Serbia have invested significant efforts in monitoring the phenomenon of wildlife poisoning, although almost exclusively in the northern regions of the country where they have more people on the ground for active and preventive searches for potential poisoning incidents. Other target countries from the region show significantly lower numbers of recorded incidents, which can mostly be attributed to the fact that systematic monitoring and documentation of wildlife poisoning has been conducted primarily in areas that are important for certain species of conservation concern at the national level (vulture species, Imperial Eagles or Saker Falcons). Additionally, apart from Bulgaria, in the remaining countries wildlife poisoning only became a focus of active research and monitoring since 2018.

Data about wildlife poisoning used to produce this study originates from internal databases on CSOs which are active in combating this environmental crime. There are no official databases among relevant governmental institutions from the Balkan countries where information about poisoning and potential poisoning incidents are stored. Most of the relevant institutions store only information about those incidents which were fully investigated by law enforcement officials and that made it to court. Less than 1% of poisoning incidents in the Balkans ever make it to court trials, and even less get officially sanctioned, as charges are usually brought up against unknown perpetrators. All of this indicates that wildlife poisoning is very low on the list of priorities of relevant governmental authorities and that their overall engagement with this type of environmental crime is also minimal.

Based on the available information about poisoning and potential poisoning incidents that occurred from 2000-2020 in the Balkan Peninsula it is evident that the **Griffon Vulture** population inhabiting this region suffered the worst from the illegal practice of wildlife poisoning (Figure 27). These vultures appear as casualties in every fifth poisoning event in the Balkans, and a total of 400 individuals perished within 233 separate poisoning or presumable poisoning incidents. **Common Buzzard** and **Red Fox** closely follow, with 392 individuals within 190 separate incidents and 389 individuals within 141 separate incidents respectively. Other more frequent victims of this illegal practice include **White-tailed Eagle**, which was recorded as a casualty in 75 separate incidents where 111 individuals got poisoned, **Marsh Harrier**, recorded in 31 separate incidents with 89 poisoned individuals and **Eurasian Wolf**, recorded in 40 separate incidents with 75 individuals found poisoned or presumably poisoned.

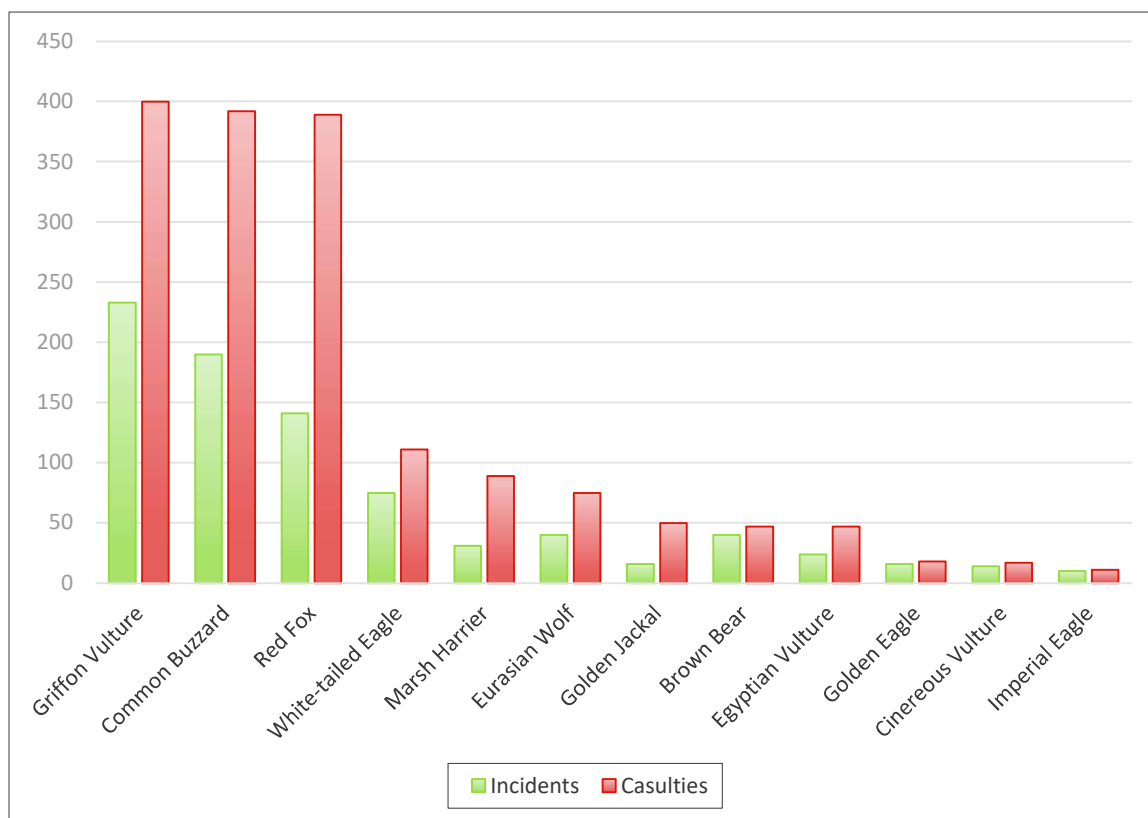


Figure 27. Common victims of wildlife poisoning in the Balkan Peninsula

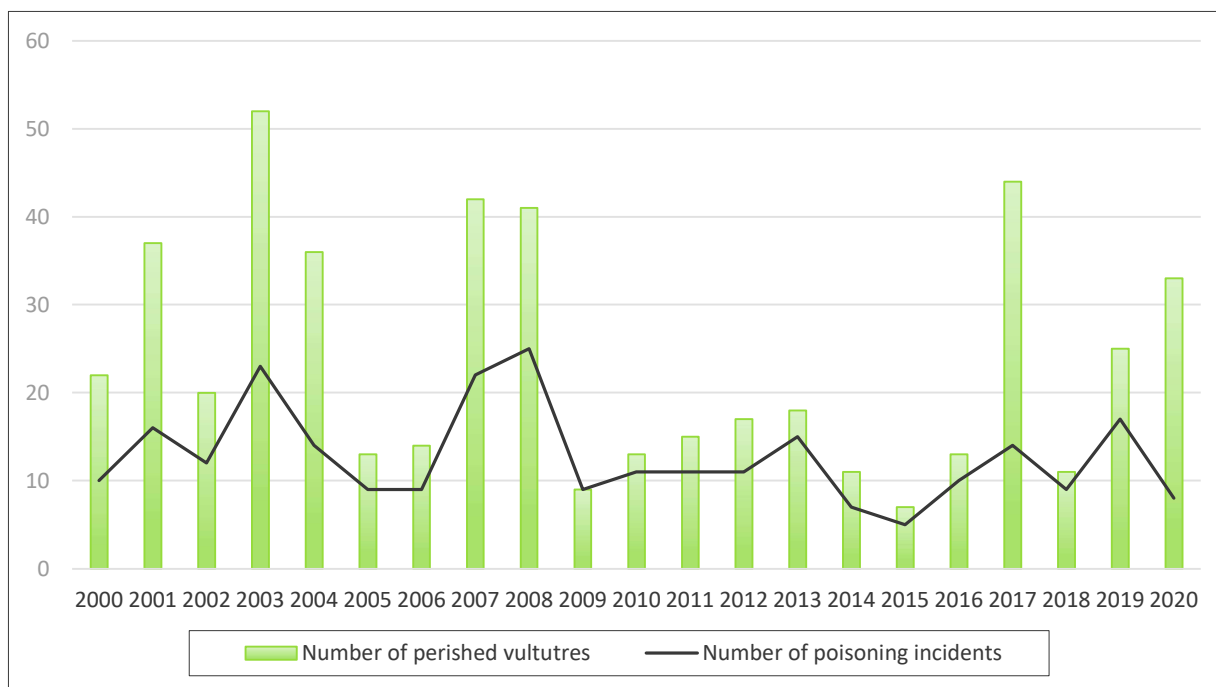


Figure 28. Vulture poisoning in the Balkan Peninsula from 2000-2020

Avian scavengers in general are a group of species which suffers the most from illegal wildlife poisoning, non-more so than vultures, which are recorded as casualties in every fourth incident. From the year 2000 to 2020 a total of 465 vultures perished in the Balkan Peninsula, including 47 Egyptian Vultures, 17 Cinereous Vultures and one Bearded Vulture. These data are not estimates, but concrete data obtained from poisoning and presumable poisoning events that occurred in the region, from which we can conclude that an average of 23 vultures are poisoned annually on the Balkan peninsula. If we take into account that approximately only 20 % of poisoning incidents are ever discovered and documented, we can estimate that about 115 vultures are potentially being poisoned annually throughout the Balkans. Such losses exert a heavy toll on the vulture populations of the region. Therefore, it is evident that wildlife poisoning continues to be the single most important threat to vultures in the Balkan Peninsula and current limiting factor for their recovery. This factor has to be taken into account when planning any conservation initiatives regarding vultures, especially re-stocking and reintroduction initiatives.

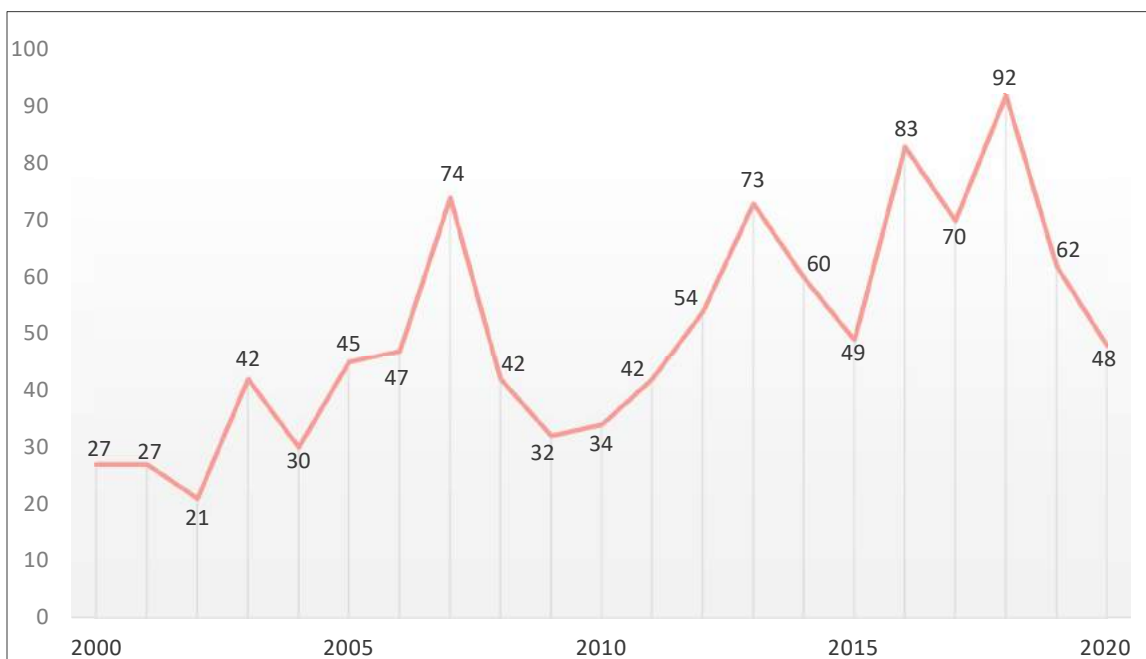


Figure 29. Number of poisoning events in the Balkan Peninsula within the research period

From the data analyzed for the purpose of this study we can conclude that wildlife poisoning generally shows an upward trend within this research period of 20 years, with highest peaks recorded in 2007 and 2018. In 2018 this practice reached its highest value, with 92 separate incidents recorded. This perceived increasing trend could be attributed to greater efforts being invested by national CSOs from the Balkans during the last 5 years in combating this illegal practice primarily through implementation of conservation projects and initiatives aimed on assessing its scope, spatial distribution, and actively combating this threat, which in turn results in more poisoning incidents being recorded. Further systematic monitoring on a regional level is recommended in order to be able to determine the actual trend of wildlife poisoning in the Balkans and the effect of conservation measures implemented in the region.

The steep drop in numbers of recorded poisoning events in the years that followed could be associated with the onset of the Covid19 pandemic and could be attributed to an overall reduction of activities in the field from many relevant stakeholders, but this can only be validated with new data in the years to come.

Motives behind wildlife poisoning in the Balkan Peninsula

Although the motives behind most of these incidents remain undiscovered, the majority of better documented and investigated poisoning events indicate that the main driver of poison use in the region are conflicts with mammalian predators (mainly wolves, foxes, jackals, but also bears, martens) and the damages they cause to livestock practices, agricultural production and to game animals in commercial hunting areas. Conflicts with mammalian predators are responsible for 164 individual poisoning events, which represents 16% of all recorded incidents in the region (Figure 30).

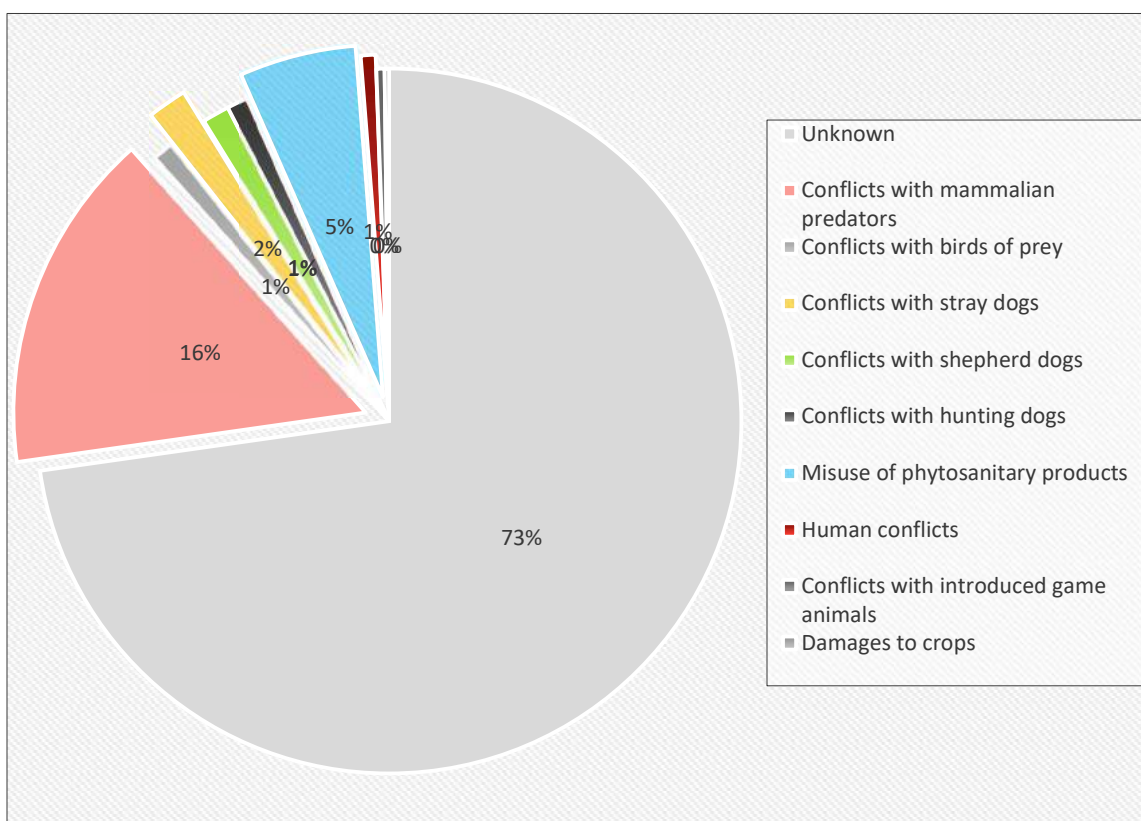


Figure 30. Drivers of wildlife poisoning in the Balkans

Poisons

The most used substances for wildlife poisoning in the Balkan peninsula by far are pesticides from the group of Carbamates, especially *Carbofuran*, which was detected in almost every second poisoning event (46%) for which forensic toxicological analysis was conducted (Figure 31). This banned pesticide was mostly used to prepare poison baits in Serbia, Croatia, followed by Greece and Bulgaria. The second compound from

this group most commonly used for poisoning is *Methomyl*, detected in every fifth poisoning event 21%), and is mostly used for wildlife poisoning in Greece. The use of these banned substances closely relates with illegal trafficking. These illegal substances are frequently advertised on the internet and occasionally sold publicly on markets in rural areas, indicating that a significant stockpile still exists, and that control of illegal trade of these substances does not represent a priority for relevant governmental enforcement agencies. *Potassium cyanide* also has a significant contribution in this practice, being responsible for 11% of the total number of poisoning events. The use of cyanide has so far only been recorded in Greece.

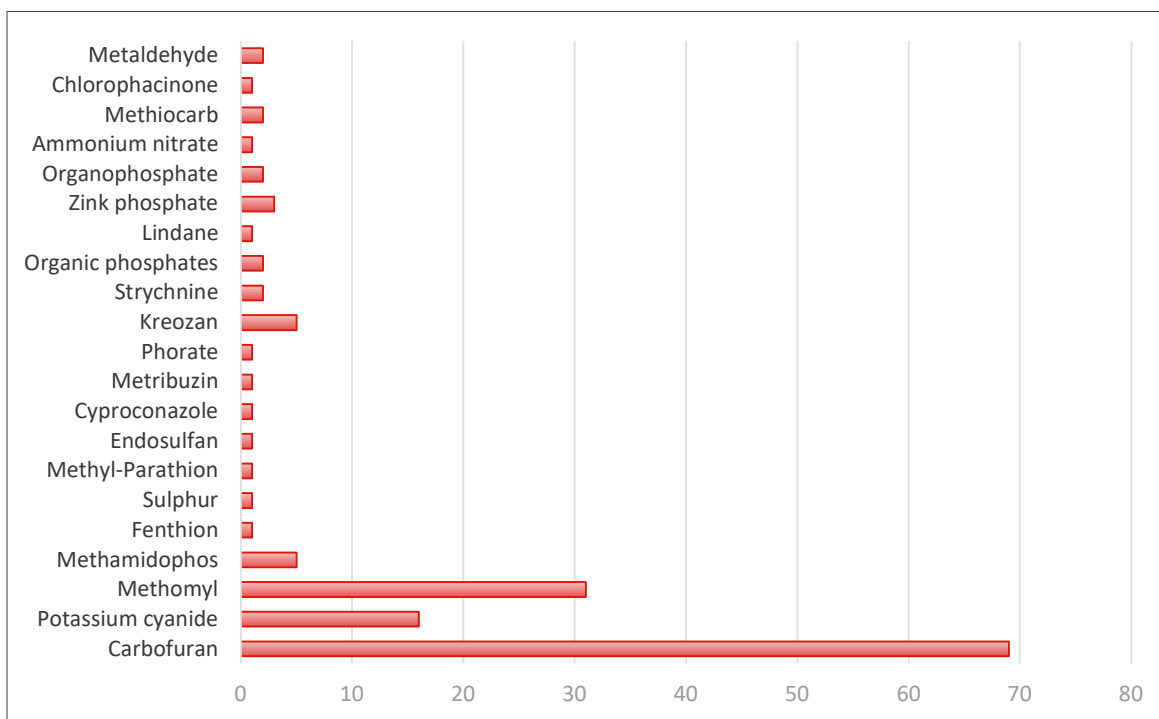


Figure 31. Toxic substances used for wildlife poisoning in the Balkan Peninsula

Why is wildlife poisoning difficult to tackle in the Balkans?

The main problems and difficulties in the struggle to reduce scope and frequency of occurrence of poisoning incidents (and the resulting casualties) in the Balkan Peninsula can mainly be attributed to:

➤ **Low awareness**

There is an evident lack of knowledge and awareness about the severity of wildlife poisoning and the threat that this type of environmental crime represents not only to wildlife (vultures in particular) and the fact that it is not only a nature conservation issue, but also a serious hazard for human health, and that it requires a multidisciplinary approach and joint efforts by multiple stakeholders in order to combat it. Low awareness is present not only amongst governmental institutions responsible for management of wildlife poisoning incidents, but also general public, which is why in many countries it has a low priority for enforcement agencies, judiciary system and consequently often inadequate penal consequences if any. In Albania for example, wildlife poisoning has just recently (2019) been recognized as a conservation issue and included in relevant national legislation as a prohibited activity.

Continuous awareness raising of general public, but also of governmental authorities is crucial for successful implementation of specific actions for detection of poison baits and poisoned animals in the field. These are the very first steps that need to be taken in order to address this most significant conservation issue for many wild species. Awareness raising actions should focus on highlighting the detrimental effects that this illegal practice has on endangered species and human health, importance of reporting potential poisoning events to the right authorities, deterrent measures and legal consequences that perpetrators face if they resort to this indiscriminate method of killing animals, and alternatives to the use of poison for sorting out conflicts with wildlife. From the survey about the perception of wildlife poisoning in rural communities in the different Balkan countries, it is evident that citizens are mostly unaware or uncertain to whom they should report potential poisoning incidents to. Additionally, it is evident that the majority of common citizens are reluctant to report potential poisoning incident for fear of conflicts within their own communities.

Even though this is not a problem affecting only the vulture guild, it is evident that vultures are perfect indicators for wildlife poisoning in the natural environment, especially Griffon Vultures (the most common vulture species in the region). Therefore, vulture conservation entities (Nature Conservation CSOs) have a key role in identification of the problem and awareness raising among all relevant decision makers and stakeholders.

➤ **Insufficient engagement of the relevant governmental authorities**

Having low awareness of the problem that wildlife poisoning represents, it is not surprising that relevant governmental authorities are poorly engaged in detection and

prevention of this type of environmental crime. In most of the Balkan countries wildlife poisoning is regarded as a serious threat for wildlife and human health mainly by CSOs. On the other hand, the use of poison baits as an indiscriminate method of extirpating animals is well defined in the existing national legislation in all Balkan countries as strictly forbidden and punishable according to the criminal or penal code of the country. Also, the use and proper procedures related to acquisition and application of various pesticides used in agriculture, which can be a significant source of unintentional poisoning, are well defined within the existing legislation. Therefore, much effort needs to be invested in engaging with relevant authorities and decision makers towards much stricter law enforcement.

One of the key stakeholders, especially in pre-investigation procedures, are police and environmental inspectorates and efforts need to be invested in engaging with them. Broadening the issue of poison use in the natural environment: associating it with the danger to the human health, the illegal traffic of banned substances or the illegal use of the allowed substances (pesticides) could help in raising the interest of the governmental institutions towards better law enforcement. Also, organizing specific training courses and educational seminars for investigation of wildlife poisoning in order to exchange best practice experience from countries which have a long tradition in effectively combating wildlife poisoning should be regarded as a priority. These training programmes, such as the Wildlife Crime Academy, which was established under the framework of the BalkanDetox LIFE project and with partnership with the Regional government of the Junta de Andalucía from Spain, are an excellent awareness raising and capacity building tool.

It is safe to say that enforcement of environmental laws has very low priority for the judiciary system in all the Balkan countries, which is why there are almost no convictions for wildlife poisoning or minimal sentences are carried out. Therefore, it is necessary that much more educational work, training and exchange of best practices from other countries is directed at public prosecutors and judges.

➤ **Vague legislation**

Unclear legislation is also an important reason for the low engagement of relevant governmental authorities in most of the Balkan countries. This is mainly associated with unclear responsibilities and jurisdictions. Therefore, more efficient, clear-cut standard operational protocols for describing responsibilities in reporting, investigation and management of cases of wildlife poisoning need to be developed and put to use. Modification of the existing protocols in line with best practice examples from countries

with significant experience regarding wildlife poisoning, and their official endorsement would be a good solution for this. Also, communication and information exchange between responsible institutions and sectors related to jurisdiction, responsibilities need to be enhanced in order to facilitate further judiciary proceedings of wildlife poisoning incidents.

Despite the prohibition of the use of poison baits and substances for extirpation of animals, which is a fundamental decision, what is required first of all is the recognition of the extent and the severity of the problem. For this purpose, it is necessary to develop regional databases and unified national databases, containing information about all documented poisoning incidents. Furthermore, the designation of national anti-poisoning strategies will contribute to this direction. In this way, the existing prohibition will be accompanied by a context of actions with the necessary connection of relevant organizations and authorities.

➤ **Lack of resources and capacities**

It is evident that there is a significant lack of knowledge in the Balkan countries when it comes to dealing with poisoning incidents on several levels: detection (surveying for poison baits or dead animals), sampling, conduction of forensic necropsies and toxicological analysis, and finally judiciary process and legal proceedings of poisoning incidents.

Significant efforts need to be invested in improving pre-investigation procedures. Standard operational procedures for investigation, forensic necropsy and toxicology need to be developed, or existing ones improved, to facilitate the work of law enforcement agents in the field.

According to the legislation of most of the Balkan countries (North Macedonia, Croatia, Serbia, B&H), official toxicological analysis can only be conducted by designated governmental laboratories and their results are the only ones valid for court proceedings. Lack of resources is mainly associated with insufficient funds available from the government and lack of necessary equipment for conduction of a broader spectrum of toxicological analysis, which is a prerequisite for further official legal proceedings of wildlife poisoning cases. In some countries (North Macedonia, Bosnia and Herzegovina, Albania) there isn't a referent national laboratory officially designated by the government for these purposes which complicates the issue. Therefore, additional referent laboratories need to be established either by creating new ones or accrediting existing laboratories. Also, in some countries, such as Greece, Bosnia and Herzegovina, recruitment of additional staff is a priority as existing capacities are not

sufficient for covering the needed toxicological analysis. On the other hand, it is important to note that in most countries there is sufficient staff expertise within these institutions for conducting basic necropsies and toxicological analysis, but additional training and exchange of best practice experience from other countries would be beneficial. Toxicological analysis should be performed promptly in order to diagnose poisoning. Without the results of these tests, which are the soundest evidence that the animal died of poisoning or any other cause, even if the poisoning incidents end up to court, they cannot be finally prosecuted.

RECOMMENDATIONS

Albania

Increase and improve relevant information about wildlife poisoning:

- Wildlife poisoning became a focus of conservation work in Albania in 2018. Since then, efforts have been invested into documentation of the current scope, as well as research into the historical scope of this practice in the country. Further efforts are needed for monitoring and documenting all potential drivers of wildlife poisoning in order to ascertain the realistic scope of this environmental crime in Albania, its effect on wild species, and potential new hotspots for this illegal practice. Data from Albania have been integrated into the regional Poison Incident Database which significantly facilitates this process.

Advocate for adaptation and improvement of current national legal framework:

- Wildlife poisoning has officially been defined as an illegal activity in Albania only in 2019, with the amendments made to the national Law on Fauna Protection by the Albanian Ornithological Society. Further efforts are needed to precisely define this type of environmental crime in the Penal or Criminal code of the country.
- Adoption of the National Anti-poisoning Road Map, which is relevant to the specific issues occurring in the country, and its incorporation into the newly amended national legislation relevant for wildlife poisoning.

- Standard operational protocols for investigation procedures, conduction of forensic necropsy and toxicological analysis of poisoning incidents are needed for facilitating the work of relevant governmental authorities responsible for dealing with this type of environmental crime.
- Designate a referent laboratory, within existing institutions, for processing cases of wildlife poisoning and conduction of forensic toxicological analysis.

Awareness raising activities:

- Additional efforts need to be made to raise awareness of the general public and governmental authorities of the problem doing so by means of media campaigns and promotional work. Awareness raising activities should focus on the importance of reporting potential poisoning events to the relevant authorities and the harmful effects that this illegal practice has on numerous species and human health.
- Continue with conducting environmental campaigns targeting all stakeholders relevant to potential use of poison baits and substances in the environment. These campaigns should stress the impact of poisons on threatened species and human health risks, plus the penalties which can apply, as well as the benefits of the presence of predators and scavengers in the ecosystem.

Capacity building and networking:

- Significant efforts need to be invested towards capacity building and provision of specific training of legal and technical personnel and law enforcement officers of the governmental authorities relevant for wildlife poisoning. Training ranging from detection of poison baits and poisoned animals in the field, conduction of forensic necropsies and toxicological analysis to prosecution and legal proceeding of poisoning incidents are essential.

Bosnia and Hercegovina

Increase and improve relevant information about wildlife poisoning:

- Long-term monitoring regarding the frequency and nature of occurrence of wildlife poisoning incidents needs to be set up in order to be able to adequately assess the actual impact of this illegal practice on the countries' wildlife, identify the most common drivers behind poison use and groups responsible. Priority should be given to those areas of the country where predator populations are abundant and where livestock losses are most frequent, because in such areas intentional poisoning most often occurs.
- Data from Bosnia and Herzegovina have been integrated into the regional Poison Incident Database which enables the user to assess the scope and severity of wildlife poisoning, as well as to define potential hotspots for these illegal activities and plan appropriate conservation actions. Efforts need to be invested into collection of any available data about poisoning and documentation of potential poisoning events.

Awareness raising activities:

- Additional efforts need to be made to raise awareness of the general public and governmental authorities of the problem doing so by means of media campaigns and promotional work. Awareness raising activities should focus on the importance of reporting potential poisoning events to the relevant authorities and the harmful effects that this illegal practice has on numerous species and human health.
- Continue with conducting environmental campaigns targeting all stakeholders relevant to potential use of poison baits and substances in the environment. These campaigns should stress the impact of poisons on threatened species and human health risks, plus the penalties which can apply, as well as the benefits of the presence of predators and scavengers in the ecosystem.

Advocate better law enforcement, adaptation and improvement of current national legal framework:

- Adoption of the National Anti-poisoning Road Map, which is relevant to the specific issues occurring in the country, and its incorporation into national legislation relevant for wildlife poisoning.
- Standard operational protocols for investigation procedures, conduction of forensic necropsy and toxicological analysis of poisoning incidents are needed for facilitating the work of relevant governmental authorities responsible for dealing with this type of environmental crime. An additional and specific difficulty in B&H is the complicated bureaucratic apparatus, involving federal,

- entity-level and cantonal governments with often conflicting legislation and unclear jurisdiction.
- Establish better cooperation and information exchange between relevant governmental institutions and NGOs in order to ensure more efficient enforcement of relevant national legislation.
 - Designate a referent laboratory, within existing institutions, for processing cases of wildlife poisoning and conduction of forensic toxicological analysis.

Capacity building and networking:

- Significant efforts are needed towards capacity building and training of legal and technical personnel and law enforcement officers of the governmental authorities related to this matter, as well as the personnel of relevant CSOs. Training ranging from detection of poison baits and poisoned animals in the field, conduction of toxicological analysis to prosecution and legal proceeding of poisoning incidents are essential.
- Encourage cooperation and coordination between various sectors involved, including experts of the Environmental authorities, public prosecutors, law enforcement officers, environmental CSOs, hunting associations, farming associations and the media on all levels (federal, entity-level, cantonal).
- Set up channels for fluid exchange of information with the law enforcement officials, Public Prosecutors' Office with other relevant governmental authorities and CSOs to coordinate joint action.

Bulgaria

Nature conservation organizations in Bulgaria have been very active in the field of vulture conservation for the past 20 years, including the struggle with illegal poisoning as the most important conservation issues for these scavengers. The course of implementation of projects and initiatives related to vulture conservation in Bulgaria have defined the following activities as priority actions to be developed and implemented in the future in order to combat wildlife poisoning more effectively on a national scale.

Advocate better law enforcement, adaptation and improvement of current national legal framework:

- Improve the legislation related to wildlife poisoning and vulture conservation towards stricter penalties and legal ramifications.
- Develop a commonly agreed and legal protocol for responsible authorities related to legal processing of wildlife poisoning cases, responsibilities and jurisdiction of all responsible governmental institutions.
- Enforcement of the recently endorsed National Action plan against wildlife poisoning in Bulgaria.

Capacity building and networking:

- Significant efforts are needed towards capacity building and training of legal and technical personnel and law enforcement officers of the governmental authorities related to this matter. Training ranging from detection of poison baits and poisoned animals in the field, conduction of toxicological analysis to prosecution and legal proceeding of poisoning incidents are essential.
- Encourage cooperation and coordination between various sectors involved, including experts of the Environmental authorities, public prosecutors, law enforcement officers, environmental CSOs, hunting associations, farming associations and the media on all levels (federal, entity-level, cantonal).

Awareness raising activities:

- Continue to raise awareness of the general public and governmental authorities of the problem doing so by means of media campaigns and promotional work.
- Continue to conduct environmental education campaigns about the impact of poisons on threatened species and human health risks, plus the penalties which can apply, as well as the benefits of the presence of predators in the ecosystem, targeting livestock breeders, hunters, gamekeepers and other stakeholders relevant to potential use of poison baits in the environment.

Active conservation measures:

- Continue with the introduction and reinforcement of wild ungulates species (Ibex, Fallow Deer, Chamois, Red deer) to provide natural prey for the predators and vultures and to decrease losses of livestock.
- Advocate for shifting from sheep and goats to cattle raising in certain areas, which would further decrease losses of livestock due to predation by mammalian predators.
- Establish a network of Permanent safe supplementary feeding sites for avian scavengers in the country.
- Continue with active detection and surveillance of the use of poison baits in the environment using Canine Teams and GPS tracked vultures.

Croatia

Awareness raising activities:

- Significant efforts need to be made towards raising awareness of the general public and governmental authorities of the magnitude of the problem with illegal poisoning and addressing the conflict between social groups involved is a way to prevent poisoning. If the specific drivers for the use of poison baits are eliminated, then the incidents of poisoning will be reduced. Awareness raising activities should also focus on the importance of reporting potential poisoning events to the relevant authorities.
- Conduct environmental education campaigns targeting all stakeholders relevant to potential use of poison baits and substances in the environment. These campaigns should stress the impact of poisons on threatened species and human health risks, plus the penalties which can apply, as well as the benefits of the presence of predators and scavengers in the ecosystem.

Advocate better law enforcement, adaptation and improvement of current national legal framework:

- Adopt National Anti-poisoning Road Map, relevant to the specific issues occurring in the country, and advocate for its incorporation into the national legislation.
- Standard operational protocols for investigation procedures, conduction of forensic necropsy and toxicological analysis of poisoning incidents are needed for facilitating the work of relevant governmental authorities responsible for dealing with this type of environmental crime.
- Advocate for the enforcement of the ministerial decision to eradicate introduced and invasive game animals on island ecosystems, as conflicts with those animals are the main reason for the use of poison, which threatens the remaining Griffon Vulture population in the country.

Increase and improve relevant information about wildlife poisoning:

- Data from Croatia have been integrated into the regional Poison Incident Database which enables the user to assess the scope and severity of wildlife poisoning, as well as to define potential hotspots for these illegal activities and plan appropriate conservation actions. Efforts need to be invested into collection of any available data about poisoning and documentation of potential poisoning events.

Capacity building and networking:

- Efforts are needed towards capacity building and training of legal and technical personnel and law enforcement officers of the governmental authorities related to this matter. Training ranging from detection of poison baits and poisoned animals in the field, conduction of toxicological analysis to prosecution and legal proceeding of poisoning incidents are essential.
- Encourage improvement of cooperation and coordination between various sectors involved, including experts of the Environmental authorities, public prosecutors, law enforcement officers, environmental CSOs, hunting associations, farming associations and the media.
- Set up channels for fluid exchange of information with the law enforcement officials, Public Prosecutors' Office with other relevant governmental authorities and CSOs to coordinate joint action.

Greece

Nature conservation organizations in Greece have been very active in combating wildlife poisoning, including the use of several Canine Teams, establishment of a national Task Force devoted to combating wildlife poisoning and a centralized database for wildlife poisoning, which has been expanded to other countries from the region. They have also lobbied and advocated for the endorsement of laws and species actions plans that address the problem of poison bait use. The course of implementation of projects and conservation initiatives related to reducing the threat of poisoning for vultures and other affected species have defined the following activities as priority actions to be developed and implemented in the future.

Advocate better law enforcement, adaptation and improvement of current national legal framework:

- Develop operational protocols for responsible authorities related to management of wildlife poisoning cases, responsibilities and jurisdiction of all responsible governmental institutions and advocate for their official endorsement by relevant governmental authorities.
- Advocate for improvement and upgrade of the MD for Local Action Plans against wildlife poisoning to JMD as well as the official governmental endorsement of a National Anti-poisoning strategy.
- Advocate for more efficient management of poisoning incidents by governmental authorities: In most cases, the competent authorities do not deal with poisoning events due to lack of staff, expertise, and awareness of the problem.
- Advocate for introduction of stricter and heftier fines and penal sanctions for perpetrators found guilty of wildlife poisoning into the existing national legislation as an important deterrent measure against this illegal practice.

Capacity building and networking:

- Efforts are needed towards capacity building and training of legal and technical personnel and law enforcement officers of the governmental authorities related to this matter. Training ranging from detection of poison baits and poisoned animals in the field, conduction of necropsies and toxicological analysis to prosecution and legal proceeding of poisoning incidents are essential.

- Improvement of existing human resources, infrastructures and equipment of the referent national toxicological laboratory, recruiting additional staff, particularly for forensic necropsies. Establish a new, second, referent toxicological laboratory in the north of Greece to be able to process more poisoning incidents.
- Encourage improvement of cooperation and coordination between various sectors involved, including experts of the Environmental authorities, public prosecutors, law enforcement officers, environmental CSOs, hunting associations, farming associations and the media.
- Set up channels for fluid exchange of information with the law enforcement officials, Public Prosecutors' Office with other relevant governmental authorities and CSOs to coordinate joint action.

Active conservation measures:

- Increase efforts to promote and enforce application of preventive measures: granting subsidies for electric fences is recommended in order to protect livestock capital from wildlife predation, as well as for usage of Greek shepherd dogs as livestock guards.
- Improve the compensation system for damages to crop production and livestock.
- Increase efforts towards warding: In poison hotspot areas or those that host species vulnerable to poisoning joint patrols should be carried out systematically by wardens, gamekeepers and rangers of the management bodies of protected areas in order to deter people from using them as well as to increase chances of locating poison baits or poisoned animals.

Awareness raising activities:

- Significant efforts need to be made towards raising awareness of the general public and governmental authorities of the magnitude of the problem with illegal poisoning and addressing the conflict between social groups involved is a way to prevent poisoning. If the drivers for the use of poison baits are eliminated, then the incidents of poisoning will be reduced.
- Conduct environmental education campaigns targeting all stakeholders relevant to potential use of poison baits and substances in the environment. These campaigns should stress the impact of poisons on threatened species and

human health risks, plus the penalties which can apply, as well as the benefits of the presence of predators and scavengers in the ecosystem.

North Macedonia

Advocate better law enforcement, adaptation and improvement of current national legal framework:

- Adoption of the National Anti-poisoning Road Map, relevant to the specific issues occurring in the country, and advocate for its incorporation in the national legislation.
- Standard operational protocols for investigation procedures, conduction of forensic necropsy and toxicological analysis of poisoning incidents are needed for facilitating the work of relevant governmental authorities responsible for dealing with this type of environmental crime.
- Develop Accredited protocols/Standard Operational Procedures (SOP) and security measures in sampling and processing poisoned animals.
- Development of organized systems and protocols related to reporting, collecting and disposal of dead animals is needed.
- Designate a referent laboratory, within existing institutions, for processing cases of wildlife poisoning and conduction of forensic toxicological analysis.

Awareness raising activities:

- Significant efforts need to be made towards raising awareness of the general public and governmental authorities of the magnitude of the problem with illegal poisoning and addressing the conflict between social groups involved is a way to prevent poisoning. If the drivers for the use of poison baits are eliminated, then the incidents of poisoning will be reduced.
- Conduct environmental education campaigns targeting all stakeholders relevant to potential use of poison baits and substances in the environment. These campaigns should stress the impact of poisons on threatened species and human health risks, the importance of reporting potential poisoning events to the relevant authorities, deterrent measures foreseen under the national legislation,

as well as the benefits of the presence of predators and scavengers in the ecosystem.

Capacity building and networking:

- Efforts are needed towards capacity building and training of legal and technical personnel and law enforcement officers of the governmental authorities related to this matter. Training ranging from detection of poison baits and poisoned animals in the field, conduction of toxicological analysis to prosecution and legal proceeding of poisoning incidents are essential.
- Encourage improvement of cooperation and coordination between various sectors involved, including experts of the Environmental authorities, public prosecutors, law enforcement officers, environmental NGOs, hunting associations, farming associations and the media.
- Set up channels for fluid exchange of information with the law enforcement officials, Public Prosecutors' Office with other relevant governmental authorities and NGOs to coordinate joint action.

Serbia

Advocate better law enforcement, adaptation and improvement of current national legal framework:

- Adoption of the National Anti-poisoning Road Map, relevant to the specific issues occurring in the country, and advocate for its incorporation in the national legislation.
- Standard operational protocols for investigation procedures, conduction of forensic necropsy and toxicological analysis of poisoning incidents are needed for facilitating the work of relevant governmental authorities responsible for dealing with this type of environmental crime.
- Advocate for enforcement of stricter deterrence measures, such as higher penal and criminal penalties.
- Advocate for more efficient management of poisoning incidents by governmental authorities: In most cases, the competent authorities do not deal

with poisoning events due to lack of staff, expertise, and awareness of the problem.

Awareness raising activities:

- Continue with conducting awareness raising activities and media campaigns towards the general public and governmental authorities of the magnitude of the problem with illegal poisoning and the importance of reporting potential poisoning event to the relevant authorities.
- Conduct environmental education campaigns targeting all stakeholders relevant to potential use of poison baits and substances in the environment. These campaigns should stress the impact of poisons on threatened species and human health risks, plus the penalties which can apply, as well as the benefits of the presence of predators and scavengers in the ecosystem.

Capacity building and networking:

- Efforts are needed towards capacity building and training of legal and technical personnel and law enforcement officers of the governmental authorities related to this matter. Training ranging from detection of poison baits and poisoned animals in the field, conduction of toxicological analysis to prosecution and legal proceeding of poisoning incidents are essential.
- Encourage improvement of cooperation and coordination between various sectors involved, including experts of the Environmental authorities, public prosecutors, law enforcement officers, environmental NGOs, hunting associations, farming associations and the media.
- Set up channels for fluid exchange of information with the law enforcement officials, Public Prosecutors' Office with other relevant governmental authorities and NGOs to coordinate joint action.

Active conservation measures:

- Increase efforts towards warding: In poison hot spot areas or those that host species vulnerable to poisoning joint patrols should be carried out systematically by wardens, gamekeepers and rangers of the management bodies of protected areas in order to deter people from using them as well as to increase chances of locating poison baits or poisoned animals.

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ANNEXES

Annex I. Overview of poisoning incidents in Albania confirmed by toxicological analysis.

Species	No. of poisoned individuals	Date/Period	Location	Type of poisoning	Main driver	Substance
Eurasian Wolf	6	2007*	Kukes	intentional	conflict with predators/protection of livestock	Strychnine
Eurasian Wolf	3	2018*	Tepelene	unknown	unknown	Organic phosphates
Eurasian Brown bear	4	2019*	Puke	intentional	conflict with predators/protection of beehives	Organic phosphates
Red Fox; Cats	1; 4	08.06.2020.	Kavajë	intentional	conflict with foxes	Methomyl 90 sp
Red Fox; Pet dogs; Cats	1; 1; 1	14.06.2020.	Kavajë	intentional	conflict with foxes	Methomyl 90 sp

* number of poisoned animals relates to the period of the entire year, not just one single poisoning incident;

Annex II. Perception of the illegal practice of wildlife poisoning in local communities in Albania – baseline report.

1. METHODOLOGY

1.1. Project background

The BalkanDetox LIFE project (LIFE19GIE/NL/001016) - Strengthening national capacities to fight wildlife poisoning and raise awareness about the problem in the Balkan countries is a project that is dedicated to the fight against illegal poisoning of wild animals which local citizens usually consider as pests, but which has serious negative consequences for the population of numerous endangered animal species, primarily vultures which eat poisoned animals or eat the poison themselves.

The study will be conducted in two waves in 2021 and 2025, as base line and follow up study aimed at measuring the current attitudes and practices, and attitudes and practices of target groups after the implementation of planned campaign and activities.

The project is being implemented at the multinational level in the Balkan region. The countries involved are Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Greece, North Macedonia, and Serbia.

1.2. Key research topics

In this first phase, the aims of the research are:

- Measuring awareness of target groups (hunters, farmers, livestock breeders) about endangered species (vultures), methods of poisoning and individuals or groups responsible for poisoning on the territories of their respective countries.
- Measuring the current attitudes and practices of target groups connected with illegal poisoning of endangered species i.e., vultures.

1.3. Methodological approach

1.3.1. Research technique

Quantitative research of the targeted groups in Albania conducted by face-to-face PAPI (Paper and Pen Interviewing) and CAWI (Computer Assisted Web Interviewing) techniques.

1.3.2. Fieldwork

The fieldwork is conducted from September the 18th to October the 21st in 2021.

1.3.3. Questionnaire length

Questionnaire length up to 10 minutes.

1.3.4. Sample - target group

The target group in the research were hunters, farmers and livestock breeders on the territory of Albania, which perform their activities in the areas where vultures exist as members of endangered species.

The research included 100 respondents, part of which participated in the research after the workshops on the topic of protection of vultures from wildlife poisoning.

1.3.5 Sample Structure

Chart 1.1. Age structure

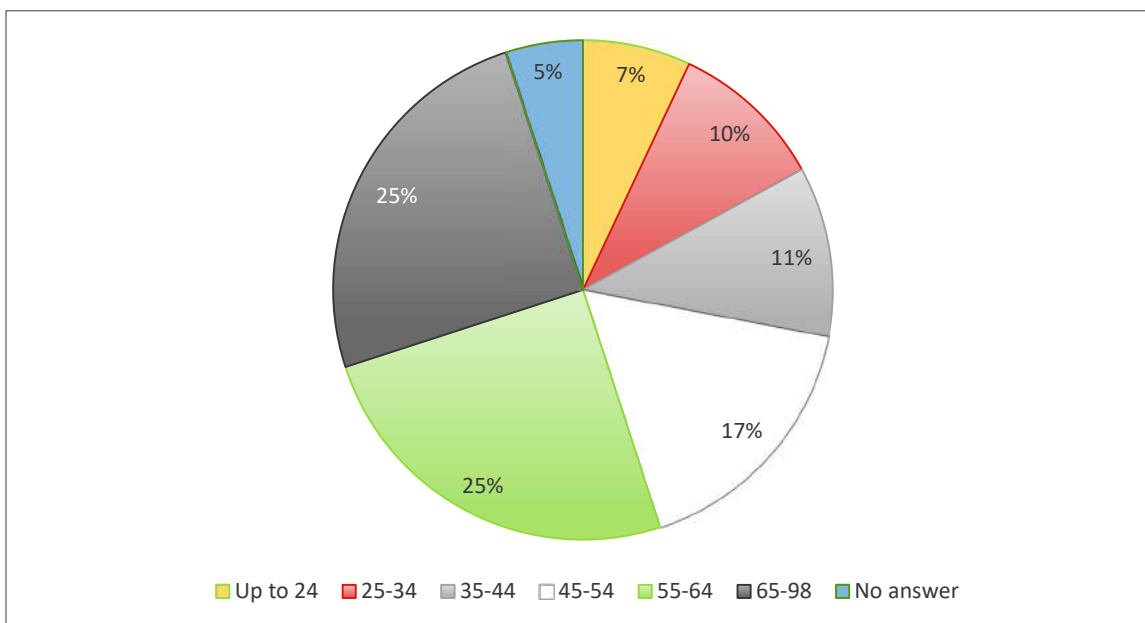


Chart 1.2. Gender

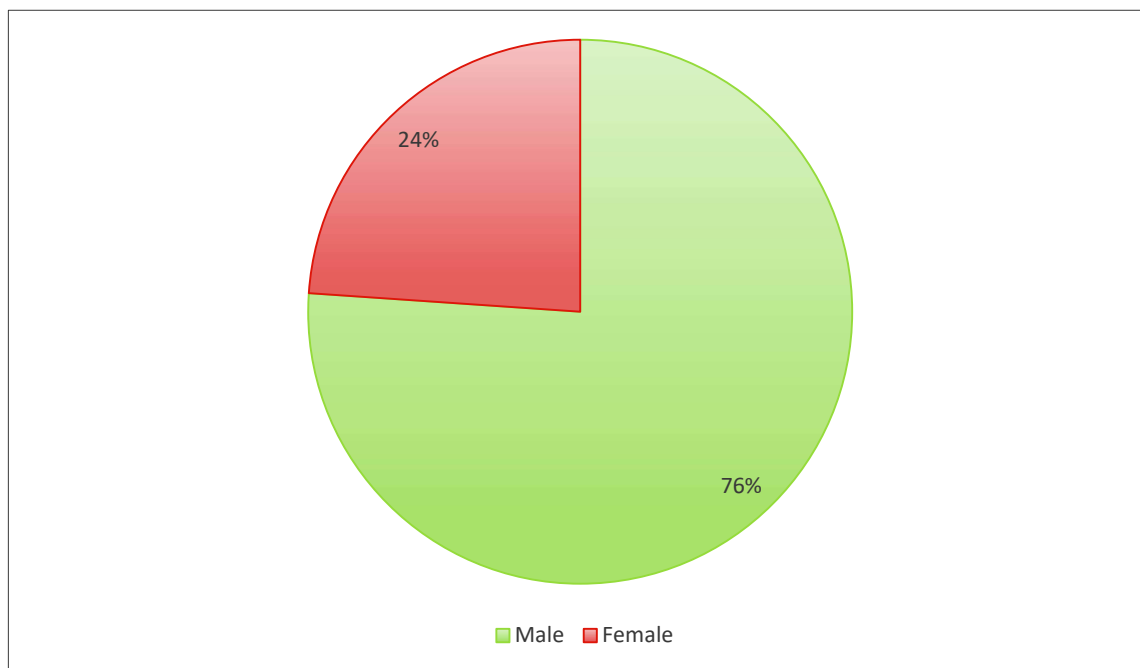


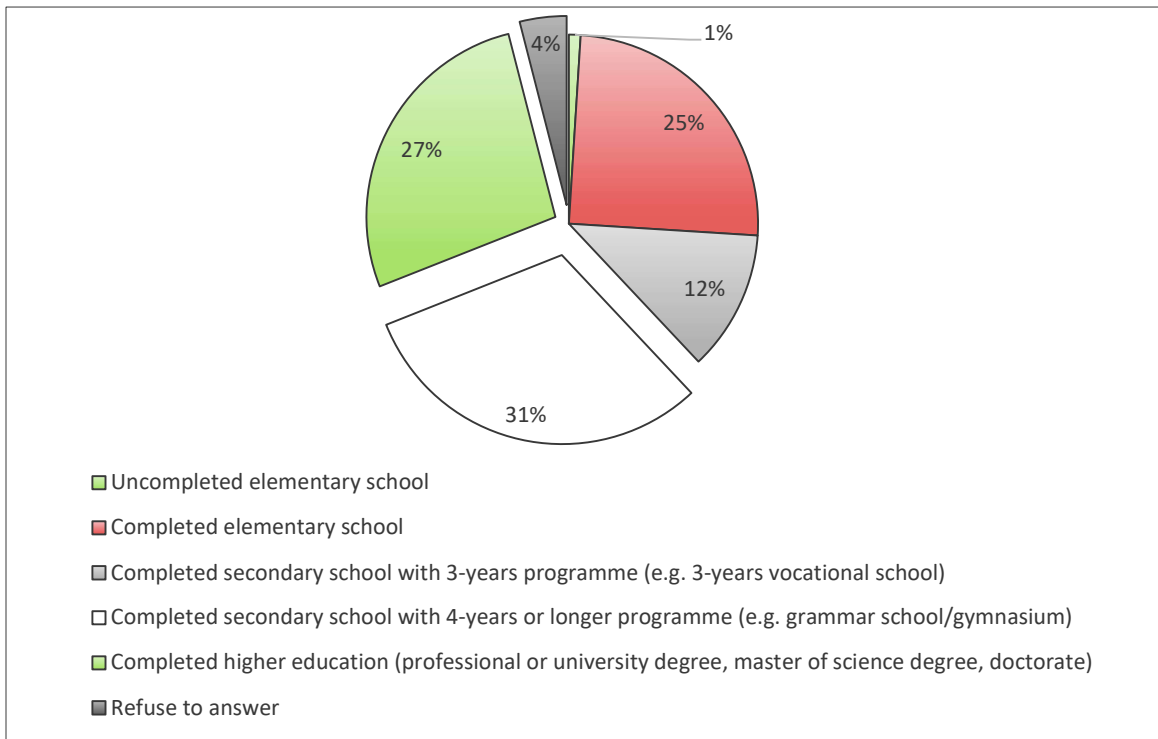
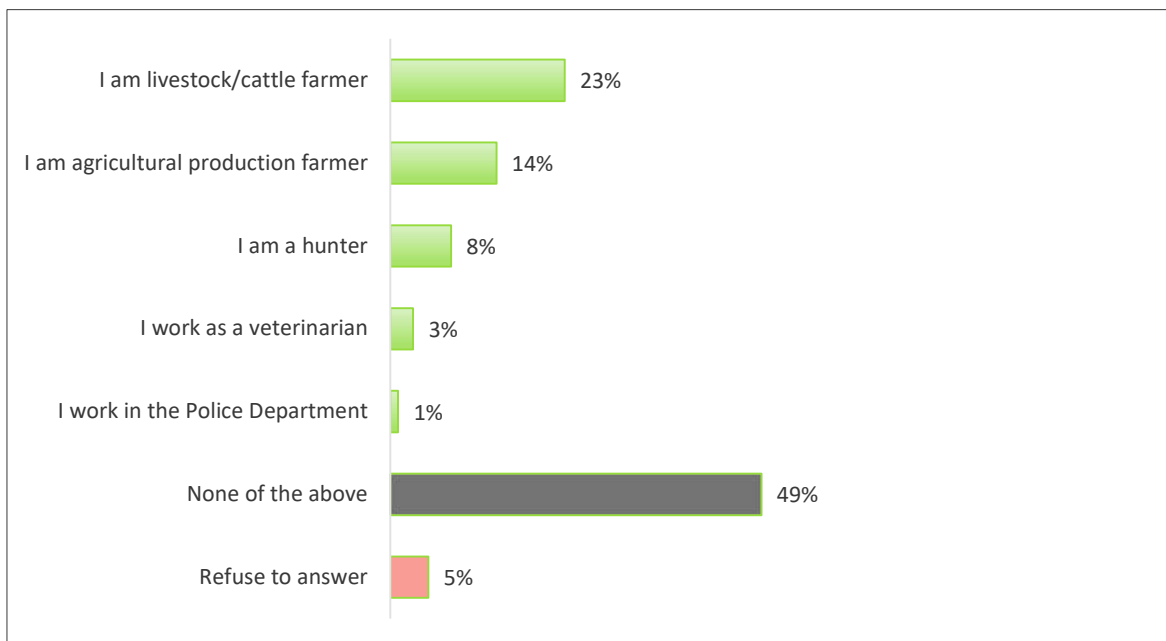
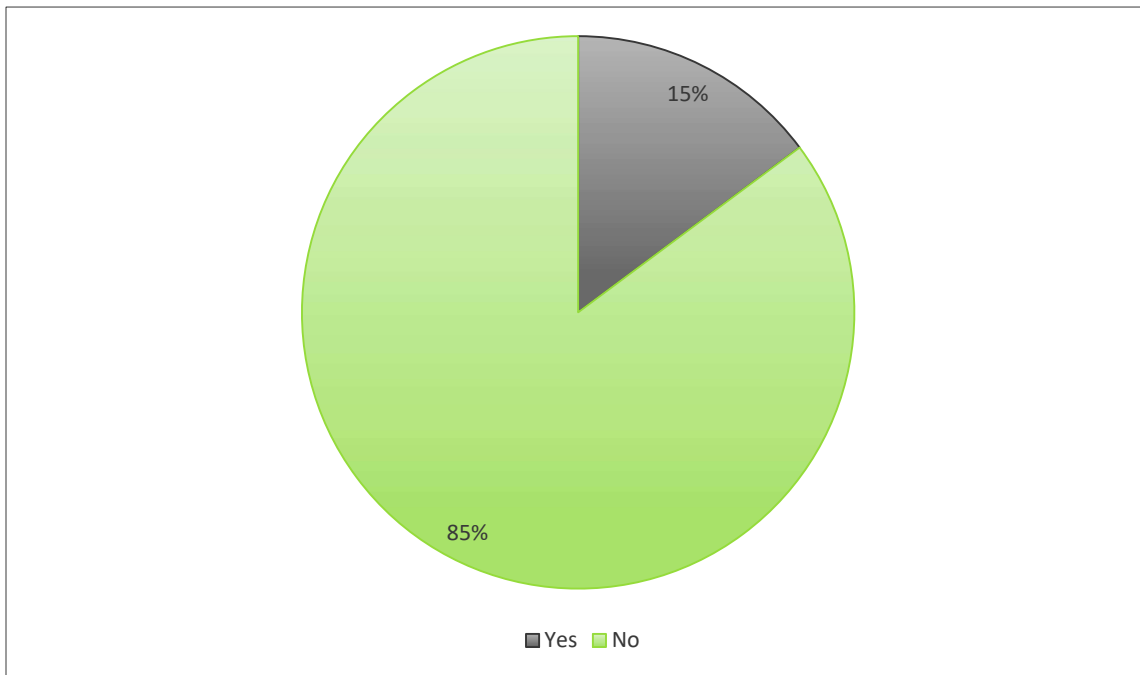
Chart 1.3. Education*Chart 1.4. Jobs connected with nature*

Chart 1.5. Hunting community

Base: Hunters, 27 respondents

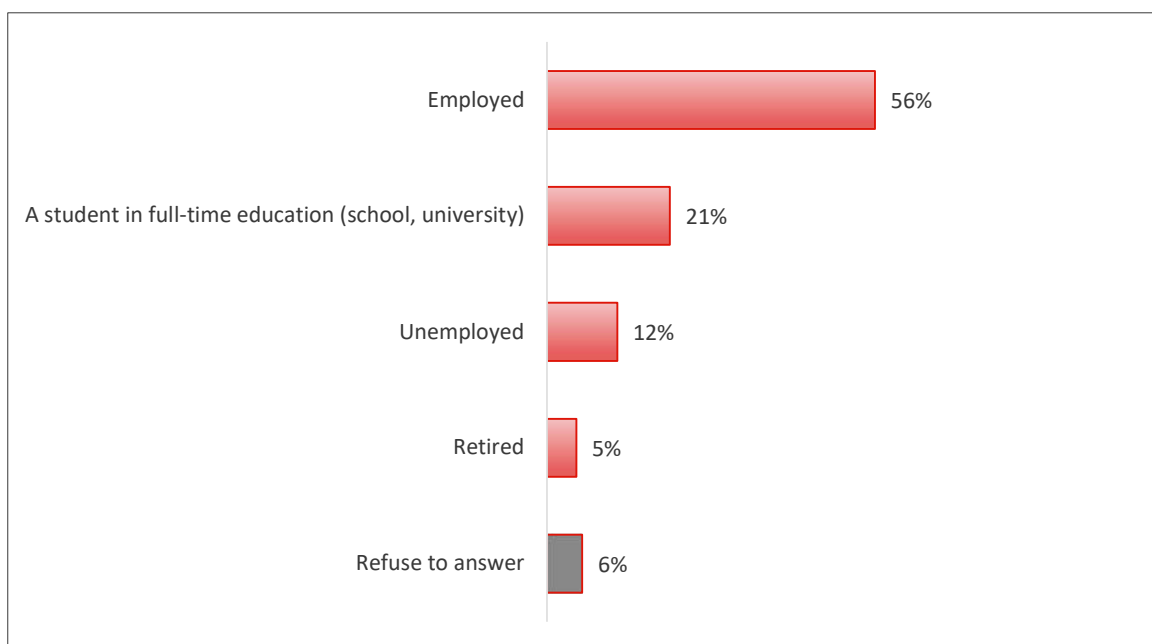
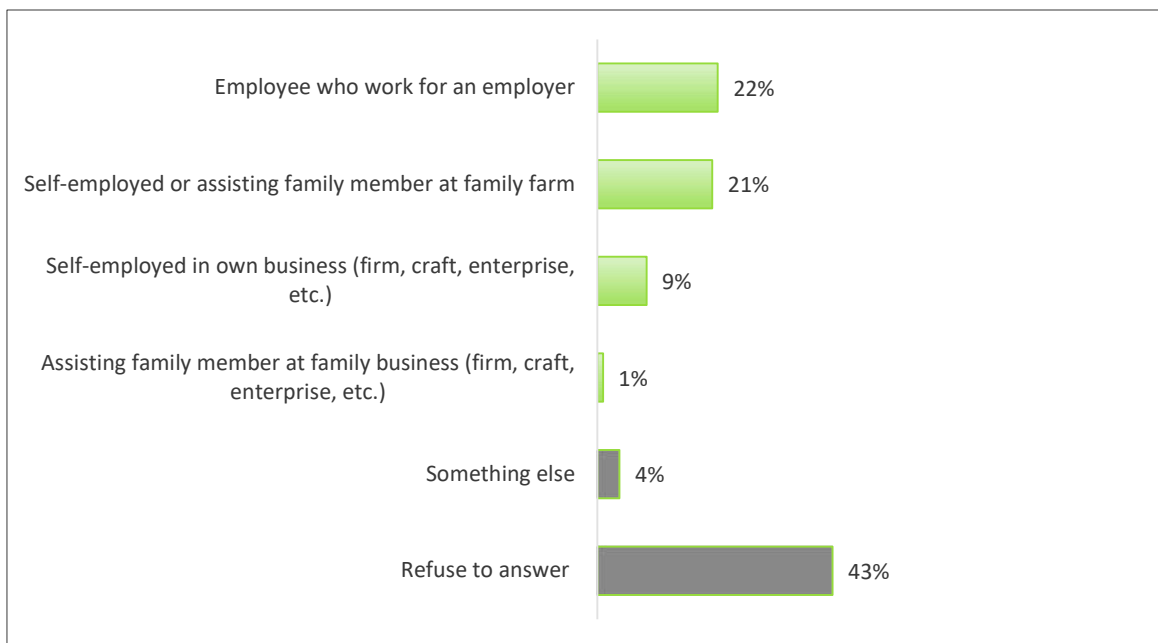
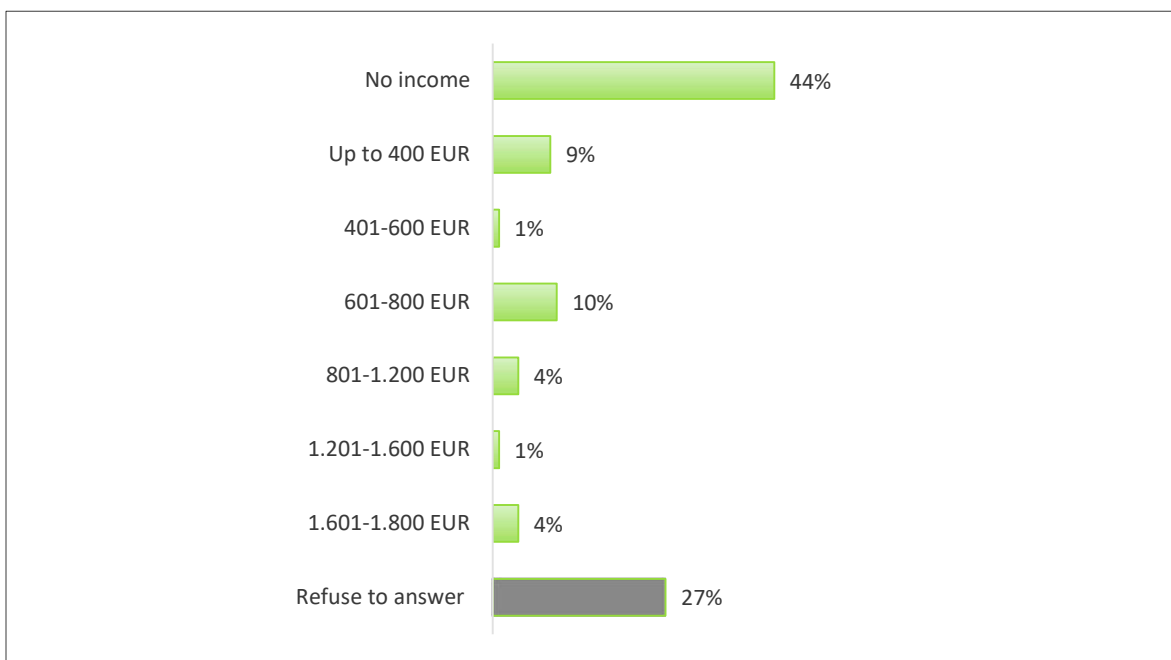
Chart 1.6. Employment status

Chart 1.7. Type of employment*Chart 1.8. Average monthly income of the household*

Close to three out of four of respondents are men (76%), and the rest of the sample is consisted of women (24%).

Regarding age structure, categories 55-64 and 65 years of age and above are the most represented in the sample and equal in the percentage of respondents (25%). There are 17% of respondents who are between 45 and 54 years old. The rest of the sample is younger than 45 years.

The largest number of respondents completed secondary school with 4-years or longer programme (31%). This category is followed by respondents who completed higher education and those who completed elementary school (27% and 25%, respectively).

Regarding respondents who have some type of job which is connected with nature, the largest number of them are livestock breeders (23%). They are followed by agricultural production farmers (14%) and hunters (8%). The smallest number of respondents work as a veterinarian (3%) and in the Police Department (1%). However, the largest number of respondents are employed in some other jobs (49%).

Among hunters, 85% of them aren't members of any hunting community.

Speaking of work status of respondents, more than a half of them are employed (56%). One fifth of the sample is consisted of students and 12% of respondents are unemployed.

The significant number of respondents claim having no income (44%). Categories of people who have average monthly income of 601-800 EUR and up to 400 EUR are almost equal in size (10% and 9%, respectively).

1.3.6 Notes on data presentation and analysis

1.3.6.1 Indication of statistical significance

Statistical significance helps us to determine whether the result reflects real differences between groups (in this case female and male respondents, different age categories ...) and whether the obtained differences can be generalized to the entire sample population or should be treated as a consequence of chance.

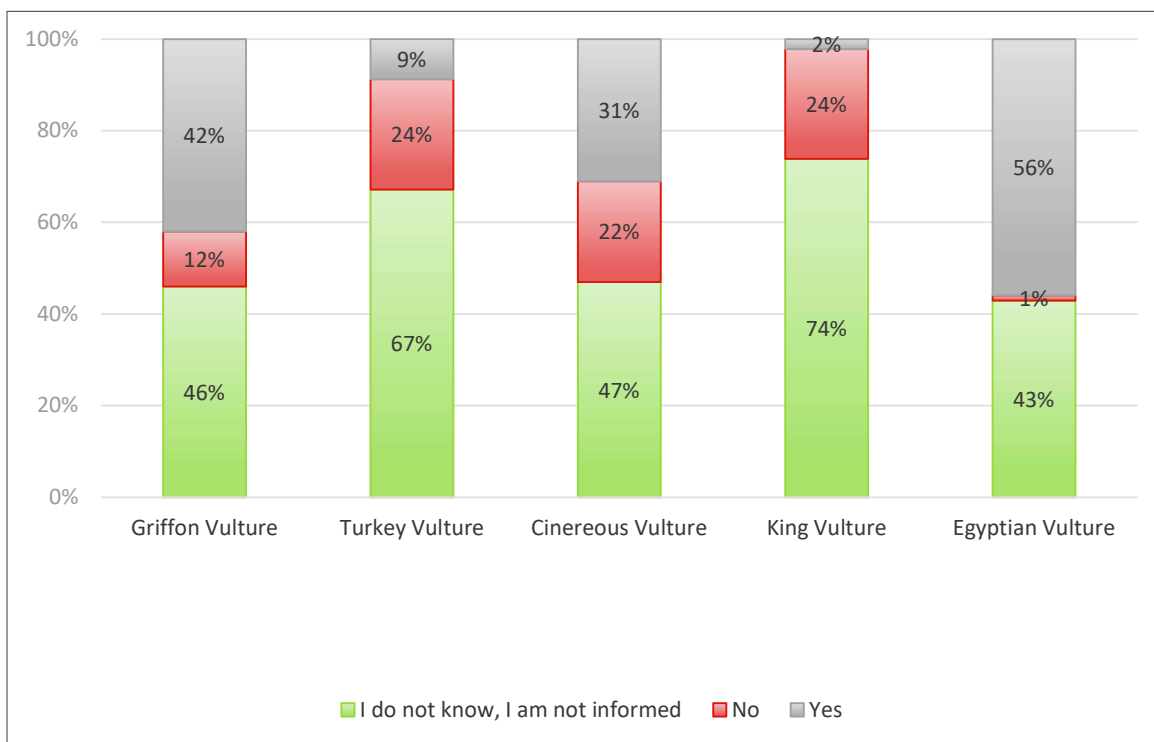
The usual significance levels of 0.95 were used in this study. This means that the finding (difference between groups) has a 95% chance of being true, and thus can be accepted as a reflection of realistically existing differences between groups.

Statistically significantly different values between groups were discussed through the analysis of the results, without graphical representation.

2. Results of quantitative research - PAPI and CAWI method

2.1 Vultures in Albania

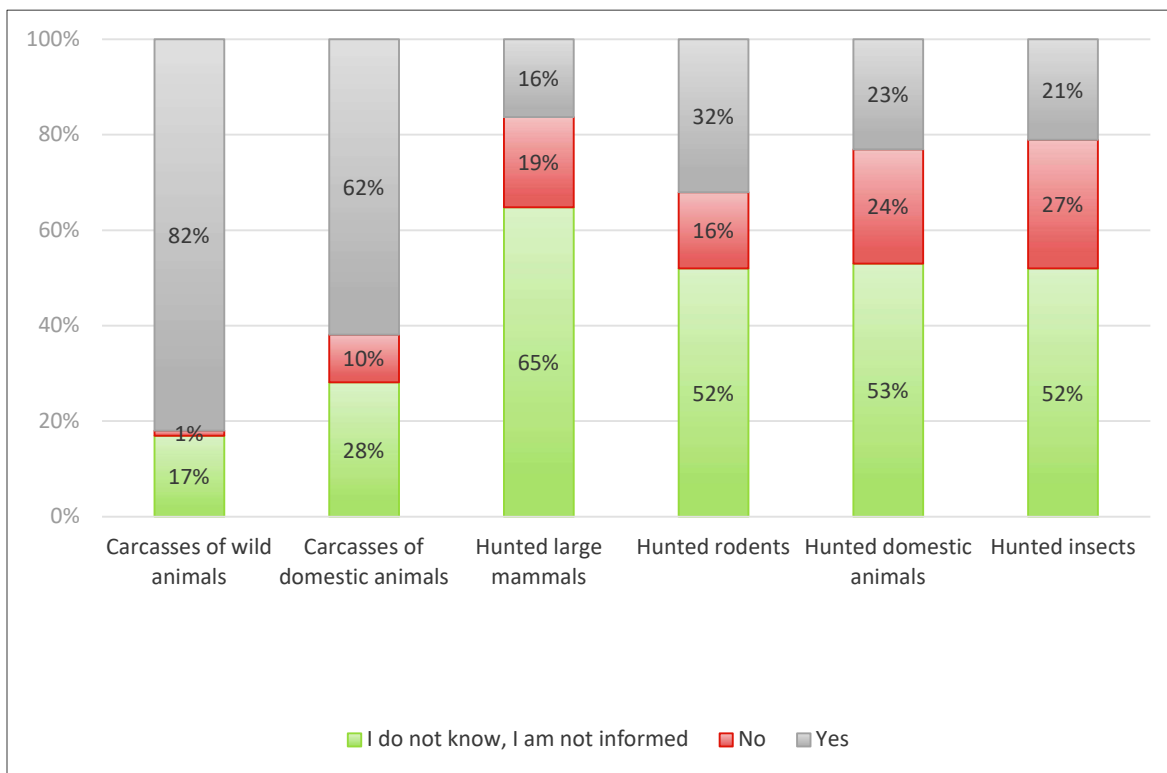
Chart 2.1. Awareness about the vulture species breeding in Albania



More than a half of hot spots target groups (livestock/ cattle and agricultural production farmers, rangers, veterinarians and policemen) believe that Egyptian Vulture breeds in Albania, somewhat more than 40% and about one third of the target group believe the same about Griffon and Cinerous Vulture, respectively. Still, the largest number of respondents are not informed about breeding and presence of key vulture species in Albania (43% and more). Turkey Vulture and King Vulture are the least familiar to respondents, with 9% and 2% (respectively) believing that these vultures breed in Albania, while close to 70% claim they are not informed.

There are some indications that younger respondents are more informed about vultures that breed on the territory of Albania compared to the oldest group, ie those older than 65 years.

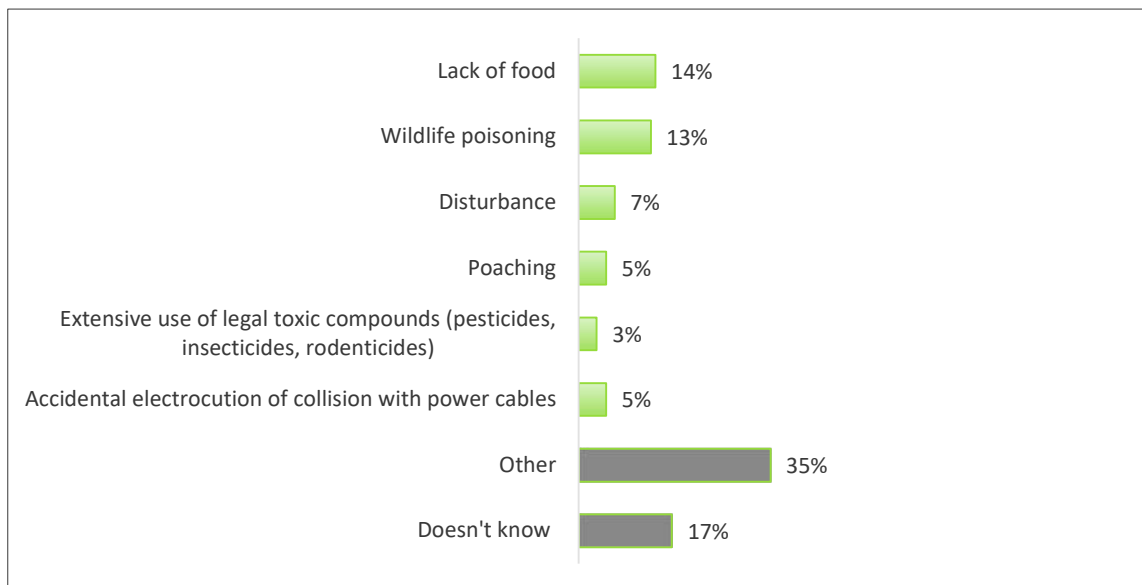
Chart 2.2. Awareness regarding the type of food which vultures feed on in Albania



The largest number of respondents believe that vultures feed on carcasses of wild animals (82%), followed by carcasses of domestic animals (62%). Other food types mentioned in considerably lower percentages are rodents (32%), domestic animals (23%) and insects (21%). For all food types, apart from carcasses of wild and domestic animals, there is around half of the respondents that don't know whether they are part of the diet of vultures or not.

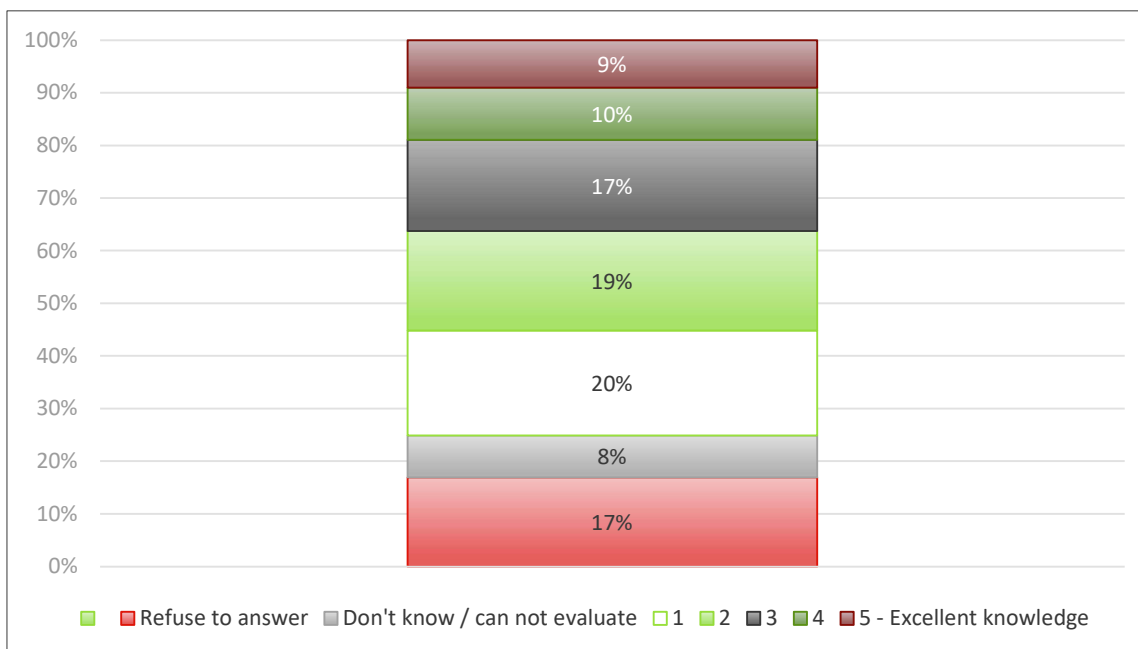
2.2 The problems behind vulture poisoning in Albania

Chart 3.1. What endangers the vulture populations in Albania the most?



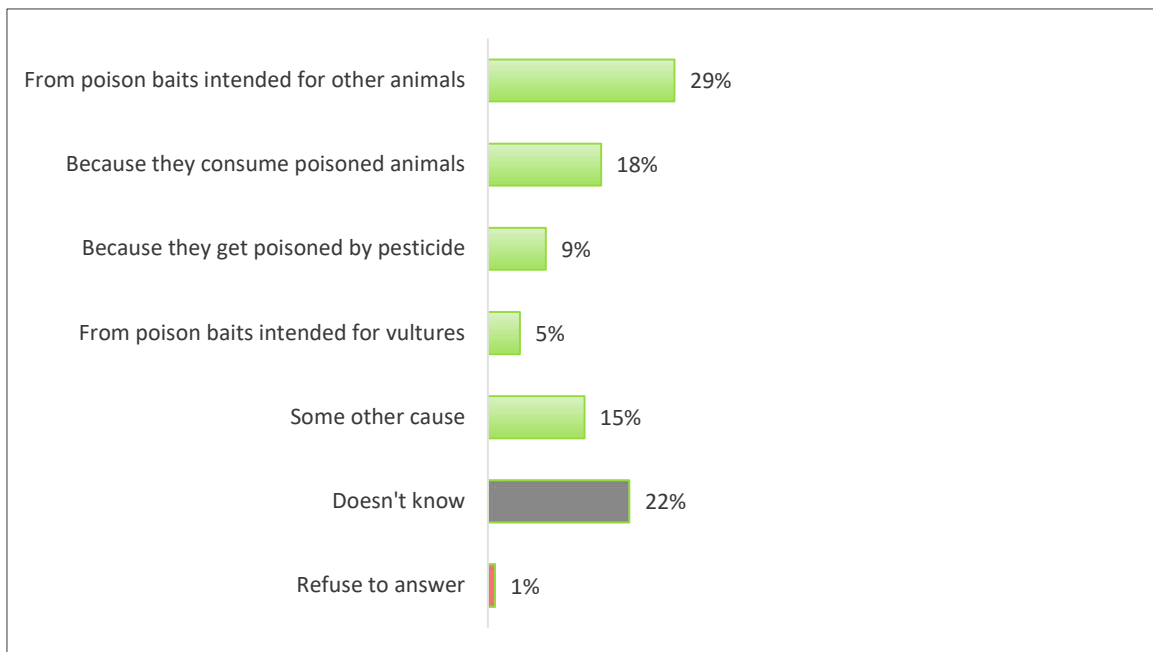
The key perceived threats to the vulture population in Albania are lack of food (14%) and wildlife poisoning (13%). These causes are followed by disturbance and poaching (7% and 5%, respectively). 17% of respondents claim they are not informed, while 35% find reasons for endangerment of vulture species in some other causes.

Chart 3.2. Evaluation of own knowledge about the issue of wildlife poisoning by inhabitants of local communities in Albania

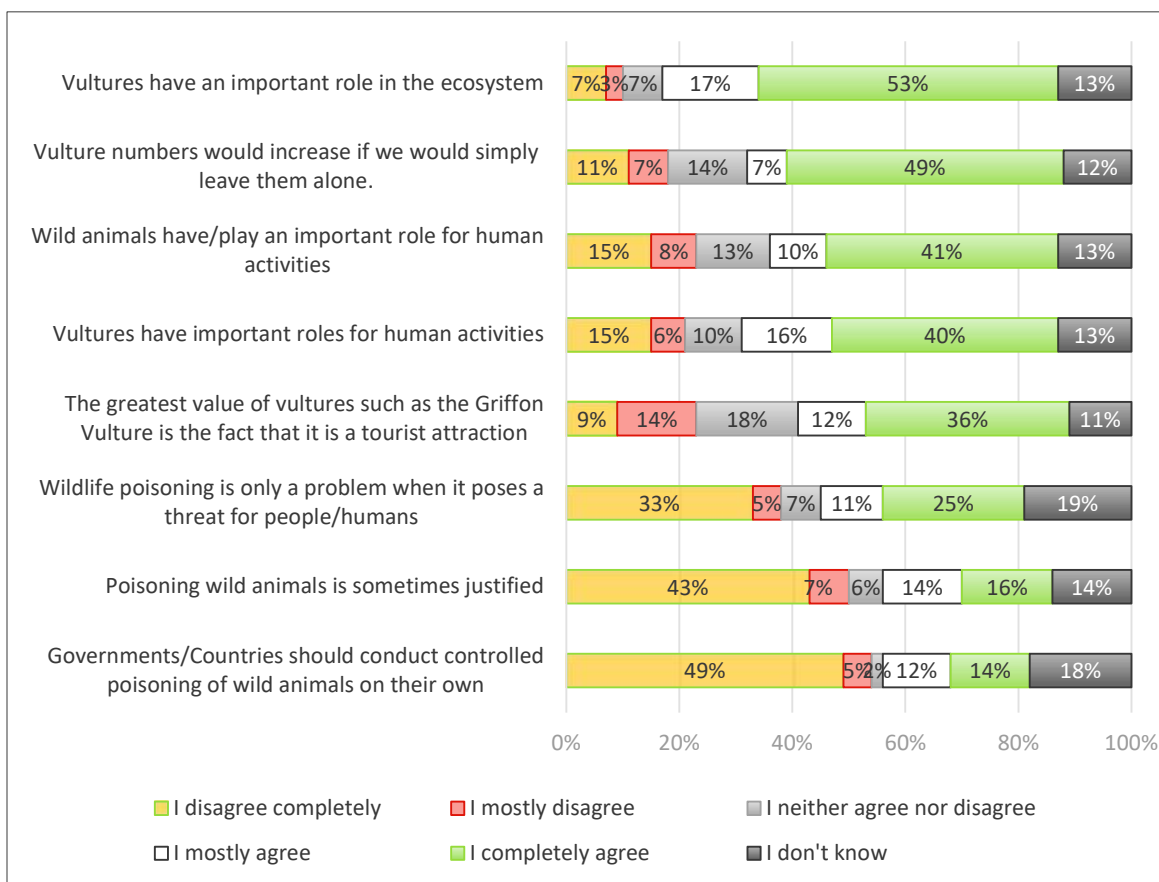


Farmers, rangers, veterinarians, and policemen in target local communities in Albania assess their knowledge of the issue of wildlife poisoning as below average (39%), while 17% consider it average. Near 20% of respondents estimated their knowledge with top marks 4 or 5.

Chart 3.3. Perceived key causes behind vulture poisoning



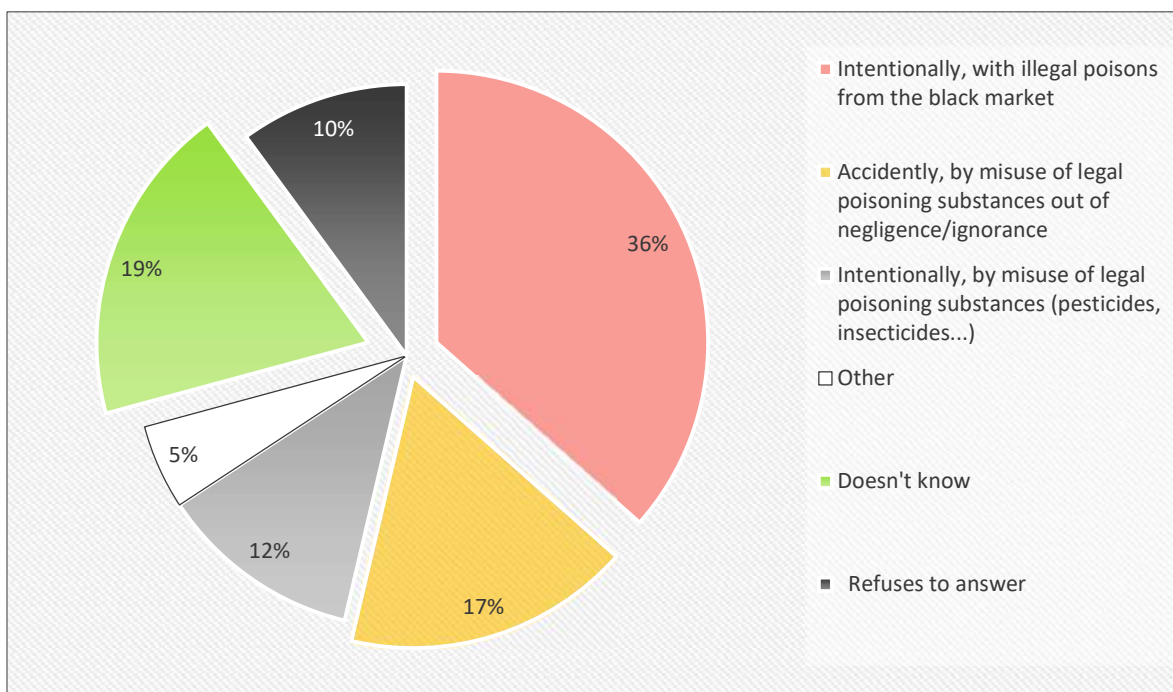
The attitudes of the target audiences in Albania about the key causes behind vulture poisoning are divided. Most believe that vultures get poisoned from poison baits intended for other animals (29%) or because they consume poisoned animals (18%). One in five claim they are not informed, while 15% mention some other cause. Pesticides and other legal toxic compounds are mentioned by 9% of hot spots target group dwellers, while 5% mention poison baits intended for vultures.

Chart 3.4. Personal attitudes towards vultures

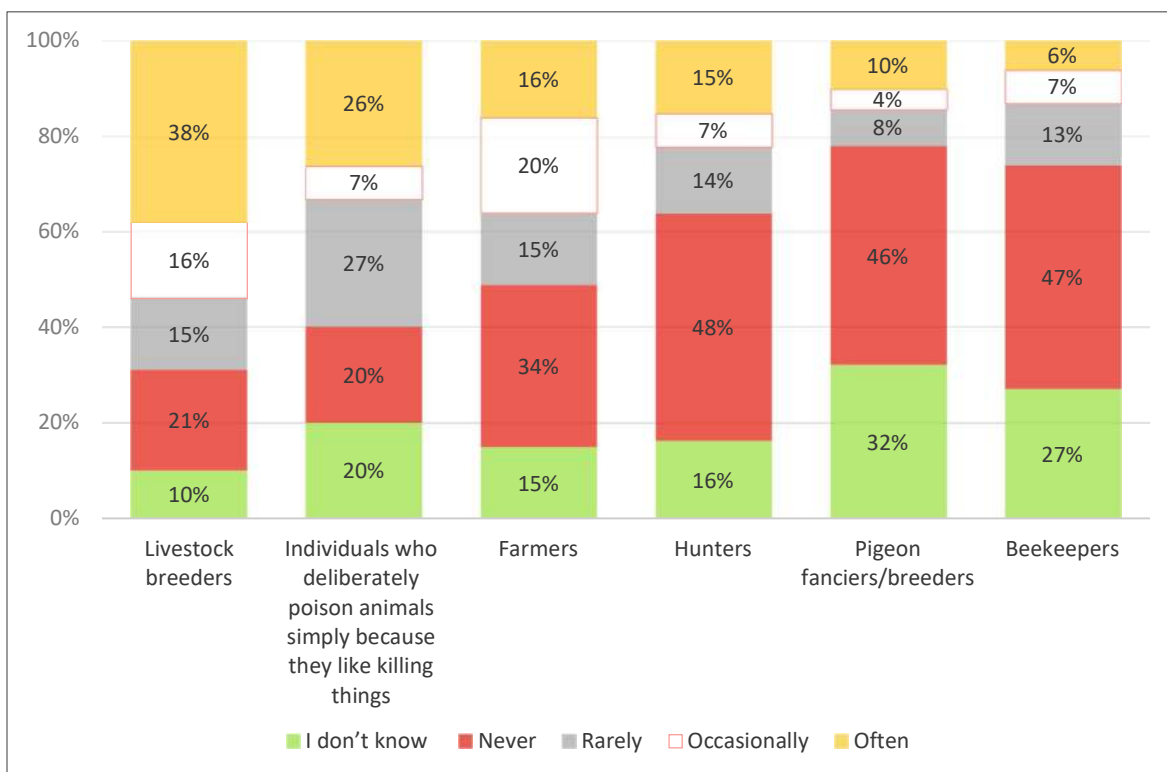
Majority of the respondents from local communities in Albania recognize the importance of vulture population for both humans and the environment. While 70% of the target group mostly or completely agrees that the vultures have an important role in the ecosystem, around 50% believes that their numbers would increase if we would simply leave them alone, and that wild animals and specifically vultures have/play an important role for human.

Around half of the respondents also state that they do not agree that poisoning of vultures is justified in certain situations or that the government and the authorities should conduct controlled poisoning of wild animals, while still around 30% agree with these beliefs.

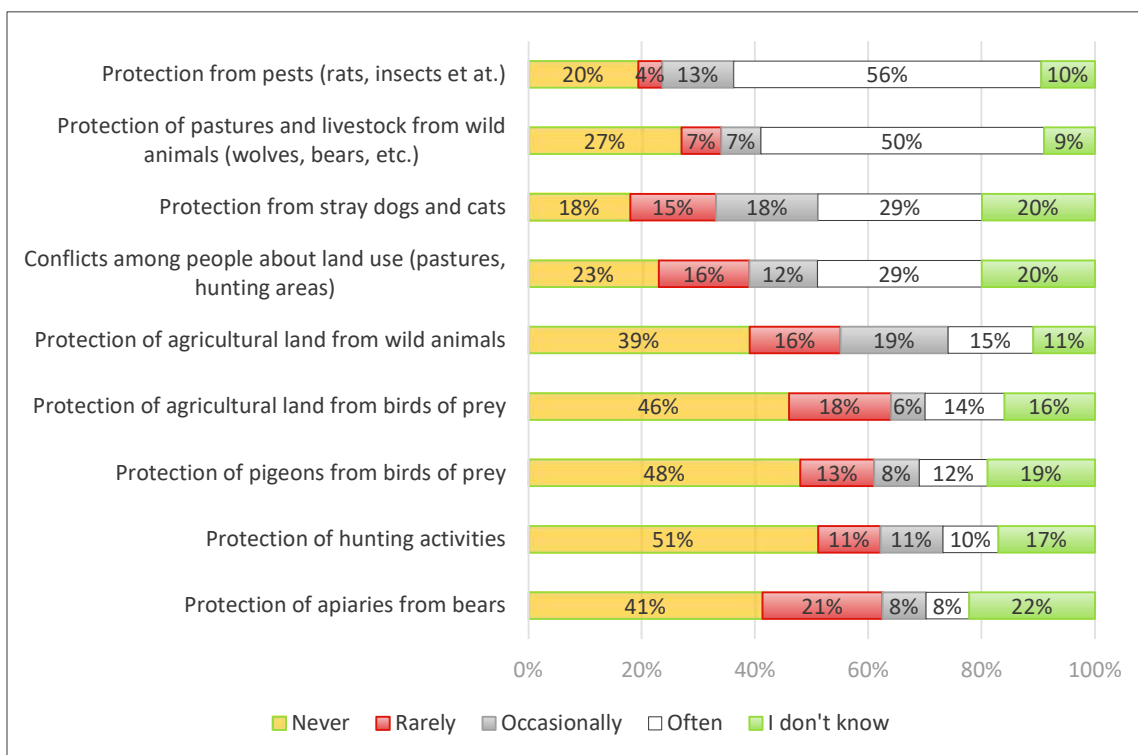
Chart 3.5. Perception about how wildlife poisoning most commonly occurs



Close to 50% of respondents believe that wildlife poisoning mostly occurs intentionally, with illegal poisons from the black market (36%) or by abuse of legal poisoning substances such as pesticides, insecticides, etc. (12%). Somewhat less than one fifth of hot spots dwellers think that wildlife poisoning happens accidentally, i.e. by misuse of legal poisoning compounds out of negligence/ignorance.

Chart 3.6. Perception regarding groups responsible for wildlife poisoning

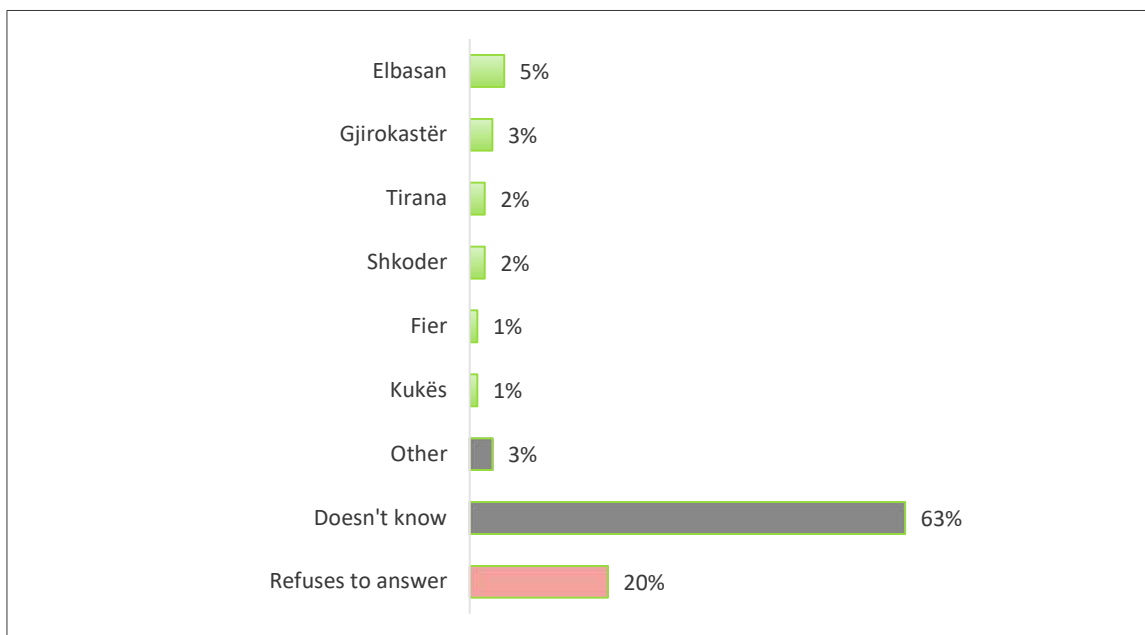
Livestock breeders are perceived as the most responsible (at least occasionally) for wildlife poisoning (somewhat more than 50%). This group is followed by farmers and people who intentionally poison animals out of aggressive and destructive impulses (36% and 33%, respectively). One in four respondents believe that hunters are responsible for poisoning. Beekeepers and pigeon fanciers/breeders (13% and 14% Occasionally or Often, respectively) are not recognized as responsible by majority of the respondents.

Chart 3.7. Motives behind the poisoning of wild animals

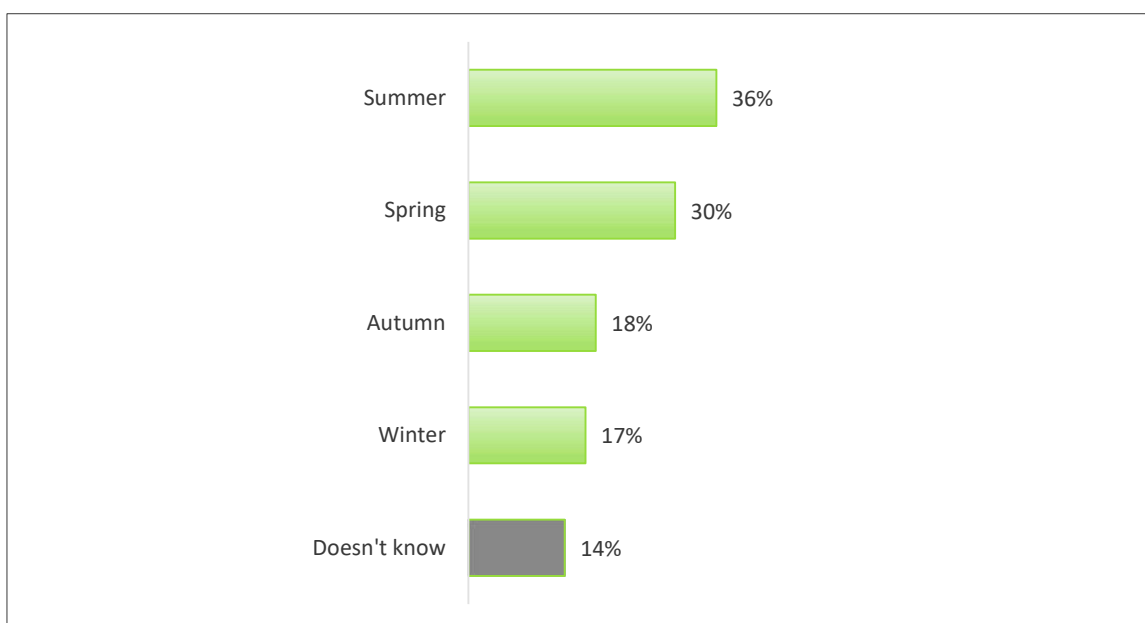
The most frequent motives behind poisoning of wild animals imply the need for better solutions for *protection from pests* and *protection of pastures and livestock from wild animals* (60-70% of respondents identify these motives as 'occasional' or 'often'). *Protection from stray dogs and cats* and *Conflicts among people about land use* follow (around 45% of the respondents, each).

Protection of agricultural land and pigeons from birds of prey, Protection of hunting activities and Protection of apiaries from bears are less often perceived as motives behind the poisoning of wild animals (around 20% of the respondents, each).

Among those who think that *conflicts among people about land use* are often a motive, there are more respondents who finished elementary school (56%) than those who completed higher education (19%).

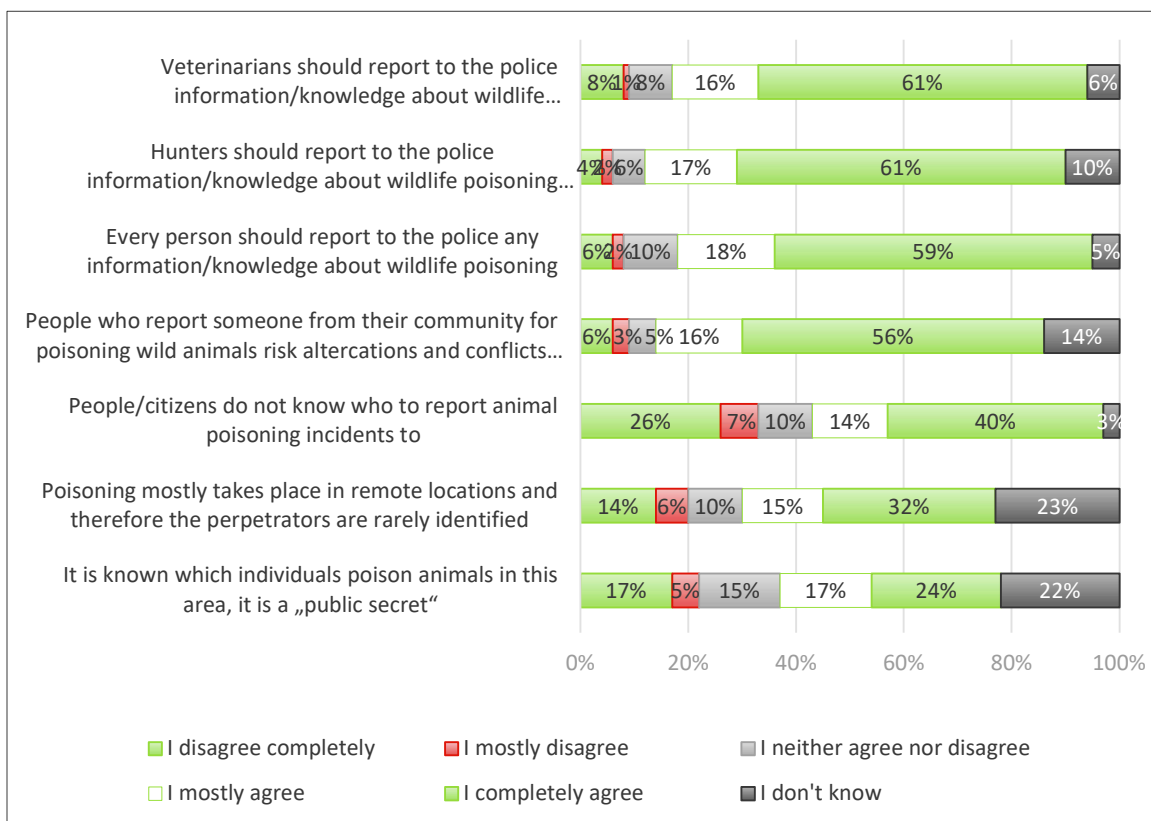
Chart 3.8. Regions of Albania where wild animals are most frequently poisoned

The vast majority of respondents are not informed about the regions in Albania where wild animals are most frequently targets of poisoning (63%). Small number of respondents with any information about the localities of wildlife poisoning most often but still rarely name Elbasan (5%), other regions follow with very small percentages.

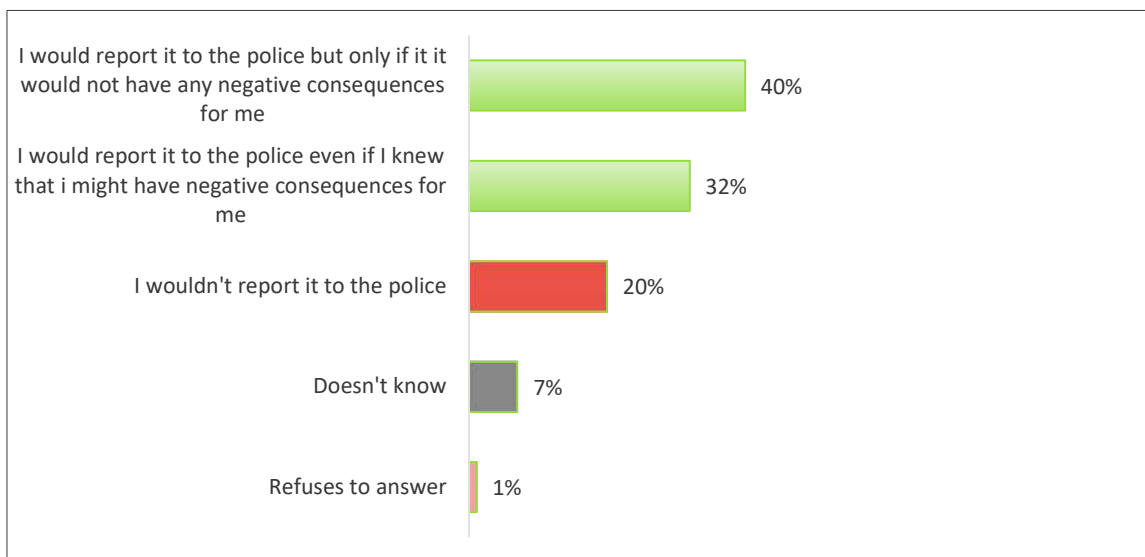
Chart 3.9. Period of the year when wildlife poisoning mostly occurs

Majority of respondents identify summer (36%) and spring (30%) as the periods of the year when wildlife poisoning mostly occurs.

Chart 3.10. Personal attitudes towards reporting poisoning incidents to the relevant authorities

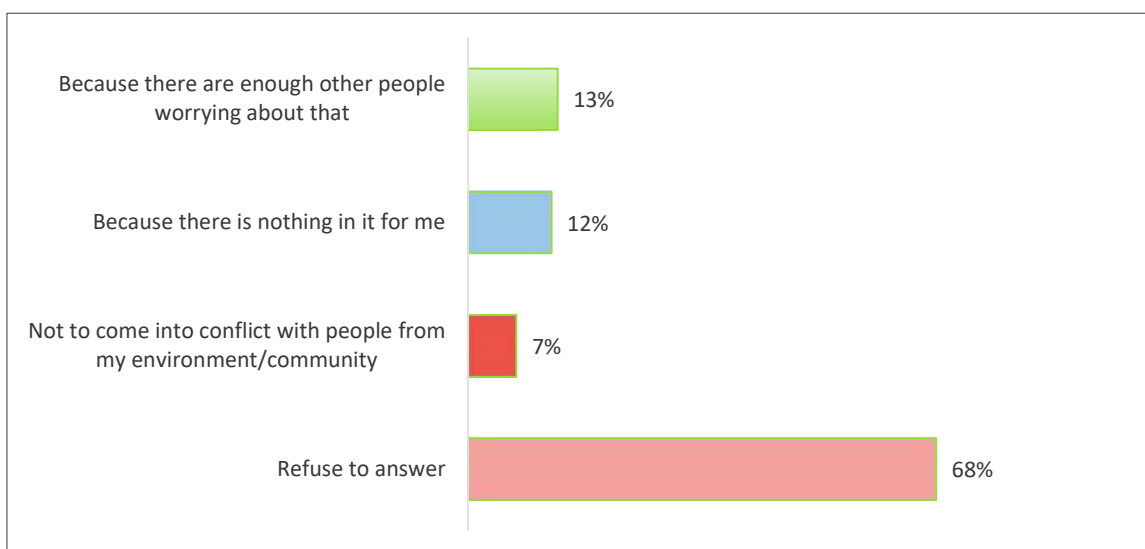


Respondents recognize hunters and veterinarians, as well as general population (every person) as the most responsible groups for reporting knowledge about wildlife poisoning to the police (around 75%). However, respondents also believe that people who report someone for poisoning wild animals risk altercations and conflicts in their community (72%). About half of respondents think that people do not know to whom they should report cases of poisoning, or that poisoning occurs in remote locations, so it is difficult to determine who is responsible. On the other hand, around 40% of them believe that this issue is a 'public secret' and that the perpetrators are known.

Chart 3.11. Steps one would take if he/she finds out some information about poisoning

While 1 in 3 respondents claim they would report the poisoning to the police in case they have some information, 40% is concerned about the possible risks and claims readiness to report the incident only if they personally wouldn't have negative consequences.

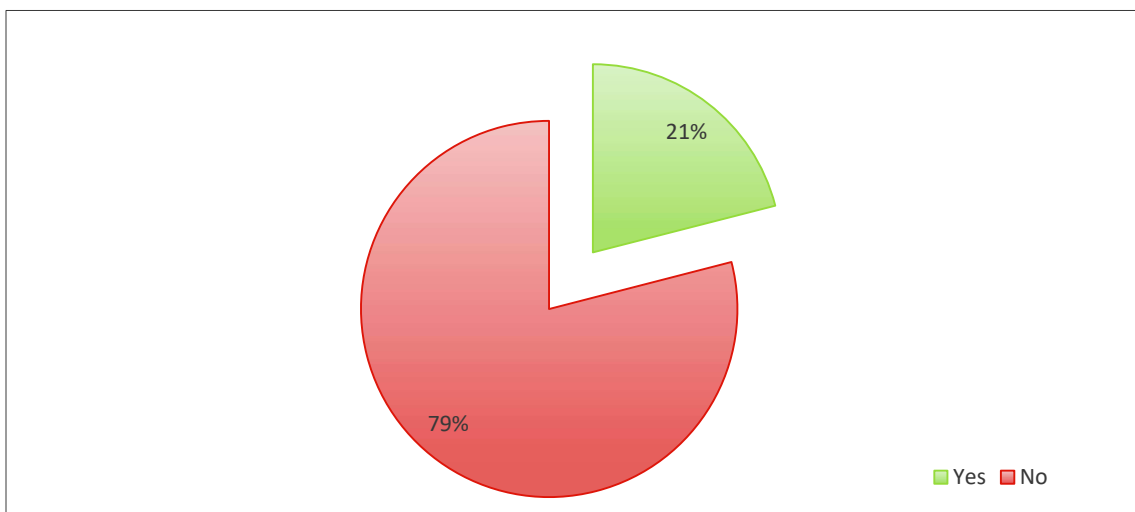
1 in 5 stated that they would not report a poisoning incident.

Chart 3.12. Reasons for not reporting poisoning

Base: 60 respondents who wouldn't report the poisoning or those who would, but only if that couldn't cause negative consequences

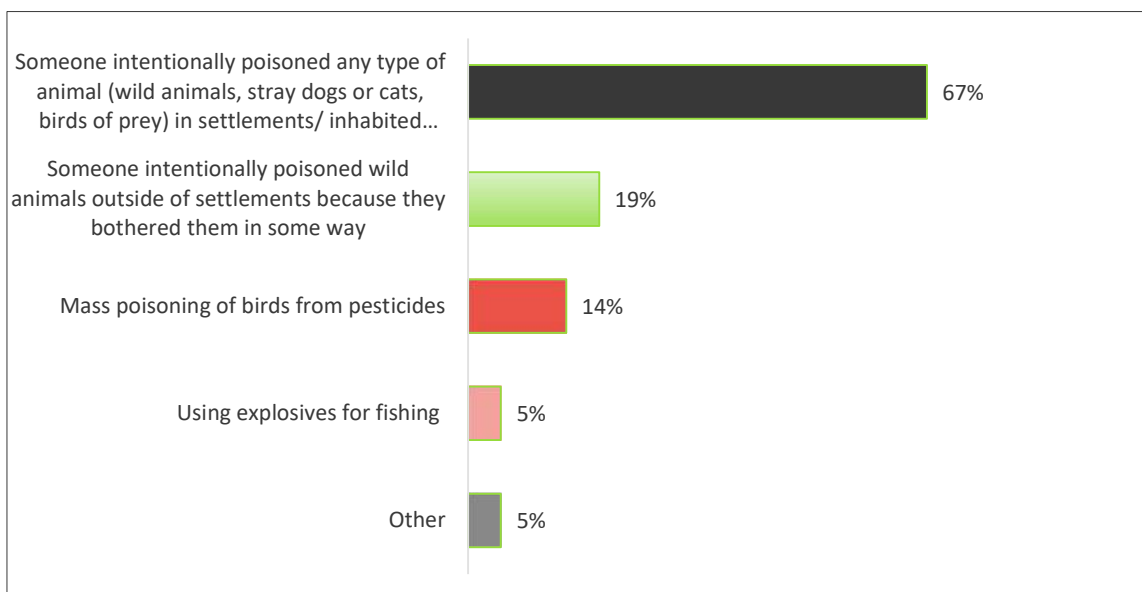
When asked about the reasons for not reporting a poisoning incident, 13% of respondents claim shared responsibility and that there were enough other people worrying about that. Also, 12% state they personally have no use of reporting. 7% would try to avoid the conflict with neighbors and members of the community by not reporting the poisoning cases.

Chart 3.13. Knowledge about poisoning incidents



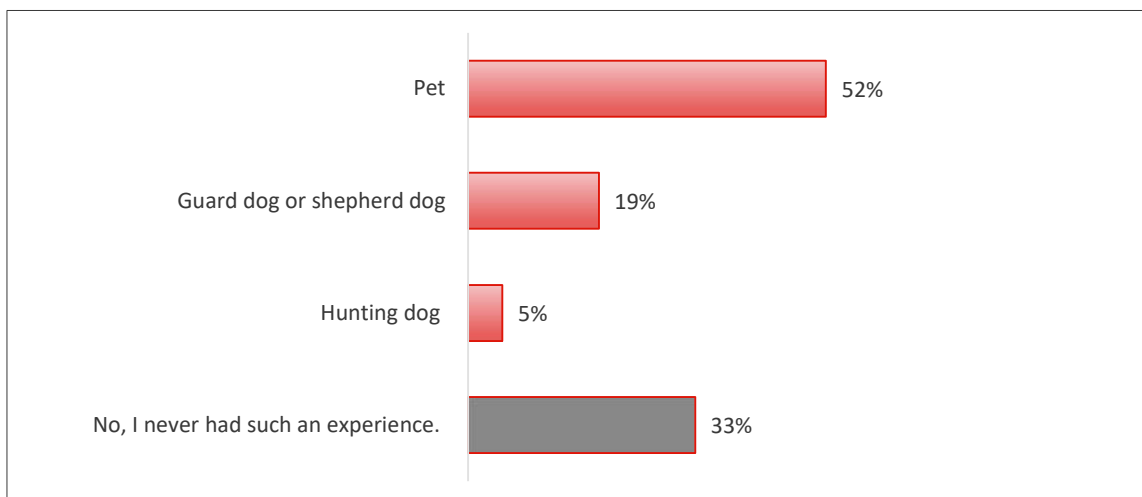
The majority of respondents (about 80%) claim they have not encountered cases of poisoning in their community in the last 10 years.

Chart 3.14. Poisoning incidents



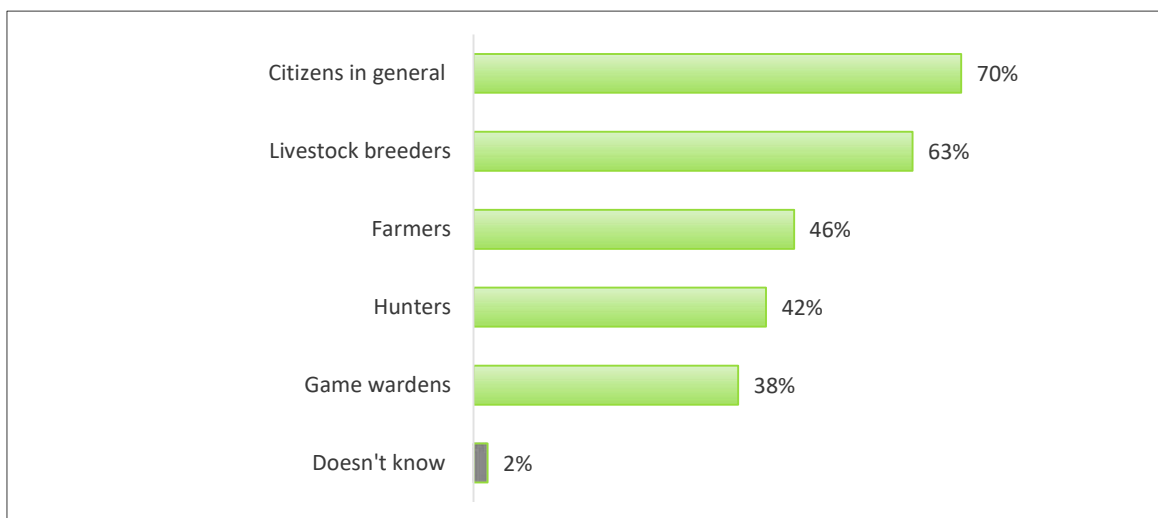
Two third of respondents who have knowledge about poisoning incidents believe that the incidents were the result of deliberate poisoning of any type of animal within the settlements and inhabited areas. Close to 20% mentioned that they were informed about situations when someone intentionally poisoned wild animals outside of settlements because they bothered them.

Chart 3.15. Personal or communal accidents involving poisoned animals



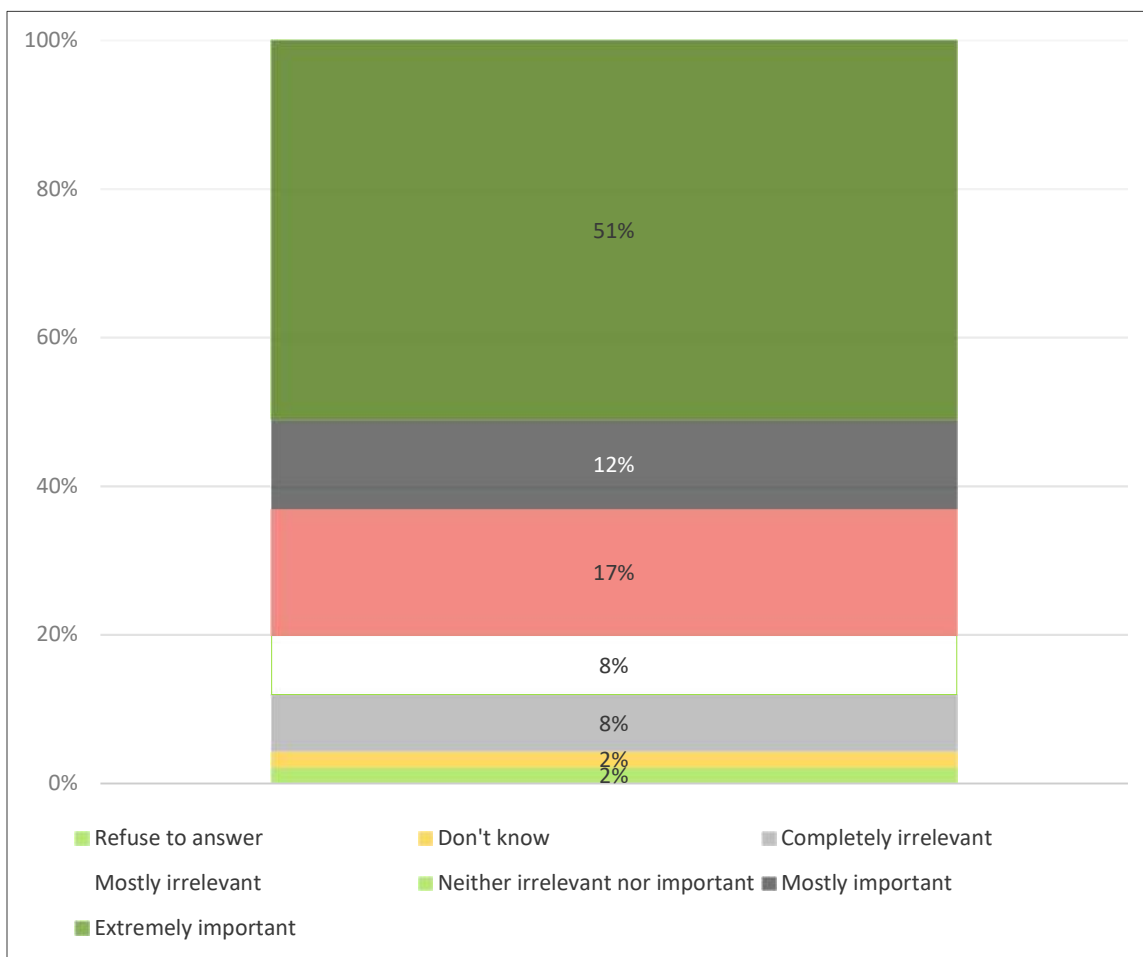
In most cases the accidentally poisoned animals in the respondent's household or community were pets, while smaller number claim that guard/ shepherd dogs were poisoned.

Chart 3.16. Groups that need to become more aware of wildlife poisoning



Citizens in general are being identified as the key target group for the awareness campaign about the threats of wildlife poisoning (70%). However, all stakeholder groups from the target local communities should be included: livestock breeders (63%), farmers (46%), hunters (42%) and game wardens (38%).

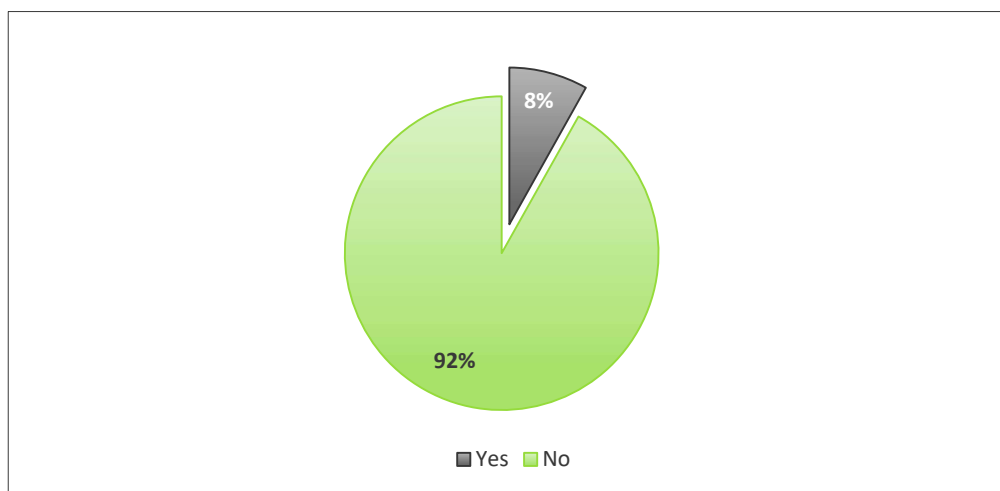
Chart 3.17. Importance of wildlife poisoning investigations, compared to other police work



When asked to compare the importance of wildlife poisoning investigations to other police work, two thirds of respondents perceive these investigations as mostly or extremely important. 16% of the target group on the other hand considers these investigations as mostly or completely unimportant.

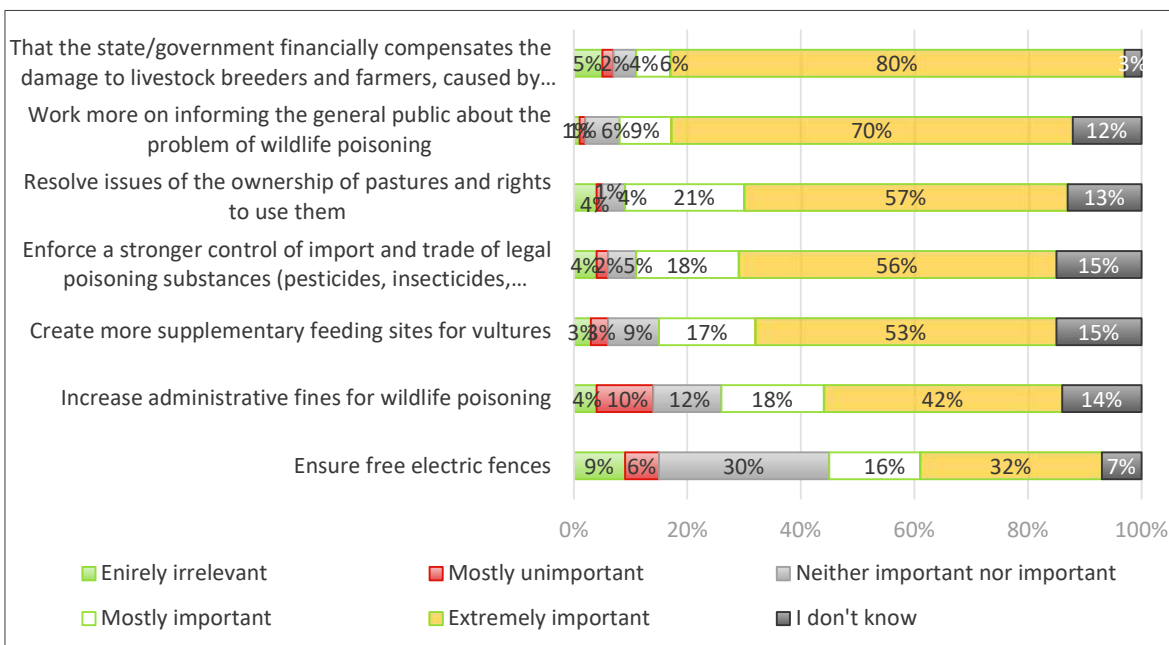
3.3. Measures connected with poisoning

Chart 4.1. Awareness about a specific case of a police investigation for a wildlife poisoning incident



8% of respondents claim being informed about the specific case(s) of the police investigations of wildlife poisoning incidents in Albania. Other respondents are not informed about the specific case(s) of such an investigation.

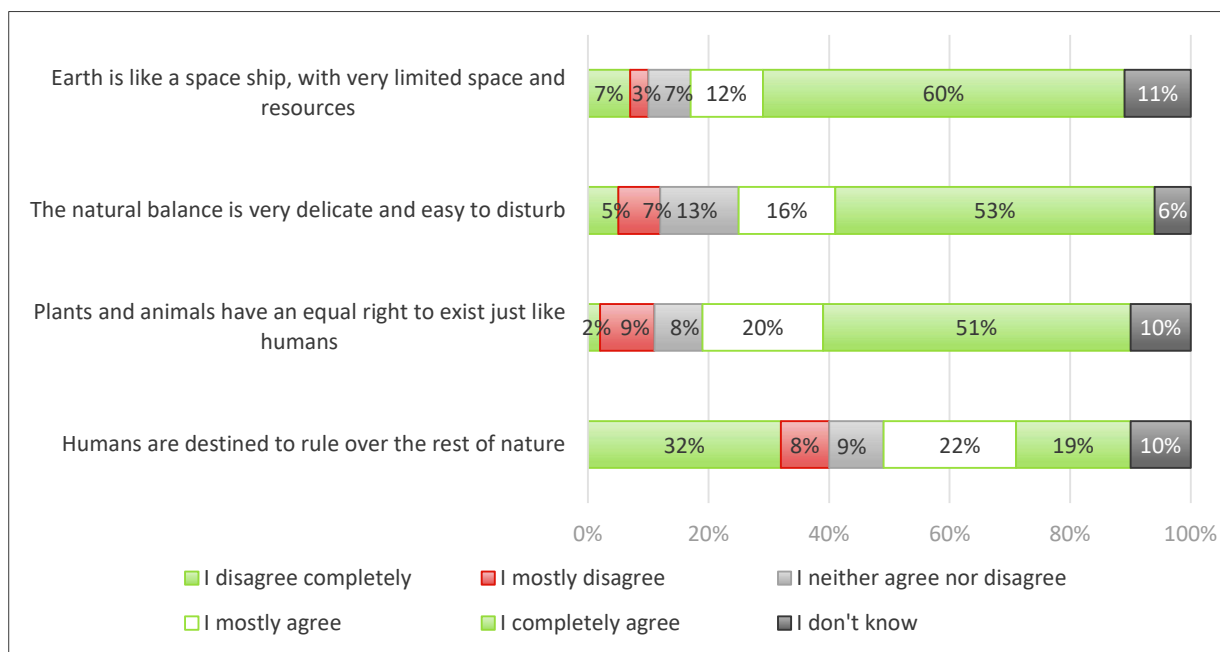
Chart 4.2. Importance of undertaking the following measures



When asked about importance of undertaking particular measures, 80%-90% of respondents perceive that that the state/government should financially compensate the damage to livestock breeders and farmers caused by wild animals, and that additional resources should be invested in informing the general population about the problem of wildlife poisoning. Around 70-75% consider addressing pasture ownership issues, controlling the export and import of legal toxic substances and creating more feeding grounds for vultures as important measures. Importance of remaining measures such as electric fences and fines for animal poisoning should not be overlooked either (with 50% or above respondents claiming their importance).

3.4. Attitudes towards nature

Chart 5.1. Personal attitudes towards nature



Respondents expressed their attitudes towards nature on the scale from 1, which represents strong disagreement, to 5, which represents strong agreement. About 70% of the respondents agree that the Earth has limited space and resources, that it is difficult to maintain the natural balance, and that plants and animals have the same rights as humans. The most polarizing attitude is related to the dominance of man over nature – while 4 out of 10 respondents believe that people are the ones who have the primacy, similar number disagrees with the idea of the human rule over nature.

Annex III. Perception of the illegal practice of wildlife poisoning within relevant governmental authorities in Albania – baseline report.

1. METHODOLOGY

1.1 Project background

The BalkanDetox LIFE project (LIFE19GIE/NL/001016) - Strengthening national capacities to fight wildlife poisoning and raise awareness about the problem in the Balkan countries is a project that is dedicated to the fight against illegal poisoning of wild animals which local citizens usually consider as pests, but which has serious negative consequences for the population of numerous endangered animal species, primarily vultures which eat poisoned animals or eat the poison themselves.

The study will be conducted in two waves in 2021 and 2025, as a base line and follow up study aimed at measuring the current attitudes and practices, and attitudes and practices of target groups after the implementation of planned campaign and activities.

The BalkanDetox LIFE project (LIFE19GIE/NL/001016) is being implemented at the multinational level in the Balkan region. The countries involved are Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Greece, Northern Macedonia, and Serbia.

1.2 Key research topics

In this first phase, the aims of the research are:

- Measuring awareness of target groups of employees of relevant government services and institutions, law enforcement agencies and veterinary services about endangered species (vultures), methods of poisoning and individuals or groups responsible for poisoning on the territories of their respective countries.
- Measuring of the current perceptions and attitudes of target groups related to aggravating circumstances and obstacles as well as capacities of the state institutions to prevent, investigate and sanction wildlife poisoning cases.
- Measuring of the current perceptions of target groups related to legislations, procedures, documentation, and processing of wildlife poisoning cases.

1.3 Methodological approach



1.3.1 Research technique

Online Interviews of the targeted groups of relevant governmental services and institutions, law enforcement agencies and veterinary services in Albania.

1.3.2 Fieldwork

The fieldwork is conducted from September 18th to November 21st in 2021.

1.3.3 Questionnaire length

Questionnaire length up to 10 minutes.

1.3.4 Sample - target group

The target group in the research were employees of relevant governmental services and institutions, law enforcement agencies and veterinary services in Albania. Due to difficulties caused by the COVID-19 pandemic, the sample included 22 respondents in total out of 49 employees in targeted institutions.

1.3.5. Sample Structure

Table 1.1. Institutions where respondents are employed

Institutions	Number of respondents
National Agency of Protected Areas	9
National Inspectorate for the Protection of the Territory	5
Ministry of Tourism and Environment	4
Faculty of Veterinary Medicine, Agricultural University of Tirana	4
Base: 22	

Table 1.2. Current job position

Job position	Number of respondents
--------------	-----------------------

Employee	5
Middle management level	3
Upper management level	6
Highest management level (director of the institution, member of the management board, general director)	8
Base: 22	

Table 1.3. Years of service in the institution where respondents currently work

Years of service - Institution	Number of respondents
Up to 5 years	5
6-10	14
11-15	0
16+	3
Base: 22	

Table 1.4. Years of service in the department where respondents currently work

Years of service - Department	Number of respondents
Up to 5 years	7
6-10	13
11-15	0
16+	2
Base: 22	

Table 1.5. Direct engagement with the issue of wildlife/ animal poisoning in respondents' line of work

Direct dealing with wildlife/ animal poisoning	Number of respondents
No	13

Yes, both of wild and domestic animals	8
Yes, but only of domestic animals	1
Base: 22	

Table 1.6. Evaluation of own knowledge about the issue of wildlife poisoning

Evaluation of own knowledge about wildlife poisoning	Number of respondents
5 - Excellent knowledge	4
4	8
3	6
2	2
1 - Very bad	1
I do not know / I cannot estimate	1
Base: 22	

Table 1.7. Attending educational programmes related to detection and processing of wildlife poisoning incidents

Educational programme attendance	Number of respondents
No	15
Yes	7
Base: 22	

Table 1.8. Educational programmes organizers

Organizers	Number of respondents
Albanian Ornithological Society	3
Vulture Conservation Foundation	2
Ornithological Association	1
Protection and Preservation of Natural Environment in Albania	1
National Agency of Protected Areas (AKZM)	1

Balkan Detox Life	1
Base: Respondents who have attended some educational programme related to detection and processing of wildlife poisoning incidents, N = 7	

Somewhat less than half of the respondents (9) work at National agency of Protected Areas, while the rest are almost equally split between National inspectorate for the Protection of the Territory (5), Ministry of Tourism and Environment (4) and Faculty of veterinary medicine (4).

Respondents are split among different employment and management levels. Most of the respondents work at the Highest management level such as director of the institution, member of the management board, general director (8), upper management level respondents follow (6), close to one fourth work as employees (5), while middle management level respondents were slightly less involved (3).

Respondents have different years of service in the institution where they work, with majority working at their respective institutions from 6 to 10 years (14), less included were those with up to five years of service (5) and above 16 years of service (3). Majority work in their departments from the start, while a few works slightly less than in their respective institutions of employment.

Somewhat less than half of the respondents (9) directly deal with the issue of wildlife and domestic animals poisoning in their line of work (among them 1 respondent deals only with domestic animals poisoning).

Slightly above half of the sample (12 respondents) evaluate their own knowledge about the issue of wildlife poisoning with highest grades (4 and 5 on the scale from 1 to 5). One third of respondents (6) evaluate their knowledge about this topic as moderate while only 3 respondents evaluate their knowledge with the lowest grades (1 or 2).

Majority of respondents (15 out of 22) didn't attend any educational programmes related to the detection and processing of wildlife poisoning incidents. Among respondents who attended at least one of these programmes, 3 respondents attended programmes that were organised by Albanian Ornithological Society, while 2 attended programmes organised by Vulture Conservation Foundation. Other organizers of educational programmes included Ornithological Association, Protection and Preservation of Natural Environment in Albania, National Agency of Protected Areas (AKZM) and Balkan Detox Life.

2. RESULTS OF ONLINE INTERVIEWS

2.1. Vultures in Albania

Table 2.1. Awareness about the vulture species breeding in Albania

Vultures	Number of respondents
Egyptian Vulture	20
Griffon Vulture	9
Cinereous Vulture	4
Turkey Vulture	1
Base: 22	

Almost all respondents state that Egyptian vulture, the only vulture species breeding in Albania, is present in the country. Less than a half of the sample also believes that Griffon vulture breeds in their country. On the other hand, a small number of targeted institutions officials consider that Cinereous Vulture and Turkey Vulture are also present in Albania.

Table 2.2. Awareness about the types of food which vultures feed on in Albania

Food	Number of respondents
Carcasses of wild animals	18
Carcasses of domestic animals	10
Hunted rodents	8
Hunted insects	8
Hunted domestic animals	2
Hunted large mammals	1
Base: 22	

The majority of respondents stated that vultures feed on the carcasses of wild animals, while nearly half of the sample thinks that the vultures diet includes carcasses of domestic animals. One third of the sample includes hunted rodents and hunted insects into the diet of vultures.

2.2. Problem of vulture poisoning in Albania

Table 3.1. What endangers the vulture populations in Albania the most?

The main danger	Number of respondents
Wildlife poisoning	12
Extensive use of legal toxic compounds (pesticides, insecticides, rodenticides)	3
Lack of food	2
Accidental electrocution of collision with power cables	2
I don't know	3
Base: 22	

Wildlife poisoning is perceived as the key threat to the vulture populations in Albania (by more than half of the respondents). Other potential threats for the vulture population are identified to a much lesser extent.

Table 3.2. Perceived key causes behind vulture poisoning

Causes	Number of respondents
From poison baits intended for other animals	10
Because they eat poisoned animals/animals that died of poisoning	6
Because they get poisoned from pesticides	4
I don't know	2
Base: 22	

Poison baits intended for other animals are viewed as the main cause for vulture poisonings (close to half of the respondents). Additionally, more than one fourth of the respondents state that vultures fall victims from secondary poisoning, that is, by consuming poisoned animals.

Table 3.3. Perception about how wildlife poisoning most commonly occurs

The way wildlife poisoning occurs	Number of respondents
Accidentally, by misuse of legal poisoning substances out of negligence/ignorance	11
Intentionally, with illegal poisons from the black market	6
Intentionally, by misuse of legal poisoning substances (pesticides, insecticides...)	4
I don't know	1
Base: 22	

There is a divided opinion among institutional employees about how wildlife poisoning most often occurs in Albania. Half of the respondents claim that wild animals are poisoned accidentally, while the rest believe that they are intentionally poisoned, using illegal poisons from the black market, as well as by misuse of legal poisoning substances such as pesticides or insecticides.

Table 3.4. Perception regarding groups responsible for wildlife poisoning

Groups	Levels of frequency (Number of respondents)			
	Never	Rarely	Occasionally	Often
Livestock breeders	4	5	4	9
Farmers	2	11	4	5
Individuals who deliberately poison animals simply because they like killing things	5	10	3	4
Hunters	5	9	5	3
Beekeepers	12	8	1	1
Pigeon fanciers/breeders	10	11	1	0
Base: 22				

Pigeon fanciers and beekeepers are in general perceived as groups that are rarely or never responsible for wildlife poisoning. On the other hand, more than half of

respondents think that livestock breeders are occasionally or often responsible for wildlife poisoning incidents. This group is followed by farmers, who are identified by less than the half of the sample as a group that is occasionally or often responsible for wildlife poisoning.

Table 3.5. Perceived motives behind the poisoning of wild animals

Motives	Levels of frequency (Number of respondents)			
	Never	Rarely	Occasionally	Often
Protection of pastures and livestock from wild animals (wolves, bears, etc.)	1	7	4	10
Protection from pests (rats, insects et at.)	2	7	8	5
Protection of agricultural land from wild animals	1	5	12	4
Protection of agricultural land from birds of prey	2	10	7	3
Conflicts among people about land use (pastures, hunting areas)	4	12	4	2
Protection of hunting activities	8	8	4	2
Protection of pigeons from birds of prey	3	15	2	2
Protection of apiaries from bears	5	10	6	1
Protection from stray dogs and cats	5	9	7	1
Base: 22				

The key motive for wildlife poisoning for three quarters of employees from targeted institutions is protection of agricultural land from wild animals. Protection of pastures and livestock from wild animals and protection from pests are also important reasons for poisoning wildlife (for close to two thirds of respondents). On the other hand, protection of pigeons from birds of prey, protection of hunting grounds and activities, protection of beehives from bears and protection from stray dogs and cats are the least important motives for poisoning of wild animals.

Table 3.6. Regions of Albania where wild animals are most frequently poisoned

Regions	Number of respondents
Gjirokaštër	12
Kukës	4
Berat	3
Tepelenë	3
Vlorë	3
Dibër	2
Elbasan	2
Gramsh	2
Lushnjë	2
Përmet	2
Fier	1
Kolonjë	1
Pogradec	1
Pukë	1
Skrapar	1
Tropojë	1
I don't know	8
Base: 22	

More than half of the respondents believe that Gjirokaštër is the region of Albania where wild animals are most frequently poisoned. Around one third of respondents claims to be uninformed about the region(s) where wild animals are most often poisoned.

Table 3.7. Period of the year when wildlife poisoning mostly occurs

Periods of year	Number of respondents
Spring	16
Summer	8
Autumn	6
Winter	3

I don't know	2
Base: 22	

Close to three fourths of respondents state that spring is the period of the year when wildlife poisoning mostly occurs. In addition, more than one third indicate summer.

Table 3.8. Importance of the aggravating circumstances and obstacles

Aggravating circumstances and obstacles	Levels of importance (Number of respondents)				
	Entirely irrelevant	Mostly unimportant	Neither important nor unimportant	Mostly important	Extremely important
Poor reporting of information from witnesses	0	0	4	8	10
Bad law enforcement	1	0	1	10	10
Lack of control over the prescribed use of legal poisons, such as pesticides, rodenticides et al.	0	1	5	7	9
Complexity of the investigation	1	0	3	10	8
Expensive toxicological analysis	1	0	3	10	8
Low penalties for wildlife poisoning	0	0	2	13	7
Inadequate and unclear protocols for police action	1	0	1	14	6
Difficulties with evidence procedures in court	2	1	5	10	4
Black market for banned poisons on Internet	3	5	4	6	4
Base: 22					

Majority of aggravating circumstances and obstacles for prevention and sanctioning of wildlife poisoning are perceived as important by two thirds or more governmental employees, apart from the black market for banned poisons on the Internet which is of estimated lower importance. The key deteriorating circumstances and barriers are inadequate law enforcement, low penalties for wildlife poisoning and inadequate and unclear protocols for police action which are identified by vast majority of respondents.

Poor reporting of information from witnesses, complexity of the investigation and expensive toxicological analysis are also identified as very important.

Table 3.9. Personal attitudes towards reporting poisoning incidents to the relevant authorities

Statements related the reporting poisoning incidents	Levels of agreement (Number of respondents)				
	I completely disagree	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree
Veterinarians should report to the police information/knowledge about wildlife poisoning more often	/	1	/	8	13
Hunters should report to the police information/knowledge about wildlife poisoning more often	/	1	/	11	10
People who report someone from their community for poisoning wild animals risk altercations and conflicts in their community	1	1	6	4	10
Every person should report to the police any information/knowledge about wildlife poisoning	/	1	3	9	9
Poisoning mostly takes place in remote locations and therefore the perpetrators are rarely identified	1	1	4	8	8
People/citizens do not know who to report animal poisoning incidents to	2	1	3	10	6
It is known which individuals poison animals in this area, it is a „public secret“	3	4	7	6	2
Base: 22					

Almost all institutional members agree that veterinarians and hunters should report poisoning of wild animals to the police. General population (every person) is also perceived as highly responsible for reporting. Still, close to two thirds of respondents perceive that reporting of such incidents can have certain risks in their respective local

communities for those who reported them. Important barrier is also believed to be that people do not know who to report animal poisoning incidents to.

Table 3.10. Groups that need to become more aware of wildlife poisoning

Groups	Number of respondents
Citizens in general	9
Livestock breeders	9
Game wardens	2
Farmers	1
Hunters	1
Base: 22	

Citizens in general and livestock breeders are identified as groups that need to become more aware of wildlife poisoning.

Table 3.11. Personal attitudes towards investigation of wildlife poisoning incidents

Statements related to the investigation of wildlife poisoning incidents	Levels of agreement (Number of respondents)				
	I disagree completely	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree
Specialized police units for environmental crime, including wildlife poisoning, are needed	1	0	0	7	14
More people are needed on the field (police, environmental inspectors, rangers etc.) for timely detection of poisoning incidents	/	/	/	9	13
Police should have specialized canine units for detecting poisonous substances used for wildlife poisoning	0	1	0	9	12

Lack of coordination among relevant institutions is a bigger problem than lack of resources	1	1	3	9	8
Game wardens to often tolerate unlawful practices in hunting areas	3	2	7	5	5
In Albania there are sufficient laboratories with enough capacities to conduct needed toxicological analyses	5	7	3	7	/
Base: 22					

Regarding the role of the police in investigating wildlife poisoning incidents and the solutions that are necessary for dealing with wildlife poisoning, all respondents agree that there is a necessity for introduction of more people in the field for timely detection of poisoning incidents, while almost all agree that specialized police units for environmental crime, including wildlife poisoning, and specialized canine units for detecting poisonous substances used for wildlife poisoning are required.

Majority of respondents also believe that lack of coordination among relevant institutions is a bigger problem than lack of resources.

On the other hand, more than half of employees from relevant governmental institutions state that Albania does not have sufficient laboratories with enough capacities to conduct necessary toxicological analyses.

Table 3.12. Personal attitudes towards legislation and legal processing of poisoning incidents

Statements related to the legislation and legal processing of poisoning incidents	Levels of agreement (Number of respondents)				
	I disagree completely	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree
The legal framework for punishing the practice of poisoning animals is good, but the main problem is law enforcement	1	3	6	8	4

Rarely are fines imposed under the Hunting Act	0	4	4	11	3
Existing legislation regulates biodiversity protection well enough	2	3	8	7	2
Public prosecutors are sufficiently educated for managing incidents related to poisoning of wild animals	5	8	8	1	0
Base: 22					

Speaking of legislation and legal processing of poisoning incidents, more than two thirds of the sample mostly or completely agree that fines are rarely imposed under the Hunting Act. Furthermore, every other institutional member agrees that the legal framework for punishing the practice of poisoning animals is good, but the main problem is law enforcement. However, large number of respondents think that public prosecutors aren't sufficiently educated for managing incidents related to the poisoning of wild animals.

Participants are most divided about the question if the existing legislation regulates biodiversity protection well enough.

Table 3.13. Evaluating the cooperation between governmental institutions and civil society organizations regarding data collection about poisoning incidents

Estimate	Number of respondents
5 - Excellent cooperation	2
4	1
3	7
2	7
1 - Very bad	4
I don't know / I cannot evaluate	1
Base: 22	

Employees in target institutions evaluated the cooperation between governmental institutions and civil society organizations regarding data collection about poisoning

incidents on the scale from 1, which represents 'very bad' to 5, which represents 'excellent cooperation'. Every other respondent stated that the cooperation between governmental institutions and civil society organizations regarding data collection about poisoning incidents is bad (marks 1 or 2), while only 3 respondents (out of 22) evaluated this cooperation as good.

Table 3.14. Knowledge of procedures and documentation related to wildlife poisoning

Procedures and documentation	Answers (Number of respondents)		
	Yes	No	I do not know, I am not informed
Is there a National action plan for combating wildlife poisoning in place	2	7	13
Is there a protocol defining procedures and jurisdictions for investigating wildlife poisoning	2	7	13
Is there a database for poisoning incidents of birds in Albania	2	8	12
Base: 22			

In general, there is very little knowledge about the existence of National action plan for combating wildlife poisoning in place, a protocol defining procedures and jurisdictions for investigating wildlife poisoning and a database for poisoning incidents of birds. Only 2 respondents (out of 22) state that there is a National action plan, protocol and database related to the wildlife poisoning.

Table 3.15. Personal attitudes towards punishment of various unlawful actions damaging to animals and the environment

Statements related to the punishment of unlawful actions that damage the nature	Levels of agreement (Number of respondents)				
	I disagree completely	I mostly disagree	I neither agree nor	I mostly agree	I completely agree

			disagree		
Higher fines are needed for every type of poaching/illegal shooting	/	1	2	8	11
All forms of mass and non-discriminative killing of animals (trapping, poisoning, explosives et al.) should be punished as severely as possible	/	1	1	10	10
If poisoning of wild animals occurs in a commercial hunting area, the concessionaire should be deprived of the concession	2	2	5	3	10
Rangers of protected areas should have the authority to arrest persons who poison animals, if they are caught in the act	/	2	3	8	9
Having poison baits should be a separate offense, regardless of whether it has been proven that an animal was killed	1	1	2	11	7
Poisoning of animals should be a criminal offense only if it occurred in a protected area (nature park, national park)	7	2	1	6	6
Prison sentences should not be administered placing poison baits unless people are not put in danger, but only animals	4	/	7	6	5
Sentences for poisoning of animals should be only administrative (financial), but not imprisonment	5	5	5	6	1
Base: 22					

Regarding punishments of various unlawful actions damaging to animals and the environment, almost all respondents agree that all forms of mass and non-discriminative killing of animals (trapping, poisoning, explosives etc.) should be punished as severely as possible; majority believes that higher fines are needed for every type of poaching or illegal shooting. They also recognize necessity for treating the

possession of poison baits as a separate offense, regardless of whether it has been proven that an animal was killed and believe that the rangers should have the authority to arrest perpetrators, if they are caught in the act.

Respondents are the most divided about the question should the fines for animal poisoning be only financial, or should they envisage imprisonment.

Table 3.16. Personal attitudes towards the capacities of the police

Statements related to the capacities of the police	Levels of agreement (Number of respondents)				
	I disagree completely	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree
Specialized police units should be introduced to deal with the crime of wildlife poisoning	/	/	/	/	/
The police do not take seriously the need to launch investigations into wildlife poisoning	/	1	6	7	8
The main is problem that incidents are not reported to the police	/	3	4	7	8
Police investigations about wildlife poisoning should include representatives of the civil society organizations	1	/	2	10	9
Police investigations about wildlife poisoning need expensive and sophisticated technology	/	3	2	13	4
The police has better things to do and should not waste resources on investigating wildlife poisoning incidents	8	4	5	2	3
The police is sufficiently equipped for investigating wildlife poisoning	4	10	3	3	2
The police is sufficiently educated for investigating incidents with wild animals	6	9	7	/	/
Base: 22					

The capacities of the police when it comes to investigating and tackling the poisoning of wild animals are perceived as inadequate, both in terms of equipment and in terms of education and training of police forces. Majority of respondents identify the needs for introduction of specialized police units to deal with the crime of wildlife poisoning, modern, sophisticated technologies, as well as for the cooperation with representatives of civil society in the investigation process. In addition, about two-thirds of respondents believe that some effort is needed to change the attitude of the police towards a more serious understanding of the need to investigate wildlife poisoning incidents.

Also, employees of the relevant governmental institutions in Albania perceive the lack of reporting of poisoning incidents to the police forces as one of the obstacles in the work of police.

3.3. Measures related to wildlife poisoning

Table 4.1. What is necessary to use in police investigations of wildlife poisoning

Necessities for police investigations	Number of respondents
Toxicological analysis	19
Records of sale of legal poisoning substances (pesticides, insecticides, redonticides...)	17
Canine units	14
Confirming time of death of the animals	12
Forensic entomology	10
Fingerprint analysis	10
Forensic ballistics	5
Forensic psychology	2
Base: 22	

Almost all respondents state that toxicological analyses are necessary to be used in police investigations of wildlife poisoning. They also recognize the importance of records of the sales of legal poisoning substances (above three fourths).

Table 4.2. Importance of undertaking some measures to prevent wildlife poisoning

Measures	Levels of importance (Number of respondents)				
	Entirely irrelevant	Mostly unimportant	Neither important nor unimportant	Mostly important	Extremely important
Work more on awareness raising among key stakeholders (livestock breeders, farmers, hunters, institutions)	/	/	/	5	17
Impose a stricter control of the trade of legal poisoning substances (pesticides, rodenticides et al.)	/	/	/	5	17
Work more on awareness raising of the general public	1	/	/	8	13
That the state/government financially compensates the damage to livestock breeders and farmers, caused by wild animals	/	1	1	7	13
Create more supplementary feeding sites for vultures	1	1	1	9	10
Completely ban logging in Albania for some time	2	1	2	7	10
Better protect wild ungulate populations	/	/	3	10	9
Resolve issues of the ownership of pastures and rights to use them	2	1	3	10	6
Ensure free electric fences	1	1	6	8	6
Ensure livestock breeders and farmers are provided with free shepherd and guard dogs	1	3	7	8	3
Work of reducing the populations of allochthone animals	2	1	11	7	1
Base: 22					

Speaking of measures for preventing wildlife poisoning, almost all respondents believe that further raising of awareness among key stakeholders (livestock breeders, farmers, hunters, institutions), as well as among the general public, imposing a stricter control of

the sales of legal poisoning substances and providing compensation to livestock breeders and farmers for the damages caused by wild animals are the key preventive measures when it comes to wildlife poisoning.

Creating additional supplementary feeding sites for vultures and better protection of wild ungulate populations are the measures which are also mostly or extremely important for majority of officials.

3.4. Attitudes towards nature

Table 5.1. Personal attitudes towards nature

Statements related to the nature	Levels of agreement (Number of respondents)				
	I disagree completely	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree
Plants and animals have an equal right to exist just like humans	1	0	1	7	13
The natural balance is very delicate and easy to disturb	0	2	0	9	11
Earth is like a spaceship, with very limited space and resources	0	1	4	10	7
Humans are destined to rule over the rest of nature	9	2	3	5	3
Base: 22					

Almost all respondents agree that plants and animals have an equal right to exist just like humans, that the natural balance is very delicate and easy to disturb, and that Earth has very limited space and resources. Also, half of the respondents mostly or completely disagree that humans are destined to rule over the rest of the nature, while one third agrees with the domination of the people over nature.

Annex IV. Perception of the illegal practice of wildlife poisoning in local communities in Bosnia and Herzegovina – baseline report.

1. METHODOLOGY

1.1.1 Sample - target group

The target group in the research were hunters, farmers and livestock breeders on the territory of Bosnia and Herzegovina, who carry out their activities in the areas where vultures exist as members of endangered species.

Due to difficulties caused by COVID-19 pandemic, the sample included 27 respondents in total.

1.1.2 Sample Structure

Chart 1.1. Age structure

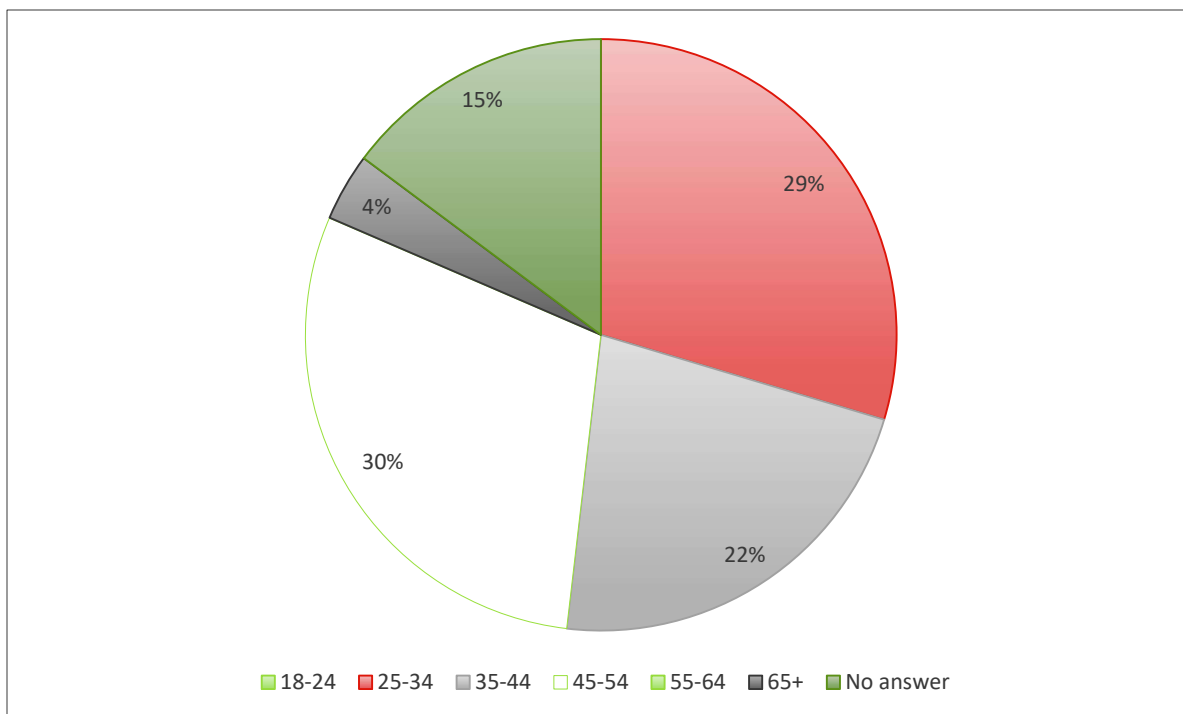


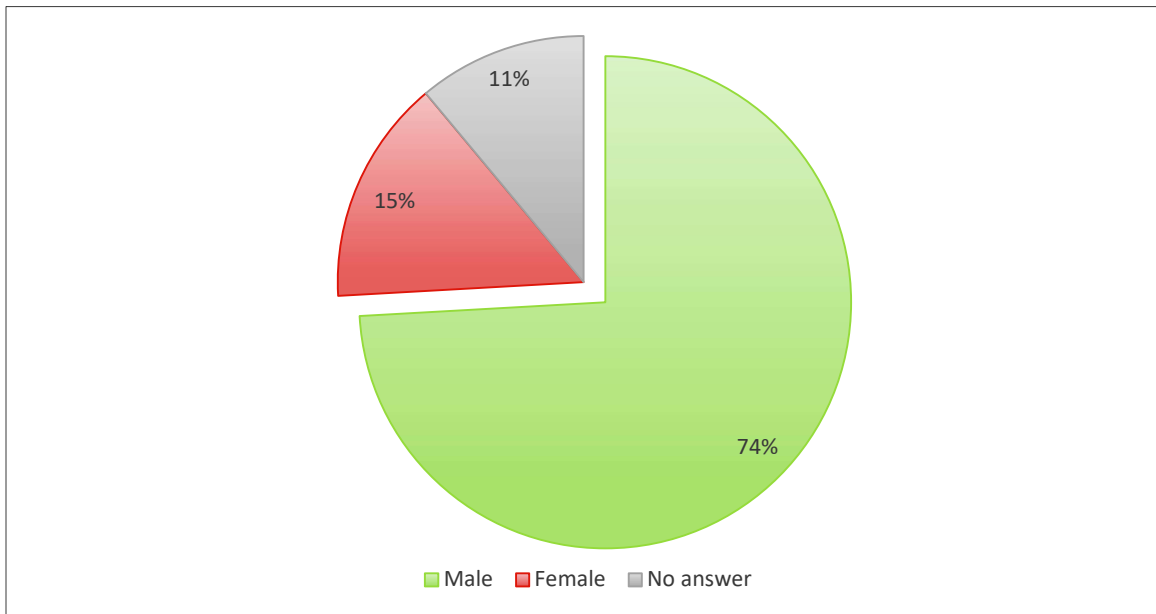
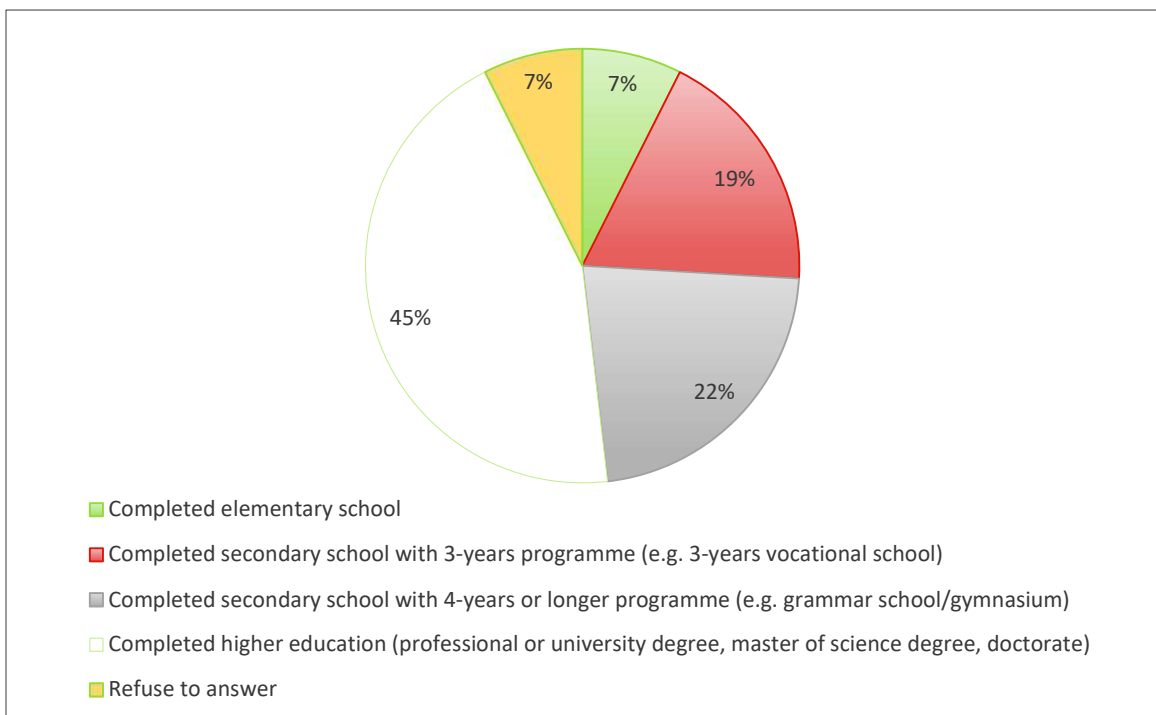
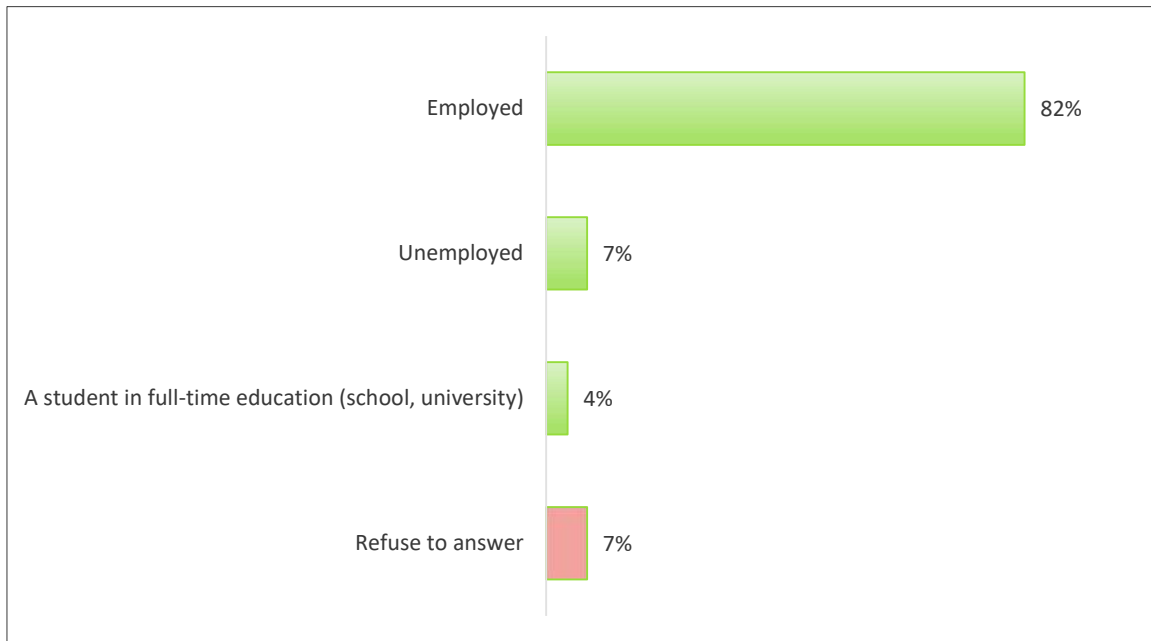
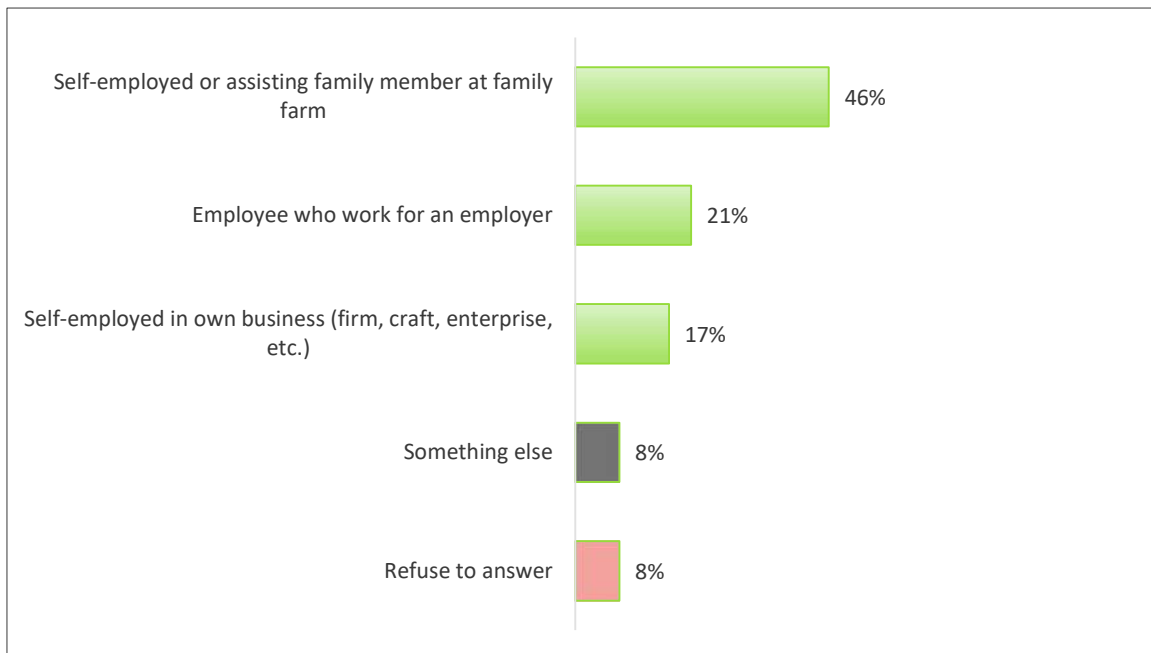
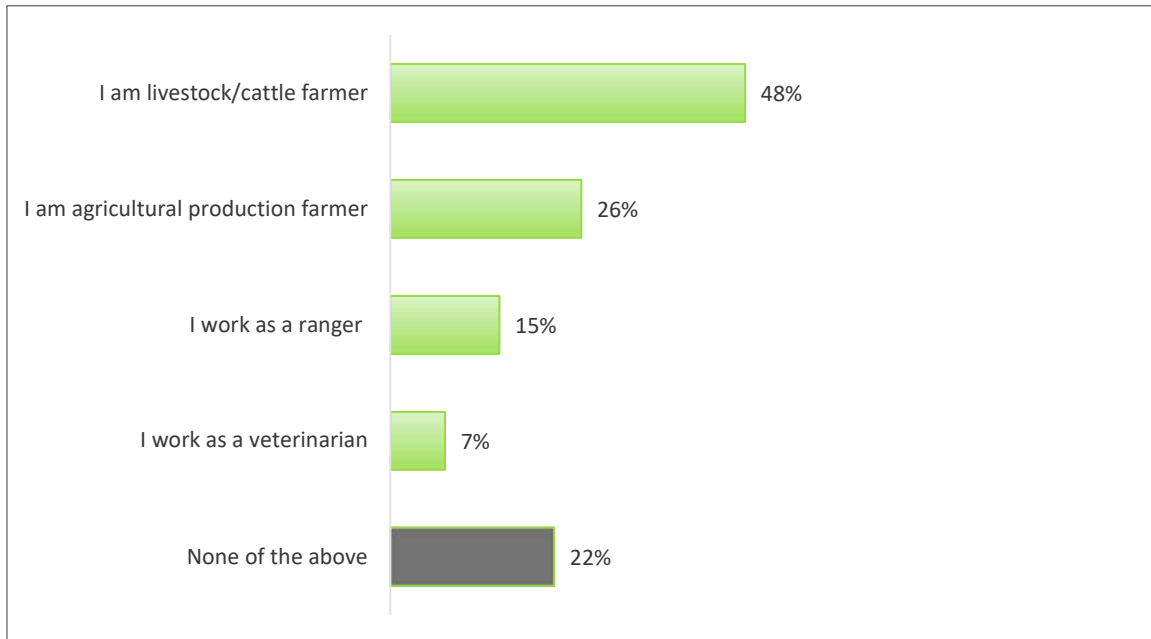
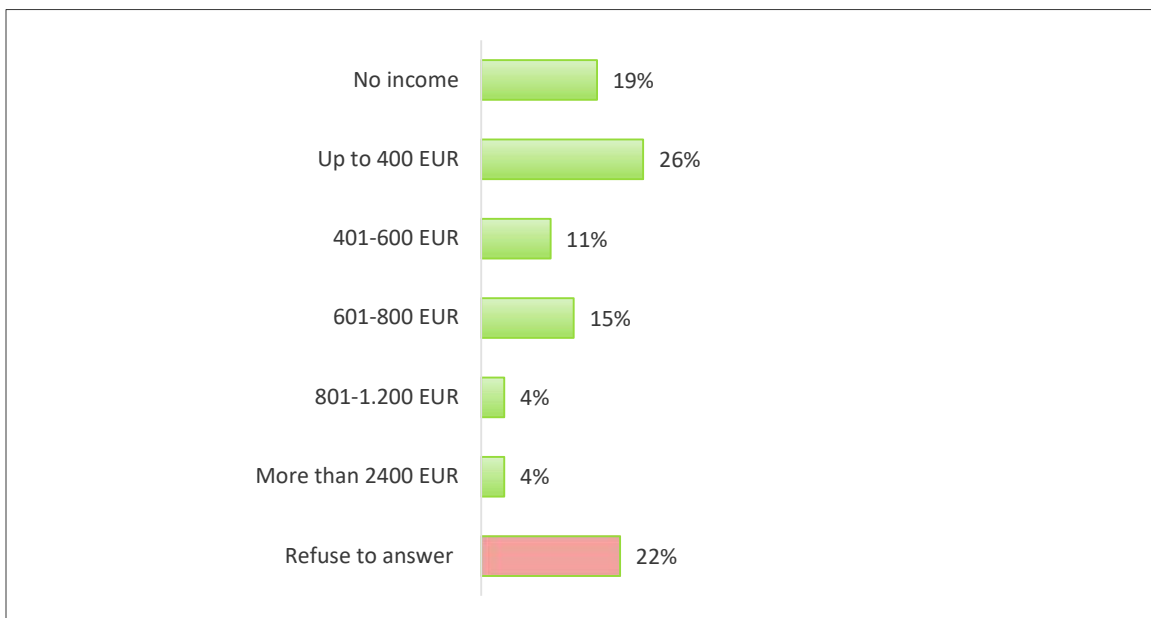
Chart 1.2. Gender*Chart 1.3. Education*

Chart 1.4. Employment status*Chart 1.5. Type of employment*

Base: 24 respondents who are employed

Chart 1.6. Jobs connected with nature*Chart 1.7. Average monthly income of the household*

Three quarters of the respondents were men, there were 15% of female respondents and 11% decided not to share information about gender.

regarding age structure of the sample, the respondents were almost equally divided between 25 to 34, 35 to 44 and 45 to 54 years of age - 29%, 22% and 30%, respectively. There were only 4% of respondents aged 65 years or older.

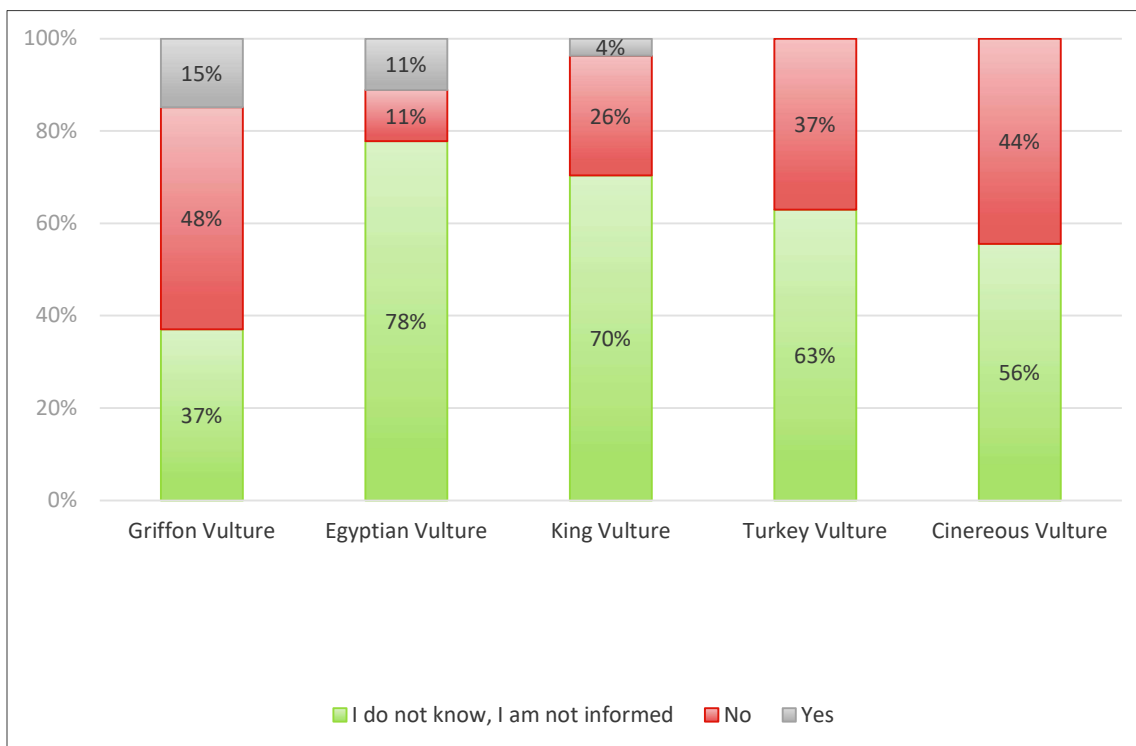
Almost half of the participants had completed higher education (professional or university degree or higher). Other half had either completed three-year secondary school (19%) or four-year secondary school (22%). Elementary education completed 7% of the respondents.

In terms of the work status, the majority of respondents were employed (82%) with 7% unemployed and 4% of students. Speaking of respondents who have some type of job which relates to nature, the largest number of them are livestock farmers (48%), followed by agricultural production farmers (26%) and rangers (15%). The smallest number of respondents work as a veterinarian (7%), while there were no hunters in the sample. Around fifth of the respondents answered that they do not have a job connected with nature.

Most participants had either no income (19%) or income up to 400 EUR (26%), 11% had between 401 and 600 EUR and 15% had between 601 and 800 EUR. Small percentage (8%) in the sample had more than 800 EUR of income.

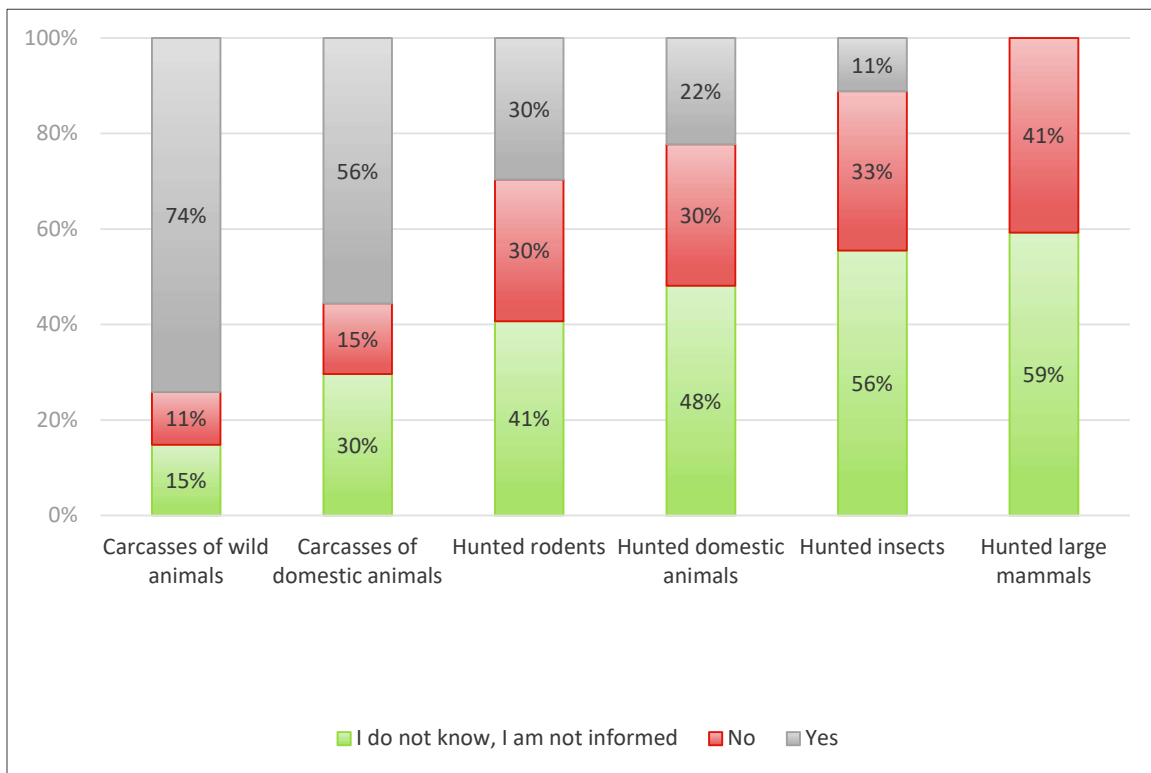
2. RESULT OF THE QUANTITATIVE RESEARCH

2.1 Vultures in Bosnia and Herzegovina

Chart 2.1. Awareness about the vulture species breeding in Bosnia and Herzegovina

In general, most respondents from our target groups in local communities (livestock and agricultural production farmers, rangers, and veterinarians) are not informed about the presence and if vulture species breed in Bosnia and Herzegovina (from 37% to 78% for specific species, with close to and above 60% for majority of species). Respondents are the most informed about presence and breeding of Griffon Vulture and Egyptian Vulture, but still at the very low level - 15% and 11% of the respondents, respectively. On the other hand, for Griffon Vultures close to 1 out of 2 respondents believe they do not breed in Bosnia and Herzegovina.

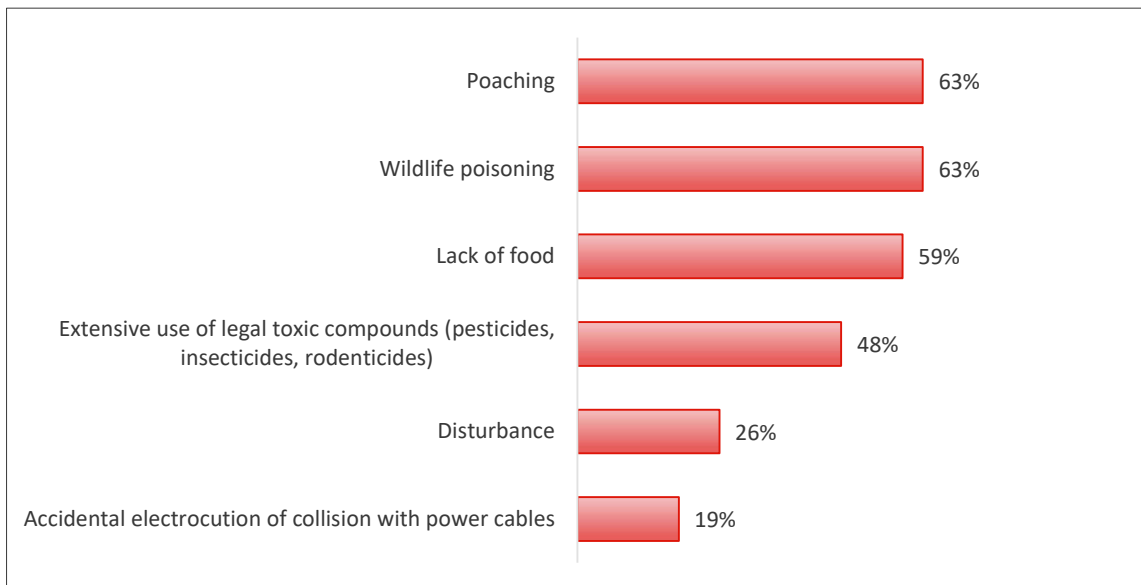
Chart 2.2. Awareness about the type of food which vultures feed on in Bosnia and Herzegovina



The largest number of respondents believe that vultures eat carcasses of wild animals (74%), followed by carcasses of domestic animals (56%). Other food types mentioned in considerably lower percentages are rodents (30%), domestic animals (22%) and insects (11%). For all food types, apart from carcasses of wild and domestic animals, there is around half of the respondents that don't know whether they are part of the vultures' diet or not.

2.2. The problems behind vulture poisoning in Bosnia and Herzegovina

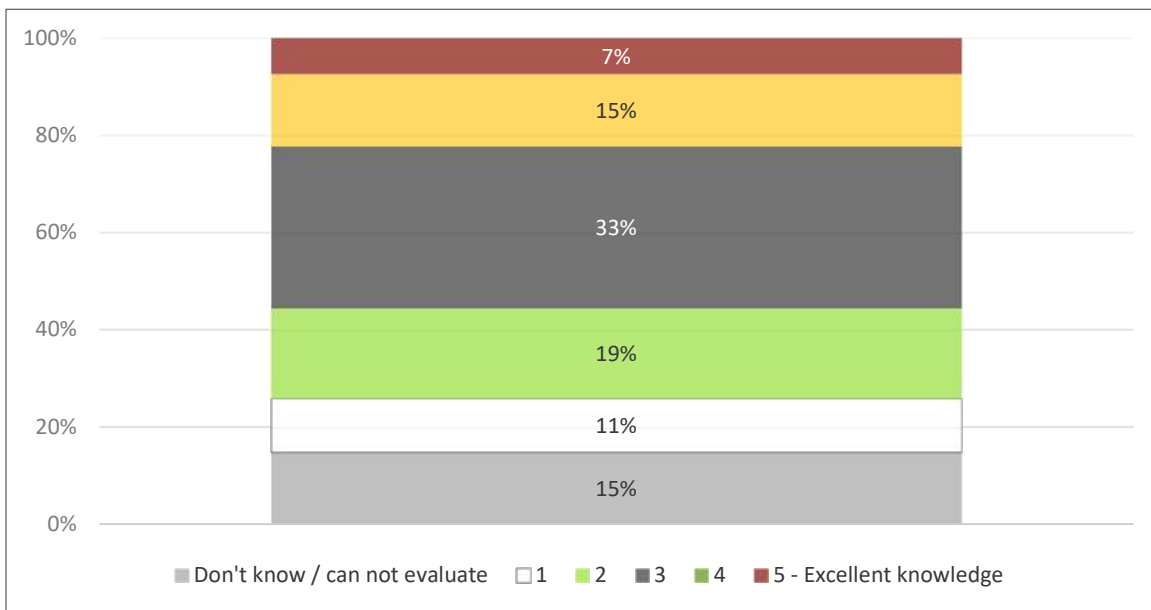
Chart 3.1. What endangers the vulture populations in Bosnia and Herzegovina the most?



Base: 27 respondents; Multiple answers

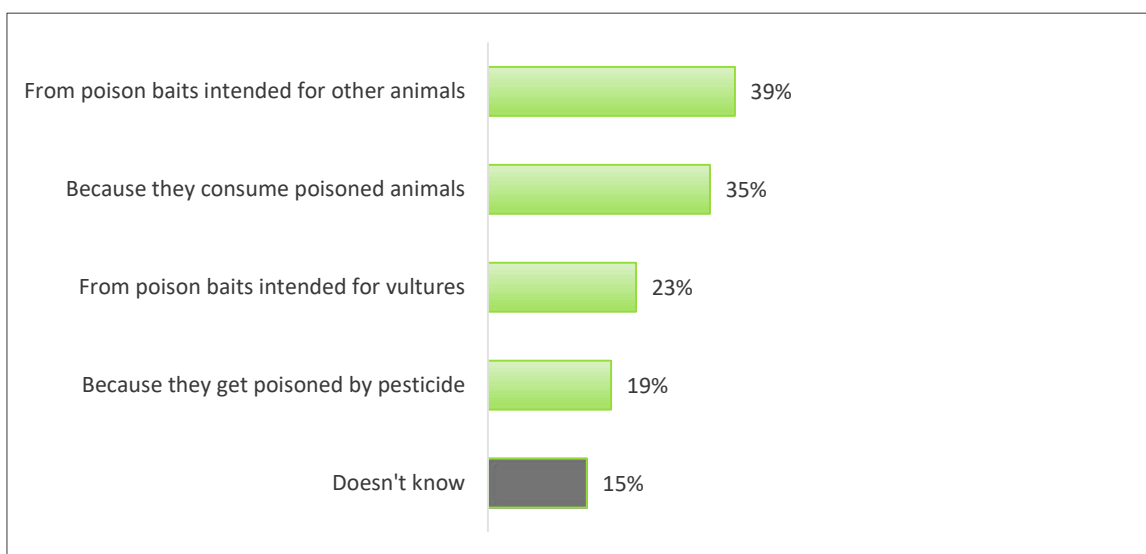
The key perceived threats to the vulture population in Bosnia and Herzegovina are poaching and wildlife poisoning (63% each), as well as the lack of food (59%). Widespread and excessive usage of the legal toxic compounds follows (48%), while 1 in 4 respondents identify disturbance as one of the factors endangering the vultures the most (26%). Accidental electrocution through collision with power cables is the least frequently identified as the one of the key causes endangering the vulture population (by 1 in 5 livestock/ cattle and agricultural production farmers, rangers, and veterinarians).

Chart 3.2. Evaluation of own knowledge about the issue of wildlife poisoning by inhabitants of local communities in Bosnia and Herzegovina



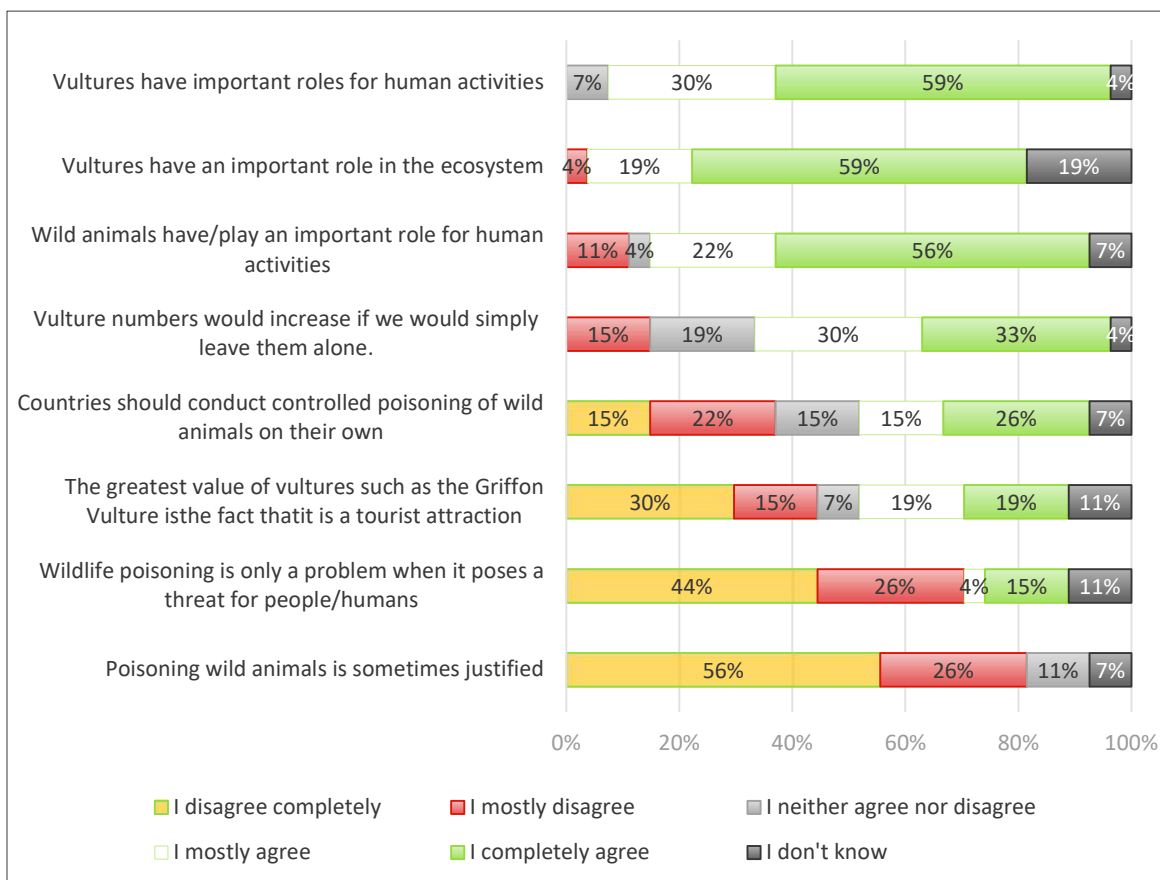
Farmers, rangers, and veterinarians from Bosnia and Herzegovina evaluate their knowledge of the issue of wildlife poisoning as average (33%) or below (30% estimated their level of knowledge with marks 1 and 2 on the scale from 1 to 5, where 5 represents excellent knowledge). Slightly above 20% of the targeted groups estimated their knowledge with top marks 4 or a 5.

Chart 3.3. Perceived key causes behind vulture poisoning



The attitudes of the target groups from local communities in Bosnia and Herzegovina about the key causes of vultures poisoning are divided. Most believe that vultures get poisoned from poison baits intended for other animals (39%) or because they consume poisoned animals (35%). Close to quarter (23%) report it is because of the poison baits intended specifically for vultures and close to 1 in 5 (19%) that the pesticides poisoning is the most frequent cause.

Chart 3.4. Personal attitudes towards vultures



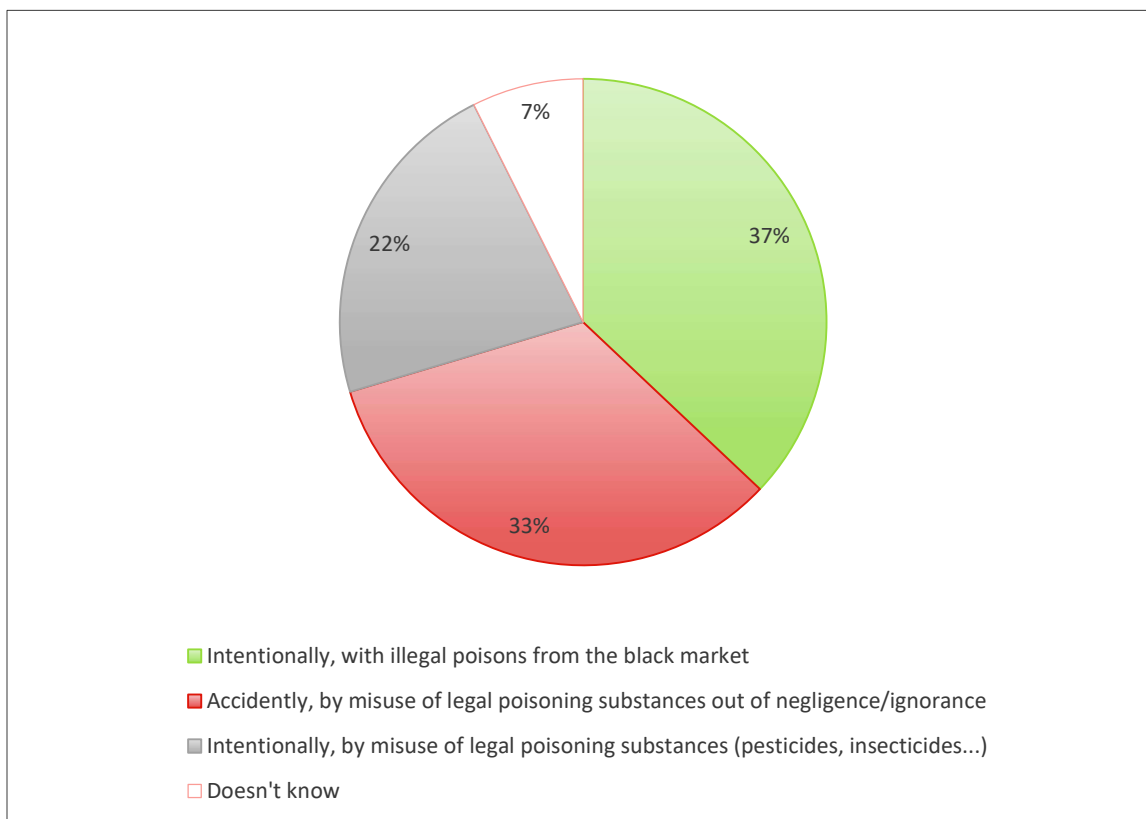
The majority of the respondents recognize the importance of vulture populations for both humans and the ecosystem in its entirety. The greatest level of agreement is shown toward statement ‘Vultures have important roles for human activities’ (89% of respondents mostly or completely agree with this statement), followed by the statements ‘Vultures have an important role in the ecosystem’ and ‘Wild animals

have/play an important role for human activities' (78% of respondents mostly or completely agree with these statements).

Close to 2 out of 3 respondents believe that the vulture populations would recover if people would leave them on their own, without interfering. On the other hand, still slightly above 40% of respondents consider controlled institutionally conducted poisoning of wild animals as a proper mean to control pests.

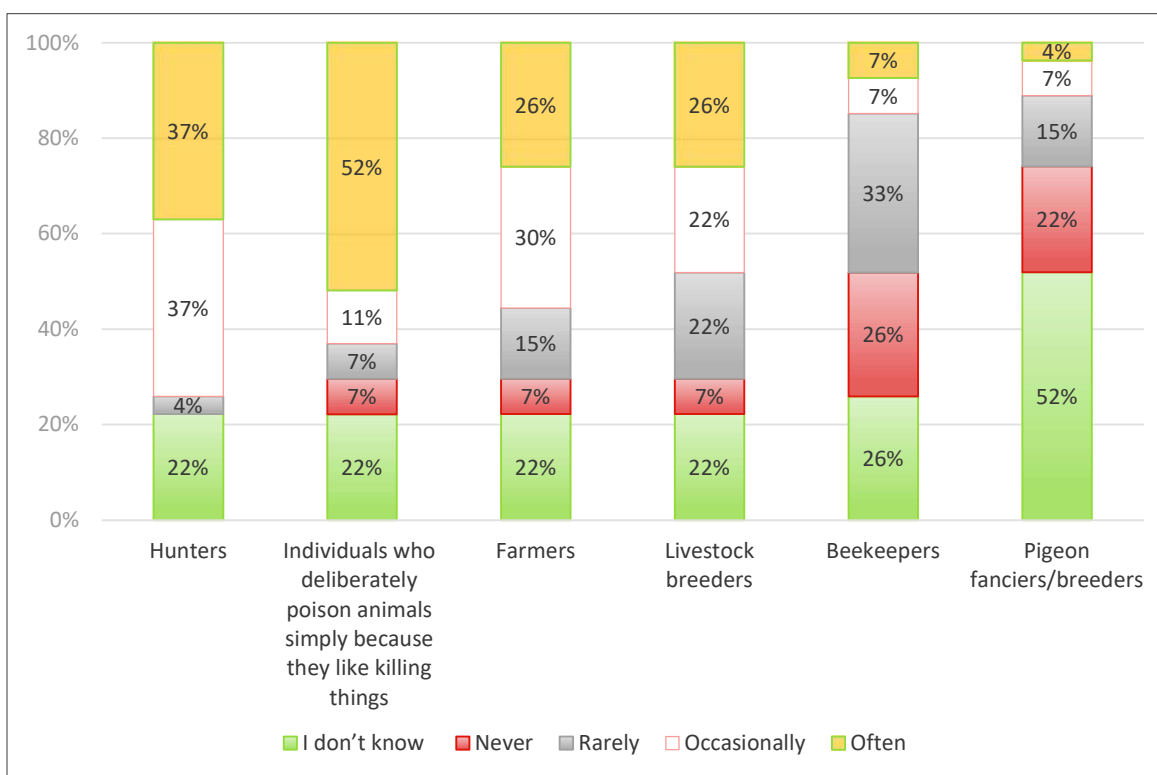
Certain level of ecological awareness and potential for accepting the vulture anti-poisoning campaign is also revealed through high levels of disagreement with statements 'Poisoning wild animals is sometimes justified' and 'Wildlife poisoning is only a problem when it poses a threat for humans' (82% and 70% of respondents mostly or completely disagree with these statements, respectively).

Chart 3.5. Perception about how wildlife poisoning most commonly occurs

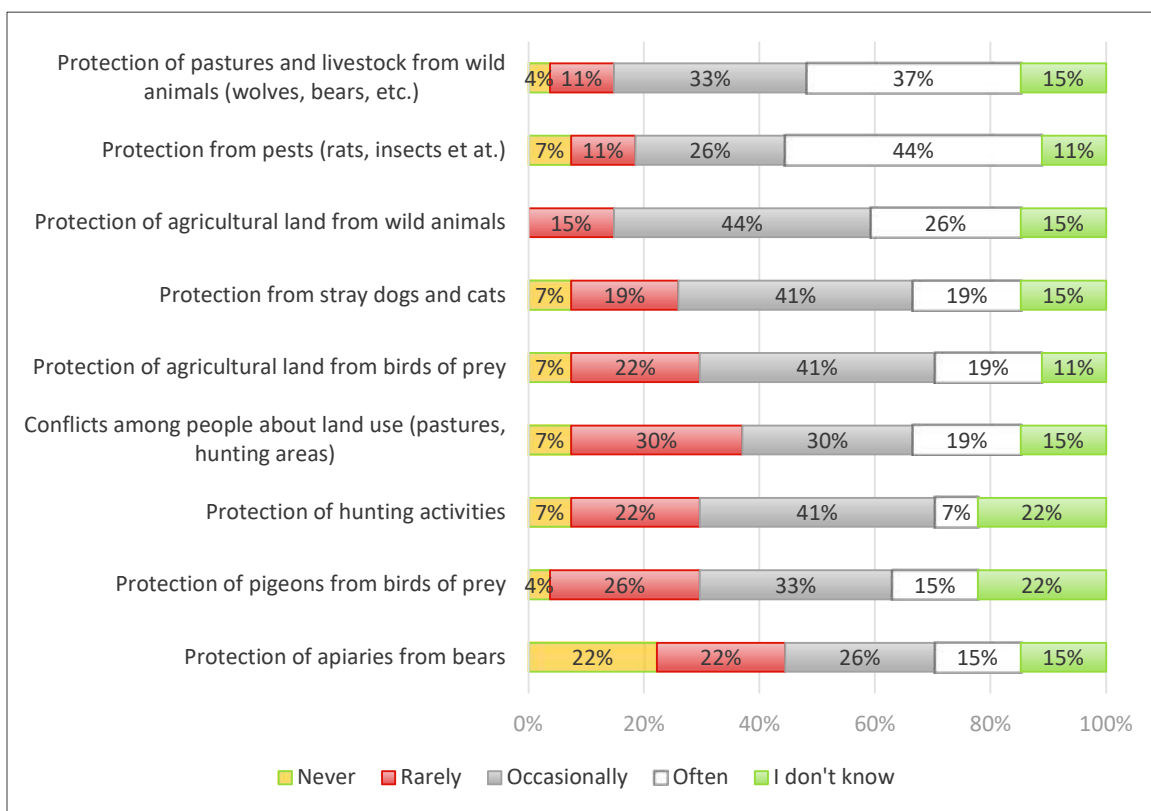


Close to 60% of surveyed residents from targeted occupational fields perceive that wildlife poisoning mostly occurs intentionally, either by illegal poisons from the black market (37%) or to a lower percentage by abuse of legal poisoning substances such as pesticides, insecticides, etc. (22%). Around one third of respondents (33%) believe that wildlife poisoning most commonly occurs accidentally, by misuse of legal poisoning substances out of negligence or ignorance.

Chart 3.6. Perception regarding groups responsible for wildlife poisoning

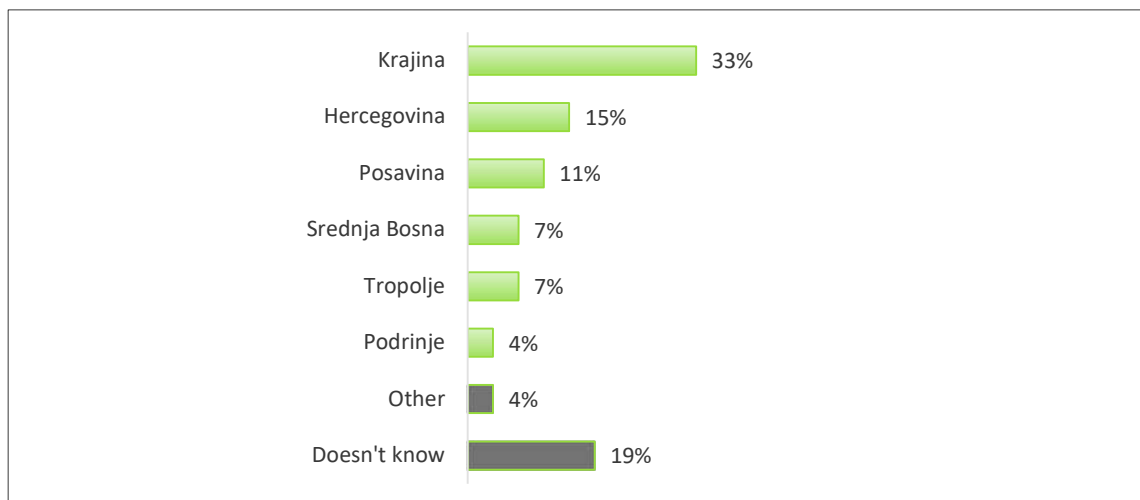


Close to 3 out of 4 members of targeted groups perceive hunters to be responsible for wildlife poisoning (74% identified them to be occasionally or often responsible). Individuals who deliberately poison animals simply because they like killing things follow but with greater certainty of respondents amongst which 52% answered often (in total 63% answered occasionally or often). Around half of the sample believe that farmers (56%) and livestock breeders (48%) are often or occasionally responsible for wildlife poisoning, while beekeepers and pigeon fanciers/breeders (14% and 11% Occasionally or Often, respectively) are not recognized as responsible by vast majority of the respondents.

Chart 3.7. Perceived motives behind the poisoning of wild animals

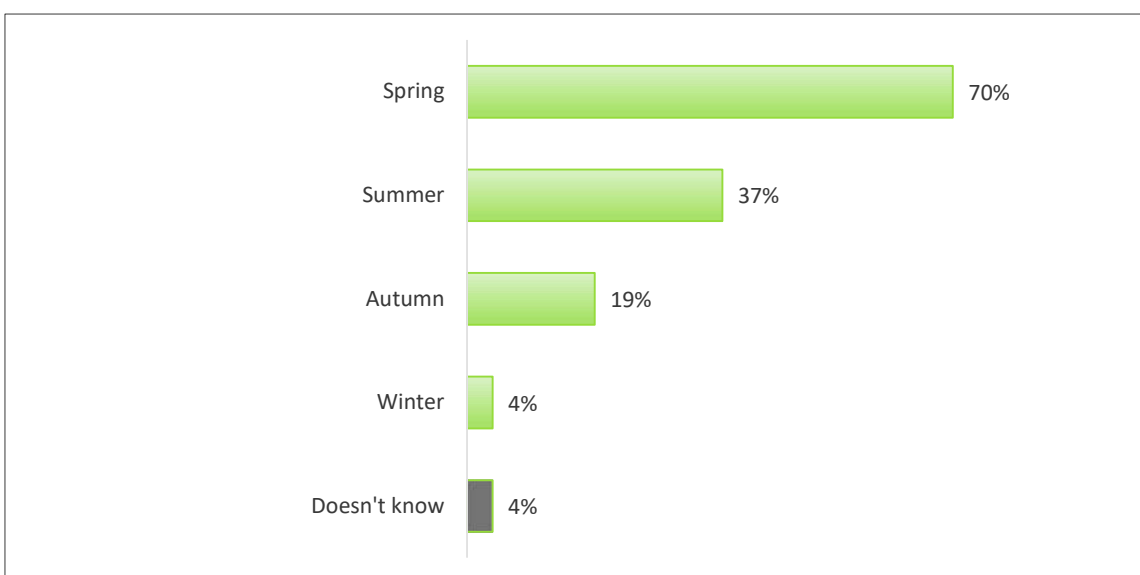
The most frequent motives behind poisoning of wild animals imply the need for better solutions for *protection from pests*, *protection of pastures and livestock from wild animals*, and *protection of agricultural lands from wild animals* (70% of respondents identify these motives as 'occasional' or 'often'). *Protection from stray dogs and cats* and *Protection of agricultural land from birds of prey* follow (60% of the respondents, each). No reasons are seen as particularly rare, as all are perceived as occasional or often motives behind the poisoning of wild animals by at least 40% of the respondents.

Chart 3.8. Regions of Bosnia and Herzegovina where wild animals are most frequently poisoned



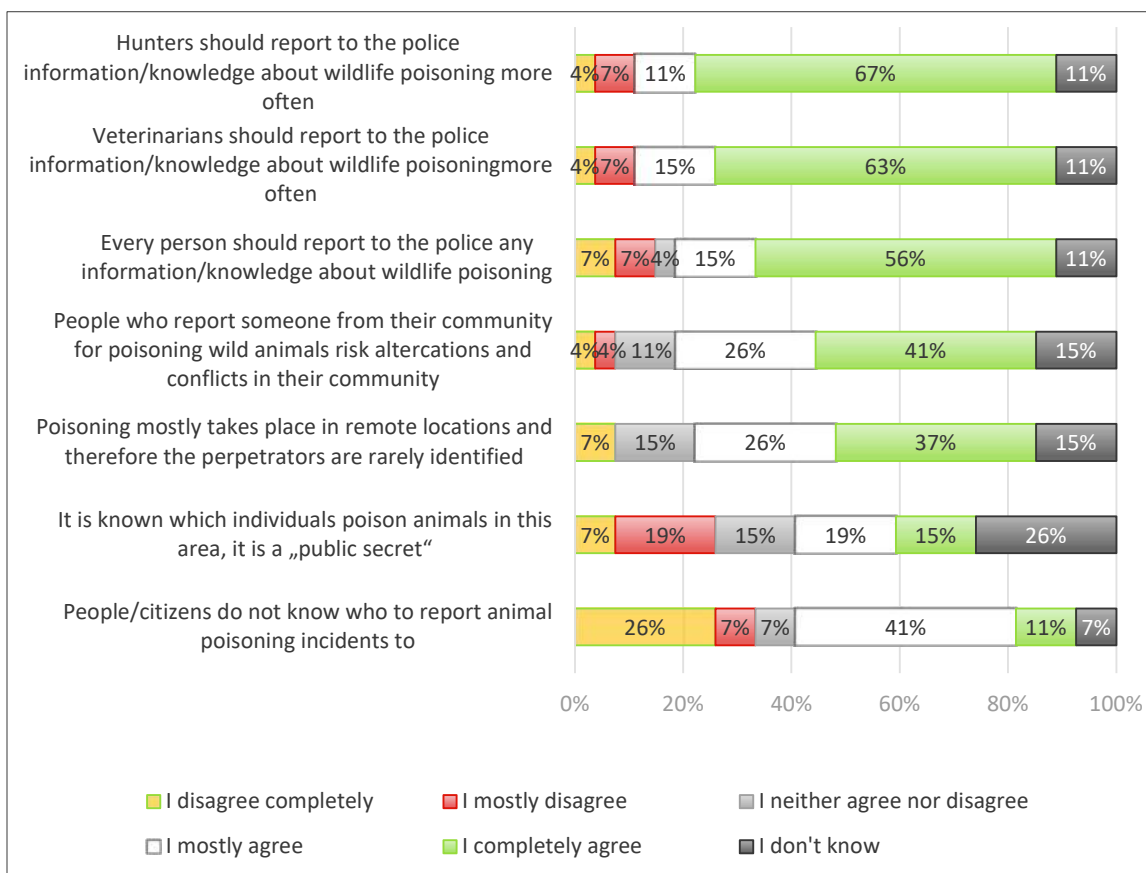
Amongst the regions of Bosnia and Herzegovina, Krajina (33%) is perceived as the region where wild animals are most frequently poisoned. Hercegovina (15%) and Posavina (11%) are recognized by more than 10% of the respondents as “red spots”, while other regions are picked by less than 10% of respondents. Close to 1 in 5 (19%) of the respondents are not informed in which region are wild animals the most frequently poisoned.

Chart 3.9. Period of the year when wildlife poisoning mostly occurs



Majority of respondents identify spring (70%) as the period of the year when wildlife poisoning mostly occurs, followed by summer (37%). Autumn (19%) and winter (4%) are less frequently perceived as periods of the year when poisoning usually occurs.

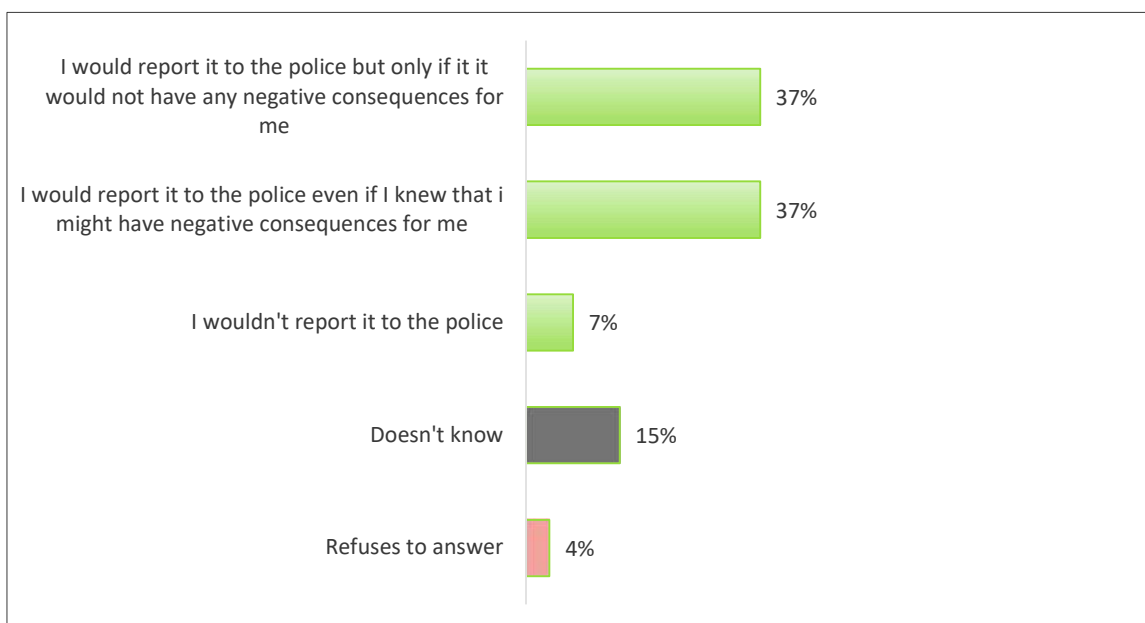
Chart 3.10. Personal attitudes towards reporting poisoning incidents to the relevant authorities



Respondents recognize hunters and veterinarians as the most responsible groups for reporting information/knowledge about wildlife poisoning to the police (78% of respondents mostly or completely agree with it). Around 70% of the participants of the survey believe that every person should report information about wildlife poisoning to the police, but also that people who report wildlife poisoning cases face some risks (i.e., conflicts in their communities). Similar number (somewhat less than 2 out of 3 respondents) also perceive that poisoning usually takes place in remote locations and therefore perpetrators remain unidentified.

The most polarizing statement 'People/ citizens do not know who to report animal poisoning incidents to' where over 50% of the respondents mostly or completely agree with the statement, but on the other hand, around one third mostly or completely disagree with it implies that further informing of the citizens is needed to help them participate in identification of the cases of poisoning and in prevention of further incidents.

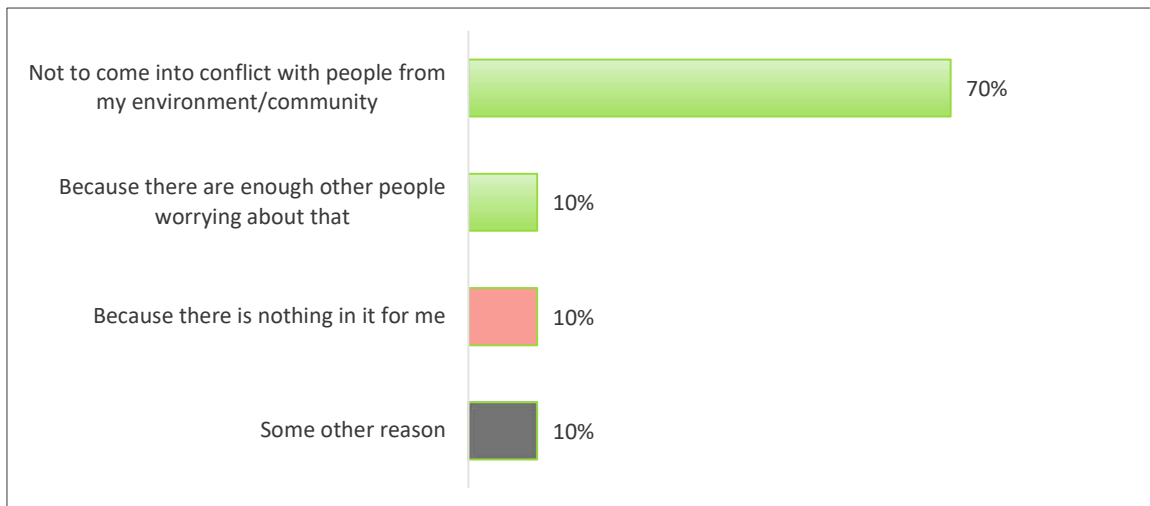
Chart 3.11. Steps one would take if he/she finds out some information about poisoning



While 1 in 3 respondents claim they would report the poisoning to the police in case they have some information, same number is concerned about the possible risks and claims readiness to report the incident only if it wouldn't have negative consequences for them.

The rest (15%) is undecided what they would do, while close to 1 in 10 stated that they would not report the poisoning (7%).

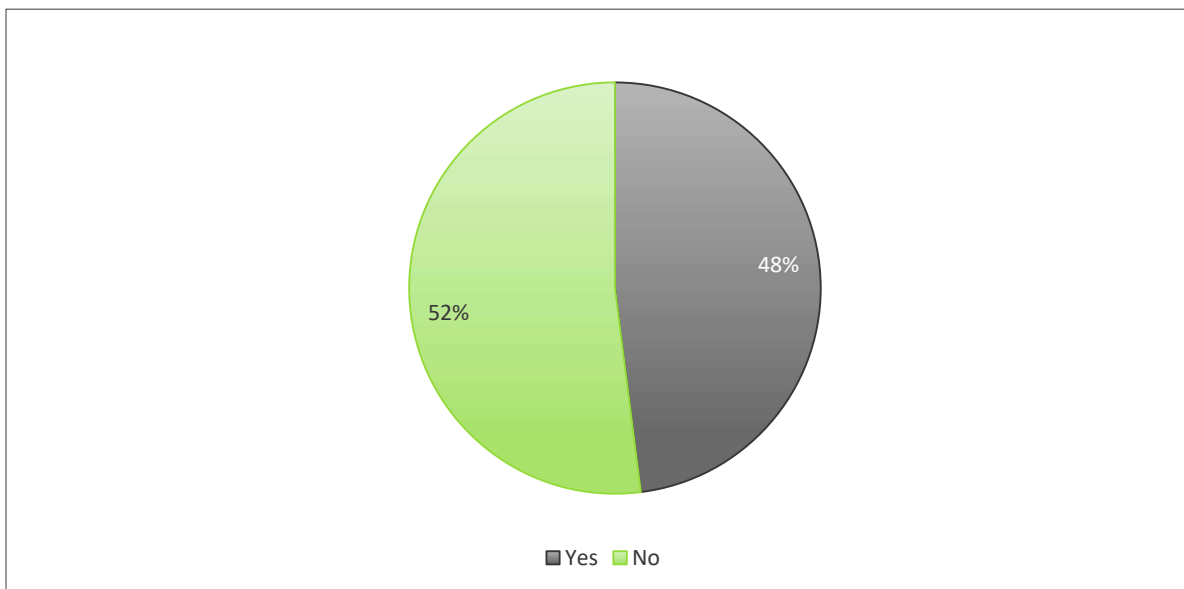
Chart 3.12. Reasons for not reporting poisoning



Base: 10 respondents who wouldn't report the poisoning or those who would, but only if that couldn't cause negative consequences

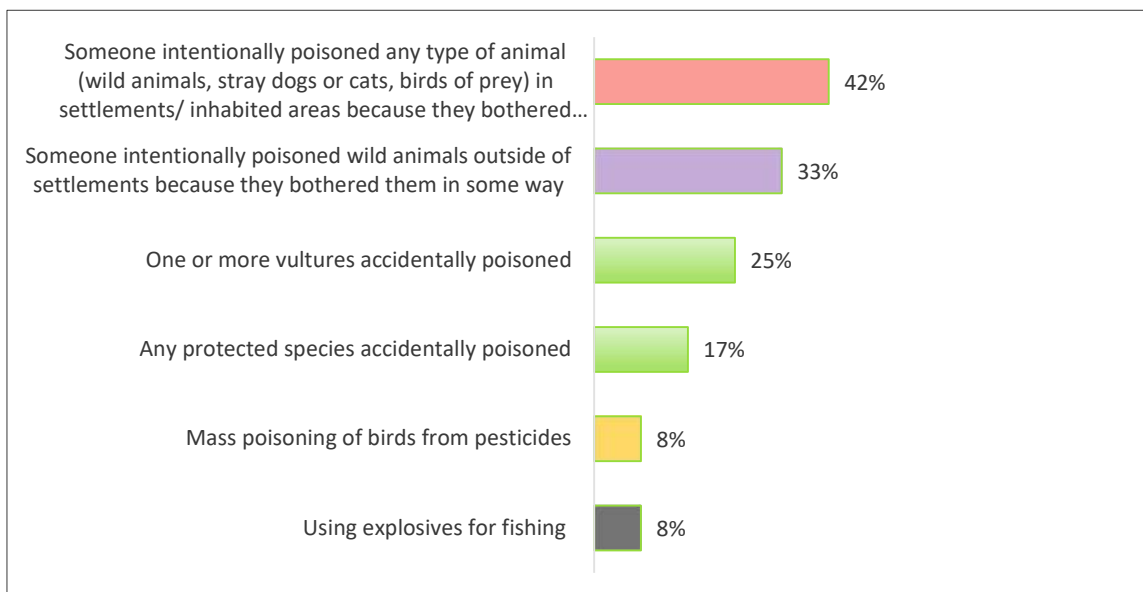
When asked about reasons for reluctance for reporting poisoning incident, majority (70%) of the respondents are concerned and would like to avoid conflicts with people from their environment/community.

Chart 3.13. Knowledge about poisoning incidents



In the past 10 years, around half of the respondent (48%) claim to have encountered case(s) of poisoning in their community.

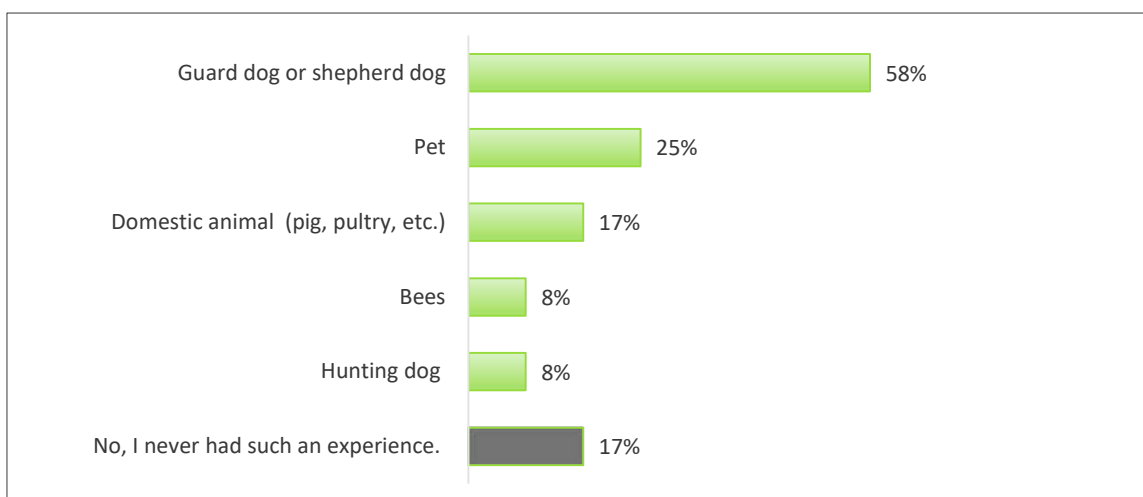
Chart 3.14. Poisoning incidents



Base: 12 respondents who heard of at least one case of poisoning

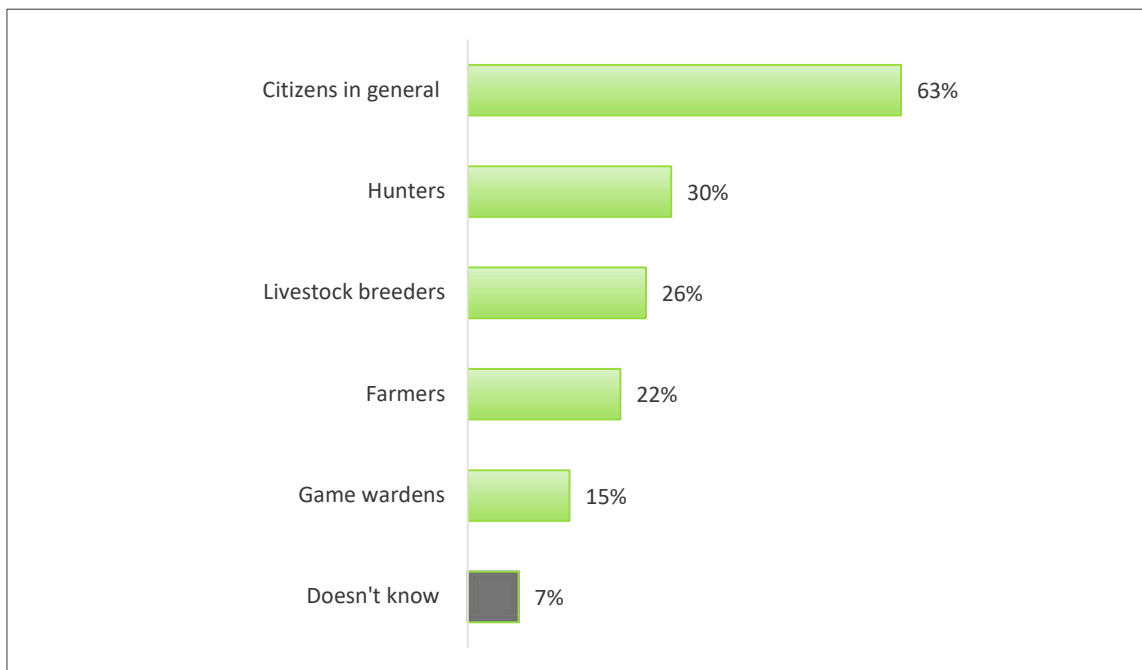
Most of the respondents had knowledge of intentional poisoning of any type of animal inside a settlement (42%) or outside of settlement (33%). 1 in 4 reported they knew about one or more vultures accidentally being poisoned, and 17% reported about protected species accidentally being poisoned.

Chart 3.15. Personal or communal accidents involving poisoned animals



In most cases, accidents involving the poisoned animals in the respondent's household or community affected guard or shepherd dogs (58%), pets (25%) or a domestic animal (17%).

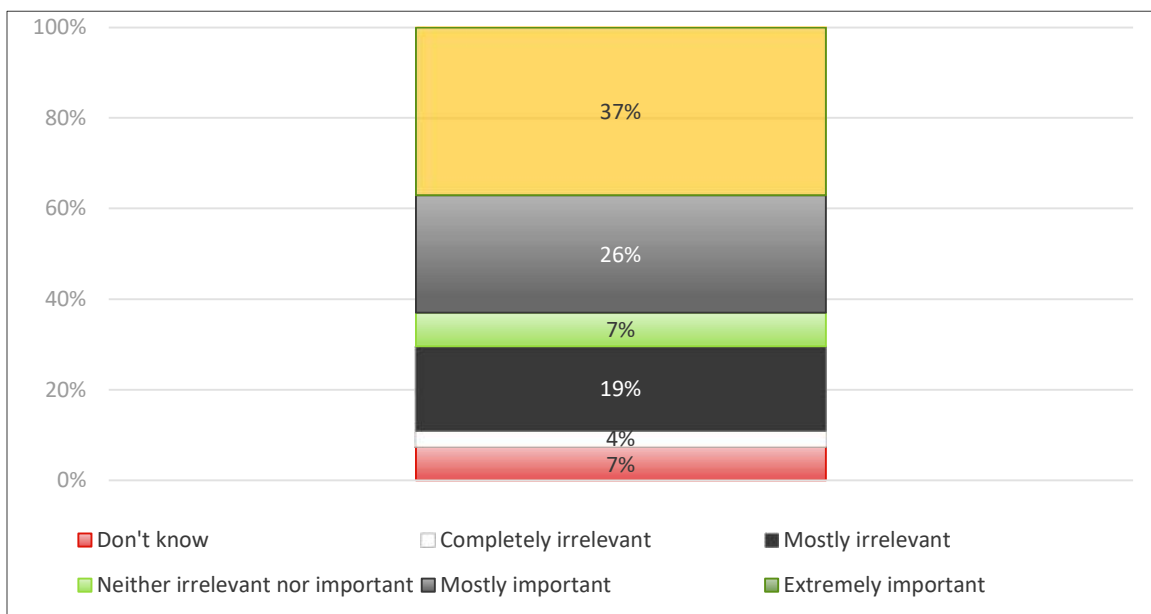
Chart 3.16. Groups that need to become more aware of wildlife poisoning



Base: 27 respondents; Multiple answers

Citizens in general are being identified as the target group for the awareness campaign about the threats of wildlife poisoning, hunters (30%), livestock breeders (26%) and farmers (22%) follow.

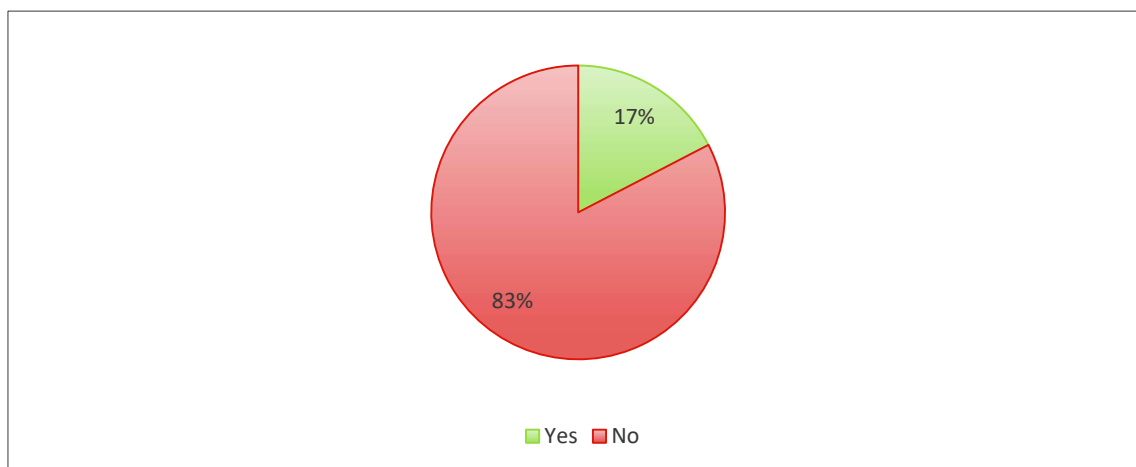
Chart 3.17. Importance of wildlife poisoning investigations, compared to other police work



When asked to compare the importance of wildlife poisoning investigations to other police work, close to two thirds of respondents (63%) thought that these investigations are mostly or extremely important. 23% of respondents sees these investigations as mostly or completely unimportant.

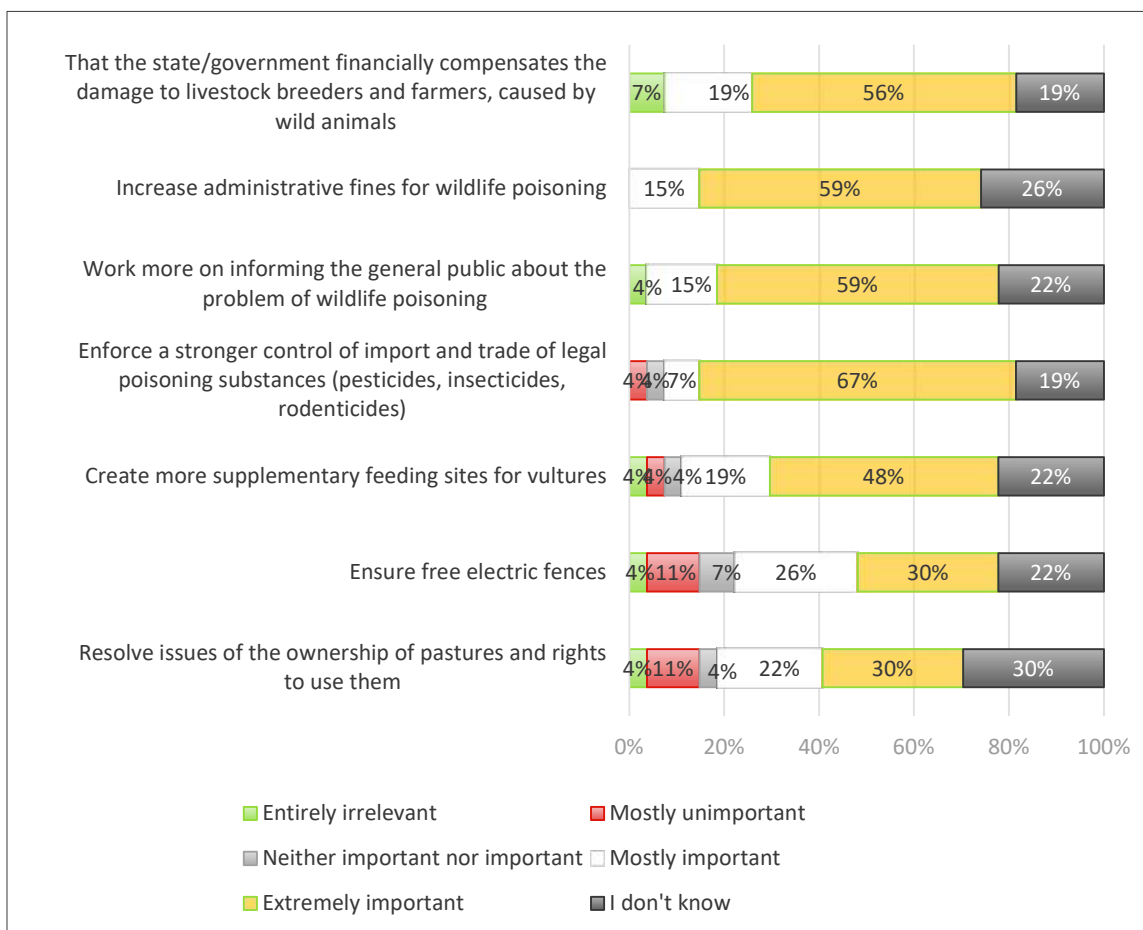
2.3. Measures related to wildlife poisoning

Chart 4.1. Awareness about a specific case of a police investigation for a wildlife poisoning incident



17% of respondents claim being familiar with the specific case of a police investigation for a wildlife poisoning incident in Bosnia and Herzegovina. Other respondents are not informed about the specific cases of such an investigation.

Chart 4.2. Importance of undertaking the following measures

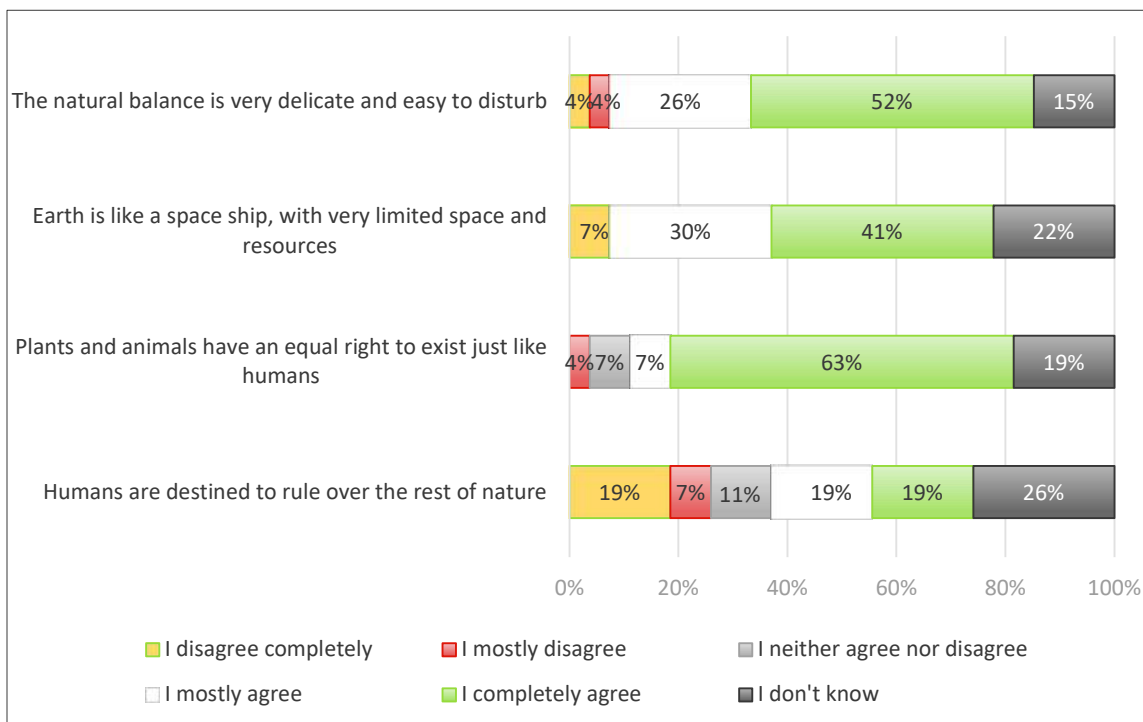


When asked about importance of undertaking particular measures, respondents generally agreed with the listed measures as all measures were assessed as important (mostly or extremely) by at least 50% of the sample. Close to three quarters of the sample (75%) believe that it is important to enforce a stronger control of import and trade of legal poisoning substances, to increase administrative fines for wildlife poisoning, to work more on informing the general public about the problem of wildlife poisoning, and that state/government should financially compensate the damage to livestock breeders and farmers, caused by wild animals.

It is also important to note that the opinions of respondents on these topics are somewhat limited as for each statement around one fifth to one quarter of participants claim being undecided or unfamiliar.

2.4 Attitudes towards nature

Chart 5.1. Personal attitudes towards nature



Respondents expressed their attitudes towards nature on the scale from 1, which represents strong disagreement, to 5, which represents strong agreement. About 70% of the respondents agree that the Earth has limited space and resources, that it is difficult to maintain the natural balance, and that plants and animals have the same rights as humans.

The most polarizing attitude is related to the primacy of man over nature – while 4 out of 10 respondents believe that people are the ones who have the primacy, similar number is either undecided or doesn't know, while around one fourth disagrees with this idea of the human rule over nature.

Annex V. Perception of the illegal practice of wildlife poisoning within relevant governmental authorities in Bosnia and Herzegovina – baseline report.

1. METHODOLOGY

1.1 Project background

The BalkanDetox LIFE project (LIFE19GIE/NL/001016) - Strengthening national capacities to fight wildlife poisoning and raise awareness about the problem in the Balkan countries is a project that is dedicated to the fight against illegal poisoning of wild animals which local citizens usually consider as pests, but which has serious negative consequences for the population of numerous endangered animal species, primarily vultures which eat poisoned animals or eat the poison themselves. The study will be conducted in two waves in 2021 and 2025, as a base line and follow up study aimed at measuring the current attitudes and practices, and attitudes and practices of target groups after the implementation of planned campaign and activities.

The project is being implemented at the multinational level in the Balkan region. The countries involved are Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Greece, Northern Macedonia, and Serbia.

1.2 Key research topics

In this first phase, the aims of the research are:

- Measuring awareness of target groups of employees of relevant government services and institutions, law enforcement agencies and veterinary services about endangered species (vultures), methods of poisoning and individuals or groups responsible for poisoning on the territories of their respective countries. Measuring of the current perceptions and attitudes of target groups related to aggravating circumstances and obstacles as well as capacities of the state institutions to prevent, investigate and sanction wildlife poisoning cases.
- Measuring of the current perceptions of target groups related to legislations, procedures, documentation, and processing of wildlife poisoning cases.

1.3 Methodological approach

1.3.1 Research technique

Online Interviews of the targeted groups of relevant governmental services and institutions, law enforcement agencies and veterinary services in Bosnia and Herzegovina.

1.3.2 Fieldwork

The fieldwork was conducted from September the 18th to October the 21st in 2021.

1.3.3 Questionnaire length

Questionnaire length up to 10 minutes.

1.3.4 Sample - target group

The target group in the research were employees of relevant governmental services and institutions, law enforcement agencies and veterinary services in Bosnia and Herzegovina.

Due to difficulties caused by the COVID-19 pandemic, the sample included 9 respondents in total out of 29 employees in targeted institutions.

1.3.5 Sample Structure

Table 1.1. Institutions where respondents are employed

Institutions	Number of respondents
Ministry of Education and Culture	3
Faculty of Veterinary Medicine, University of Sarajevo	2
Ministry of Physical Planning, Civil Engineering and Ecology of the Republika Srpska	1
Ministry of Agriculture, Water Management and Forestry of the Federation of Bosnia and Herzegovina	1
Federal Department for Inspection Affairs	1
Ministry of Agriculture, Forestry and Water Management of the Republika Srpska	1
Base: 9	

Table 1.2. Current job position

Job position	Number of respondents
Employee	3
Middle management level	3
Upper management level	2
Other	1
Base: 9	

Table 1.3. Years of service in the institution where respondents currently work

Years of service - Institution	Number of respondents
Up to 5 years	2
6-10	3
11-15	3
16+	1
Base: 9	

Table 1.4. Years of service in the department where respondents currently work

Years of service - Department	Number of respondents
Up to 5 years	2
6-10	3
11-15	3
16+	1
Base: 9	

Table 1.5. Direct engagement with the issue of wildlife/ animal poisoning in respondents' line of work

Direct dealing with wildlife/ animal poisoning	Number of respondents
No	6
Yes, both of wild and domestic animals	3
Yes, but only of domestic animals	0
Base: 9	

Table 1.6. Involvement in the issue of wildlife/ animal poisoning in respondents' line of work

Involvement in the issue of wildlife/ animal poisoning	Number of respondents
Yes, both of wild and domestic animals	4
Yes, but only of domestic animals	1
No	1
Base: Respondents who don't directly deal with the issue of wildlife poisoning in their line of work, N = 6	

Table 1.7. Evaluation of own knowledge about the issue of wildlife poisoning

Evaluation of own knowledge about wildlife poisoning	Number of respondents
5 - Excellent knowledge	1
4	2
3	3
2	2
1 - Very bad knowledge	0
I do not know / I cannot estimate	1
Base: 9	

Table 1.8. Attending educational programmes related to detection and processing of wildlife poisoning incidents

Educational programme attendance	Number of respondents
No	5
Yes	4
Base: 9	

Table 1.9. Educational programmes organizers

Organizers	Number of respondents
Vulture Conservation Foundation	2
Ornithological Society 'Naše ptice'	1
Institute for Nature Conservation of Vojvodina	1
Base: Respondents who have attended some educational programme related to detection and processing of wildlife poisoning incidents, N = 4	

Out of nine respondents participating in online interviews, three are employed in the Ministry of Education and Culture, while two are employed at the Faculty of Veterinary Medicine, University of Sarajevo. The rest of the respondents are equally split (one each) at the following institutions: Ministry of Agriculture, Water Management and Forestry of the Federation of Bosnia and Herzegovina; Ministry of Physical Planning, Civil Engineering and Ecology of the Republika Srpska; Federal Department for Inspection Affairs and Ministry of Agriculture, Forestry and Water Management of the Republika Srpska.

The majority of respondents employed in the institutions work at middle management and employee level positions (three each). Two of the respondents are employed at upper management level.

Most of the respondents (six) have between 6 and 15 years of service at their respective institutions, as well as at the departments where they are currently employed. Two have been working up to 5 years, and one has been working more than 16 years at both the institution and the department of current employment.

Two thirds of the respondents in this research did not directly deal with the issue of wildlife poisoning in their line of work, compared to one third that have been dealing with

the poisoning of both domestic and wild animals. Most of the respondents (four) who don't directly deal with the issue of wildlife poisoning have however been involved in the matter of poisoning of both domestic and wild animals.

The majority of the respondents evaluate their own knowledge about the issue of wildlife poisoning with average grades, or somewhat below or above the average. Only one respondent evaluates his/ her own knowledge on the issue as excellent.

Respondents are divided when it comes to attending educational programmes related to the detection and processing of wildlife poisoning incidents - four of them have attended some educational programme and five of them haven't attended any. Respondents who have attended some educational programme related to detection and processing of wildlife poisoning incidents name the Vulture Conservation Foundation, the Ornithological Society 'Naše ptice' and the Institute for Nature Conservation of Vojvodina as the organizers of the programmes.

2. RESULTS OF THE ONLINE INTERVIEWS

2.1. Vultures in Bosnia and Herzegovina

Table 2.1. Awareness about vulture species breeding in Bosnia and Herzegovina

Vultures	Number of respondents
Griffon Vulture	7
Egyptian Vulture	2
Cinereous Vulture	1
Turkey Vulture	1
Base: 9	

Most of the respondents employed within the relevant institutions believe that Griffon Vultures breed in Bosnia and Herzegovina, while a small number consider that Egyptian Vulture, Cinereous Vulture and Turkey Vulture are also present in Bosnia and Herzegovina. However, today none of the four species of European vultures breeds in the country with only rare and isolated sightings of vagrant Griffon Vultures.

Table 2.2. Awareness of the types of food which vultures feed on in Bosnia and Herzegovina

Food	Number of respondents
Carcasses of wild animals	8
Carcasses of domestic animals	8
Hunted rodents	3
Hunted insects	1
Base: 9	

Almost all respondents are aware that vultures in Bosnia and Herzegovina feed on the carcasses of wild and domestic animals. Part of the respondents state that the vultures' diet also includes hunted rodents, while hunted insects are mentioned rarely.

2.2 Problem of vulture poisoning in Bosnia and Herzegovina

Table 3.1. What endangers the vulture populations in Bosnia and Herzegovina the most?

The main danger	Number of respondents
Extensive use of legal toxic compounds (pesticides, insecticides, rodenticides)	4
Wildlife poisoning	3
Lack of food	1
Poaching	1
Base: 9	

The key perceived threats to the vulture population in Bosnia and Herzegovina are extensive usage of legal toxic compounds (pesticides, insecticides, rodenticides) and wildlife poisoning. Lack of food and poaching are perceived as dangers for the vulture population rarely.

Table 3.2. Perceived key causes behind vulture poisoning

Causes	Number of respondents
From poison baits intended for other animals	4
Because they eat poisoned animals/animals that died of poisoning	3
From poison baits intended for vultures	2
Base: 9	

The attitudes of the target group of institutions employees in Bosnia and Herzegovina about the key causes of vulture poisoning are divided. The majority believe that vultures get poisoned from poison baits intended for other animals or because they consume poisoned animals (that died of poisoning). A smaller number report it is because of the poison baits intended specifically for vultures.

Table 3.3. Perception about how wildlife poisoning most commonly occurs

The way wildlife poisoning occurs	Number of respondents
Accidentally, by misuse of legal poisoning substances out of negligence/ignorance	4
Intentionally, with illegal poisons from the black market	3
Intentionally, by misuse of legal poisoning substances (pesticides, insecticides...)	2
Base: 9	

When asked about the way wildlife poisoning most commonly occurs, the respondents' opinions are divided. While some state that wildlife poisoning occurs accidentally, by misuse of legal poisoning substances out of negligence or ignorance, other believe that wildlife poisoning occurs intentionally, with illegal poisons from the black market or by misuse of legal poisoning substances (pesticides, insecticides...).

Table 3.4. Perception regarding groups responsible for wildlife poisoning

Groups	Levels of frequency (Number of respondents)			
	Never	Rarely	Occasionally	Often
Individuals who deliberately poison animals simply because they like killing things	1	2	4	2
Livestock breeders	1	3	3	2
Farmers	/	5	3	1
Hunters	2	5	1	1
Beekeepers	5	2	1	1
Pigeon fanciers/breeders	4	4	/	1
Base: 9				

The biggest responsibility for wildlife poisoning is attributed to individuals who deliberately poison animals simply because they like killing things, and who are identified as the ones poisoning wildlife occasionally but also often. Opinions are divided for livestock breeders and farmers who have been named as responsible at least rarely. Institutional employees generally estimate that pigeon fanciers/ breeders, beekeepers and hunters are rarely or never responsible for vulture poisoning.

Table 3.5. Perceived motives behind the poisoning of wild animals

Motives	Levels of frequency (Number of respondents)			
	Never	Rarely	Occasionally	Often
Protection from pests (rats, insects, etc.)	/	3	3	3
Protection of pastures and livestock from wild animals (wolves, bears, etc.)	1	2	3	3
Protection of agricultural land from wild animals	1	2	3	3
Protection of agricultural land from birds of prey	2	2	2	3
Conflicts among people about land use (pastures, hunting areas)	2	2	3	2
Protection of pigeons from birds of prey	1	4	3	1

Protection from stray dogs and cats	1	3	5	/
Protection of apiaries from bears	1	6	1	1
Protection of hunting activities	3	4	2	/
Base: 9				

The most frequent motives behind the poisoning of wild animals identified by employees from the relevant institutions imply the need for better solutions for *protection from pests, protection of pastures and livestock from wild animals, and protection of agricultural lands from wild animals* (the majority of respondents identify these motives as 'occasional' or 'often'). *Protection of agricultural land from birds of prey and conflicts among people about land use (pastures, hunting areas)* follow (although respondents are mostly divided about their frequency).

Protection of pigeons from birds of prey and Protection from stray dogs and cats are identified as motives at least rarely.

Table 3.6. Regions of Bosnia and Herzegovina where wild animals are most frequently poisoned

Regions	Number of respondents
Herzegovina	4
Posavina	2
I don't know	5
Base: 9	

Over half of the employees from the institutions do not know in which regions of Bosnia and Herzegovina wildlife poisoning is the most recurrent. On the other hand, a relatively similar number of respondents believe that most of wildlife poisoning is committed in the region of Herzegovina.

Table 3.7. Period of the year when wildlife poisoning mostly occurs

Periods of the year	Number of respondents
Spring	3
Autumn	3
Summer	2
Winter	0
I don't know	4
Base: 9	

Respondents are either not informed about the period of the year in which wildlife poisoning mostly occurs or identify spring and autumn as the periods of major threats for wildlife.

Table 3.8. Importance of the aggravating circumstances and obstacles

Aggravating circumstances and obstacles	Levels of importance (Number of respondents)				
	Entirely irrelevant	Mostly unimportant	Neither important nor unimportant	Mostly important	Extremely important
Bad law enforcement	/	/	/	2	7
Lack of control over the prescribed use of legal poisons, such as pesticides, rodenticides etc.	/	/	1	1	7
Difficulties with evidence procedures in court	1	/	/	2	6
Complexity of the investigation	1	/	1	1	6
Black market for banned poisons on Internet	/	/	1	3	5
Low penalties for wildlife poisoning	/	/	1	3	5
Poor reporting of information from witnesses	1	/	1	2	5
Expensive toxicological analysis	1	/	3	1	4
Inadequate and unclear protocols for police action	1	/	/	5	3
Base: 9					

At least half of the respondents have stated that each of the aggravating circumstances and obstacles for prevention and sanctioning of wildlife poisoning is mostly or extremely important. *Bad law enforcement* and *lack of control over the prescribed use of legal poisons, such as pesticides, rodenticides etc.* are perceived by the whole sample as extremely or mostly important aggravating circumstances and obstacles.

Table 3.9. Personal attitudes towards reporting poisoning incidents to the relevant authorities

Statements related to reporting poisoning incidents	Levels of agreement (Number of respondents)				
	I completely disagree	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree
Every person should report to the police any information/knowledge about wildlife poisoning	/	1	/	/	8
Hunters should report to the police information/knowledge about wildlife poisoning more often	/	1	/	2	6
Veterinarians should report to the police information/knowledge about wildlife poisoning more often	/	1	1	1	6
People/citizens do not know who to report animal poisoning incidents to	/	1	1	2	5
People who report someone from their community for poisoning wild animals risk altercations and conflicts in their community	1	/	2	3	3
It is known which individuals poison animals in this area, it is a „public secret“	/	1	2	4	2
Poisoning mostly takes place in remote locations and therefore the perpetrators are rarely identified	1	/	5	2	1
Base: 9					

Responsibility for reporting information and knowledge about wildlife poisoning is appointed to citizens in general by almost all institution employees participating in the research. Likewise, the majority of respondents agree that hunters and veterinarians are also relevant figures of authority responsible for reporting of poisoning incidents to the police. A similar number of institution employees on the other hand believe that one of the important barriers in sanctioning poisoning incidents is the fact that citizens do not know who to report animal poisoning to, and that reporting of such incidents can have certain risks in their respective local communities for those who reported them.

Respondents also mostly believe that it is a common knowledge – a “public secret” which individuals poison animals in hot spots areas, while the attitudes are mostly divided, and respondents are uncertain when it comes to whether the remoteness of the locations in which poisoning takes place prevents easier and quicker detection of these incidents.

Table 3.10. Groups that need to become more aware of wildlife poisoning

Groups	Number of respondents
Citizens in general	7
Livestock breeders	1
Hunters	1
Base: 9	

Citizens in general are identified as the target whose awareness of wildlife poisoning needs to be increased the most (7 out of 9 respondents).

Table 3.11. Personal attitudes towards investigation of wildlife poisoning incidents

Statements related to the investigation of wildlife poisoning incidents	Levels of agreement (Number of respondents)				
	I disagree completely	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree

Police should have specialized canine units for detecting poisonous substances used for wildlife poisoning	/	/	1	3	5
More people are needed on the field (police, environmental inspectors, rangers etc.) for timely detection of poisoning incidents	/	/	1	4	4
Specialized police units for environmental crime, including wildlife poisoning, are needed	/	1	/	4	4
Lack of coordination among relevant institutions is a bigger problem than lack of resources	1	1	1	1	5
Game wardens too often tolerate unlawful practices in hunting areas	/	1	3	/	5
In Bosnia and Herzegovina there are sufficient laboratories with enough capacities to conduct needed toxicological analyses	4	1	1	3	/
Base: 9					

Almost all relevant institutions employees participating in the research agree that measures to promote prevention, detection and sanctioning of wildlife poisoning should include equipping the police with specialized canine units for detecting poisonous substances used for wildlife poisoning, increasing the human force in the field (police, environmental inspectors, rangers etc.) for timely detection of poisoning incidents and forming specialized police units for environmental crime, including wildlife poisoning. Most of the employees also agree that the lack of the coordination among relevant institutions is a bigger challenge than a lack of resources.

The respondents are however divided when it comes to the responsibility of game wardens for tolerating unlawful practices in hunting areas (they either agree or are undecided). The respondents are on the other hand polarized (they either disagree or agree) whether there is a sufficient number of laboratories with enough capacities to conduct needed toxicological analyses.

Table 3.12. Personal attitudes towards legislation and legal processing of poisoning incidents

Statements related to the legislation and legal processing of poisoning incidents	Levels of agreement (Number of respondents)				
	I disagree completely	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree
Rarely are fines imposed under the Hunting Act	/	3	2	1	3
The legal framework for punishing the practice of poisoning animals is good, but the main problem is law enforcement	/	2	3	2	2
Existing legislation regulates biodiversity protection well enough	/	/	4	4	1
Public prosecutors are sufficiently educated for managing incidents related to poisoning of wild animals	4	2	3	/	/
Base: 9					

Regarding the legal framework for regulating and punishing the illegal practice of animal poisoning, respondents somewhat more agree than disagree that the key challenge lays in the enforcement of existing laws regulating the area and in imposing the fines under the Hunting Act.

Although the respondents mostly perceive positively or are uncertain about the adequacy of legislations that should regulate and protect the biodiversity, on the other hand they mostly estimate public prosecutors' education for managing incidents related to poisoning of wild animals as inadequate.

Table 3.13. Evaluating the cooperation between governmental institutions and civil society organizations regarding data collection about poisoning incidents

Estimate	Number of respondents
5 - Excellent cooperation	1
4	0
3	2
2	2
1 - Very bad	2
I don't know / I cannot evaluate	2
Base: 9	

When it comes to the evaluation of the cooperation between governmental institutions and civil society organizations regarding data collection about poisoning incidents, the majority of respondents estimate this collaboration as inadequate, or are undecided and cannot evaluate it.

Table 3.14. Knowledge of procedures and documentation related to wildlife poisoning

Procedures and documentation	Answers (Number of respondents)		
	Yes	No	I do not know, I am not informed
Is there a protocol defining procedures and jurisdictions for investigating wildlife poisoning	2	4	3
Is there a database for poisoning incidents of birds in Serbia	1	4	4
Is there a national action plan for combating wildlife poisoning in place	1	6	2
Base: 9			

Respondents are mostly uninformed or believe that there are no databases on poisoning incidents, that there is no national action plan to combat poisoning or protocol defining procedures and responsibilities in investigations into wildlife poisoning.

Table 3.15. Personal attitudes towards punishment of various unlawful actions damaging to animals and the environment

Statements related to punishment of unlawful actions that damage the nature	Levels of agreement (Number of respondents)				
	I disagree completely	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree
All forms of mass and non-discriminative killing of animals (trapping, poisoning, explosives et al.) should be punished as severely as possible	/	/	/	1	8
Higher fines are needed for every type of poaching/illegal shooting	/	/	/	1	8
Rangers of protected areas should have the authority to arrest persons who poison animals, if they are caught in the act	/	/	/	3	6
Having poison baits should be a separate offense, regardless of whether it has been proven that an animal was killed	/	1	1	5	2
If poisoning of wild animals occurs in a commercial hunting area, the concessionaire should be deprived of the concession	/	1	3	2	3
Prison sentences should not be administered for placing poison baits unless people are put in danger, and only animals are	3	1	2	3	/
Sentences for poisoning of animals should be only administrative (financial), but not imprisonment	4	1	1	3	/
Poisoning of animals should be a criminal offense only if it occurred in a protected area (nature park, national park)	7	1	/	1	/
Base: 9					

All employees from the relevant institutions participating in the research advocate the strictest punishment for all forms of mass and non-discriminatory killing of animals, as well as higher penalties for all forms of poaching, and declaring animal poisoning a criminal offense in general and not just if it occurred in a protected area (nature park, national park).

They recognize that rangers in protected areas should have the authority to arrest persons who poison animals if they are caught in the act, and that having poison baits should be a separate offense, regardless of whether it has been proven that an animal was killed.

Table 3.16. Personal attitudes towards the capacities of the police

Statements related to the capacities of the police	Levels of agreement (Number of respondents)				
	I disagree completely	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree
Police investigations about wildlife poisoning should include representatives of civil society organizations	/	/	2	3	4
Specialized police units should be introduced to deal with the crime of wildlife poisoning	/	/	2	3	4
The police do not take seriously the need to launch investigations into wildlife poisoning	1	1	/	3	4
The main problem is that incidents are not reported to the police	/	/	/	7	2
Police investigations about wildlife poisoning need expensive and sophisticated technology	/	1	5	1	2
The police is sufficiently equipped for investigating wildlife poisoning	4	4	1	/	/
The police has better things to do and should not waste resources on investigating wildlife poisoning incidents	6	2	1	/	/

The police is sufficiently educated for investigating incidents with wild animals	6	3	/	/	/
Base: 9					

Respondents recognize that investigations related to wildlife poisoning are relevant police work, i.e., that the police should take them seriously, as well as the need for all poisoning incidents to be reported to the police, which is not the case now, and the need to introduce specialized police units which would deal with the crimes of wildlife poisoning.

They perceive the need for police investigations on wildlife poisoning to include representatives of civil society organizations, as well as the need to equip police forces with modern and sophisticated technology. On the other hand, they recognize that the police forces are currently not sufficiently equipped, as well as not sufficiently educated to investigate wildlife poisoning.

2.3. Measures related to wildlife poisoning

Table 4.1. What is necessary to use in police investigations of wildlife poisoning

Necessaries for police investigations	Number of respondents
Canine units	9
Toxicological analysis	8
Records of sale of legal poisoning substances (pesticides, insecticides, rodenticides...)	8
Confirming time of death of the animals	6
Fingerprint analysis	5
Forensic entomology	4
Forensic ballistics	3
Forensic psychology	2
Base: 9	

Respondents unanimously agree that canine units are essential in police investigations of wildlife poisoning, while they almost unanimously agree about the importance of using toxicological analyses and data on the sales of legal poisonous substances (pesticides, insecticides, rodenticides ...).

These aspects that are considered necessary for police investigations are followed by: confirmation of the time of death of animals, fingerprint analysis and forensic entomology (around half of the respondents).

Forensic ballistics and forensic psychology are linked with higher lack of knowledge and more obstacles amongst institutions employees and have lower perceived significance in police investigations.

Table 4.2. Importance of undertaking some measures to prevent wildlife poisoning

Measures	Levels of importance (Number of respondents)				
	Entirely irrelevant	Mostly unimportant	Neither important nor unimportant	Mostly important	Extremely important
Impose a stricter control of the trade of legal poisoning substances (pesticides, rodenticides et al.)	/	/	/	1	8
Work more on awareness raising of the general public	/	/	/	2	7
Work more on awareness raising among key stakeholders (livestock breeders, farmers, hunters, institutions)	/	/	/	2	7
That the state/government financially compensates the damage to livestock breeders and farmers, caused by wild animals	/	/	/	3	6
Create more supplementary feeding sites for vultures	/	/	1	2	6
Better protect wild ungulate populations	/	/	1	4	4
Resolve issues of the ownership of pastures and rights to use them	1	/	1	3	4

Ensure free electric fences	1	/	/	5	3
Completely ban logging in Bosnia and Herzegovina for some time	/	3	/	3	3
Ensure livestock breeders and farmers are provided with free shepherd and guard dogs	1	/	3	2	3
Work on reducing the populations of allochthone animals	2	2	2	2	1
Base: 9					

Imposing of a stricter control of the trade of legal poisoning substances (pesticides, rodenticides, etc.), raising awareness of the general public and key stakeholders (livestock breeders, farmers, hunters, institutions) and state / government financial compensation for the damage caused by wild animals to livestock breeders and farmers, have a key place in the prevention of wildlife poisoning incidents.

The importance of a larger number of feeding grounds for vultures, better protection of wild ungulate populations, as well as resolving of the issues of pasture ownership and the right to use them, and ensuring free electric fences are also recognized as important factors in stopping of wildlife poisoning.

2.4. Attitudes towards nature

Table 5.1. Personal attitudes towards nature

Statements related to the nature	Levels of agreement (Number of respondents)				
	I disagree completely	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree
The natural balance is very delicate and easy to disturb	/	/	/	2	7
Plants and animals have an equal right to exist just like humans	/	/	/	2	7
Earth is like a spaceship, with very limited space and resources	/	/	/	3	6

Humans are destined to rule over the rest of nature	4	2	3	/	/
Base: 9					

Respondents employed within relevant institutions in Bosnia and Herzegovina unanimously recognized the sensitivity of the natural balance and the possibility of it being easily disturbed, the fact that plants and animals have the same rights to exist as humans and that the Earth is like a spaceship, with very limited space and resources. They are less unanimous when it comes to the view that people are destined to rule over nature - but with prevailing disagreement with this view.

Annex VI. Overview of poisoning incidents in Bulgaria confirmed by toxicological analysis.

Species	No. of poisoned individuals	Date/Period	Location	Type of poisoning	Main driver	Substance
Wolf, Wild boar, Raven	1, 1, 4	2001	Tserovo, Blagoevgrad	intentional	Conflicts with wolves	Lindane
Wolf	8	2003	Krandjilitsa, Petrich	intentional	Conflicts with wolves	Strychnine
Griffon Vulture	2	16.04.2003	Studen Kladenets, Krumovgrad	Unknown	Conflicts with wolves	Zink phosphate
Griffon Vulture	1	05.05.2003	Letovnik, Momchilgrad	unknown	conflicts with wolves	Organophosphate
Partridge	1	22.06.2004	Blagoevgrad	incidental	agriculture	Organophosphate
Common Starling	12	15.11.2004	Stara Zagora	incidental	agriculture	Carbofuran
Common Buzzard	2	11.12.2004	Topolovgrad	incidental	agriculture	Zink phosphate
Goshawk	1	15.12.2004	Topolovgrad	incidental	agriculture	Carbamate/ Organophosphate
Egyptian Vulture	2	2004	Jenda, Kardzhali	unknown	Conflicts with wolves	Carbamate/ Organophosphate
Imperial Eagle	1	2004	Yambol, Bolyarovo	unknown	unknown	Organophosphate
Hen harrier	1	15.01.2005	Topolovgrad	incidental	agriculture	Carbamate/ Organophosphate
Common Buzzard	1	16.01.2005	Durankulak, Dobrich	incidental	agriculture	Carbamate
Common Starling	8	15.02.2005	Plovdiv	incidental	agriculture	Carbamate/ Organophosphate
Golden Eagle	2	14.12.2005	Pirdop	intentional	Conflicts with wolves	Zink phosphate
Griffon Vulture	1	14.01.2006	Studen Kladenets, Krumovgrad	unknown	Conflict with wolves	Carbamate/ Organophosphate
Black Stork	2	March, 2006	Katina, Sofia	incidental	agriculture	Carbamate/ Organophosphate
Imperial Eagle	1	05.06.2006	Topolovgrad	incidental	agriculture	rodenticide
White Stork	1	June, 2006	Simitli	incidental	agriculture	Carbamate/ Organophosphate
Common Buzzard	1	December, 2006	Pazardjik	incidental	agriculture	Carbamate/ Organophosphate
Common Buzzard	15	19.01.2007	Belozem	incidental	agriculture	rodenticides
Common	5, 3, 3	February ,	Along Trakia	incidental	agriculture	Carbamate/

Buzzard, Barn Owl, Tawny Owl		2007	Highway, near Plovdiv			Organophosphate
Golden Eagle, Raven, Golden Jackal	1, 1, 9	17.03.2007	Shilkovtsii, Elena	intentional	Killing of Jackals	Carbamate/ Organophosphate
Partridge, Common Buzzard, Peregrine	20, 12, 1	April, 2007	near Pazardjik	intentional	Killing of Jackals	Lannate/ Methomyl
Brown Bear	1	June, 2007	Rozino	intentional	Killing of bear, with contaminated bee honey	Carbamate/ Organophosphate
Egyptian Vulture	1	26.07.2007	Madzharovo, Haskovo	incidental	Most probably have eaten at rubbish dump	Carbamate/ Organophosphate
Brown Bear	1	July, 2007	Klisoura	intentional	Killing of bear, with contaminated bee honey	Ammonium nitrate
Egyptian Vulture	1	16.10.2007	Madzharovo, Haskovo	unknown	Unknown, dry corpse found quite late under the nest	Carbamate/ Organophosphate
Wild Boar	1	09.05.2010	Gradevo, Simitli	intentional	Killing of wild boar in potato field	Carbamate/ Organophosphate
Griffon Vulture	3	10.05.2010	Rakitna, Simitli	incidental	Poisoned Wild boar served on feeding site for vultures	Carbamate/ Organophosphate
Griffon Vulture	1	March, 2011	Kotel	incidental	Vultures fed in aviary with pig carcass, that appears to have been poisoned	Carbamate/ Organophosphate
Goshawk, Jackal, fox, Hare, Dog	1, 4, 2, 1, 6	07.04.2011	Koshov, Ruse	intentional	Killing of predators	Carbamate/ Organophosphate
Imperial Eagle	1	2011	Plovdiv	intentional	losses from pigeon fanciers	Methomyl
Griffon Vulture	1	27.11. 2011	Kotel	incidental	unknown	Carbamate/ Organophosphate
Griffon Vulture	1	07.12. 2011	Dolno Ozirovo, Varshets	incidental	unknown	Carbamate/ Organophosphate
Peregrine	1	30.12.2011	Stara Zagora	incidental	unknown	Carbamate/ Organophosphate
Griffon Vulture	1	28.02. 2012	Kotel	incidental	unknown	Carbamate/ Organophosphate

Golden Eagle, Dog	2, 3	12.04.2012	Lilyanovo, Sandanski	intentional	A whole donkey carcass poisoned as bait to kill wolves ¹⁷	Carbamate
Egyptian Vulture	1	01.12.2013	Rakitna, Simitli	incidental	A goat killed by wolves given as food for vultures in the cage	Carbamate/ Organophosphate
Cinereous Vulture	1	01.12.2013	Rakitna, Simitli	Incidental	A goat killed by wolves given as food for vultures in the cage	Carbamate/ Organophosphate
Fox, dog	1, 4	12.03.2015	Vlahi, Kresna	intentional	Killing of predators, pieces of meat used as a bait	Carbamate
Common Buzzard, Dog,	1, 3	15.03.2016	Kresna	intentional	Killing of predators, dead calves used as a bait	Lannate/ Methomyl
Griffon Vulture	1	10.10.2016	Strazhets village, Krumovgrad municipality	incidental	conflicts with wolves	Lannate/ Methomyl
Golden Jackal, Wolf	?	2016	Kardzali, Krumovgrad	intentional	livestock losses	Methomyl
Griffon Vulture, Wolf, Dog, Raven, Wild boar	30+ (40), 3, 5, 20, 1	12.03.2017	Tserovo, Blagoevgrad, Kresna gorge, Simitli	intentional	conflicts with wolves	Carbofuran
Dog, Fox, Common Buzzard	3, 2, 1	12.10.2017	Tserovo, Blagoevgrad	intentional	conflicts with wolves	Carbofuran
Griffon Vulture, Golden Jackal, Red Fox	3	2017	Blagoevgrad, Kresna	intentional	livestock losses	Carbamate
Saker Falcon	1	June, 2018	Sofia	intentional	Pigeon keepers conflict with birds of prey	Carbamate/ Organophosphate
Griffon Vulture	3	2020	Haskovo, Madzharovo	intentional	livestock losses	Carbofuran

Annex VII. Perception of the illegal practice of wildlife poisoning within relevant governmental authorities in Bulgaria – baseline report.

1. METHODOLOGY

1.1 Project background

The BalkanDetox LIFE project (LIFE19GIE/NL/001016) - Strengthening national capacities to fight wildlife poisoning and raise awareness about the problem in the Balkan countries is a project that is dedicated to the fight against illegal poisoning of wild animals which local citizens usually consider as pests, but which has serious negative consequences for the population of numerous endangered animal species, primarily vultures which eat poisoned animals or eat the poison themselves. The study will be conducted in two waves in 2021 and 2025, as a base line and follow up study aimed at measuring the current attitudes and practices, and attitudes and practices of target groups after the implementation of planned campaign and activities.

The project is being implemented at the multinational level in the Balkan region. The countries involved are Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Greece, North Macedonia, and Serbia.

1.2 Key research topics

In this first phase, the aims of the research are:

- Measuring awareness of target groups of employees of relevant governmental services and institutions, law enforcement agencies and veterinary services about endangered species (vultures), methods of poisoning and individuals or groups responsible for poisoning on the territories of their respective countries. Measuring the current perceptions and attitudes of target groups related to aggravating circumstances and obstacles as well as capacities of the state institutions to prevent, investigate and sanction wildlife poisoning cases.
- Measuring the current perceptions of target groups related to legislation, procedures, documentation, and processing of wildlife poisoning cases.

1.3 Methodological approach

1.3.1 Research technique

Online Interviews of the targeted groups of relevant governmental services and institutions officials, law enforcement officials and veterinary services employees in Bulgaria.

1.3.2 Fieldwork

The fieldwork is conducted from September 18th to November 21st 2021.

1.3.3 Questionnaire length

Questionnaire length up to 10 minutes.

1.3.4 Sample - target group

The target group in the research were employees of relevant governmental services and institutions, law enforcement agencies and veterinary services in Bulgaria.

Due to difficulties caused by the COVID-19 pandemic, the sample included 5 respondents in total out of 8 employees in targeted institutions.

1.3.5 Sample Structure

Table 1.1. Institutions where respondents are employed

Institutions	Number of respondents
Ministry of Environment and Water	3
Regional Inspectorate of Environment and Water	2
Base: 5	

Table 1.2. Current job position

Job position	Number of respondents
Employee	4

Middle management level	1
Base: 5	

Table 1.3. Years of service in the institution where respondents currently work

Years of service - Institution	Number of respondents
2 years	1
6 years	1
10 years	1
13 years	1
20 years	1
Base: 5	

Table 1.4. Years of service in the department where respondents currently work

Years of service - Department	Number of respondents
1 year	1
2 years	1
6 years	1
10 years	1
13 years	1
Base: 5	

Table 1.5. Direct engagement with the issue of wildlife/animal poisoning in respondents' line of work

Direct dealing with wildlife poisoning	Number of respondents
Yes, both of wild and domestic animals	3
No	2
Base: 5	

Table 1.6. Involvement in the issue of wildlife/ animal poisoning in respondents' line of work

Involvement in the issue of wildlife/ animal poisoning	Number of respondents
Yes, both of wild and domestic animals	1
No	1
Base: Respondents who don't directly deal with the issue of wildlife poisoning in their line of work, N = 2	

Table 1.7. Evaluation of own knowledge about the issue of wildlife poisoning

Evaluation of own knowledge about wildlife poisoning	Number of respondents
5 - Excellent knowledge	1
4	1
3	2
2	1
1 - Very bad knowledge	0
I do not know / I cannot estimate	0
Base: 5	

Table 1.8. Attending educational programmes related to detection and processing of wildlife poisoning incidents

Educational programme attendance	Number of respondents
No	4
Yes	1
Base: 5	

Table 1.9. Educational programmes organizers

Organizers	Number of respondents
Bulgarian Society for the Protection of Birds	1

Base: Respondents who have attended some educational programme related to detection and processing of wildlife poisoning incidents, N = 1

Out of five respondents who participated in online interviews, three are employed in the Ministry of Environment and Water and two are employed at Regional Inspectorate of Environment and Water.

The majority of respondents employed in the institutions work in the position of employee (4 respondents), while one is in the middle management position. Respondents have different lengths of service in the institution where they work (from 2 to 20 years), while in the departments where they currently work, they are also differently employed (from 1 to 13 years).

Four out of five respondents directly dealt with the issue of wildlife poisoning in their line of work or had contact with wildlife poisoning in their practice.

All respondents rate themselves differently when it comes to level of information and knowledge of the topic of wildlife poisoning (grades from 2 to 5 on a scale from 1 - worst grade to 5 - excellent grade).

Most of the respondents did not participate in or attend any educational program related to the detection and processing of wildlife poisoning incidents. Only one respondent attended a program conducted by the Bulgarian Society for the Protection of Birds.

2. RESULTS OF ONLINE INTERVIEWS

2.1. Vultures in Bulgaria

Table 2.1. Awareness about vulture species breeding in Bulgaria

Vultures	Number of respondents
Egyptian Vulture	5
Griffon Vulture	4
Cinereous Vulture	2
Base: 5	

Almost all respondents from the target group of employees of relevant governmental institutions are familiar with the fact that Griffon Vulture and Egyptian Vulture breed in Bulgaria today, while two mention the Cinereous Vulture.

Table 2.2. Awareness of the types of food which vultures feed on in Bulgaria

Food	Number of respondents
Carcasses of wild animals	5
Carcasses of domestic animals	4
Hunted domestic animals	4
Hunted large mammals	3
Hunted rodents	2
Base: 5	

Almost all officials are aware that vultures in Bulgaria feed on the carcasses of wild and domestic animals, as well as hunted domestic animals. Part of the respondents state that the vultures' diet also includes hunted large mammals and rodents.

2.2. Problem of vulture poisoning in Bulgaria

Table 3.1. What endangers the vulture populations in Bulgaria the most?

The main danger	Number of respondents
Extensive use of legal toxic compounds (pesticides, insecticides, rodenticides)	2
Accidental electrocution of collision with power cables	2
Wildlife poisoning	1
Base: 5	

The key perceived threats to the vulture population in Bulgaria are accidental electrocution from electric cables or fences and excessive and negligent use of legal poisons (pesticides, insecticides, rodenticides). Only one in five respondents mentions wildlife poisoning as a key risk factor.

Table 3.2. Perceived key causes behind vulture poisoning

Causes	Number of respondents
Because they eat poisoned animals/animals that died of poisoning	3
Because they get poisoned from pesticides	2
Base: 5	

As the key causes of vulture poisoning, employees from the relevant institutions mention accidental consumption of poisoned animals and poisoning with pesticides.

Table 3.3. Perception about how wildlife poisoning most commonly occurs

The way wildlife poisoning occurs	Number of respondents
Accidentally, by misuse of legal poisoning substances out of negligence/ignorance	2
Intentionally, with illegal poisons from the black market	2
I don't know	1
Base: 5	

Regarding the information about the way wildlife poisoning most commonly occurs, the respondents' opinions are divided. While some state that wildlife poisoning occurs accidentally, by misuse of legal poisoning substances out of negligence or ignorance, other believe that wildlife poisoning occurs intentionally, with illegal poisons from the black market. One respondent states that he/she is not aware.

Table 3.4. Perception regarding groups responsible for wildlife poisoning

Groups	Levels of frequency (Number of respondents)			
	Never	Rarely	Occasionally	Often
Livestock breeders	/	3	1	1
Hunters	1	2	1	1
Farmers	1	2	2	/

Individuals who deliberately poison animals simply because they like killing things	2	1	2	/
Pigeon fanciers/breeders	/	4	1	/
Beekeepers	5	/	/	/
Base: 5				

While pigeon breeders are generally estimated to be rarely responsible for vulture poisoning, officials unanimously share the opinion that beekeepers are not involved. Opinions are divided about hunters, livestock breeders, farmers, and people who deliberately poison animals to kill them, who have mostly been named as responsible at least sometimes.

Table 3.5. Perceived motives behind the poisoning of wild animals

Motives	Levels of frequency (Number of respondents)			
	Never	Rarely	Occasionally	Often
Protection of pastures and livestock from wild animals (wolves, bears, etc.)	/	1	3	1
Protection of hunting activities	/	2	2	1
Conflicts among people about land use (pastures, hunting areas)	1	2	1	1
Protection from pests (rats, insects et at.)	1	2	1	1
Protection of pigeons from birds of prey	/	2	3	/
Protection from stray dogs and cats	/	2	3	/
Protection of agricultural land from wild animals	/	3	2	/
Protection of agricultural land from birds of prey	/	3	2	/
Protection of apiaries from bears	2	3	/	/
Base: 5				

The key reasons for the poisoning of vultures that have been identified are protection of pastures and livestock from wild animals and protection of hunting grounds. Opinions are relatively divided when it comes to conflicts between people over land use (pastures, hunting grounds), protection from pests (rats, insects, etc.), protection of pigeons from

birds of prey, protection of agricultural land from wildlife and birds of prey and even protection from stray dogs and cats. Protecting beehives from bears is considered a rare reason or is not singled out as a reason for poisoning wild animals.

Table 3.6. Regions of Bulgaria where wild animals are most frequently poisoned

Regions	Number of respondents
The valley of the river Struma, Rila and Pirin	3
Forebalkan, Stara planina, Trans-Balkan fields	1
The valley of the river Mesta and the Rhodopes	1
I don't know	2
Base: 5	

The valleys of the Struma, Rila and Pirin rivers are perceived as the key areas most often affected by animal poisoning. The Forebalkans, Stara Planina, Trans-Balkan fields, the valley of the river Mesta and the Rhodopes are also mentioned. However, almost half of the respondents (2) do not know which areas are the most affected.

Table 3.7. Period of the year when wildlife poisoning mostly occurs

Periods of year	Number of respondents
Summer	5
Autumn	2
Spring	1
Base: 5	

All respondents mention summer as the season when poisonings most often occur, while some mention autumn.

Table 3.8. Importance of the aggravating circumstances and obstacles

Aggravating circumstances and obstacles	Levels of importance (Number of respondents)				
	Entirely irrelevant	Mostly unimportant	Neither important nor unimportant	Mostly important	Extremely important
Low penalties for wildlife poisoning	/	1	1	/	3
Complexity of the investigation	/	/	/	3	2
Difficulties with evidence procedures in court	/	/	/	3	2
Bad law enforcement	/	2	/	1	2
Lack of control over the prescribed use of legal poisons, such as pesticides, rodenticides et al.	1	2	/	1	1
Black market for banned poisons on Internet	/	1	/	4	/
Expensive toxicological analysis	/	2	1	2	/
Poor reporting of information from witnesses	/	3	/	2	/
Inadequate and unclear protocols for police action	/	2	2	1	/
Base: 5					

The key aggravating circumstances and obstacles for prevention and sanctioning of wildlife poisoning have been identified as the complexity of the investigation, difficulties with evidence in the court and the black market for illegal poisons on the Internet.

Low penalties for wildlife poisoning and inadequate law enforcement are also perceived as important obstacles in the prevention, detection and sanctioning of wildlife poisoning.

Table 3.9. Personal attitudes towards reporting poisoning incidents to the relevant authorities

Statements related to reporting poisoning incidents	Levels of agreement (Number of respondents)				
	I completely disagree	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree
Every person should report to the police any information/knowledge about wildlife poisoning	/	/	/	/	5
Hunters should report to the police information/knowledge about wildlife poisoning more often	/	/	/	/	5
Veterinarians should report to the police information/knowledge about wildlife poisoning more often	/	/	/	1	4
People who report someone from their community for poisoning wild animals risk altercations and conflicts in their community	/	/	/	1	4
Poisoning mostly takes place in remote locations and therefore the perpetrators are rarely identified	/	/	2	/	3
It is known which individuals poison animals in this area, it is a „public secret“	/	1	2	/	2
People/citizens do not know who to report animal poisoning incidents to	2	1	2	/	/
Base: 5					

The responsibility for reporting incidents of poisoning to institutions in charge lies with citizens, hunters, and veterinarians. However, respondents also agree that the reporting process remains challenging because those who report someone risk conflicts in their communities.

Table 3.10. Groups that need to become more aware of wildlife poisoning

Groups	Number of respondents
Citizens in general	3
Livestock breeders	2
Base: 5	

Citizens in general and livestock breeders have been singled out as key target groups for awareness-raising campaigns on wildlife poisoning.

Table 3.11. Personal attitudes towards investigation of wildlife poisoning incidents

Statements related to the investigation of wildlife poisoning incidents	Levels of agreement (Number of respondents)				
	I disagree completely	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree
Specialized police units for environmental crime, including wildlife poisoning, are needed	/	/	/	1	4
Police should have specialized canine units for detecting poisonous substances used for wildlife poisoning	/	/	/	1	4
More people are needed on the field (police, environmental inspectors, rangers etc.) for timely detection of poisoning incidents	/	/	1	1	3
Lack of coordination among relevant institutions is a bigger problem than lack of resources	/	1	1	/	3
Game wardens to often tolerate unlawful practices in hunting areas	/	/	2	2	1

In Bulgaria there are sufficient laboratories with enough capacities to conduct needed toxicological analyses	2	/	1	1	1
Base: 5					

Regarding the investigation of animal poisoning incidents, important solutions include the need for specialized police units for environmental crimes, including wildlife poisoning, police reinforcement with specialized canine units for detecting poisonous substances used for wildlife poisoning, and the need to put more people in the field (police, environmental inspectors, rangers, etc.) for timely detection of poisoning incidents. Opinions are divided regarding laboratory capacities to perform the necessary toxicological analyses, the practice of tolerating illegal procedures in hunting grounds by game wardens, and the lack of coordination among relevant institutions as a bigger problem than lack of resources.

Table 3.12. Personal attitudes towards legislation and legal processing of poisoning incidents

Statements related to the legislation and legal processing of poisoning incidents	Levels of agreement (Number of respondents)				
	I disagree completely	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree
Rarely are fines imposed under the Hunting Act	1	/	/	2	2
The legal framework for punishing the practice of poisoning animals is good, but the main problem is law enforcement	1	/	3	1	/
Existing legislation regulates biodiversity protection well enough	1	1	2	1	/
Public prosecutors are sufficiently educated for managing incidents related to poisoning of wild animals	4	/	/	1	/

Base: 5

Respondents indicate as an aggravating circumstance the insufficient education of public prosecutors for handling cases related to poisoning of wild animals and the insufficient or rare application of penalties based on the laws governing hunting grounds. Respondents are divided when it comes to the quality of the legal framework for punishing animal poisoning and the perception that the main problem is the lack of implementation of these laws, as well as whether the existing legislation regulates biodiversity protection well enough.

Table 3.13. Evaluating the cooperation between governmental institutions and civil society organizations regarding data collection about poisoning incidents

Estimate	Number of respondents
5 - Excellent cooperation	0
4	1
3	1
2	2
1 - Very bad	0
I don't know / I cannot evaluate	1
Base: 5	

When it comes to the evaluation of the cooperation between governmental institutions and civil society organizations regarding data collection about poisoning incidents, respondents are divided estimating this collaboration mostly as inadequate, or are undecided and cannot evaluate it.

Table 3.14. Knowledge of procedures and documentation related to wildlife poisoning

Procedures and documentation	Answers (Number of respondents)		
	Yes	No	I do not know, I am not informed

Is there a database for poisoning incidents of birds in Bulgaria	1	3	1
Is there a protocol defining procedures and jurisdictions for investigating wildlife poisoning	1	1	3
Is there a National action plan for combating wildlife poisoning in place	0	2	3
Base: 5			

Respondents are mostly uninformed or believe that there are no databases on poisoning incidents, that there is no national action plan to combat poisoning or protocol defining procedures and responsibilities in investigations into wildlife poisoning.

Table 3.15. Knowledge of database for poisoning incidents

Database related questions	Answers (Number of respondents)		
	Yes	No	I do not know, I am not informed
Do you ever use data from the existing database for carrying out work within your jurisdiction	0	1	0
Is there a clear protocol for documenting poisoning incidents in the database	0	0	1
Do you consider that the existing database is adequately used for informing the public and raising their awareness about the problem of wildlife poisoning	0	0	1
Base: Respondents who state that there is a database for poisoning incidents of birds in Bulgaria, N = 1			

The respondent who is informed that there is a database for poisoning incidents of birds in Bulgaria, is not informed if the existing database is adequately used for informing the public and raising their awareness about the problem of wildlife poisoning and whether

there is a clear protocol for documenting poisoning incidents in the database. This respondent claims that he/ she does not use the data from the existing database for carrying out work within his/ her jurisdiction.

Table 3.16. Knowledge of the protocol that defines procedures and protocols for investigating wildlife poisoning

Protocol related questions	Answers (Number of respondents)		
	Yes	No	I do not know, I am not informed
Is the existing protocol clear enough?	1	0	0
According to the protocol, must the reports about poisoning incidents include an impact analysis of a single poisoning incident to the environment and biodiversity?	0	1	0
Should the existing protocol be improved?	0	1	0
Base: Respondents who state that there is a protocol defining procedures and jurisdictions for investigating wildlife poisoning, N = 1			

The official informed about a protocol defining procedures and jurisdictions for investigating wildlife poisoning believes that the existing protocol is clear enough. He/ she however also believes that the existing protocol should be improved and that the reports about poisoning incidents do not need to include an impact analysis of a single poisoning incident to the environment and biodiversity.

Table 3.17. Personal attitudes towards punishment of various unlawful actions damaging to animals and the environment

Statements related to the punishment of unlawful actions that	Levels of agreement (Number of respondents)
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damage the nature	I disagree completely	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree
Higher fines are needed for every type of poaching/illegal shooting	/	/	/	/	5
All forms of mass and non-discriminative killing of animals (trapping, poisoning, explosives et al.) should be punished as severely as possible	/	/	/	1	4
Rangers of protected areas should have the authority to arrest persons who poison animals, if they are caught in the act	/	/	1	1	3
If poisoning of wild animals occurs in a commercial hunting area, the concessionaire should be deprived of the concession	1	/	1	/	3
Having poison baits should be a separate offense, regardless of whether it has been proven that an animal was killed	2	/	1	/	2
Sentences for poisoning of animals should be only administrative (financial), but not imprisonment	4	/	/	/	1
Prison sentences should not be administered placing poison baits unless people are not put in danger, but only animals	3	/	1	1	/
Poisoning of animals should be a criminal offense only if it occurred in a protected area (nature park, national park)	4	/	/	1	/
Base: 5					

Officials are in favor of the most severe punishment for all forms of mass and non-discriminatory killing of animals, as well as higher penalties for every form of poaching/illegal shooting.

They recognize that rangers in protected areas should have the authority to arrest persons who poison animals if they are caught in the act, and if poisoning of wild animals occurs in a commercial hunting area, the concessionaire should be deprived of the concession.

Table 3.18. Personal attitudes towards the capacities of the police

Statements related to the capacities of the police	Levels of agreement (Number of respondents)				
	I disagree completely	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree
Specialized police units should be introduced to deal with the crime of wildlife poisoning	/	/	/	/	5
Police investigations about wildlife poisoning need expensive and sophisticated technology	/	/	2	1	2
The main is problem that incidents are not reported to the police	/	/	2	1	2
Police investigations about wildlife poisoning should include representatives of the civil society organizations	/	1	1	1	2
The police do not take seriously the need to launch investigations into wildlife poisoning	/	1	2	1	1
The police is sufficiently equipped for investigating wildlife poisoning	1	/	4	/	/
The police is sufficiently educated for investigating incidents with wild animals	1	2	2	/	/
The police has better things to do and should not waste resources on investigating wildlife poisoning incidents	4	1	/	/	/
Base: 5					

Employees of the relevant governmental institutions recognize that investigations into wildlife poisoning are relevant police work and point the need to introduce specialized police units to deal with wildlife poisoning crimes. They are divided about sufficient level of education of the police forces for investigating incidents with wild animals, the need for expensive and sophisticated technology and the level of the problem that incidents are not reported to the police.

2.3. Measures related to wildlife poisoning

Table 4.1. What is necessary to use in police investigations of wildlife poisoning

Necessaries for police investigations	Number of respondents
Toxicological analysis	5
Canine units	5
Records of sale of legal poisoning substances (pesticides, insecticides, rodenticides...)	3
Confirming time of death of the animals	2
Forensic entomology	1
Fingerprint analysis	1
Forensic psychology	1
Base: 5	

Officials emphasize the importance of using toxicological analyzes, search dogs and data on the sale of legal poisonous substances (pesticides, insecticides, rodenticides, etc.).

Table 4.2. Importance of undertaking some measures to prevent wildlife poisoning

Measures	Levels of importance (Number of respondents)				
	Entirely irrelevant	Mostly unimportant	Neither important nor unimportant	Mostly important	Extremely important

Work more on awareness raising of the general public	/	/	/	/	5
Work more on awareness raising among key stakeholders (livestock breeders, farmers, hunters, institutions)	/	/	/	/	5
Impose a stricter control of the trade of legal poisoning substances (pesticides, rodenticides et al.)	/	/	/	/	5
Resolve issues of the ownership of pastures and rights to use them	/	/	/	2	3
That the state/government financially compensates the damage to livestock breeders and farmers, caused by wild animals	/	/	1	2	2
Ensure livestock breeders and farmers are provided with free shepherd and guard dogs	/	1	/	2	2
Work of reducing the populations of allochthone animals	/	1	/	2	2
Ensure free electric fences	/	/	2	1	2
Create more supplementary feeding sites for vultures	/	/	/	4	1
Better protect wild ungulate populations	/	/	1	4	/
Completely ban logging in Bulgaria for some time	2	/	1	2	/
Base: 5					

Imposing of a stricter control of the trade of legal poisoning substances (pesticides, rodenticides, etc.), raising awareness of the general public and key stakeholders (livestock breeders, farmers, hunters, institutions), resolving issues of the ownership of pastures and rights to use them and state / government financial compensation for the damage caused by wild animals to livestock breeders and farmers, have a key place in the prevention of wildlife poisoning incidents. Increased number of feeding grounds for vultures, and better protection of wild ungulate populations also have a key place in the prevention of wildlife poisoning incidents.

2.4. Attitudes towards nature

Table 5.1. Personal attitudes towards nature

Statements related to nature	Levels of agreement (Number of respondents)				
	I disagree completely	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree
The natural balance is very delicate and easy to disturb	/	/	/	/	5
Plants and animals have an equal right to exist just like humans	/	/	/	/	5
Earth is like a spaceship, with very limited space and resources	/	/	1	1	3
Humans are destined to rule over the rest of nature	3	1	1	/	/
Base: 5					

Among the respondents employed in relevant institutions in Bulgaria, the sensitivity of the natural balance and the possibility of it being easily disturbed was unanimously recognized, as well as the fact that plants and animals have the same right to exist as humans. Employees in the institutions are somewhat less unanimous when it comes to the view that people are destined to rule over nature and that the Earth is like a spaceship, with very limited space and resources - but with still prevailing disagreement, ie agreement with these views.

Annex VIII. Overview of poisoning incidents in Croatia confirmed by toxicological analysis.

Species	No. of poisoned individuals	Date/Period	Location	Main driver	Substance
Griffon Vulture	1	October 2004	Island of Cres	conflict with introduced game animals	Methomyl
Griffon Vulture	1	October 2004	Island of Krk	unknown	Methomyl
Griffon Vulture	17	December 2004	Island of Rab	conflict with introduced game animals	Carbofuran
Common Buzzard	2	December 2004	Island of Rab	Human-human conflict; human-wildlife conflict	Carbofuran
Eurasian Brown bear	1	April 2010	Svetobrd	conflicts with predators (jackal/fox)	Carbofuran
Eurasian Otter	1	2014	unknown	unknown	Carbofuran
Griffon Vulture	2	April 2016	Island of Krk	conflicts with predators (jackals)	Carbofuran
Griffon Vulture	1	October 2016	Island of Krk	conflicts with predators (jackals)	Carbofuran
Griffon Vulture	1	October 2017	Island of Krk	conflicts with predators (jackals)	Carbofuran
Common Buzzard	9	January 2018	Lonjsko polje	conflicts with predators (jackals)	Carbofuran
Golden Jackal	11	January 2018	Lonjsko polje	conflicts with predators (jackals)	Methiocarb
Feral pigeon	70	February 2018	Osijek	intentional	Methiocarb
Common Buzzard	1	February 2019	Rastovac, Vodice	non-intentional	Carbofuran
Common Buzzard	2	April 2019	Šibenik	conflicts with predators	Carbofuran
White Stork	1	June 2019	Đakovo	non-intentional	Metaldehyde
White Stork	1	2019	Osječko-Baranjska županija	non-intentional	Metaldehyde
Griffon Vulture	1	2019	Cres	unknown	Carbofuran
White Stork	1	2019		unknown	Carbofuran
Griffon Vulture	1	2019	Cres	unknown	Carbofuran, Chlorophacinone
Griffon Vulture	1	2019	Cres	unknown	Carbofuran
Griffon Vulture	1	2019	Cres	unknown	Carbofuran

Griffon Vulture	1	2019	Cres	unknown	Carbofuran
Griffon Vulture	1	2019	Cres	unknown	Carbofuran
Eurasian Wolf	1	January 2020	Mazin	conflicts with predators	Carbofuran
Red Fox	1	January 2020	Mazin	conflicts with predators	Carbofuran

Annex IX. Perception of the illegal practice of wildlife poisoning in local communities in Croatia – baseline report.

1. Sample and conduction of surveys

Data collection took place in two ways. For the first target group (farmers, stockbreeders and hunters), it was conducted through a telephone survey for which the research agency Promocija plus d.o.o. was engaged. Data collection took place during October and November 2021. For this target group (farmers, stockbreeders and hunters) a sample of a total of 408 respondents was realized, with a total response rate of 13%, which means a total of 7 attempts per realized contact. Participants from the group of farmers and stockbreeders were recruited using the telephone contacts of the research agency and using other publicly available sources (available data from the Ministry of Agriculture, websites with contacts of family farms, etc., Croatian Hunting Association website, Register of Croatian Associations). data, a sample of 394 respondents entered the final data processing.

2. Survey results of cattle breeders, farmers and hunters

2.1. Socio-demographic data on respondents

Table 2.1. County in which the respondents live

County	N	% column
Ličko-senjska	123	31,2%
Primorsko-goranska	100	25,4%
Splitsko-dalmatinska	171	43,4%
Ukupno	394	100,0%

Table 2.2. Target group. According to data from the registers

Skupina	N	% od ukupnog broja ispitanika
Farmers	298	75,6%
Livestock breeders	104	26,4%
Hunters	59	15,0%

Table 2.3. What activities do the respondents do - their own statement

Are they engaged in agriculture, livestock, hunting or other listed activities?	N	% of the total number of respondents
I am engaged in animal husbandry	103	26,1%
I am engaged in agriculture	174	44,2%
I hunt	59	15,0%
I work as a ranger	3	0,8%
I work in the police	6	1,5%
None of the above	125	31,7%
Total	394	100,0%

Given the established discrepancy between, on the one hand, the administrative data on which the sample was based and, on the other hand, self-perception, and given the overlap of the three target groups in the sense that one can belong to both groups at the same time, only the data of those who do not have overlapping categories will be used. These are respondents who meet two criteria: a) they have overlapping data from registers and self-identification and b) they are exclusively either farmers, or livestock breeders or hunters. There are 119 such farmers, 50 cattle breeders and 42 hunters among the respondents.

Table 2.4. Are hunters members of a hunting society?

Are you a member of a hunting society?	N	% of total number of hunters
Yes	54	91,5%
No	5	8,5%
Total	59	15,0%

Table 2.5. Gender of respondents

Sex	N	% column
Woman	213	54,1%
Man	181	45,9%
Total	394	100,0%

Respondents are on average 60 years old, with a range ranging from 18 to 88 years.

Table 2.6. Completed level of education of respondents

What is your highest completed level of education?	N	% stupca
No completed primary school	3	0,8%
Completed primary school	51	12,9%
Completed high school lasting 3 years (eg three-year vocational school)	80	20,3%
Completed secondary school lasting 4 or more years (eg grammar school)	170	43,1%
Completed higher education (professional or university study, master's degree, doctorate)	89	22,6%
Refuses to answer	1	0,3%
Total	394	100,0%

Table 2.7. Respondent's employment status

Koji je vaš radni status?	N	% column
What is your employment status?	134	34,0%
Unemployed	35	8,9%
Retired	209	53,0%
Student in regular schooling (school, college, etc.)	6	1,5%
Housewife taking care of the household full time	9	2,3%
Permanently incapable of work (due to long-term illness or disability)	0	0,0%
Other	0	0,0%
Refuses to answer	1	0,3%
Total	394	100,0%

Table 2.8. Manner of employment of respondents.

If you work in any form, how are you employed?	N	% column
Self-employed or helping member on a family farm	46	11,8%
Self-employed in own trade or company	27	6,9%
Assisting member in a family business or enterprise	4	1,0%
Employed by an employer	91	23,3%
Other	210	53,8%
Refuses to answer	12	3,1%
Total		100,0%

Table 2.9. The amount of monthly income of the households in which the respondents live

What was the total income of your household in the previous month, regardless of the sources?	N	% column
Up to 3.000 kn	55	14,0%
3.001 - 6.000 kn	111	28,2%
6.001 - 9.000 kn	70	17,8%
9.001 - 12.000 kn	27	6,9%
12.001 - 15.000 kn	12	3,0%
15.001 - 18.000 kn	8	2,0%
15.001 - 18.000 kn	5	1,3%
18.001 - 21.000 kn	4	1,0%
Refuses to answer	102	25,9%
Total	394	100,0%

2.2. Have respondents heard of BIOM?

Table 2.10. Have respondents heard of BIOM?

Have you heard of BIOM?	N	% column
Yes	49	12,4%
No	345	87,6%
Total	394	100,0%

Table 2.11. Where did respondents hear about BIOM?

Where did you hear about BIOM?	N	% of the number of respondents who heard of BIOM
On television	27	55,1%
From friends / acquaintances / colleagues	11	22,4%
In newspapers	9	18,4%
On social networks	5	10,2%
Elsewhere on the Internet	5	10,2%
I don't know	5	10,2%
On the radio	4	8,2%
In the hunting ground	1	2,0%

2.3. Respondents' knowledge of vultures

Table 2.12. What species of vultures nest in the Republic of Croatia?

According to your information, are the following species of vultures nesting in the Republic of Croatia today?	N	% of the total number of respondents
Griffon Vulture ¹	285	72,3%
Turkey Vulture	44	11,2%
Cinereous Vulture	37	9,4%
King Vulture	35	8,9%
Egyptian Vulture	33	8,4%

Table 2.13. What do vultures eat in Croatia?

Do you know what all of the above feed on vultures in Croatia?	Yes	No	I don't know
Carcasses of wild animals	83,80%	4,10%	12,20%
Carcasses of domestic animals	83,00%	5,60%	11,40%
Hunted large mammals	50,30%	23,10%	26,60%
Hunted redents	59,90%	18,50%	21,60%

¹ For questions that measure knowledge, the correct answers are highlighted in green.

Hunted domestic animals	58,40%	21,60%	20,10%
Hunted insects	39,80%	32,70%	27,40%

Table 2.14. What threatens vultures in Croatia the most?

Što najviše ugrožava populacije lešinara u Hrvatskoj?	N	% column
Excessive use of legal poisons (pesticides, insecticides, rodenticides)	108	28,6%
Wildlife poisoning	70	18,6%
Poaching of birds	55	14,6%
Lack of food	53	14,1%
Doesn't know	45	11,9%
Accidental death from electric cables or fences	24	6,4%
Harassment	22	5,8%
Refuses to answer	17	4,3%
Other	0	0,0%
Total	394	100,0%

Table 2.15. What threatens vultures in Croatia the most: a comparison of cattle breeders, farmers and hunters.

What threatens vultures in Croatia the most?	Livestock breeders (% column)	Farmers (% column)	Hunters (% column)
Lack of food	22,9%	12,4%	17,1%
Harassment	4,2%	3,5%	4,9%
Wildlife poisoning	12,5%	23,9%	19,5%
Poaching of birds	14,6%	15,0%	12,2%
Accidental death from electric cables or fences	12,5%	4,4%	4,9%
Excessive use of legal poisons (pesticides, insecticides, rodenticides)	18,8%	31,9%	36,6%
Other	0,0%	0,0%	0,0%
Doesn't know	14,6%	8,8%	4,9%
Refuses to answer	0,0%	0,0%	0,0%

There is no statistically significant difference between the 3 groups (Chi-square 13,567, df = 12, Sig. = 0.329).

Table 2.16. How vultures are most often poisoned.

Which of the following ways do you think vultures are most often poisoned?	N	% column
From poison baits intended for other animals	104	26,4
Because they consume poisoned animals	96	24,4
Because they are poisoned by pesticides	95	24,1
From poison baits intended precisely for vultures	51	12,9
Doesn't know	48	12,2
Refuses to answer	0	0,0%
Total	394	100,0

Table 2.17. How vultures are most often poisoned: a comparison of cattle breeders, farmers and hunters.

Do you agree with the following statements?	Livestock breeders (% column)	Farmers (% column)	Hunters (% column)
From poison baits intended precisely for vultures	6,0%	12,6%	11,9%
From poison baits intended for other animals	32,0%	21,0%	28,6%
Because they consume poisoned animals	22,0%	31,9%	28,6%
Because they are poisoned by pesticides	28,0%	30,3%	23,8%
Other	0,0%	0,0%	0,0%
Doesn't know	12,0%	4,2%	7,1%
Refuses to answer	0,0%	0,0%	0,0%

There is no statistically significant difference between the 3 groups (Chi-square 8,308, DF = 12, Sig. = 0,404).

Table 2.18. Attitudes about vultures and poisoning.

Rating on a scale of 1 - I do not agree at all to 5 - I completely agree.

Do you agree with the following statements?	I completely disagree	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree	Average
Vultures play an important role in human activities	9,1%	4,1%	21,1%	20,6%	45,2%	3,89

The greatest value of vultures like Griffon Vulture is that they are a tourist attraction	20,1%	15,7%	21,6%	17,5%	25,1%	3,12
The number of vultures would grow rapidly if we simply left them alone	6,6%	6,1%	25,9%	20,3%	41,1%	3,83
Vultures play an important role in the ecosystem	2,5%	1,3%	15,5%	14,7%	66,0%	4,40
Wild animals play an important role in human activities	3,3%	5,6%	20,6%	20,8%	49,7%	4,08
Wildlife poisoning is sometimes justified	48,0%	16,5%	14,7%	10,9%	9,9%	2,18
States should carry out controlled wildlife poisoning themselves	19,5%	5,8%	16,0%	17,8%	40,9%	3,55
Animal poisoning is a problem only when it poses a danger to humans	34,5%	14,0%	16,8%	10,2%	24,6%	2,76

Table 2.19. Attitudes about vultures and poisoning: a comparison of cattle breeders, farmers and hunters.

Do you agree with the following statements?	Livestock breeders (average)	Farmers (average)	Hunters (average)
Vultures play an important role in human activities	3,90	3,69	4,50
The greatest value of vultures like Griffon Vulture is that they are a tourist attraction	3,38	3,02	2,74
The number of vultures would grow rapidly if we simply left them alone**	4,22	3,79	3,36
Vultures play an important role in the ecosystem*	4,52	4,28	4,79
Wild animals play an important role in human activities	4,10	4,06	4,48
Wildlife poisoning is sometimes justified*	2,44	2,33	1,64
States should carry out controlled wildlife poisoning themselves	4,00	3,78	3,33
Animal poisoning is a problem only when it poses a danger to humans**	3,32	2,82	2,19

* $p < 0.05$, ** $p < 0.01$

Compared to the other two groups, hunters are statistically significantly more likely to agree with the claims:

- Vultures play an important role in human activities
- Vultures play an important role in the ecosystem

Livestock breeders are statistically significantly more inclined to agree with the statements compared to the other two groups:

- The number of vultures would grow rapidly if we simply left them alone
- Animal poisoning is a problem only when it poses a danger to humans

Livestock breeders and farmers are statistically significantly more likely to agree with the statement compared to hunters:

- Wildlife poisoning is sometimes justified

2.4. Attitudes and knowledge of respondents about animal poisoning

Assessment of one's own knowledge of animal poisoning

"How would you rate your own knowledge of animal poisoning on a scale of 1 to 5, where 5 is excellent knowledge?"

The average rating of one's own knowledge of the topic of animal poisoning on a scale from 1 (very poor) to 5 (excellent) is 2.7. with 34 (8.6%) stating that they could not estimate. There are no statistically significant differences between the three groups, with averages of 2.77 for livestock farmers, 2.65 for farmers and 3.00 for hunters.

Table 2.20. At what time of year is poisoning most common?

According to your assessment, when does wildlife poisoning occur in Croatia during the year? (It is possible to choose one or more answers.)	N	% of the total number of respondents
Spring	184	46,7%
Summer	73	18,5%
Autumn	106	26,9%
Winter	35	8,9%
I don't know	81	20,6%

Table 2.21. In which county is poisoning most common?

According to your assessment, in which county in Croatia are wild animals poisoned the most?	N	% column
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Bjelovarsko-bilogorska	6	1,5%
Brodsko-posavska	4	1,0%
Dubrovačko-neretvanska	0	0,0%
Grad Zagreb	2	0,5%
Istarska	1	0,3%
Karlovačka	0	0,0%
Koprivničko-križevačka	1	0,3%
Krapinsko-zagorska	1	0,3%
Ličko-senjska	41	10,4%
Međimurska	1	0,3%
Osječko-baranjska	25	6,3%
Požeško-slavonska	21	5,3%
Primorsko-goranska	20	5,1%
Sisačko-moslavačka	4	1,0%
Splitsko-dalmatinska	33	8,4%
Šibensko-kninska	5	1,3%
Varaždinska	0	0,0%
Virovitičko-podravska	1	0,3%
Vukovarsko-srijemska	8	2,0%
Zadarska	2	0,5%
Zagrebačka	4	1,0%
I don't know	213	54,1%
Refuses to answer	1	0,3%
Total	394	100,0%

Table 2.22. How does poisoning most often occur?

Poisoning of wild animals in Croatia can occur intentionally or accidentally, with illegal or legal toxic substances. In your opinion, how does it happen most often?	N	% column
Intentionally, by abusing legal toxic substances (pesticides, insecticides, etc.)	162	41,1
Accidentally, by misuse of legal toxic substances, out of ignorance	122	31,0
Deliberately, illegal poisons from the black market	77	19,5
I don't know	33	8,4
Total	394	100,0

Table 2.23. Responsibility of individual groups for poisoning.

Assessment on a scale of 1 - often to 4 - never.

How often do you think people from the following groups are responsible for poisoning of wild animals in Croatia?	Never	Rarely	Occasionally	Often	I don't know	Responses average*
Livestock breeders	25,9%	26,4%	23,1%	14,7%	9,9%	2,70
Hunters	28,4%	18,8%	23,9%	18,5%	10,4%	2,64
Farmers	18,0%	25,9%	28,9%	17,5%	9,6%	2,49
Beekeepers	45,9%	16,8%	14,7%	6,6%	16,0%	3,21
Pigeon breeders	41,1%	13,7%	11,7%	7,4%	26,1%	3,20
Individuals who deliberately poison animals because they simply like to kill	14,2%	15,0%	22,1%	36,8%	11,9%	2,07

* In the average, those who answered "I don't know" are not included; lower value means more often.

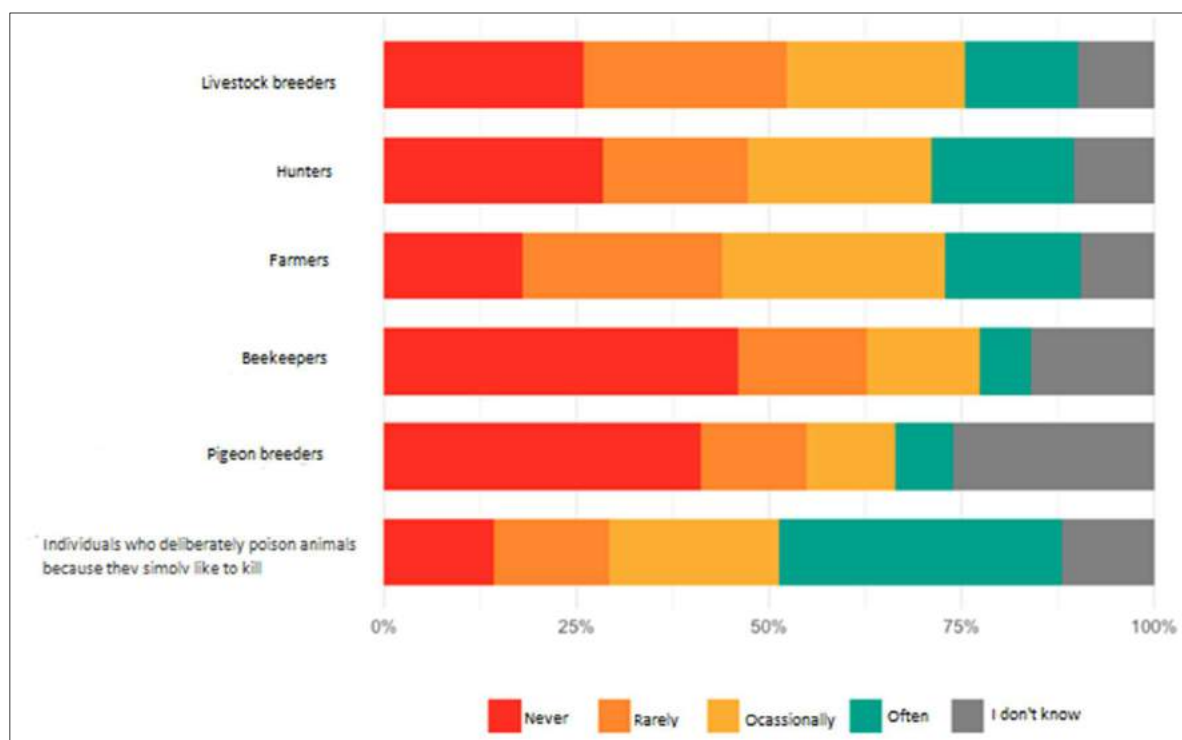


Figure 1. Responsibility of individual groups for poisoning

Table 2.24. Responsibility of individual groups for poisoning: a comparison of livestock breeders, farmers and hunters.

How often do you think people from the following groups are responsible for wildlife poisoning in Croatia?	Stočari (prosjek)*	Poljoprivrednici (prosjek)	Lovci (prosjek)
Livestock breeders	2,83	2,60	2,49
Hunters**	2,57	2,46	3,00
Farmers	2,42	2,46	2,33
Beekeepers	3,29	3,20	3,33
Pigeon breeders	3,44	3,22	3,26
Individuals who deliberately poison animals because they simply like to kill	1,88	2,07	2,10

* On average, those who answered "I don't know" are not included; lower value means more often.

** $p < 0.05$

Hunters are statistically significantly less likely than farmers to estimate that they themselves are often responsible for wildlife poisoning in Croatia.

Table 2.25. What are the reasons behind wildlife poisoning?

Assessment on a scale of 1 - often to 4 - never.

In your opinion, how often is each of the above reasons behind the poisoning of wild animals in Croatia?	Never	Rarely	Occasionally	Often	I don't know	Nnsver average*
Protection of pastures and livestock from wild animals (e.g., wolves, bears)	18,0%	22,6%	24,9%	26,1%	8,4%	2,35
Protection of agricultural land from wild animals	16,2%	20,1%	28,2%	29,2%	6,3%	2,25
Protection of agricultural land from birds of prey	23,1%	22,3%	23,9%	19,0%	11,7%	2,56
Protection of pigeons from birds of prey	21,1%	24,6%	20,3%	12,4%	21,6%	2,69
Protection of apiaries from bears	27,4%	23,1%	17,3%	13,2%	19,0%	2,80
Conflicts among people over land use (e.g., pastures, hunting grounds)	22,3%	21,1%	24,6%	16,8%	15,2%	2,58
Protection of hunting activities	23,6%	22,8%	22,1%	12,7%	18,8%	2,71
Protection against stray dogs and cats	26,1%	19,8%	21,6%	19,8%	12,7%	2,60
Protection against pests (rats, insects, etc.)	15,0%	17,0%	24,1%	34,5%	9,4%	2,14

Table 2.26. What are the reasons behind wildlife poisoning? comparison of cattle breeders, farmers and hunters.

In your opinion, how often is each of the above reasons behind the poisoning of wild animals in Croatia?	Livestock breeders (average)*	Farmers (average)	Hunters (average)
Protection of pastures and livestock from wild animals (e.g., wolves, bears)	2,42	2,28	2,22
Protection of agricultural land from wild animals	2,24	2,34	2,07
Protection of agricultural land from birds of prey	2,59	2,59	2,43
Protection of pigeons from birds of prey	2,72	2,83	2,73
Protection of apiaries from bears	2,92	2,74	2,90
Conflicts among people over land use (e.g., pastures, hunting grounds)	2,90	2,57	2,54
Protection of hunting activities	2,94	2,60	2,85
Protection against stray dogs and cats	2,76	2,40	2,74
Protection against pests (rats, insects, etc.)	2,09	2,17	2,07

* On average, those who answered "I don't know" are not included; lower value means more often.

There is no statistically significant difference between the 3 groups (the difference was tested by analyzing the variance of responses to each of the claims).

Table 2.27. Do the respondents know about a poisoning incident in their environment, back ten years (except for rodent control)?

Did you know ten years ago, for at least one case of animal poisoning in your environment, except for deratization?	N	% column
Yes	106	26,9%
No	288	73,1%
Total	394	100,0%

Table 2.28. What kind of cases of poisoning were involved?

What were the poisoning incidents about? (Multiple answers possible)	N	% of respondents who know about a poisoning incident
Someone deliberately poisoned any type of animal (wild animals, stray dogs or cats, birds of prey) in the populated area that bothered him / her	78	73,6%
Someone deliberately poisoned wild animals outside the populated area because they bothered him / her	13	12,3%
That any of the protected species was accidentally poisoned	3	2,8%
Fishing with explosives	2	1,9%
That one or more vultures were accidentally poisoned	1	0,9%
Mass death of birds due to pesticides	0	0,0%
Something else, what? (<i>answer below</i>)	12	11,3%
▪ Dog poisoning	2	1,9%
▪ Wild boars	1	0,9%
▪ Hunters poisoned each other's dogs because of jealousy	1	0,9%
▪ Cats	1	0,9%
▪ Someone poisoned stray dogs	1	0,9%
▪ My son's dog was poisoned accidentally	1	0,9%
▪ Accidental poisoning of a dog due to deratization	1	0,9%
▪ Neighbor prepares pesticides 5 times stronger than prescribed	1	0,9%
▪ Poisoning of foxes	1	0,9%
▪ Poisoning of wolves for killing sheep	1	0,9%
▪ Related to bees	1	0,9%

Table 2.29. Did it happen personally to the respondents that their animal was poisoned?

Has an animal been poisoned belonging to you personally or to someone in your environment? If so, which one? (Multiple answers possible)	N	% of respondents who know about a poisoning incident
Pet	52	49,1%
Guard dog or shepherd dog	18	17,0%
Hunting dog	5	4,7%
Domestic animal (pigs, poultry..)	9	8,5%
Bees	0	0,0%

Pigeons	1	0,9%
No, I didn't experience such things	28	26,4%
Other animal	3	2,8%
▪ Cat	2	1,9%
▪ Fox	1	0,9%

2.5 Respondents' views about reporting and investigations of poisoning incident

Table 2.30. Attitudes about reporting poisoning incidents to the authorities

Rating on a scale of 1 - I do not agree at all to 5 - I completely agree.

To what extent do you agree with the following statements, related to reporting poisoning to the competent institutions?	I completely disagree	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree	Average
People do not know to whom to report animal poisoning	17,5%	9,9%	17,8%	15,0%	39,8%	3,50
In most areas, it is a "public secret" that individuals poison animals	16,8%	9,1%	29,2%	17,5%	27,4%	3,30
Every person should report to the police information about wildlife poisoning	2,0%	3,6%	9,4%	13,2%	71,8%	4,49
Hunters should report wildlife poisoning to police more often	1,8%	2,8%	9,4%	12,7%	73,4%	4,53
Veterinarians should report wildlife poisoning to police more often	1,5%	3,0%	10,4%	12,9%	72,1%	4,51
People who report someone from their environment for animal poisoning risk quarrels and conflicts in their community	3,6%	5,8%	11,4%	17,5%	61,7%	4,28
Poisoning mainly takes place in remote locations and therefore few people know who the perpetrators are	7,1%	11,7%	23,1%	14,0%	44,2%	3,76

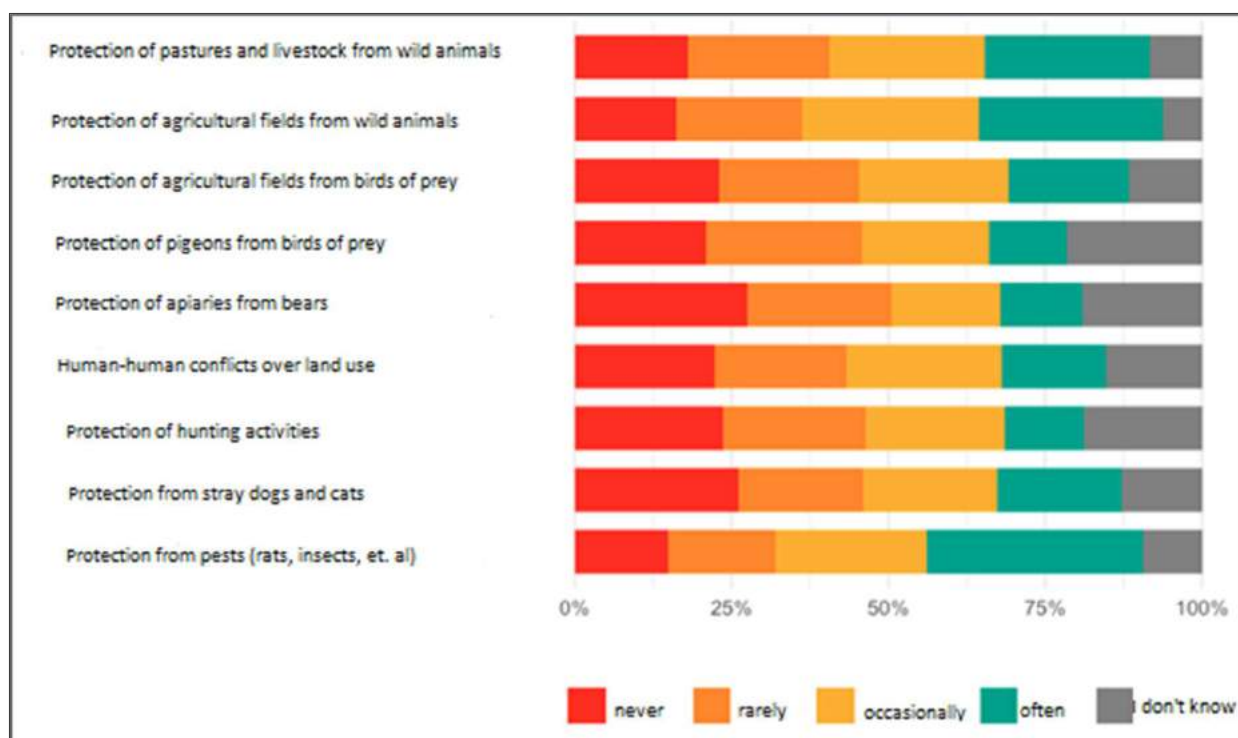


Figure 2. Attitudes about reporting poisoning incidents to the authorities

Table 2.31. Attitudes towards reporting to institutions: a comparison of livestock farmers, farmers and hunters.

To what extent do you agree with the following statements, related to reporting poisoning to the competent institutions?	Livestock breeders (average)	Farmers (average)	Hunters (average=)
People do not know to whom to report animal poisoning	3,76	3,55	3,36
In most areas, it is a "public secret" that individuals poison animals	3,28	3,37	3,24
Every person should report to the police information about wildlife poisoning	4,48	4,44	4,55
Hunters should report wildlife poisoning to police more often	4,56	4,61	4,38
Veterinarians should report wildlife poisoning to police more often	4,58	4,61	4,45
People who report someone from their environment for animal poisoning risk quarrels and conflicts in their	4,42	4,36	4,40

community			
Poisoning mainly takes place in remote locations and therefore few people know who the perpetrators are	3,78	3,82	3,40

There is no statistically significant difference between the 3 groups (the difference was tested by analyzing the variance of responses to each of the claims).

Table 2.32. Would respondents report poisoning?

I would not report to the police	N	% column
I would not report to the police	47	11,9%
I would report it to the police, but only if it did not have any negative consequences for m	131	33,2%
I would report to the police even if it could have negative consequences for me	180	45,7%
I don't know	36	9,1%
Total	394	100,0%

Table 2.33. Why not report poisoning incidents?

If you wouldn't report poisoning to the authorities, what of the following would be the main reason?	N	% column*
Because there are enough others to take care of it	29	16,7%
Not to come into conflict with people from my environment	110	63,2%
Because I don't benefit from that	27	15,5%
For some other reason	0	0,0%
Refuses to answer	8	4,6%
Unknown	4	2,3%
Total	187	100,0%

* The question was answered by those who previously answered "I would not report to the police" or "I would report to the police, but only if that would not have any negative consequences for me."

Table 2.34. Assess the importance of poisoning investigations.

How important would you rate investigations into wildlife poisoning, compared to other police work?	N	% column
Completely irrelevant	28	7,1%
Mostly irrelevant	48	12,2%
Not important nor unimportant	71	18,0%
Mostly important	105	26,6%
Extremely important	122	31,0%
I don't know	20	5,1%
Total	394	100,0%

Table 2.35. Do respondents know of any case of animal poisoning investigation?

Do you know a specific case of a police investigation into the poisoning of wild animals in Croatia, for example a case that was in the media?	N	% column
Yes	57	14,50%
No	333	85,50%
Total	394	100,0%

2.6. Attitudes about the need to raise awareness and prevention measures

Table 2.36. In which group is it most important to raise awareness about animal poisoning?

In which group of people is the most important thing to raise awareness about wildlife poisoning?	N	% column
Citizens in general	243	61,7%
Hunters	39	9,9%
Livestock breeders	39	9,9%
Farmers	33	8,4%
I don't know	21	5,3%
Gamekeepers	10	2,5%
Refuses to answer	9	2,3%
Some other group	0	0,0%
Total	394	100,0%

Table 2.37. In which group is it most important to raise awareness about animal poisoning? comparison of cattle breeders, farmers and hunters.

In which group of people is the most important thing to raise awareness about wildlife poisoning?	Livestock breeders (% column)	Farmers (% column)	Hunters (% column)
Citizens in general	48,0%	68,1%	71,4%
Hujnters	18,0%	8,4%	4,8%
Gamekeepers	8,0%	2,5%	0,0%
Stočara	14,0%	9,2%	7,1%
Farmers	8,0%	6,7%	11,9%
Some other group	0,0%	0,0%	0,0%
I don't know	2,0%	4,2%	2,4%
Refuses to answer	2,0%	0,8%	2,4%

There is no statistically significant difference between the 3 groups (Chi-square 15,850, DF = 12, Sig. = 0,198).

Table 2.38. Assess the importance of individual measures to prevent poisoning. Rating on a scale of 1 - I do not agree at all to 5 - I completely agree.

In your opinion, how important would it be to take some of the mentioned measures?	I completely disagree	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree	Average
That the state compensates the damage to livestock and farmers caused by wild animals	2,0%	2,0%	6,6%	14,2%	75,1%	4,58
Create more feeding stations for vultures	4,8%	3,6%	10,7%	24,6%	56,3%	4,24
Provide free electric fences	5,3%	5,1%	19,3%	21,3%	49,0%	4,04
Resolve issues of ownership and use rights of pastures	1,5%	5,1%	13,7%	17,0%	62,7%	4,34
Work more to inform the public about the problem of wildlife poisoning	1,0%	2,8%	7,9%	16,5%	71,8%	4,55
Increase fines for wildlife poisoning	3,8%	2,3%	18,5%	11,4%	64,0%	4,29
Introduce stronger control over the import and trade of legal toxic substances (pesticides, insecticides, rodenticides)	2,3%	3,6%	12,2%	13,5%	68,5%	4,42

Table 2.39. Assessing the importance of individual measures to prevent poisoning: a comparison of livestock, farmers and hunters.

In your opinion, how important would it be to take some of the above measures?	Livestock breeders (average)	Farmers (average)	Hunters (average=)
That the state compensates financially the damage to livestock and farmers caused by wild animals	4,82	4,71	4,33
Create more feeding stations for vultures*	4,24	4,54	3,83
Osigurati besplatne električne ograde	4,06	4,24	4,00
Riješiti pitanja vlasništva i prava korištenja pašnjaka	4,36	4,43	4,36
Više raditi na informiranju javnosti o problemu trovanja divljih životinja	4,64	4,63	4,60
Povisiti novčane kazne za trovanje divljih životinja	4,16	4,33	4,24
Uvesti jaču kontrolu nad uvozom i trgovinom legalnih otrovnih supstanci (pesticida, insekticida, mišomora)	4,60	4,50	4,19

* $p < 0.01$

Livestock breeders are statistically significantly more likely to agree with the statement:

- That the state compensates the livestock and farmers for the damage caused by wild animals

Compared to hunters, farmers are statistically significantly more likely to agree with the statement:

- Create more feeding grounds for vultures

2.7. Attitudes about the relationship between man and nature

Table 2.40. Respondents' attitudes about the relationship between man and nature.

Rating on a scale of 1 - I do not agree at all to 5 - I completely agree.

To what extent do you agree with the following statements?	I completely disagree	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree	Average
The natural balance is very sensitive and easy to disturb	0,3%	1,5%	7,9%	11,2%	79,2%	4,68
Earth is like a spaceship, with very limited	1,8%	4,1%	11,2%	13,2%	69,8%	4,45

space and resources						
Plants and animals have the same right to exist as humans	1,0%	1,5%	7,4%	10,4%	79,7%	4,66
Humans are destined to rule over the rest of nature	20,3%	11,9%	17,0%	18,0%	32,7%	3,31

Table 2.41. Respondents' attitudes about the relationship between man and nature: a comparison of cattle breeders, farmers and hunters.

In your opinion, how important would it be to take some of the listed measures?	Livestock breeders (average)	Farmers (average)	Hunters (average=)
The natural balance is very sensitive and easy to disturb	4,66	4,67	4,64
Earth is like a spaceship, with very limited space and resources	4,42	4,45	4,38
Plants and animals have the same right to exist as humans	4,92	4,72	4,50
Humans are destined to rule over the rest of nature*	3,66	3,45	2,76

* p <0.05

Compared to farmers and hunters, cattle breeders are statistically significantly more inclined to agree with the statement:

- Plants and animals have the same right to exist as humans

Compared to farmers and stockbreeders, hunters are statistically significantly less likely to agree with the statement:

- Humans are destined to rule over the rest of nature.

Annex X. Perception of the illegal practice of wildlife poisoning within relevant governmental authorities in Croatia – baseline report.

1. Working profile of respondents

Table 1.1. Institution of employment of respondents.

Institution	N	% column
Ministry of Interior	21	33,9%
Ministry of Agriculture	16	25,8%
Public institution for nature conservation	12	19,4%
Institute for Environmental Protection	10	16,1%
State Inspectorate	3	4,8%
Total	62	100,0%

Respondents have an average of 16 years of service in a state administration body or public institution where they work, with a range ranging from less than one to a maximum of 42 years of service.

Respondents have an average of 7.5 years of service in the department they now work in, with a range ranging from less than one to a maximum of 42 years of service.

Table 1.2. Position in the hierarchy of the employment institution.

Što od sljedećeg najbolje opisuje Vaše trenutno radno mjesto?	N	% column
Employee	24	38,7%
Middle management level	16	25,8%
Lower management level	9	14,5%
Higher management level	8	12,9%
Highest management level (director of the institution)	4	6,5%
Something else - employee on employment contract	1	1,6%
Total	62	100,0%

Table 1.3. Do the respondents deal directly with the issue of animal poisoning in their work?

In your work, do you directly deal with the issue of wildlife poisoning?	N	% column
No	46	74,2%
Yes, both wild and domestic	11	17,7%
Yes, but only domestic	5	8,1%
Total	62	100,0%

Table 1.4. Did the respondents encounter the problem of animal poisoning at all? (Only those who previously answered "No" answered the question)

In your work, have you ever been in contact with the issue of animal poisoning?	N	% column
No	30	65,2%
Yes, both wild and domestic	11	23,9%
Yes, but only domestic	5	10,9%
Total	46	100,0%

Table 1.5. Have respondents ever attended training about wildlife poisoning?

Have you ever undergone any training related to detecting and prosecuting wildlife poisoning cases?	N	% column
No	56	90,3%
Yes	6	9,7%
Total	62	100,0%

Table 1.6. Who organized the training? (Only those who previously answered "Yes" answered the question)

Who organized the training? (Free entry of answers)	N
Organization for protection of animals and Police	1
The Ministry	1

Falconry centre	1
VCF	1
Association BIOM	1
VCF and BIOM	1
Total	6

The cooperation of government institutions and non-governmental organizations on a scale from 1 (very bad) to 5 (excellent) is assessed by respondents with an average score of 2.6, with a large share (49% and 30 respondents, respectively) stating that they do not know how to assess.

2. Respondents' knowledge of vultures

Table 2.1. What species of vultures breed in the Republic of Croatia?

According to your information, which species of vultures nest in the Republic of Croatia today? (Please tick any answers you think are correct.)	N	% of the total number of respondents
Griffon Vulture	57	91,9%
Cinereous Vulture	6	9,7%
I don't know	4	6,5%
Turkey Vulture	3	4,8%
Egyptian Vulture	2	3,2%
King Vulture	1	1,6%

Table 2.1. What do vultures eat in Croatia?

Do you know what all of the above feed on vultures in Croatia? (Please tick any answers you think are correct.)	N	% of the total number of respondents
Lešine divljih životinja	55	88,7%
Lešine domaćih životinja	51	82,3%
Hunted rodents	16	25,8%
Hunted domestic animals	9	14,5%
Hunted large mammals	3	4,8%
Hunted insects	2	3,2%

I don't know	1	1,6%
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Table 2.2. What is endangering vultures in Croatia the most?

What is most endangering the vulture population in Croatia?	N	% column
Wildlife poisoning	19	30,6%
Lack of food	12	19,4%
Excessive use of legal poisons (pesticides, insecticides, rodenticides)	9	14,5%
Harassment	6	9,7%
Poaching of birds	5	8,1%
I don't know	4	6,5%
Something else. Please specify what?	7	11,3%
Total	62	100,0%

One person entered the following answers under "Something else":

And poisoning, harassment and probably poaching; Direct loss and habitat fragmentation: Almost nothing, they are occasionally poisoned, but now that the Agroproteinka is feeding them, there should be no more problems.

Table 3.10. The most common ways of poisoning vultures.

Which of the following ways do you think vultures are most often poisoned?	N	% column
Because they consume poisoned animals	27	43,5%
From poison baits intended for other animals	21	33,9%
From poison baits intended for vultures specifically	5	8,1%
I don't know	5	8,1%
Because they are poisoned by pesticides	4	6,5%
Total	62	100,0%

1.3. Attitudes and knowledge of respondents about animal poisoning

The average assessment of their own knowledge of the topic of animal poisoning on a scale from 1 (very poor) to 5 (excellent) is 2.6, with 30 (40.4%) stating that they could not assess.

Table 3.11. At what time of year is poisoning most common?

According to your assessment, when does wildlife poisoning occur in Croatia during the year? (It is possible to choose one or more answers.)	N	% of the total number of respondents
Spring	24	38,7%
Summer	6	9,7%
Autumn	20	32,3%
Winter	11	17,7%
I don't know	21	33,9%

Table 3.12. In which county is poisoning most common? (Counties alphabetically)

According to your assessment, in which county in Croatia are wild animals poisoned the most?	N	% of the total number of respondents
Bjelovarsko-bilogorska	2	3,2%
Brodsko-posavska	2	3,2%
Dubrovačko-neretvanska	3	4,8%
Grad Zagreb	0	0,0%
Istarska	0	0,0%
Karlovačka	1	1,6%
Koprivničko-križevačka	0	0,0%
Krapinsko-zagorska	0	0,0%
Ličko-senjska	19	30,6%
Međimurska	1	1,6%
Osječko-baranjska	6	9,7%
Požeško-slavonska	3	4,8%
Primorsko-goranska	12	19,4%
Sisačko-moslavačka	12	19,4%
Splitsko-dalmatinska	2	3,2%
Šibensko-knińska	16	25,8%
Varaždinska	0	0,0%
Virovitičko-podravska	1	1,6%
Vukovarsko-srijemska	2	3,2%
Zadarska	7	11,3%
Zagrebačka	2	3,2%
I don't know	28	45,2%

Table 3.13. How is wildlife poisoning most common in Croatia?

Poisoning of wild animals in Croatia can occur intentionally or accidentally, with illegal or legal toxic substances. In your opinion, how does it happen most often?	N	% column
Accidentally, by misuse of legal toxic (pesticides, insecticides, etc.) substances, out of ignorance	24	38,7%
Intentionally, by abusing legal toxic substances (pesticides, insecticides, etc.)	19	30,6%
I don't know	10	16,1%
Deliberately, by illegal poisons from the black market	9	14,5%
Total	62	100,0%

Table 3.14. Responsibility of individual groups for poisoning.

Assessment on a scale of 1 - often to 4 - never.

How often do you think people from the following groups are responsible for wildlife poisoning in Croatia?	Never	Rarely	Occasionally	Often	I don't know	Average answer*
Livestock breeders	4,8%	16,1%	43,5%	17,7%	17,7%	2,10
Hunters	17,7%	35,5%	25,8%	12,9%	8,1%	2,63
Farmers	1,6%	24,2%	40,3%	19,4%	14,5%	2,09
Beekeepers	37,1%	27,4%	4,8%	3,2%	27,4%	3,36
Pigeon breeders	12,9%	27,4%	14,5%	3,2%	41,9%	2,86
Individuals who deliberately poison animals because they simply like to kill	9,7%	19,4%	32,3%	14,5%	24,2%	2,32

* On average, those who answered "I don't know" are not included; lower value means more often.

Table 3.15. How often are certain reasons behind wildlife poisoning?

Assessment on a scale of 1 - often to 4 - never.

In your opinion, how often is each of the above reasons behind the poisoning of wild animals in Croatia?	Never	Rarely	Occasionally	Often	I don't know	Average answer*
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Protection of pastures and livestock from wild animals (e.g., wolves, bears)	1,6%	12,9%	46,8%	25,8%	12,9%	1,89
Protection of agricultural land from wild animals	3,2%	21,0%	45,2%	19,4%	11,3%	2,09
Protection of agricultural land from birds of prey	14,5%	22,6%	37,1%	8,1%	17,7%	2,53
Protection of pigeons from birds of prey	4,8%	38,7%	17,7%	0,0%	38,7%	2,79
Protection of beehives from bears	6,5%	38,7%	14,5%	1,6%	38,7%	2,82
Conflicts among people over land use (pastures, hunting grounds)	1,6%	30,6%	30,6%	8,1%	29,0%	2,36
Protection of hunting activities	11,3%	33,9%	24,2%	8,1%	22,6%	2,63
Protection against stray dogs and cats	4,8%	27,4%	32,3%	17,7%	17,7%	2,24
Protection against pests (rats, insects, etc.)	0,0%	14,5%	35,5%	37,1%	12,9%	1,74

* On average, those who answered "I don't know" are not included; lower value means more often.

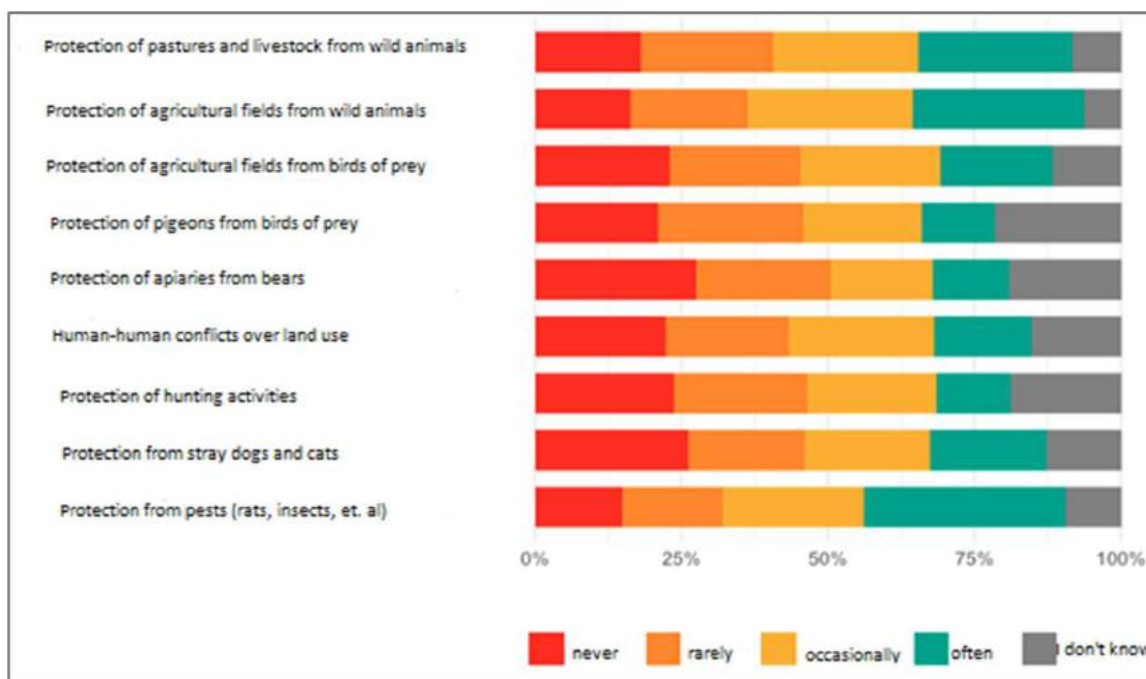


Figure 1. How often are certain reasons behind wildlife poisoning?

1.4 Attitudes towards reporting, methods of investigation and punishment

Table 3.16. Attitudes towards reporting to institutions.

Rating on a scale of 1 - I do not agree at all to 5 - I completely agree.

To what extent do you agree with the following statements related to reporting poisoning to the competent institutions?	I completely disagree	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree	Average
People do not know to whom to report animal poisoning	3,2%	9,7%	19,4%	50,0%	17,7%	3,69
In most areas, it is a "public secret" that individuals poison animals	1,6%	6,5%	27,4%	35,5%	29,0%	3,84
Every person should report to the police information about wildlife poisoning	1,6%	1,6%	6,5%	35,5%	54,8%	4,40
Hunters should report wildlife poisoning to police more often	0,0%	1,6%	11,3%	32,3%	54,8%	4,40
Veterinarians should more often report wildlife poisoning to the police	0,0%	0,0%	8,1%	38,7%	53,2%	4,45
People who report someone from their environment for animal poisoning risk quarrels and conflicts in their community	0,0%	8,1%	24,2%	25,8%	41,9%	4,02
Poisoning takes place mainly in remote locations and therefore few people know who the perpetrators	6,5%	17,7%	24,2%	37,1%	14,5%	3,35

Table 3.17. Methods needed in poisoning investigations.

In police investigations of animal poisoning incidents, it is necessary to use: (Please tick any answers you think are correct.)	N	% of the total number of respondents
Toxicological analysis	41	66,1%
Data on sales of legal toxic substances (pesticides, rodenticides...)	31	50,0%
Dating of animal's death	25	40,3%
Search dogs	23	37,1%
I don't know / can't estimate	18	29,0%
Fingerprint analysis	17	27,4%
Forensic Entomology	12	19,4%
Forensic Ballistics	10	16,1%
Forensic Psychology	8	12,9%

Table 3.18. Attitudes about poisoning cases.

Rating on a scale of 1 - I do not agree at all to 5 - I completely agree.

Do you agree with the following statements regarding legislation and case processing?	I completely disagree	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree	Average
Public prosecutors are sufficiently trained to handle wildlife poisoning case	11,3%	35,5%	37,1%	11,3%	4,8%	2,63
The legal framework for punishing animal poisoning is high quality, but the main problem is the lack of law enforcement	1,6%	12,9%	38,7%	43,6%	3,2%	3,34
Rarely are fines imposed under the Hunting Act	1,6%	3,2%	56,5%	22,6%	16,1%	3,48
Existing legislation regulates biodiversity protection well enough	12,9%	11,3%	45,2%	27,4%	3,2%	2,97

Table 3.19. Attitudes about punishment.

Rating on a scale of 1 - I do not agree at all to 5 - I completely agree.

To what extent do you agree with the following statements, related to the punishment of various illegal acts that harm animals or nature?	I completely disagree	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree	Average
All forms of mass and non-discriminatory killing of animals (traps, poisoning, explosives, etc.) should be severely punished	0,0%	1,6%	8,1%	38,7%	51,6%	4,40
More penalties are needed for each form of poaching	0,0%	1,6%	17,7%	32,3%	48,4%	4,27
There should be no prison sentences for poisoning unless they endanger humans, only animals	27,4%	27,4%	25,8%	16,1%	3,2%	2,40
Rangers in nature reserves should have the authority to arrest people who poison animals if they are caught in the act	11,3%	4,8%	21,0%	32,3%	30,6%	3,66
Penalties for animal poisoning should be only fines, but not imprisonment	22,6%	22,6%	30,6%	19,4%	4,8%	2,61
Possession of poisonous baits should be a separate criminal offense, regardless of whether it has been proven that an animal was killed	45,2%	19,4%	25,8%	6,5%	3,2%	2,03
If poisoning of wild animals occurs in the hunting area under concession, the concessionaire should be deprived of the concession	11,3%	11,3%	38,7%	25,8%	12,9%	3,18

1.5. Assessment of resources and capacity for poison investigations

Table 3.20. Resources for poison investigations.

Rating on a scale of 1 - I do not agree at all to 5 - I completely agree.

Do you agree with the following statements, related to the investigation of wildlife poisoning cases?	I completely disagree	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree	Average
It is necessary to introduce specialized police units that would investigate criminal offenses of endangering the environment, including poisoning of wild animals	0,0%	11,3%	33,9%	35,5%	19,4%	3,63
We need more people in the field (police, conservationists, etc.) to be able to detect poisoning cases in a timely manner	3,2%	4,8%	19,4%	43,5%	29,0%	3,90
Gamekeepers too often tolerate illegal practices in hunting areas	3,2%	1,6%	37,1%	29,0%	29,0%	3,79
Police should have search dogs for poison detection used against wild animals	8,1%	11,3%	24,2%	40,3%	16,1%	3,45
Insufficient coordination between institutions is a bigger problem than lack of resources	0,0%	6,5%	33,9%	37,1%	22,6%	3,76
There are enough laboratories in Croatia that have the capacity for the necessary toxicological analysis	4,8%	12,9%	61,3%	16,1%	4,8%	3,03

Table 3.21. Police capacities for poison investigations.

Rating on a scale of 1 - I do not agree at all to 5 - I completely agree.

To what extent do you agree with the following statements, related to the capacity of the police?	I completely disagree	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree	Average
Police investigations into animal poisoning require expensive and sophisticated technology	3,2%	24,2%	51,6%	17,7%	3,2%	2,94
The main problem is not reporting to the police	3,2%	3,2%	40,3%	40,3%	12,9%	3,56
Police are well enough equipped to	25,8%	30,6%	38,7%	3,2%	1,6%	2,24

investigate wildlife poisoning						
Police are sufficiently educated to investigate wildlife poisoning	24,2%	32,3%	35,5%	8,1%	0,0%	2,27
Police should include representatives of non-governmental organizations in police investigations into animal poisoning	17,7%	12,9%	29,0%	29,0%	11,3%	3,03
Police has more important work to do and should not be exhausted in wildlife poisoning investigations	21,0%	21,0%	40,3%	9,7%	8,1%	2,63
Police do not take seriously the need to launch investigations into wildlife poisoning	9,7%	12,9%	35,5%	30,6%	11,3%	3,21
Specialized police units should be introduced to deal with wildlife poisoning crimes	11,3%	16,1%	37,1%	22,6%	12,9%	3,10

Table 3.22. Existence of a database and protocol for recording poisoning cases.

The next few claims relate to procedures, procedures and documents related to animal poisoning. To the best of your knowledge:	Yes	No	I don't know, I'm not informed
Is there a database on animal poisoning incidents in Croatia?	6,5%	24,2%	69,4%
Is there a national action plan to combat wildlife poisoning?	3,2%	27,4%	69,4%
Is there a protocol that will define procedures and responsibilities in investigations into wildlife poisoning?	8,1%	25,8%	66,1%

*Table 3.23. Database data. **

Regarding the database on animal poisoning incidents:	Yes	No	I don't know, I'm not informed
Is there a clear protocol for recording cases in that database?	1	0	3
Do you ever use data from the existing database on poisoning incidents in the course of your work?	1	1	2
Do you think that the existing database is sufficiently used to raise public awareness about the problem of wildlife poisoning?	0	2	2

* The question was answered by the respondents who answered "Yes" (N = 4) to the question "Is there a database...?"

*Table 3.24. Protocol information. **

Regarding the protocol defining procedures and competencies in wildlife poisoning investigations:	Yes	No	I don't know, I'm not informed
Is this existing protocol clear enough?	1	0	4
According to the protocol, do poisoning reports have to include an analysis of the impact of each poisoning incident on the environment and biodiversity?	1	0	4

The question was answered by the respondents who answered, "Is there a protocol" with "Yes". "(N = 5).

One person who answered "Yes" under "How?" Said: "To be more operational."

1.6. Attitudes about the need to raise awareness and prevention measures

Table 3.25. In which group is it most important to raise awareness about animal poisoning?

In which group of people is it not most important to raise awareness about wildlife poisoning?	N	% column
Citizens in general	30	48,4%
Livestock breeders	11	17,7%
I don't know, I can't estimate	10	16,1%
Farmers	6	9,7%
Hunters	4	6,5%
Some other groups. Which ones? "Police and lawyers" (municipal and state)	1	1,6%
Total	62	100,0%

Table 3.26. What measures should be taken to prevent poisoning?

Assessment on a scale of 1 - completely irrelevant to 5 - extremely important.

Here are some ways to prevent wildlife poisoning. In your opinion, how important would it be to take some of the listed	Completely unimportant	Mostly unimportant	? Neither important nor	Mostly important	Extremely important	Average

measures			unimportant			
That the state compensates for the damage to livestock and farmers caused by wild animals	6,5%	6,5%	6,5%	46,8%	33,9%	3,95
Protect wild ungulates (deer, etc.) so that wild predators have more food	6,5%	14,5%	45,2%	21,0%	12,9%	3,19
Create more feeding stations for vultures	0,0%	0,0%	24,2%	59,7%	16,1%	3,92
Provide free of charge to shepherds and farmers shepherd dogs and guard dogs	8,1%	8,1%	37,1%	25,8%	21,0%	3,44
Provide free electric fences	1,6%	4,8%	30,6%	40,3%	22,6%	3,77
Resolve issues of ownership and rights to use pastures	3,2%	8,1%	30,6%	22,6%	35,5%	3,79
Completely ban deforestation in Croatia for some time	14,5%	17,7%	24,2%	24,2%	19,4%	3,16
Work to reduce introduced animal populations	11,3%	8,1%	33,9%	25,8%	21,0%	3,37
Work more on raising public awareness	0,0%	1,6%	6,5%	51,6%	40,3%	4,31
Work more on raising awareness of key stakeholders (livestock farmers, farmers, hunters, institutions)	0,0%	1,6%	9,7%	45,2%	43,5%	4,31
Introduce stricter control over the import and trade of legal toxic substances	0,0%	1,6%	21,0%	41,9%	35,5%	4,11

Table 3.27. Aggravating circumstances for prevention and sanctioning.

Assessment on a scale of 1 - completely irrelevant to 5 - extremely important.

Individuals who intend to poison wild animals in Croatia can be prevented and sanctioned in various ways by state institutions. In your opinion, how important are certain aggravating circumstances and obstacles in Croatia?	Completely unimportant	Mostly unimportant	Neither important nor unimportant	Mostly important	Extremely important	Average
Poor law enforcement	1,6%	6,5%	11,3%	59,7%	21,0%	3,92
Complexity of the investigation	1,6%	6,5%	17,7%	38,7%	35,5%	4,00
Difficulties with court evidence	0,0%	0,0%	11,3%	33,9%	54,8%	4,44
Cost of toxicological analysis	1,6%	8,1%	27,4%	32,3%	30,6%	3,82
Black market for illicit poisons over the Internet	0,0%	9,7%	24,2%	43,5%	22,6%	3,79
Lack of control over the prescribed use of	0,0%	6,5%	21,0%	53,2%	19,4%	3,85

permitted poisons such as pesticides, rodenticides, etc.						
Low penalties for animal poisoning	0,0%	1,6%	21,0%	41,9%	35,5%	4,11
Insufficient and unclear protocols for police action	0,0%	3,2%	24,2%	30,6%	41,9%	4,11
Witnesses report too infrequently	1,6%	0,0%	16,1%	53,2%	29,0%	4,08

1.7. Attitudes about the relationship between man and nature

Table 3.28. Attitudes about the relationship between man and nature.

Rating on a scale of 1 - I do not agree at all to 5 - I completely agree.

To what extent do you agree with the following statements?	I completely disagree	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree	Average
The natural balance is very sensitive and easy to disturb	1,6%	0,0%	8,1%	38,7%	51,6%	4,39
Earth is like a spaceship, with very limited space and resources	0,0%	0,0%	1,6%	35,5%	62,9%	4,61
Plants and animals have the same right to exist as humans	4,8%	3,2%	17,7%	45,2%	29,0%	3,90
Humans are destined to rule over the rest of nature	32,3%	29,0%	21,0%	11,3%	6,5%	2,31

2. Summary of results and conclusions

2.1. Survey results of cattle breeders, farmers and hunters

Regarding the socio-demographic characteristics of the respondents, it is important to note that in the sample we have an older population with lower average monthly household incomes compared to the national average (according to CBS data, the average salary in Croatia in September 2021 was 7108 HRK). Among the respondents, the older ones are also on average and have lower education (given the relatively high number of highly educated, this was further verified by the analysis of variance, $F = 6,789$, $p < 0,01$). More than half of the respondents in the sample are pensioners, who we

can assume is the result of the fact that the target groups belong to the majority of the population living in rural areas where there are more elderly people. In addition, it is possible that the share of older people and retirees has been increased by CATI survey techniques, which are more difficult for younger people to reach. Among the participants in the survey, 12.4% had heard of BIOM, most often on television, from friends / colleagues / acquaintances or in newspapers.

We generally measured the environmental awareness of the respondents with an abbreviated version of the questionnaire known as NEP (New Ecological Paradigm). In general, respondents are predominantly "pro-environmental", yet do not have a clear departure from anthropocentrism (roughly every other respondent agrees with the statement that humans are destined to rule the rest of nature). Those involved in livestock farming are less likely than two other groups to agree that plants and animals have the same right to exist as humans, and hunters are less likely than two other groups to agree with the statement that "humans are destined to rule over the rest of nature."

When it comes to respondents' knowledge of vultures, most respondents answered all questions correctly, but at the same time a considerable number of respondents answered incorrectly, which indicates the need for education. When it comes to respondents' attitudes about vultures and poisoning, most respondents recognize that vultures play an important role in the ecosystem (this is the question with the highest average agreement). On the other hand, it is certainly negative that a significant proportion of respondents agree with the statements "Animal poisoning is sometimes justified" and about a fifth of respondents agree (summed up answers "mostly agree" and "strongly agree") and "Poisoning animals are a problem only when they pose a danger to humans", with which more than a third of respondents agree. A comparison of the three groups shows that hunters are more inclined to attitudes that recognize the importance of vultures, and on the other hand cattle breeders and farmers are more inclined to perceive wildlife poisoning as sometimes justified.

Respondents rate their knowledge of poisoning on average 2.7 on a scale of 1 (where 1 is very poor and 5 is excellent). Accordingly, large proportions of respondents answered that they do not know when poisoning most often occurs in a year (20.6%) and in which county (54.1%). Compared to the current actual situation, of the three counties most affected by the problem of poisoning, respondents are the least aware of animal poisoning in the Primorje-Gorski Kotar County.

In total, just over 60% of respondents believe that poisoning of wild animals occurs intentionally, and most often through the abuse of legal toxic substances (pesticides, insecticides, etc.). Respondents estimate that individuals who deliberately poison

animals because they simply like to kill are most often responsible for poisoning, followed by farmers, then hunters and cattle breeders. At the same time, hunters are significantly less likely than farmers to estimate that they themselves are often responsible for poisoning wild animals.

When respondents are asked to assess how often certain reasons are behind the poisoning of wild animals, they put the protection of pests (rats, insects, etc.) in the first place in terms of frequency, the protection of agricultural areas from wild animals in the second place and protection in the third place. pastures and livestock from wild animals. At the same time, we did not find that there was a statistically significant difference in estimates between cattle breeders, farmers and hunters.

Approximately one in four respondents is aware of at least one case of animal poisoning in their environment (excluding rodent control) ten years ago. Of those who know of such cases, most know of cases of intentional poisoning, most commonly in populated areas. Respondents themselves or people in their environment were most often poisoned pets or sheepdogs or guard dogs.

When it comes to respondents' attitudes about reporting poisoning cases to the competent institutions, respondents mostly believe that poisoning should be reported (more often) by veterinarians, hunters and anyone who has knowledge of such cases. Let us remind you that the respondents from the survey among cattle breeders, farmers and hunters mostly agree with the same three statements. However, we see an interesting difference in the statement "People do not know to whom to report animal poisoning": a larger share of respondents in the survey of livestock, farmers and hunters disagree with this statement (27.4%, compared to 12.9% of respondents from the ranks of representatives institution).

Regarding the methods that need to be applied in poisoning investigations, the representatives of the institutions put toxicological analysis in the first place, although it is interesting that one third of the respondents did not recognize such analysis as important. Since the list of offered answers is based on the experience of Spain, where all the above methods are used in interdisciplinary teams, the fact that respondents rarely recognized the relevance of many of these methods suggests the need for education on good practices in other countries.

Regarding the capacities for processing poisoning cases, it is generally possible to note that a large part of the respondents could not determine themselves according to the allegations in the questions asked. Representatives of the institutions at least agree with the statement "Public prosecutors are sufficiently educated to handle cases related to

wildlife poisoning." On the other hand, they are mostly inclined to agree on average that they rarely impose penalties under the Hunting Act.

Regarding the punishment of various illegal acts that harm animals and nature, the general impression is that the respondents who participated in the survey of representatives of institutions support strict punishment. Of all the claims offered, they strongly agree with "All forms of mass and non-discriminatory killing of animals (traps, poisoning, explosives, etc.) should be severely punished," and immediately afterwards that more penalties are needed for each form of poaching. Also, over two-thirds of respondents agreed with the statement that conservationists (rangers) should have the authority to arrest people who poison animals if they are caught in the act.

Regarding resources for poisoning investigations, respondents mostly agree with the statement "We need more people in the field (police, conservationists, etc.) to be able to detect poisoning cases in time", while the least agree with the statement "There are enough in Croatia laboratories that have the capacity for the necessary toxicological analysis". In general, attitudes about the need for greater resources for poisoning investigations dominate, but it is interesting that almost a fifth of the respondents do not recognize search dogs for the detection of poisons used against wild animals as a relevant resource.

Regarding the capacity of the police to investigate poisonings, the main problem is the non-reporting of poisoning cases to the police. But the second statement according to the level of average agreement is "Police do not take seriously the need to launch investigations into wildlife poisoning", while respondents least agree with the statement that the police are sufficiently equipped and educated to investigate wildlife poisoning. We can summarize that the attitudes of the respondents suggest that there is room for better capacity building of the police for wildlife poisoning investigations, but also for raising awareness of the importance of these investigations.

Approximately a quarter of respondents are aware of the fact that in Croatia there is no database on animal poisoning incidents, a national action plan to combat animal poisoning or a protocol that will define procedures and responsibilities in investigations into wildlife poisoning. However, the answers of the participants in the research indicate that it is possible that some institutions or their organizational units still have internal protocols and a database of poisoning cases.

Respondents working in state institutions, as well as those surveyed from the groups of cattle breeders, farmers and hunters, put in the first place raising awareness of wildlife poisoning among citizens in general, ie the general public. Respondents, on average, consider the most important work to raise awareness of the general public and key

stakeholders (livestock, farmers, hunters, institutions), followed by the introduction of stricter control over the import and trade of legal toxic substances. We find it interesting to point out that, comparing the average answers to the offered claims, respondents from state institutions give less priority to state monetary compensation for livestock and farmers, compared to respondents from the survey of cattle breeders, farmers and hunters, who support this measure.

We also asked the interviewed representatives of the institutions to assess how important certain aggravating circumstances are, which make prevention and sanctioning more difficult. Respondents estimate that these are first of all difficulties with evidence in court, followed by insufficient and unclear protocols for police actions and too low penalties for animal poisoning, while they perceive the black market of prohibited poisons over the Internet as the least important problem.

Respondents, like those from the survey of cattle breeders, farmers and hunters, are predominantly pro-environmentally oriented, but with a slightly different emphasis. Respondents from the ranks of representatives of institutions thus strongly reject anthropocentrism (whose indicator is agreement with the statement "People are destined to rule over the rest of nature") and put the problem of limited resources in the first place.

Annex XI. Overview of poisoning incidents in Greece confirmed by toxicological analysis.

Species	No. of poisoned individuals	Date/Period	Location	Main driver	Substance
Red Fox	3	01.01.2000	Volos	unknown	Potassium cyanide
Cinereous Vulture	3	27.02.2000	Soufli	unknown	Metamidophos
Red Fox	1	30.06.2000	Almyros	Conflicts with predators/damages to game animals	Potassium cyanide
Bearded Vulture	1	04.09.2000	Siteia	Conflicts with predators/damages to livestock	Fenthion
Corvidae spp.	3	01.08.2001	Irakleio	unknown	Methomyl
Red Fox	3	01.01.2003	Grevena	unknown	Methomyl
Red Fox	1	21.03.2003	Grevena	unknown	Metamidophos
Cinereous Vulture	1	04.07.2003	Soufli	Conflicts with shepherd dogs	Methomyl
Cinereous Vulture	1	25.07.2003	Soufli	Damages to agricultural production	Metamidophos
Red Fox, European Badger	1, 1	28.07.2003	Lokroi	unknown	Sulphur
Griffon Vulture	1	22.04.2204	Soufli	unknown	Methyl-Parathion
Cinereous Vulture	1	27.09.2004	Soufli	Conflicts with shepherd dogs	Carbofuran
Red Fox	7	31.12.2004	Grevena	unknown	Carbofuran
Corvidae spp.	1	01.01.2005	Kos	unknown	Methomyl
Red Fox	1	28.02.2005	Grevena	unknown	Methomyl
Raptor spp.	2	15.09.2005	Irakleio (Kritis)	unknown	Methomyl
Red Fox	2	01.01.2006	Grevena	unknown	Methomyl
Corvidae spp.	2	01.01.2006	Kos	unknown	Methomyl
Red Fox, Griffon Vulture, Golden Eagle	14	01.03.2006	Aktio-Vonitsa	Conflicts with predators/damages to game animals	Potassium cyanide
Raptor spp.	1	30.09.2006	Irakleio (Kritis)	unknown	Methomyl
Red Fox	3	31.03.2007	Grevena	unknown	Methomyl
Brown Bear	1	29.04.2011	Prespes	Conflicts with predators/damages to livestock	Methomyl
Red Fox	8	16.01.2012	Makrakomi	unknown	Potassium cyanide

Red Fox	8	18.02.2021	Domokos	Conflicts with predators/damages to game animals	Potassium cyanide
Red fox	7	21.02.2012	Domokos	unknown	Potassium cyanide
Griffon Vulture, Golden Eagle, Common Buzzard	7	22.02.2012	Topeiros	Conflicts with predators/damages to livestock	Carbofuran
Red Fox	1	17.03.2012	Prespes	unknown	Methomyl
Red Fox	1	17.03.2012	Prespes	Conflicts with predators/damages to livestock	Methomyl
Common Buzzard, Pine Martin	8	23.10.2012	Mylopotamos	unknown	Carbofuran
Pine Martin	2	28.10.2012	Irakleio (Kritis)	unknown	Methomyl
Egyptian Vulture	2	02.04.2013	Amfipoli	Conflicts with predators/damages to livestock	Aldehyde, Carbofuran
Griffon Vulture	1	15.09.2013	Almopia	unknown	Carbofuran
Griffon Vulture	2	16.09.2013	Almopia	Conflicts with predators/damages to livestock	Carbofuran
Red Fox	2	26.05.2014	Alexandroupoli	Conflicts with predators/damages to game animals	Potassium cyanide
Red Fox	1	28.08.2014	Arriana	Conflicts with predators/damages to game animals	Endosulfan
Common Buzzard	2	07.11.2014	Gortyna	Conflicts with predators/damages to game animals	Methomyl
Red Fox	1	20.03.2015	Pyli	Conflicts with predators/damages to game animals	Potassium cyanide
Griffon Vulture	2	24.04.2015	Arriana	Conflicts with predators/damages to livestock	Carbofuran
Egyptian Vulture	2	16.07.2015	Kalampaka	unknown	Chlorpyrifos
Red Fox	4	27.09.2015	Soufli	Conflicts with predators/damages to game animals	Potassium cyanide
Red Fox	2	10.01.2016	Kalampaka	Conflicts with hunting dogs	Methomyl
Red Fox	4	01.04.2016	Trikala	Conflicts with predators/damages to game animals	Potassium cyanide
Red Fox	1	04.04.2016	Zagori	unknown	Potassium cyanide
Eurasian Wolf, Red Fox	2, 3	03.06.2016	Kalampaka	Conflicts with shepherd dogs	Methomyl

Red Fox	1	14.12.2016	Kalampaka	Conflicts with predators/damages to game animals	Potassium cyanide
Common Buzzard	4	28.02.2017	Kalampaka	Conflicts with shepherd dogs	Carbofuran
Red Fox, Pine Martin	2, 2	30.03.2017	Kalampaka	Conflicts with predators/damages to livestock	Methomyl
Red Fox	1	10.04.2017	Komotini	Conflicts with predators/damages to game animals	Potassium cyanide
Red Fox	1	26.04.2017	Xanthi	Conflicts with predators/damages to game animals	Methomyl
Griffon Vulture	1	11.09.2017	Agios Nikolaos	unknown	Cyproconazole
European Hedgehog	2	17.09.2017	Kalampaka	Conflicts with hunting dogs	Methomyl
Red Fox	1	01.12.2017	Maroneia-Sapes	unknown	Potassium cyanide
Common Buzzard	1	07.12.2017	Malevizi	Conflicts with predators/damages to game animals	Metribuzin
Griffon Vulture	1	07.12.2017	Viannos	unknown	Methomyl
Cinereous Vulture	1	05.03.2018	Alexandroupoli	unknown	Phorate
Red Fox	2	24.03.2018	Kalampaka	Local disputes among land users	Potassium cyanide
Golden Eagle	1	22.02.2019	Soufli	Conflicts with predators/damages to livestock	Potassium cyanide

Annex XII. Perception of the illegal practice of wildlife poisoning in local communities in Greece – baseline report.

1. METHODOLOGY

1.1 Project background

The BalkanDetox LIFE project (LIFE19GIE/NL/001016) - Strengthening national capacities to fight wildlife poisoning and raise awareness about the problem in the Balkan countries is a project that is dedicated to the fight against illegal poisoning of wild animals which local citizens usually consider as pests, but which has serious negative consequences for the population of numerous endangered animal species, primarily vultures which eat poisoned animals or eat the poison themselves. The study will be conducted in two waves in 2021 and 2025, as base line and follow up study aimed at measuring the current attitudes and practices, and attitudes and practices of target groups after the implementation of planned campaign and activities.

The project is being implemented at the multinational level in the Balkan region. The countries involved are Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Greece, Northern Macedonia, and Serbia.

1.2 Key research topics

In this first phase, the aims of the research are:

- Measuring awareness of target groups (hunters, farmers, livestock breeders) about endangered species (vultures), methods of poisoning and individuals or groups responsible for poisoning on the territories of their respective countries.
- Measuring the current attitudes and practices of target groups connected with illegal poisoning of endangered species i.e., vultures.

1.3 Methodological approach

1.3.1 Research technique

Quantitative research of the targeted groups in Greece conducted by face-to-face PAPI (Paper and Pen Interviewing) and CAWI (Computer Assisted Web Interviewing) techniques.

1.3.2 Fieldwork

The fieldwork was conducted from September the 18th to October the 21st 2021.

1.3.3 Questionnaire length

Questionnaire length up to 10 minutes.

1.3.4 Sample - target group

The target group in the research were hunters, farmers and livestock breeders on the territory of Greece, who perform their activities in the areas where vultures exist as members of endangered species.

Due to difficulties caused by COVID-19 pandemic, the sample included 43 respondents in total.

1.3.5 Sample Structure

Chart 1.1. Age structure

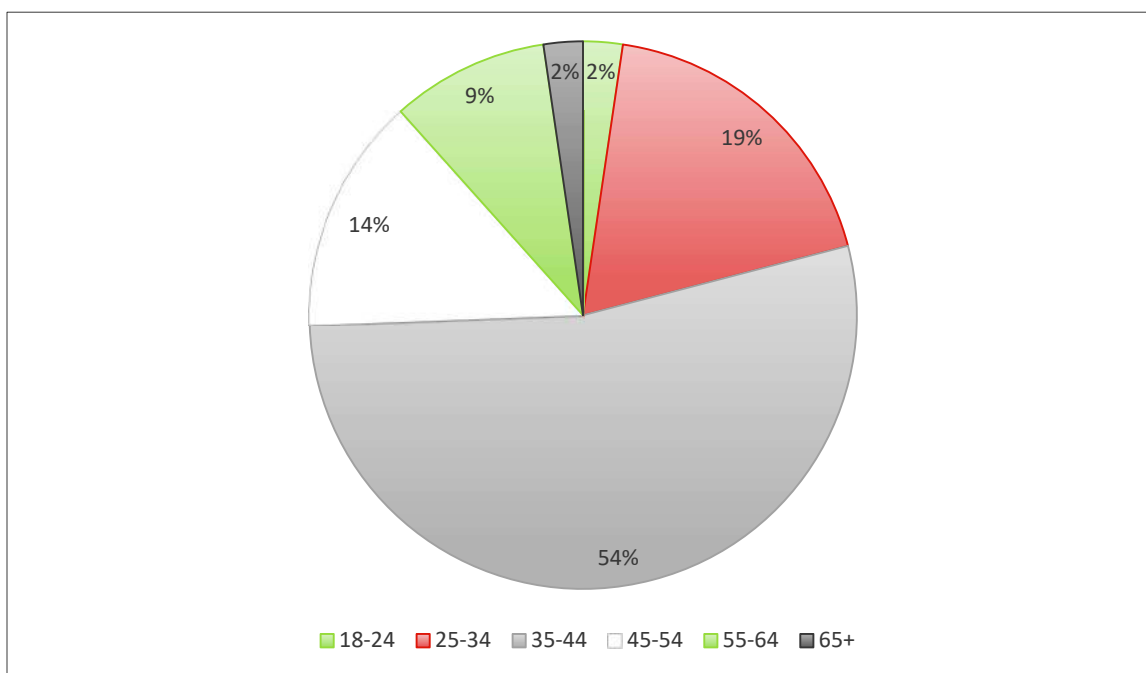


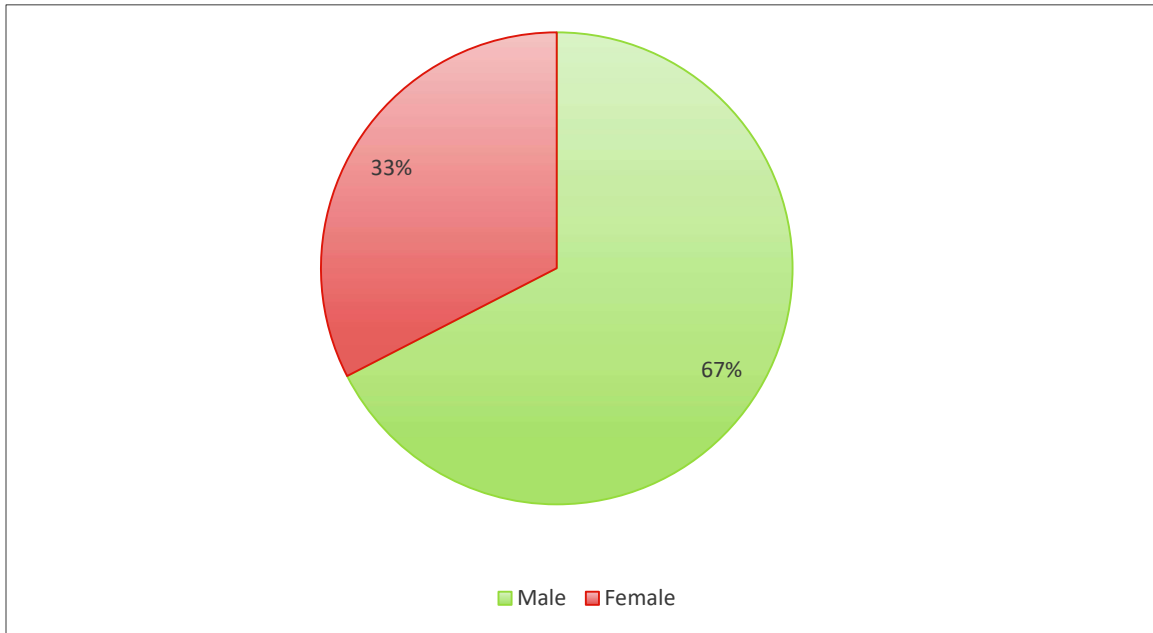
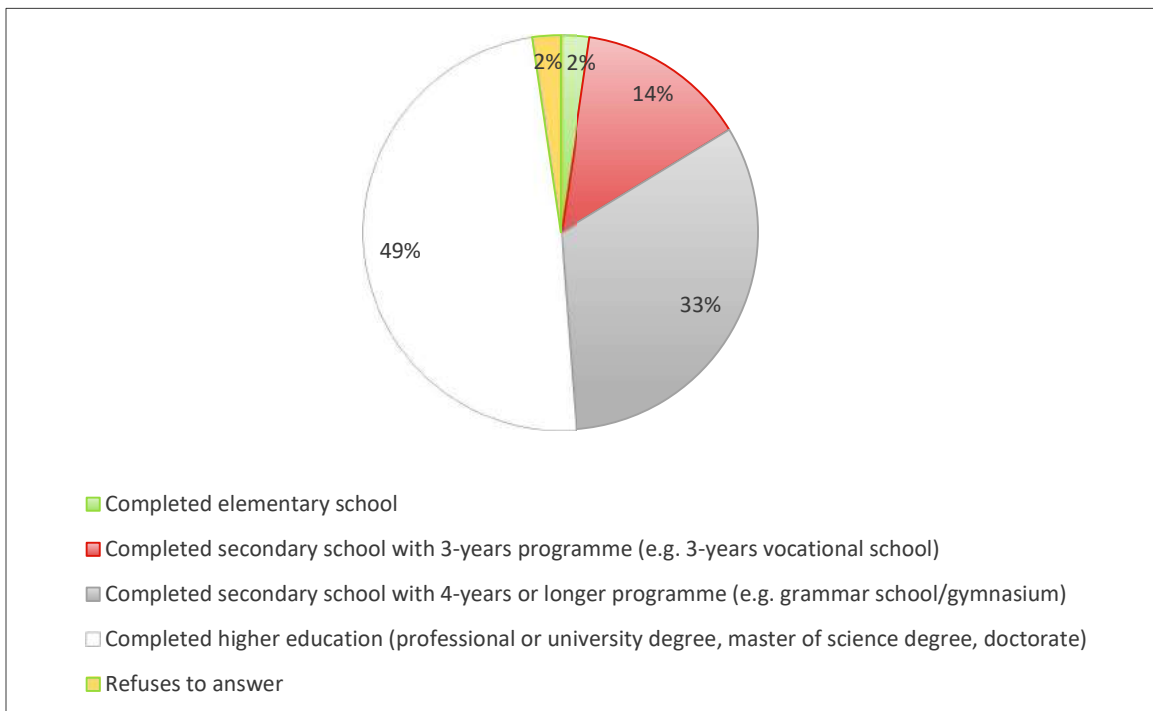
Chart 1.2. Gender*Chart 1.3. Education*

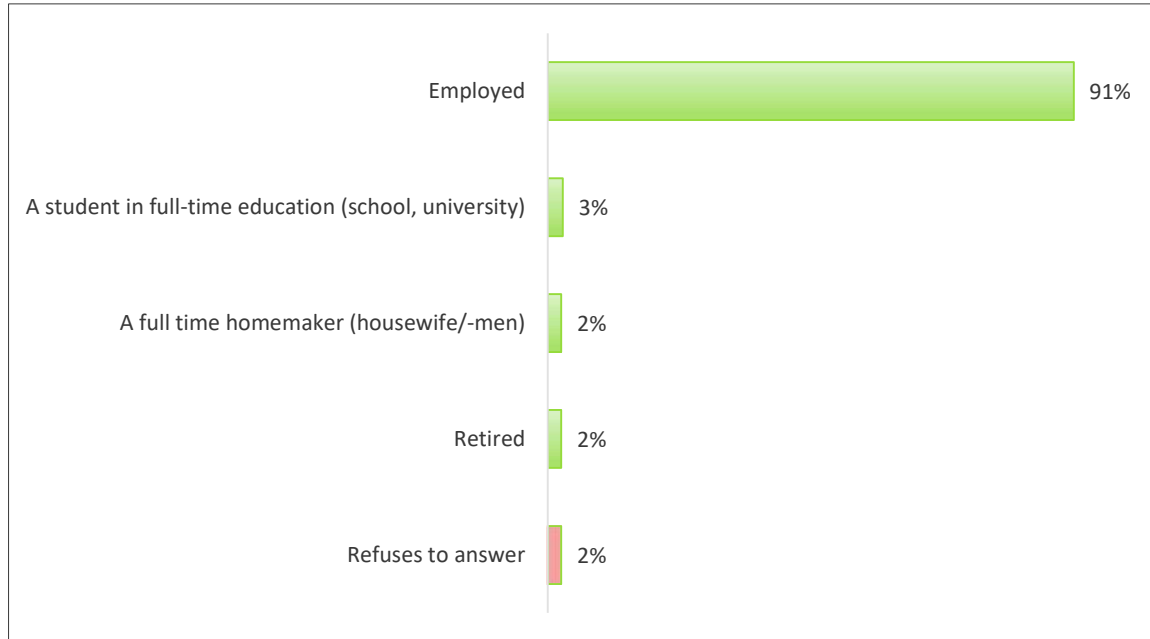
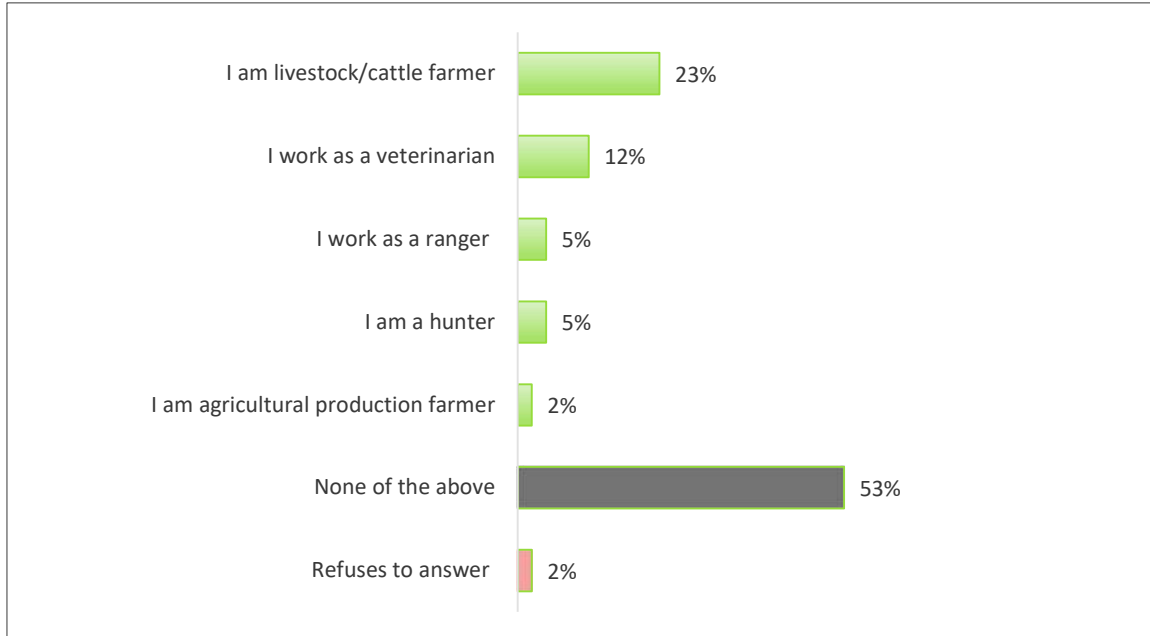
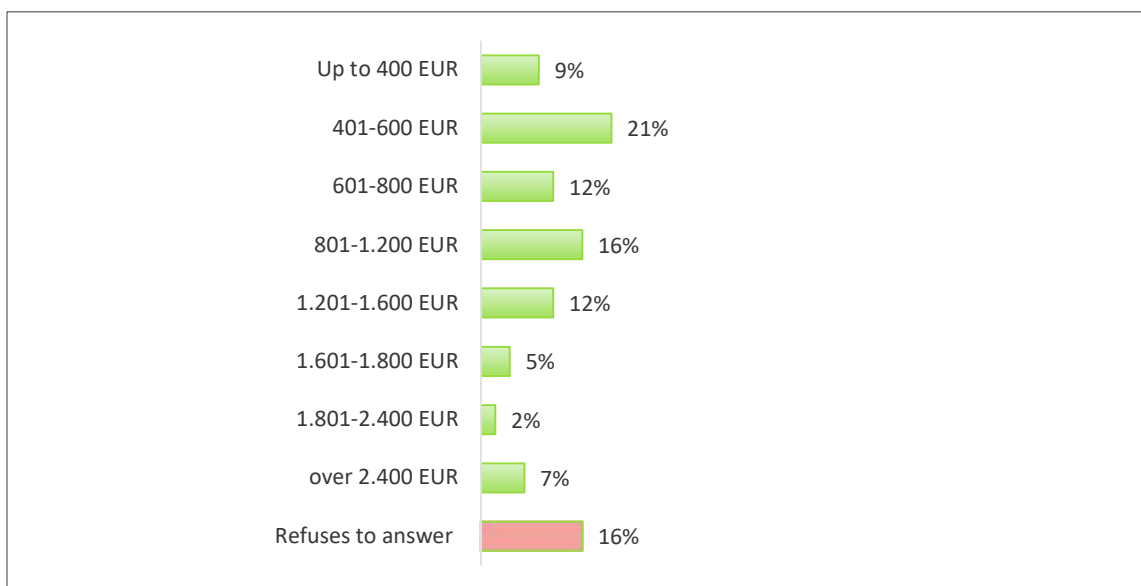
Chart 1.4. Employment status*Chart 1.5. Jobs connected with nature*

Chart 1.6. Average monthly income of the household

Two thirds of respondents were men (67%), and the rest of the sample consisted of women (33%).

Regarding the age structure of the sample, more than half of the sample was between 35 and 44 years of age (54%), while close to one fifth of respondents were aged between 25 and 34 years. This age group was followed by those who are between 45 and 54 years of age (14%). There were near 10% of respondents who are between 55 and 64 years old.

Almost half of the respondents have completed higher education (49%). One third of respondents completed secondary school with 4-years or a longer programme, followed by respondents who completed secondary school with a 3-years programme (14%). The smallest number of respondents completed elementary school (2%).

When it comes to respondents who have some type of job which is connected with nature, the largest number of them were livestock/cattle farmers (23%). They were followed by vets (12%), rangers and hunters (5% of respondents in both categories), while the smallest number of respondents work as agricultural production farmers (2%).

The majority of respondents were employed (91%) and when it comes to other categories of work status (students, housewife/househusband, retired), they were smaller and similar in size (from 2% to 3%).

The largest number of respondents had income between 401 and 600 EUR (21%), 16% had between 801 and 1200 EUR (16%). Categories of people who have an average monthly income of 601-800 EUR and 1201-1600 EUR are equal in size (12%), while other average monthly income categories had less than 10% of respondents, each.

1.3.6 Notes on data presentation and analysis

1.3.6.1 Indication of statistical significance

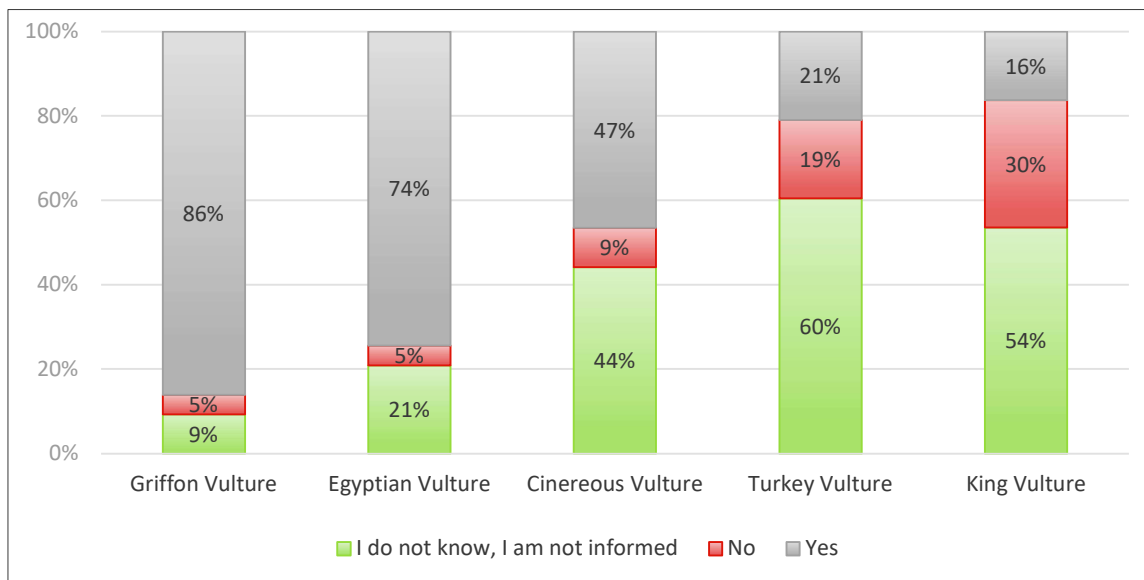
Statistical significance helps us to determine whether the result reflects real differences between groups (in this case female and male respondents, different age categories, etc.) and whether the obtained differences can be generalized to the entire population or should be treated as a consequence of chance.

The usual significance levels of 0.95 were used in this study. This means that the finding (difference between groups) has a 95% chance of being true, and thus can be accepted as a reflection of realistically existing differences between groups. Statistically significantly different values between groups were discussed through the analysis of the results, without graphical representation.

2. RESULTS OF QUANTITATIVE RESEARCH

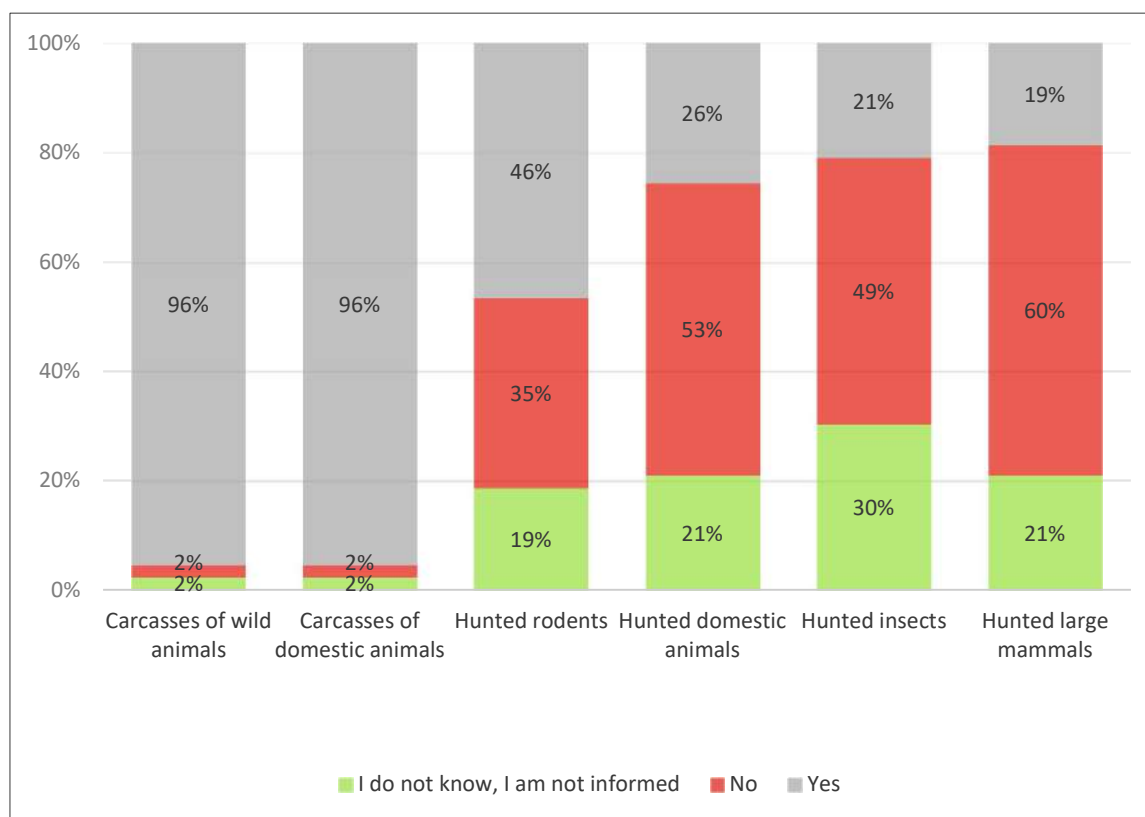
2.1 Vultures in Greece

Chart 2.1. Awareness about the vulture species breeding in Greece



The surveyed target groups in local communities in Greece (livestock and agricultural production farmers, rangers, hunters and veterinarians) are the most informed about the presence and breeding of Griffon Vulture (86%), as well as Egyptian Vulture (74%). Nearly half of respondents are informed about the breeding of the Cinereous Vulture in Greece. On the other hand, about half of the target group (44-60%) was not informed about the presence of Cinereous, Turkey and King Vulture in the country, while nearly third believe that King Vultures do not breed in Greece.

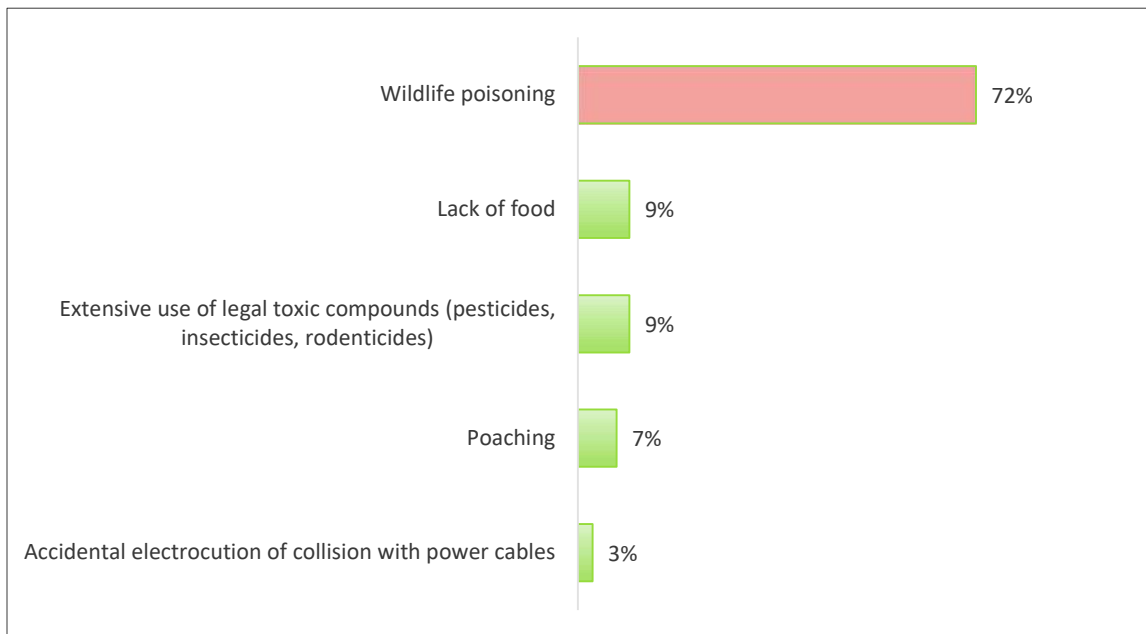
Chart 2.2. Awareness about the type of food which vultures feed on in Greece



When it comes to awareness of the types of food which vultures feed on in Greece, almost all respondents believe that vultures eat both types of carcasses (wild and domestic animals). Carcasses are followed by hunted rodents, which are chosen by nearly half of the sample as part of the vultures' diet, while there are between 19% and 26% of respondents who think that other hunted animals (domestic animals, insects and large mammals) are eaten by vultures in Greece. On the other hand, about half of the sample believe that hunted domestic animals, insects and large mammals are not types of vulture food, and neither are hunted rodents (one third).

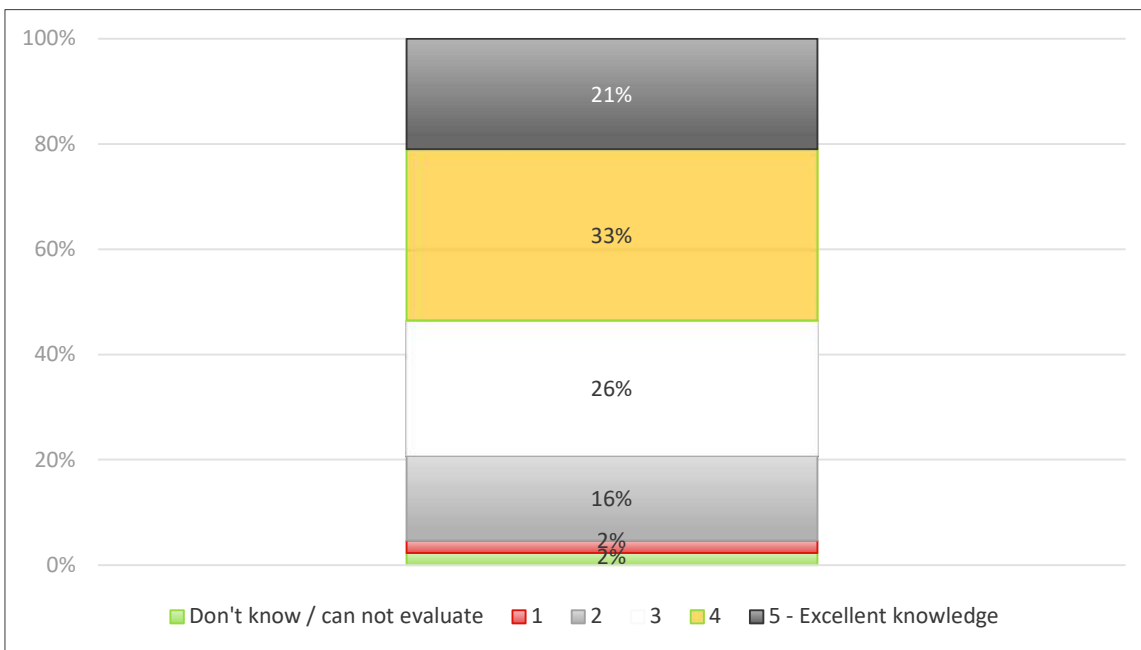
2.2 Problems behind vulture poisoning in Greece

Chart 3.1. What endangers the vulture populations in Greece the most?



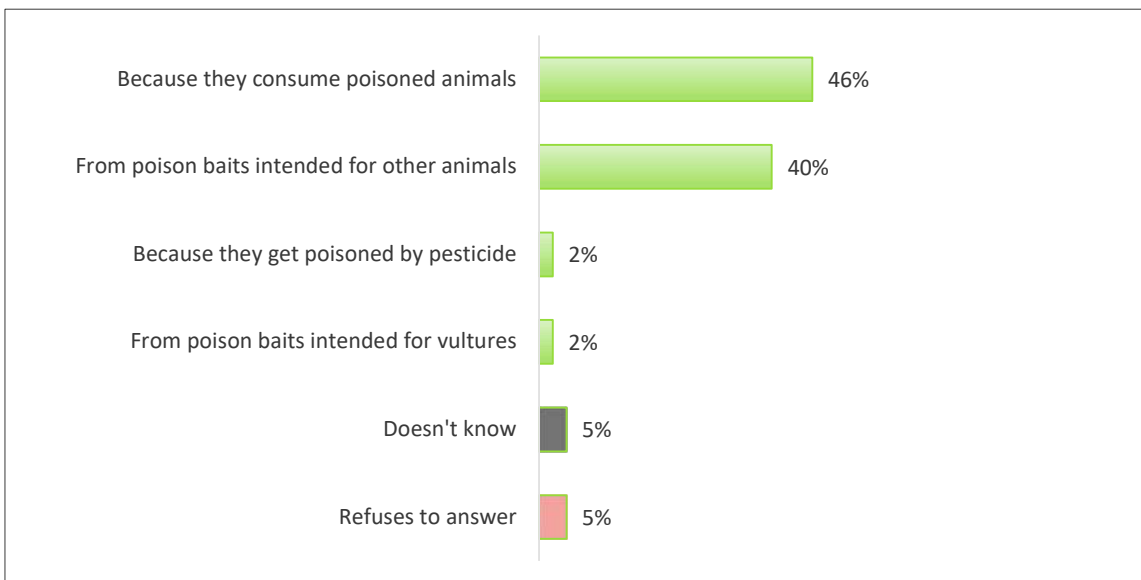
Wildlife poisoning is considered a key threat for the vulture populations in Greece for close to 75% of the respondents from our target groups. All other threats (lack of food, extensive use of legal toxic compounds poaching and accidental electrocutions) are considered less important for endangering the vulture population (3-9%).

Chart 3.2. Evaluation of own knowledge about the issue of wildlife poisoning by inhabitants of local communities in Greece



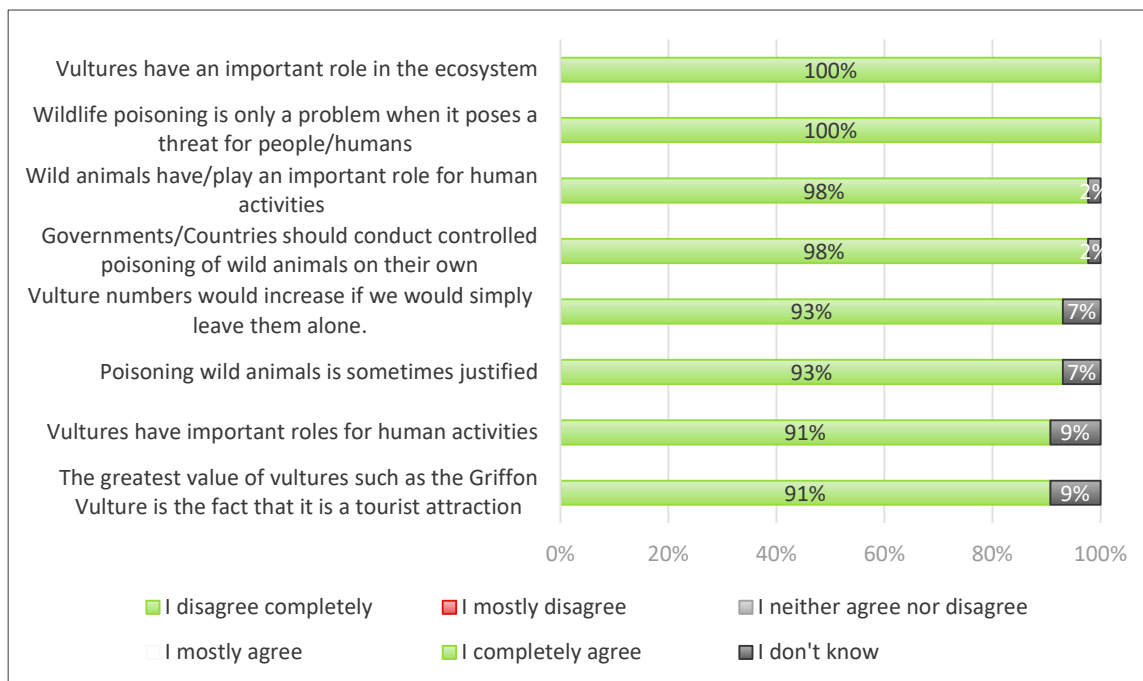
More than half of the respondents estimated their knowledge with top marks 4 or a 5, while one fourth believe that they have average knowledge about the issue of wildlife poisoning. Also, 1 out of 5 people from the local communities in Greece estimated their level of knowledge with marks 1 and 2.

Chart 3.3. Perceived key causes behind vulture poisoning



Farmers, hunters, rangers, and veterinarians in local communities in Greece believe that the two key reasons for vultures poisoning are that the vultures consume poisoned animals (46%) or get poisoned from poison baits intended for other animals (40%).

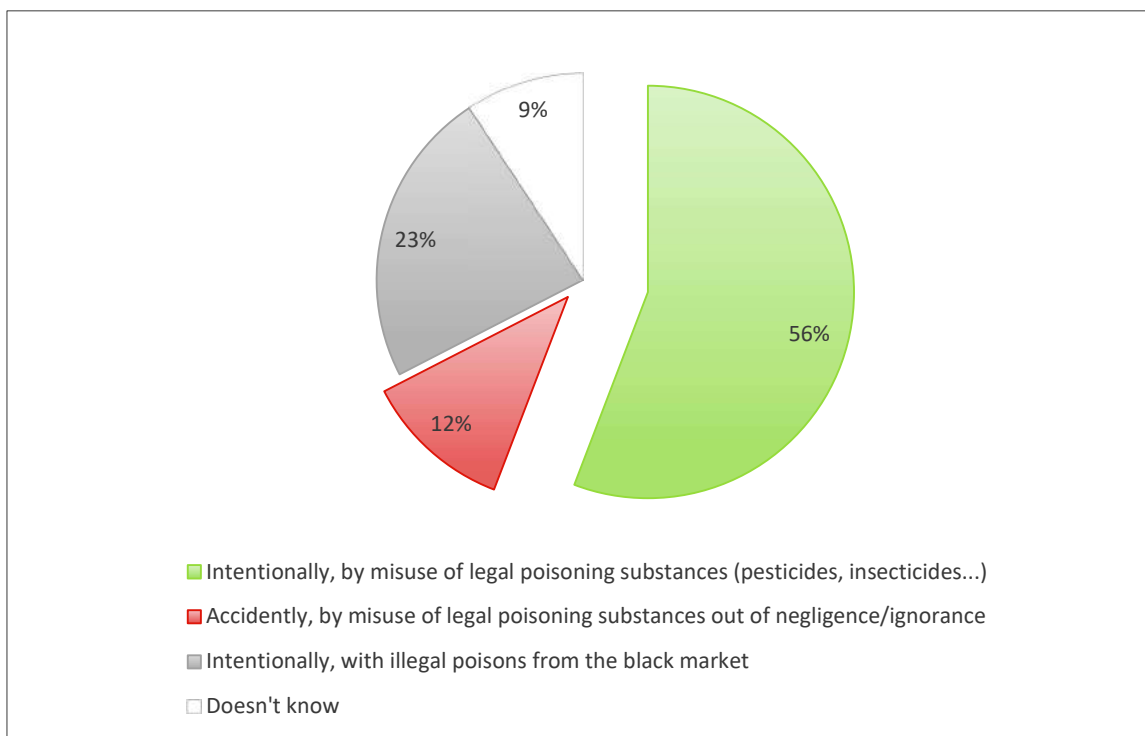
Chart 3.4. Personal attitudes towards vultures



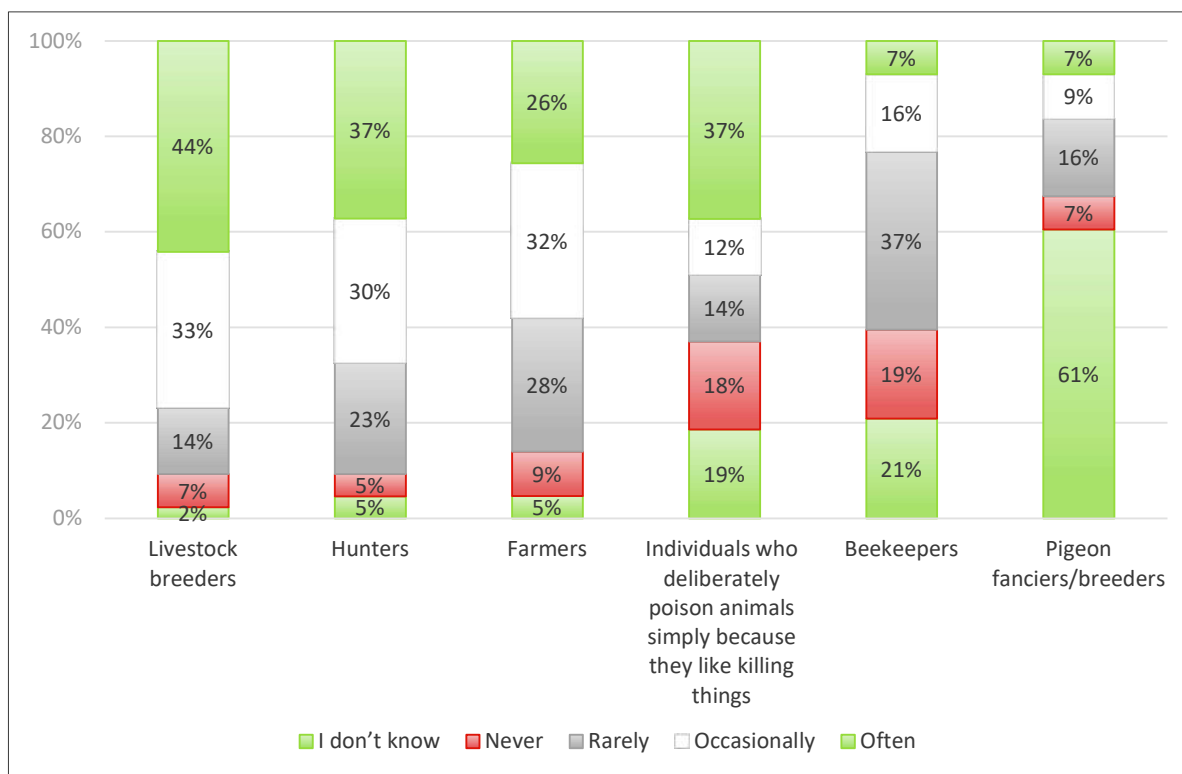
Respondents show a high level of agreement with all of the mentioned statements regarding vultures (above 90% of respondents agree with each statement). All participants believe that vultures have an important role in the ecosystem, but also that wildlife poisoning is only a problem when it poses a threat for humans. The attitude that wild animals have an important role in human activities and that governments should conduct controlled poisoning of wild animals on their own follow (98%, each). More than 90% still believe that poisoning of pests can be justified under particular circumstances.

Although residents of target areas in Greece recognize the importance of vultures for the ecosystem, they also put human interests first and believe in government-controlled activities regarding regulation of pests.

Chart 3.5. Perception about how wildlife poisoning most commonly occurs

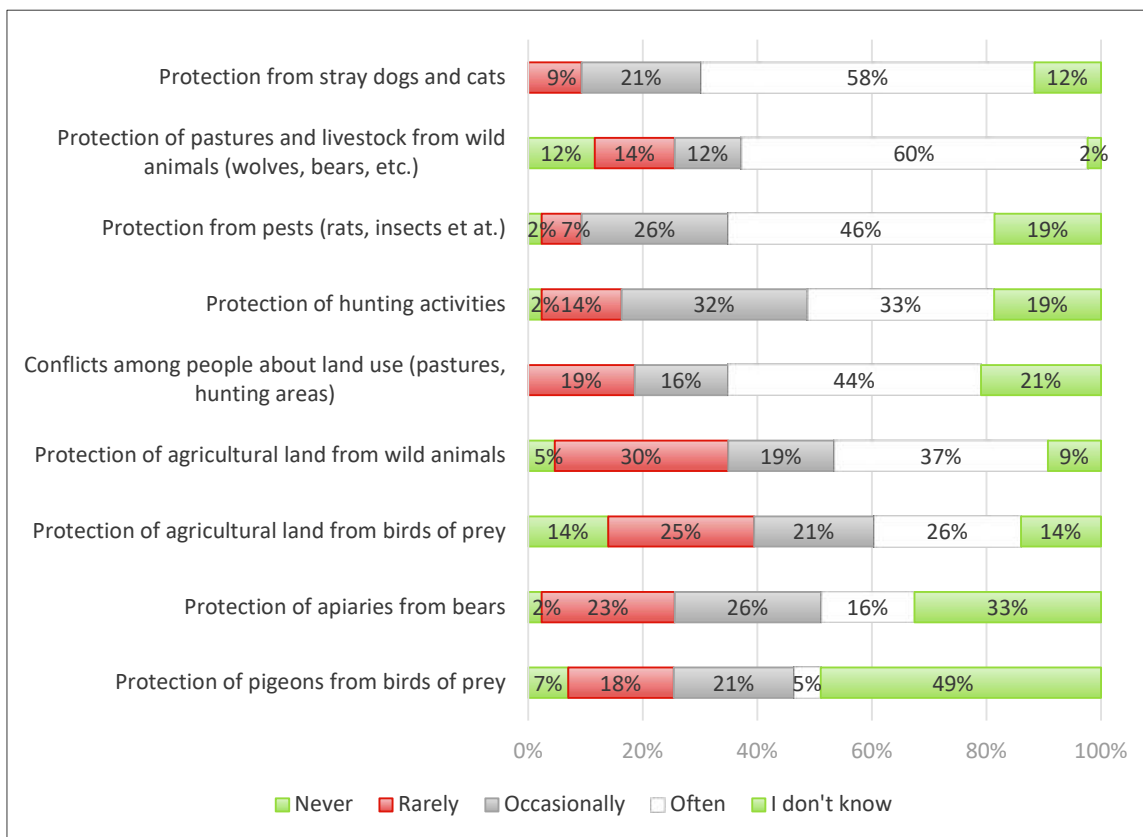


The majority of respondents (about 80%) perceive that wildlife poisoning occurs intentionally, either by misuse of legal poisoning substances (every other member), or by illegal poisons from the black market (nearly one fourth of the respondents). On the other hand, 12% of the target group believe that wildlife poisoning occurs accidentally, by misuse of legal poisoning substances out of negligence or ignorance.

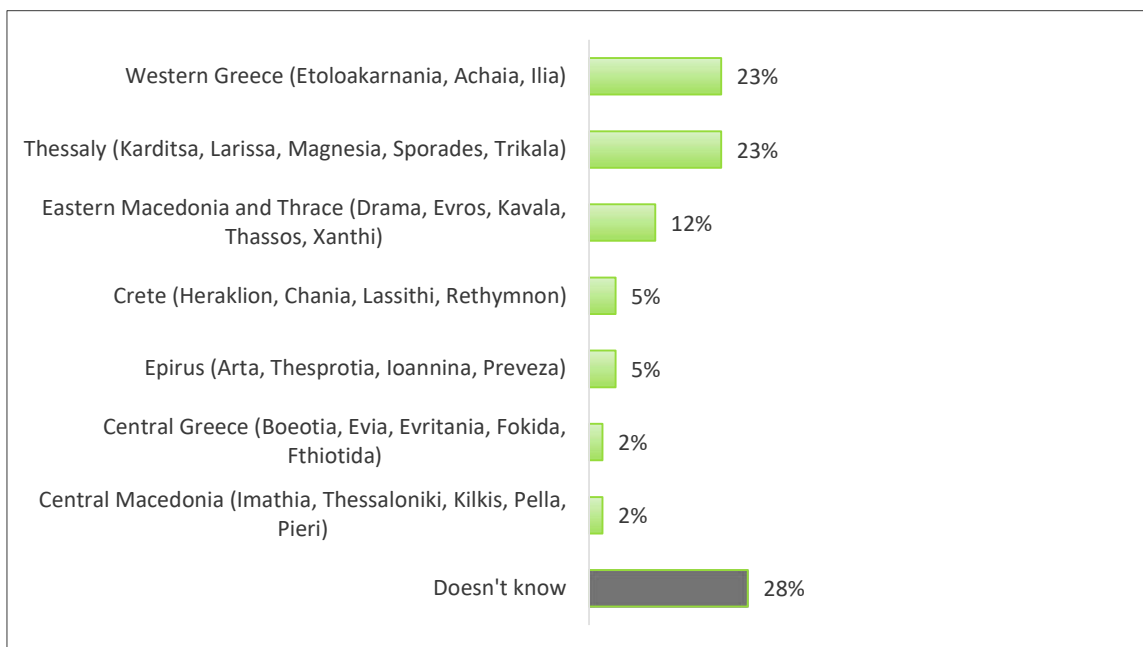
Chart 3.6. Perception regarding groups responsible for wildlife poisoning

Livestock breeders are considered to be the key group responsible for wildlife poisoning by around 3 out of 4 respondents from target groups in Greece, while two-thirds identify hunters as responsible (at least occasionally) for wildlife poisoning. Farmers (58%) and individuals who deliberately poison animals simply because they like killing things (49%) follow.

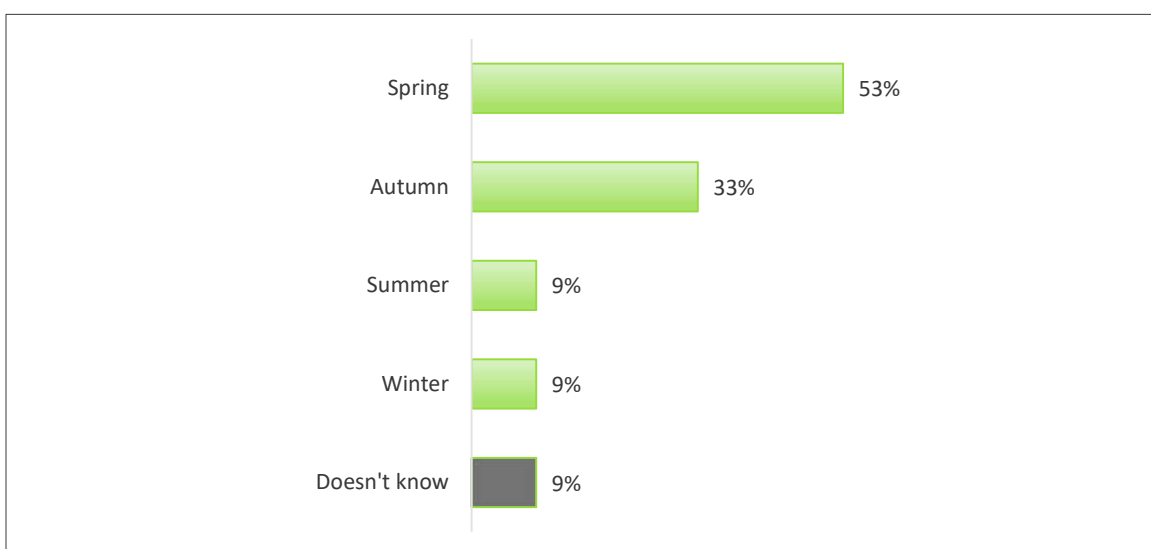
On the other hand, close to 60% of the respondents think that beekeepers are rarely or never responsible for wildlife poisoning, while the biggest lack of knowledge, respondents have about pigeon fanciers (61%).

Chart 3.7. Perceived motives behind the poisoning of wild animals

Protection from stray dogs and cats is the most frequent motive that is behind the poisoning of wild animals according to 79% of target group members. This motive is followed by *protection from pests* and *protection of pastures and livestock from wild animals* (72% of respondents answered 'occasionally' or 'often', for each motive), while about two thirds of respondents think that *protection of hunting activities* is a frequent motive behind wildlife poisoning.

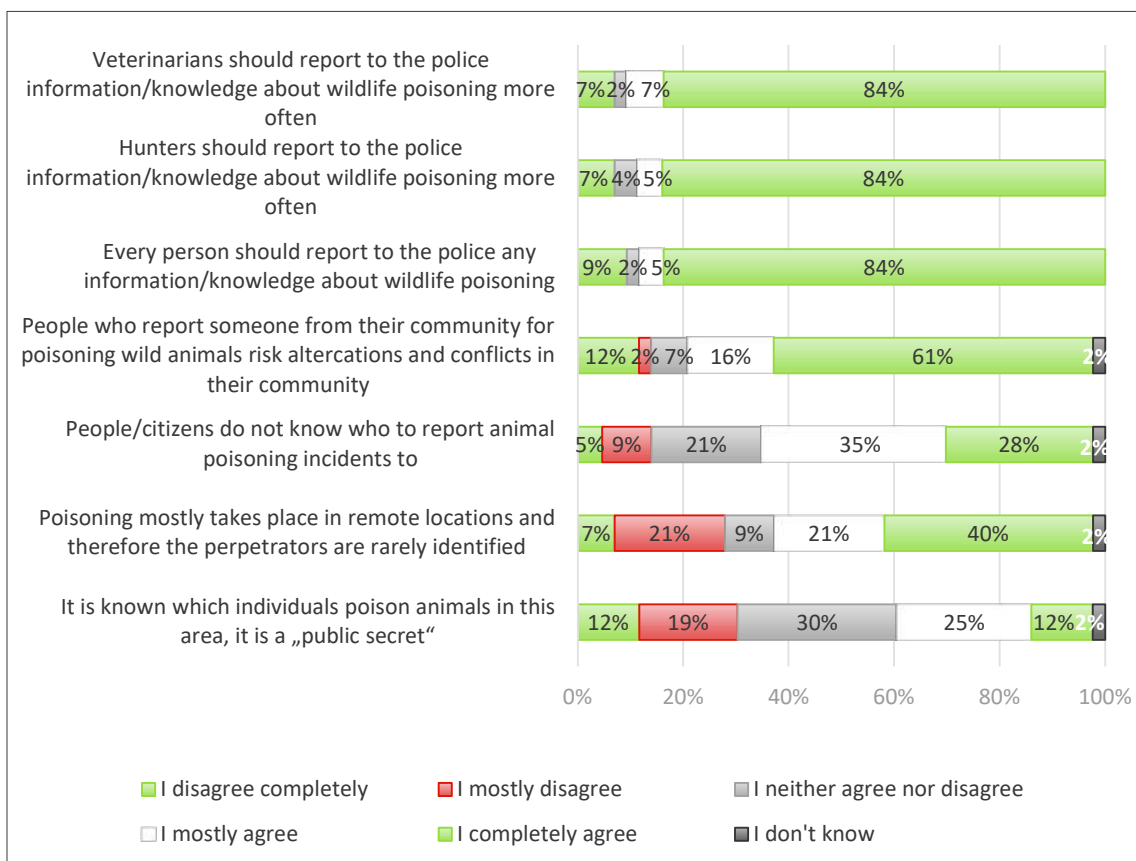
Chart 3.8. Regions of Greece where wild animals are most frequently poisoned

Western Greece and Thessaly are the regions of Greece where wild animals are the most frequently poisoned (near one fourth of respondents mention each region). These regions are followed by Eastern Macedonia and Thrace, identified as the region where wild animals are the most frequently poisoned by 12% of respondents.

Chart 3.9. Period of the year when wildlife poisoning mostly occurs

Every other member of our target groups from local communities perceives that the largest number of poisoning incidents occur in the spring, while a third of respondents identify autumn as the period of the year when wildlife poisoning mostly occurs.

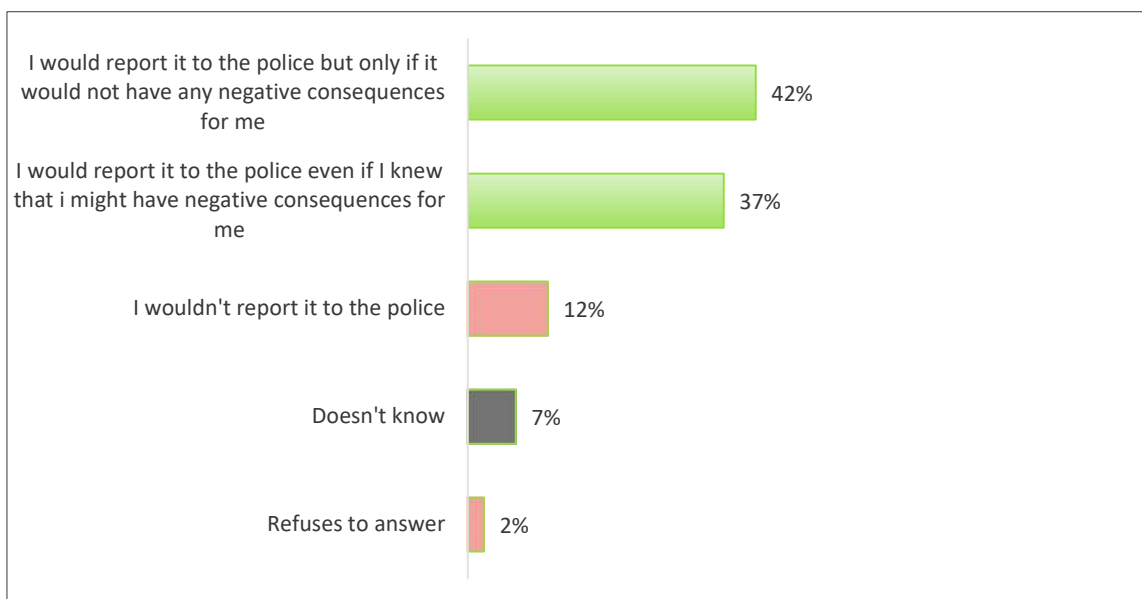
Chart 3.10. Personal attitudes towards reporting poisoning incidents to the relevant authorities



Veterinarians, hunters, as well as the general public (every person), are identified as key groups responsible for reporting information/ knowledge about wildlife poisoning to the police by the majority of respondents (nearly 90%). Also, 3 out of 4 respondents believe that people who report wildlife poisoning cases face some risks (i.e., conflicts in their communities).

‘It is known which individuals poison animals in this area, it is a „public secret“ ‘ is the most polarizing statement with divided opinion, where nearly a third of respondents mostly or completely agree with it, another third disagree with this statement, while the rest do not have a clearly defined opinion, i.e., they neither agree nor disagree.

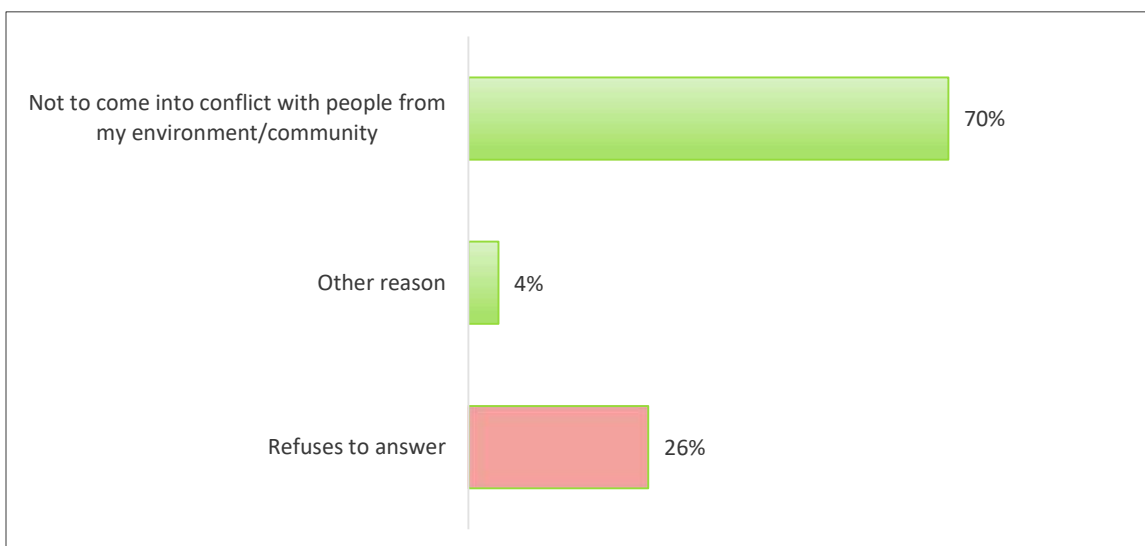
Chart 3.11. Steps one would take if he/she finds out some information about poisoning



The majority of the sample claims that they would report information about poisoning to the police: 42% of respondents claim that they would report it, but only in case it wouldn't have negative consequences for them, while more than one third said that they would report it even if reporting could have some negative consequences for them.

On the other hand, 12% of key hot spots residents stated that they would not report the poisoning.

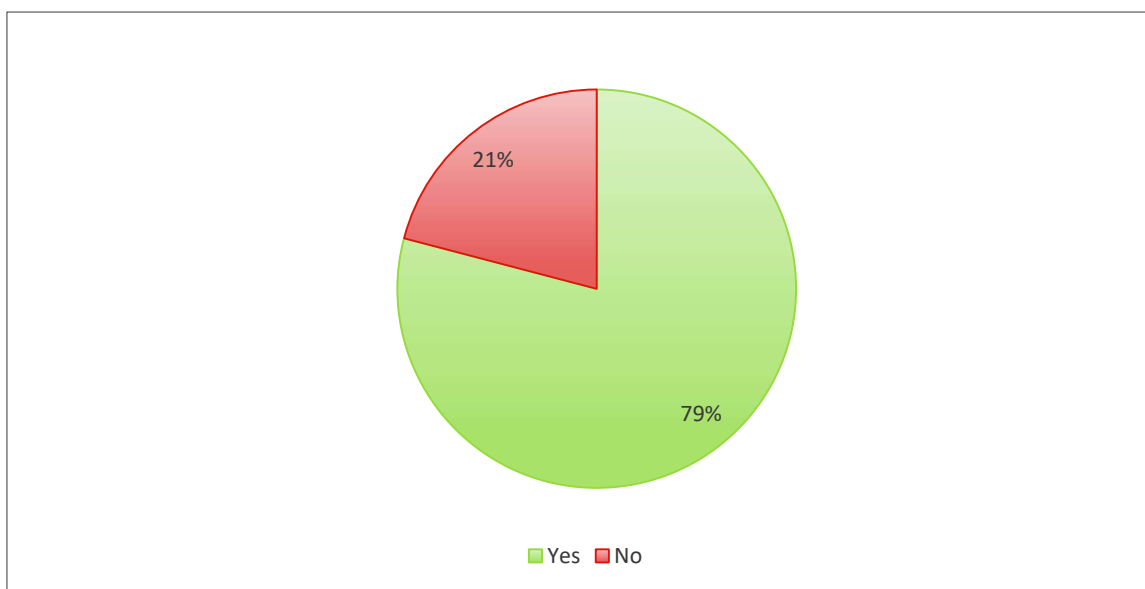
Chart 3.12. Reasons for not reporting poisoning



Base: 23 respondents who wouldn't report the poisoning or those who would, but only if that couldn't cause negative consequences

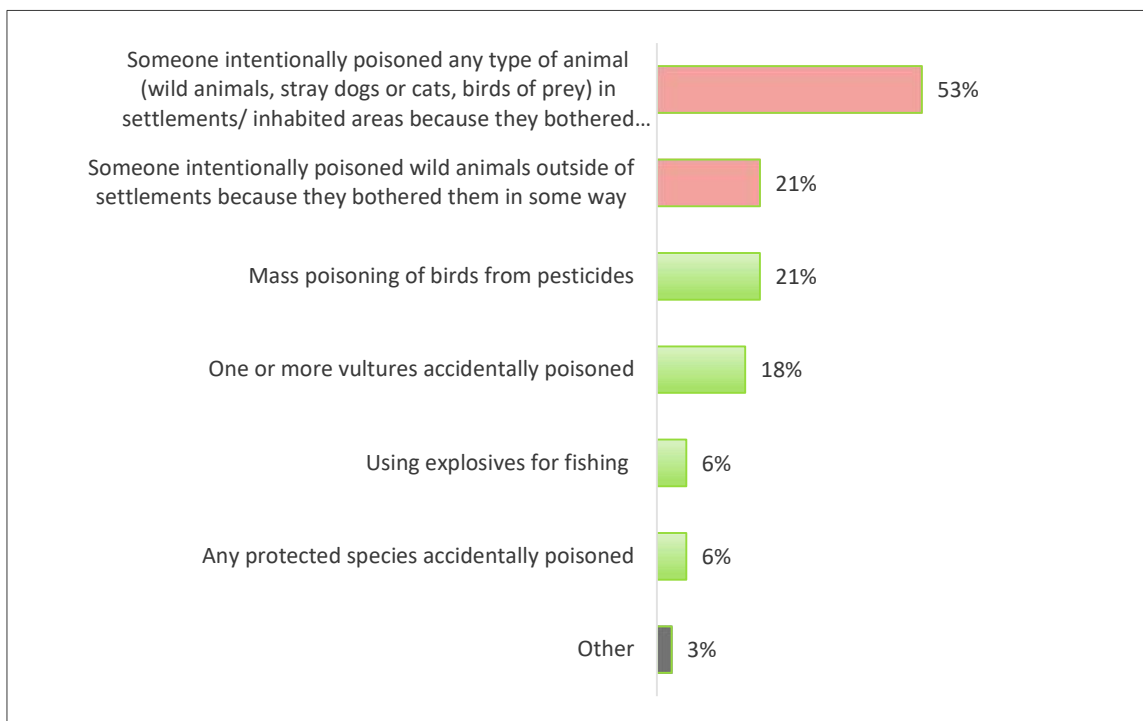
Avoiding conflicts with people from their environment/ community is the key reason for not reporting poisoning for 70% of respondents.

Chart 3.13. Knowledge about poisoning incidents



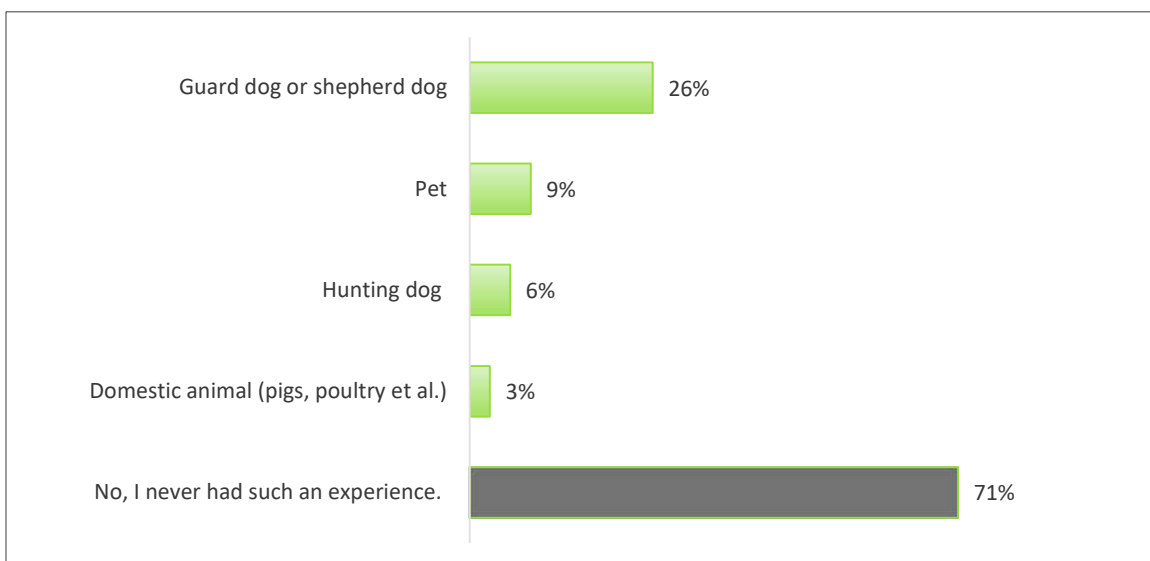
About 80% of respondents claim that they heard of at least one poisoning incident in their community in the past 10 years.

Chart 3.14. Poisoning incidents



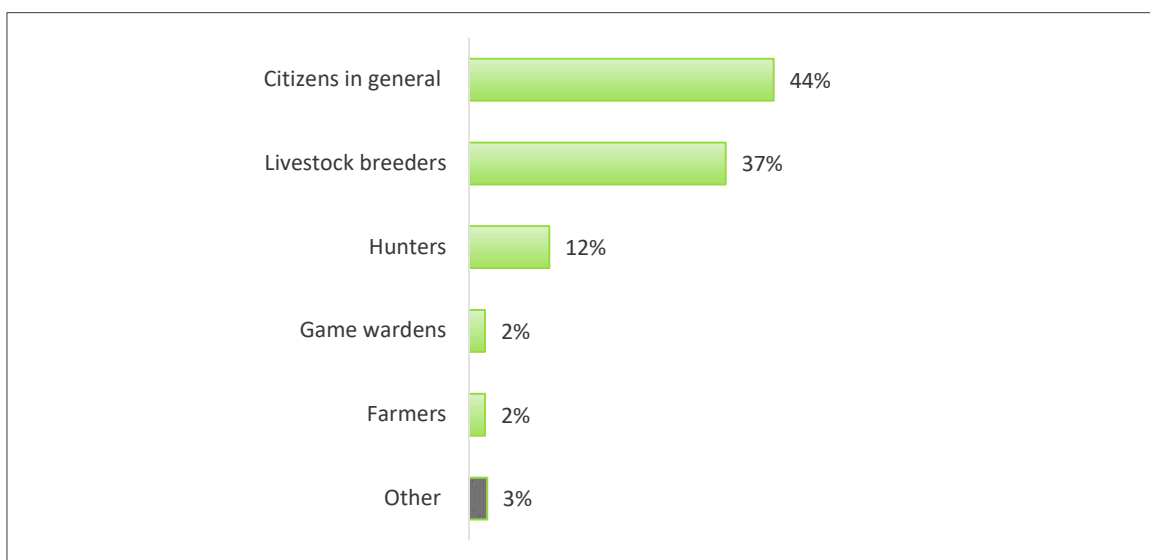
Base: 34 respondents who heard for at least one case of poisoning

More than half of the respondents who are informed about poisoning incidents said that these incidents happened when someone intentionally poisoned any type of animal in the settlements. Around one fifth of the respondents said that they were informed about intentional poisoning of wild animals outside of settlements, the mass poisoning of birds with pesticides, or the accidental poisoning of vultures.

Chart 3.15. Personal or communal accidents involving poisoned animals

Base: 34 respondents who heard for at least one case of poisoning

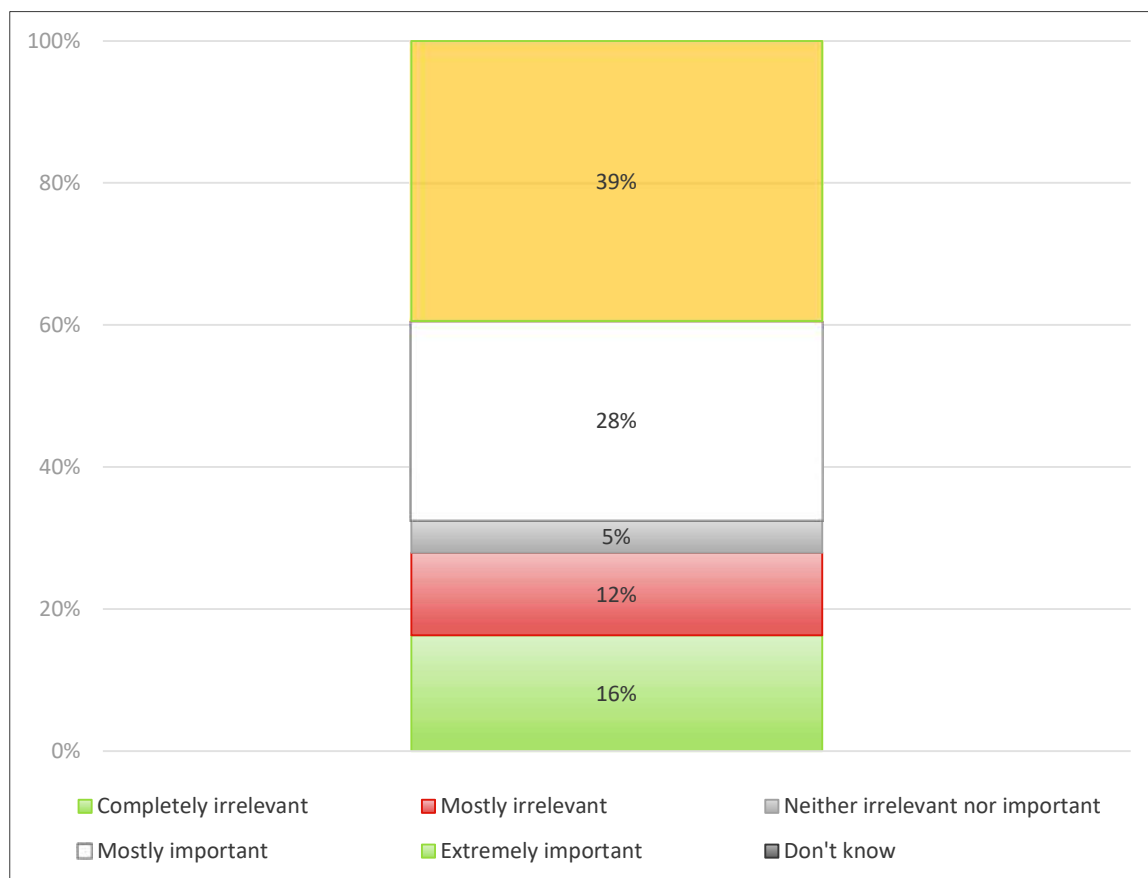
One fourth of surveyed people from local communities in Greece said that poisoned animals in their community were guard dogs or shepherd dogs. However, the majority of those who heard of poisoning cases claim that they had never had such an experience (71%).

Chart 3.16. Groups that need to become more aware of wildlife poisoning

Base: 43 respondents; Multiple answers

Citizens in general, as well as livestock breeders, are identified as the two main target groups whose awareness about wildlife poisoning should be raised in order to reduce or further prevent wildlife poisoning in the future.

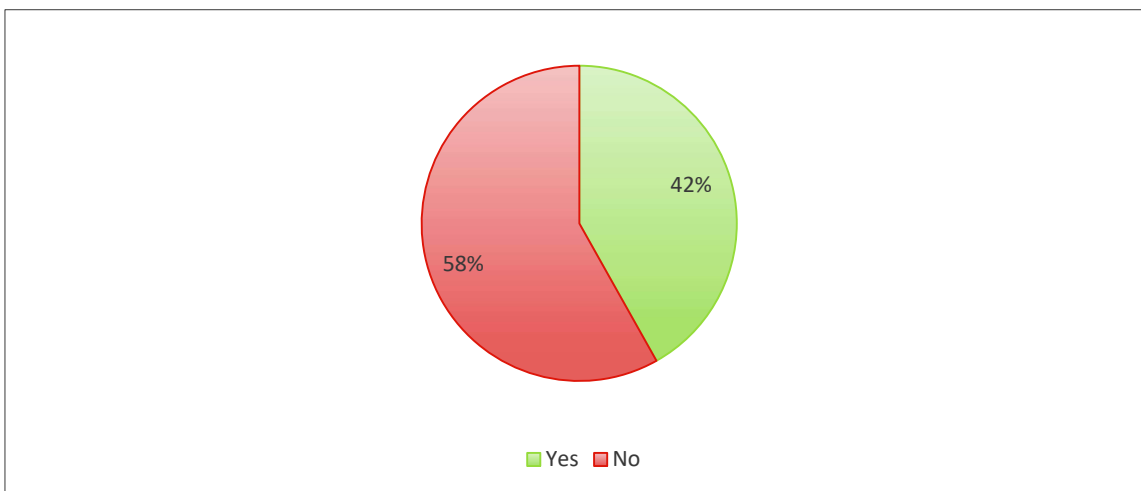
Chart 3.17. Importance of wildlife poisoning investigations, compared to other police work



When asked to compare the importance of wildlife poisoning investigations to other police work, two thirds of respondents think that these investigations are mostly or extremely important, while slightly above one fourth see these investigations as mostly or completely unimportant.

2.3 Measures related to wildlife poisoning

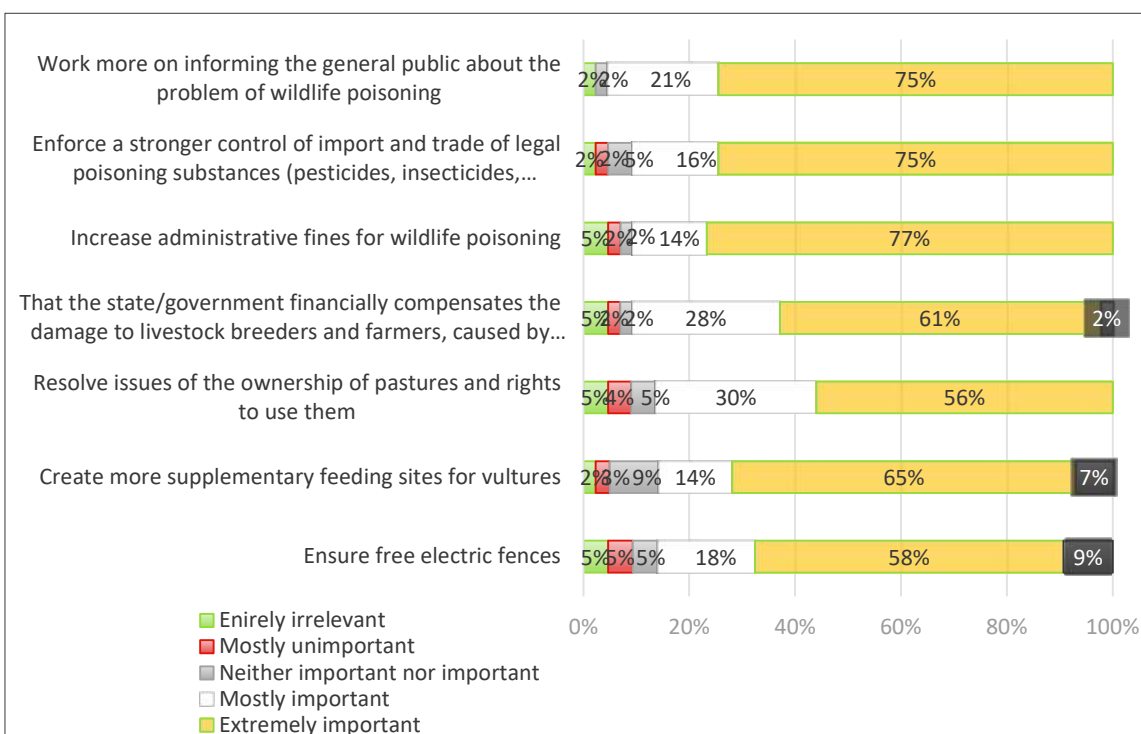
Chart 4.1. Awareness about a specific case of a police investigation for a wildlife poisoning incident



Base: 43 respondents

While more than half of target group members are not informed of specific cases of a police investigation of a wildlife poisoning incident in Greece, 42% of respondents claim to be familiar with such investigations.

Chart 4.2. Importance of undertaking the following measures

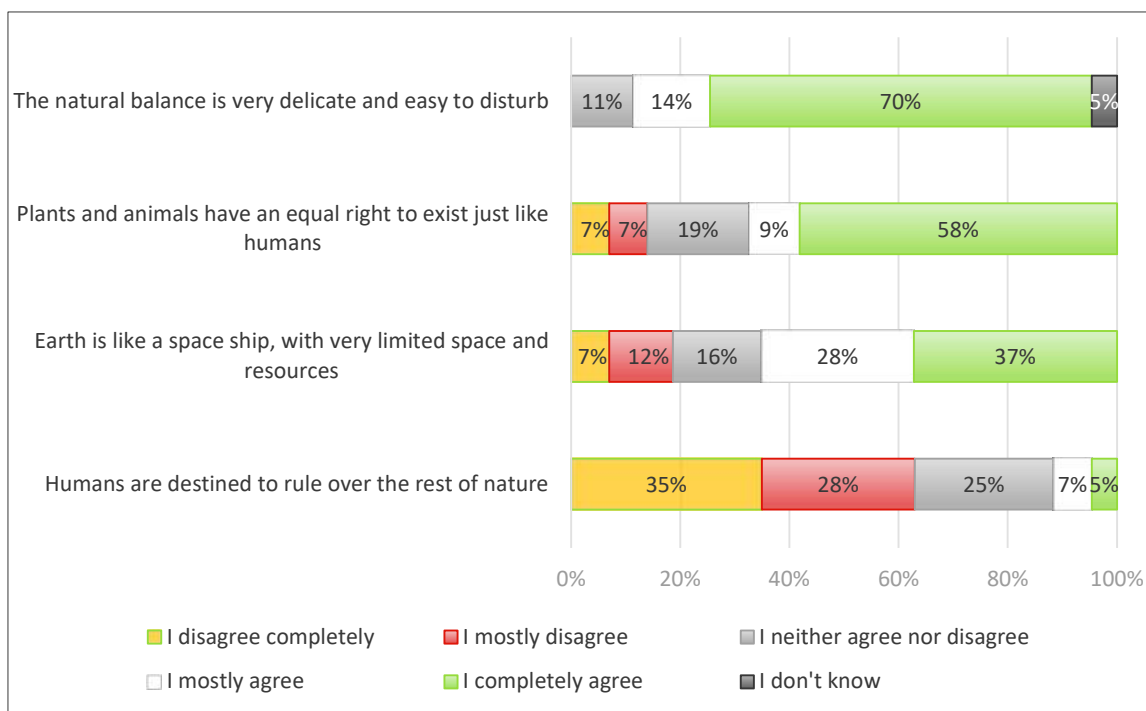


Farmers, hunters, rangers, and veterinarians from local communities in Greece generally agreed with all of the listed measures that should be undertaken in the future (all measures were assessed as mostly or extremely important by at least 76% of respondents).

The most important measure is raising awareness of the general public about wildlife poisoning (almost all participants rated this measure as important). 9 out of 10 respondents stated that it is important to enforce a stronger control of import and trade of legal poisoning substances (such as pesticides, insecticides, rodenticides), to increase administrative fines for wildlife poisoning, as well as that state/government should financially compensate the damage to livestock breeders and farmers, caused by wild animals.

2.4 Attitudes towards nature

Chart 5.1. Personal attitudes towards nature



When it comes to attitudes towards nature, 84% of respondents mostly or completely agreed with the statement that it is difficult to maintain the natural balance. There is a

similar percentage of those who agreed with the statements that plants and animals have an equal right to exist just like humans and that the Earth has limited space and resources (near two thirds of respondents per each statement).

Nearly two thirds don't think that humans are destined to rule over the rest of nature (63% of respondents mostly or completely disagree with this statement).

Annex XIII. Perception of the illegal practice of wildlife poisoning within relevant governmental authorities in Greece – baseline report.

1. METHODOLOGY

1.1 Project background

The BalkanDetox LIFE project (LIFE19GIE/NL/001016) - Strengthening national capacities to fight wildlife poisoning and raise awareness about the problem in the Balkan countries is a project that is dedicated to the fight against illegal poisoning of wild animals which local citizens usually consider as pests, but which has serious negative consequences for the population of numerous endangered animal species, primarily vultures which eat poisoned animals or eat the poison themselves. The study will be conducted in two waves in 2021 and 2025, as a base line and follow up study aimed at measuring the current attitudes and practices, and attitudes and practices of target groups after the implementation of planned campaign and activities.

The project is being implemented at the multinational level in the Balkan region. The countries involved are Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Greece, Northern Macedonia, and Serbia.

1.2 Key research topics

In this first phase, the aims of the research are:

- Measuring awareness of target groups of employees of relevant government services and institutions, law enforcement agencies and veterinary services about endangered species (vultures), methods of poisoning and individuals or groups responsible for poisoning on the territories of their respective countries. Measuring of the current perceptions and attitudes of target groups related to aggravating circumstances and obstacles as well as capacities of the state institutions to prevent, investigate and sanction wildlife poisoning cases.
- Measuring of the current perceptions of target groups related to legislations, procedures, documentation, and processing of wildlife poisoning cases.

1.3 Methodological approach

1.3.1 Research technique

Online Interviews of the targeted groups of relevant governmental services and institutions officials, law enforcement officials and veterinary services employees in Greece.

1.3.2 Fieldwork

The fieldwork was conducted from September the 22nd to November the 7th in 2021.

1.3.3 Questionnaire length

Questionnaire length up to 10 minutes.

1.3.4 Sample - target group

The target group in the research were employees of relevant governmental services and institutions, law enforcement agencies and veterinary services in Greece.

Due to difficulties caused by the COVID-19 pandemic, the sample included 17 respondents in total out of 42 employees in targeted institutions.

1.3.5 Sample Structure

Table 1.1. Institutions where respondents are employed

Institutions	Number of respondents
Ministry of Environment and Energy	11
Ministry of Rural Development and Food	3
Ministry of Citizen Protection/Police	3
Base: 17	

Table 1.2. Current job position

Job position	Number of respondents
Employee	9
Middle management level	3
Upper management level	3
Highest management level (director of the institution, member of the management board, general director)	2
Base: 17	

Table 1.3. Years of service in the institution where respondents currently work

Years of service - Institution	Number of respondents
Up to 5 years	5
6-10	4
11-15	1
16+	7
Base: 17	

Table 1.4. Years of service in the department where respondents currently work

Years of service - Department	Number of respondents
Up to 5 years	8
6-10	5
11-15	2
16+	2
Base: 17	

Table 1.5. Direct engagement with the issue of wildlife/animal poisoning in respondents' line of work

Evaluation of own knowledge about wildlife poisoning	Number of respondents
5 - Excellent knowledge	0
4	6
3	5
2	5
1 - Very bad knowledge	0
I do not know / I cannot estimate	1
Base: 17	

Table 1.6. Evaluation of own knowledge about the issue of wildlife poisoning

Direct dealing with wildlife/ animal poisoning	Number of respondents
Yes, both of wild and domestic animals	12
No	3
Yes, but only of domestic animals	2
Base: 17	

Table 1.7. Attending educational programmes related to detection and processing of wildlife poisoning incidents

Educational programme attendance	Number of respondents
Yes	9
No	8
Base: 17	

The majority of respondents are employed in the Ministry of Environment and Energy (11 respondents), while the same number of respondents are employed at the Ministry of Rural Development and Food and the Ministry of Citizen Protection/Police (3 respondents each).

Most of the respondents (9) are employed at employee level positions, while three are employed at the middle management level and the same number at upper management level. Two respondents have positions at the highest management level.

The respondents differ regarding the years of service that they have in their current institutions. One half of the respondents (8) have been working in their institutions for between 11 and 16+ years, whereas 5 of them have been working in their respective institutions for up to 5 years. 4 respondents have between 6-10 years of service at their current place of employment.

When it comes to the years of service in the department where respondents currently work, half of them (8) have been working for up to 5 years in their department and close to a third of them (5) have between 6-10 years of experience in their department. 4 respondents have been working in their departments for between 11 and 16+ years.

The majority of the respondents claim that they deal directly with the poisoning of both domestic and wild animals (12 respondents), while two respondents deal directly with the issue of poisoning domestic animals, and three of them do not deal directly with wildlife/animal poisoning in their line of work.

All of the respondents evaluate their own knowledge about the issue of wildlife poisoning with average grades, or somewhat below or above the average. 6 respondents rate their knowledge with a grade 4. The rest would give themselves the grades 2 or 3 (5 respondents each.) None of the respondents claim to have very bad or excellent knowledge on this topic.

When it comes to attending educational programmes related to the detection and processing of wildlife poisoning incidents, the respondents are divided. 9 out of 17 have attended some educational programme, while the rest have not.

2. RESULTS OF ONLINE INTERVIEWS

2.1 Vultures in Greece

Table 2.1. Awareness about vulture species breeding in Greece

Vultures	Number of respondents
Egyptian Vulture	17
Griffon Vulture	15
Cinereous Vulture	15
Turkey Vulture	1
King Vulture	1
Base: 17	

Regarding the species of vultures that are present in Greece, all of the respondents (17) acknowledge that the Egyptian Vulture breeds in Greece. Also, the vast majority of them believe that the Griffon Vulture and Cinereous Vulture nest in Greece (15 respondents each).

Table 2.2. Awareness of the types of food which vultures feed on in Greece

Food	Number of respondents
Carcasses of wild animals	15
Carcasses of domestic animals	13
Hunted large mammals	2
Hunted rodents	2
Base: 17	

The majority of respondents recognize that vultures feed on the carcasses of wild (15 respondents) and domestic animals (13 respondents). A quarter of respondents (4) believe that hunted animals constitute part of the vultures' diet, with 2 respondents each who think that hunted large mammals and hunted rodents are included in the vultures' diet.

2.2 Problems of vulture poisoning in Greece

Table 3.1. What endangers the vulture populations in Greece the most?

The main danger	Number of respondents
Wildlife poisoning	12
Accidental electrocution of collision with power cables	2
Lack of food	1
Disturbance	1
Extensive use of legal toxic compounds (pesticides, insecticides, rodenticides)	1
Base: 17	

Wildlife poisoning is identified as the key threat to vulture populations in Greece. It is followed by accidental electrocution as a result of collision with power cables, which is perceived as the most important threat by 2 institutions employees. Lack of food, disturbance, and extensive use of legal toxic compounds (pesticides, insecticides and rodenticides) are considered to be significantly less severe threats when it comes to the existence of vultures in Greece (1 respondent each).

Table 3.2. Perceived key causes behind vulture poisoning

Causes	Number of respondents
From poison baits intended for other animals	10
Because they eat poisoned animals/animals that died of poisoning	6
From poison baits intended for vultures	1
Base: 17	

Employees of relevant governmental institutions in Greece believe that vultures are unintentional victims of poisoning and that they perish due to consuming poison baits laid out for other animals (10 respondents) and poisoned animals that have died of poisoning (6 respondents).

Table 3.3. Perception about how wildlife poisoning most commonly occurs

The way wildlife poisoning occurs	Number of respondents
Intentionally, by misuse of legal poisoning substances (pesticides, insecticides...)	10
Intentionally, with illegal poisons from the black market	5
Accidentally, by misuse of legal poisoning substances out of negligence/ignorance	1
I don't know	1
Base: 17	

The majority of employees from relevant institutions in Greece (15) believe that wildlife poisoning in general is the result of intentional actions, and that it occurs primarily by misuse of legal poisoning substances such as pesticides or insecticides, etc. (10 respondents) and to a lesser extent with illegal poisons from the black market (5 respondents).

Table 3.4. Perception regarding groups responsible for wildlife poisoning

Groups	Levels of frequency (Number of respondents)			
	Never	Rarely	Occasionally	Often
Livestock breeders	0	1	6	10
Hunters	2	1	9	5
Individuals who deliberately poison animals simply because they like killing things	2	10	2	3
Farmers	1	4	10	2
Beekeepers	5	9	3	0
Pigeon fanciers/breeders	7	7	3	0
Base: 17				

Institutional employees almost unanimously (16 respondents) identify livestock breeders as the most responsible group when it comes to wildlife poisoning. They are followed by hunters (14 respondents) and farmers (12 respondents).

Pigeon fanciers/breeders and beekeepers are in general not perceived to be groups that are responsible for wildlife poisoning, as 14 respondents believe that pigeon fanciers are rarely or never responsible for poisoning, and 13 of them believe the same for beekeepers.

Table 3.5. Perceived motives behind the poisoning of wild animals

Motives	Levels of frequency (Number of respondents)			
	Never	Rarely	Occasionally	Often
Protection of pastures and livestock from wild animals (wolves, bears, etc.)	1	1	3	12
Protection of agricultural land from wild animals	0	4	5	8
Conflicts among people about land use (pastures, hunting areas)	1	3	8	5
Protection of hunting activities	2	3	9	3
Protection from pests (rats, insects et at.)	1	8	5	3
Protection from stray dogs and cats	0	10	6	1
Protection of pigeons from birds of prey	2	10	4	1
Protection of agricultural land from birds of prey	3	10	3	1
Protection of apiaries from bears	2	7	8	0
Base: 17				

The respondents believe that the most important motive behind wildlife poisoning is *protection of pastures and livestock from wild animals* (15 respondents), the other dominant motives are *protection of agricultural land from wild animals* and *conflicts among people about land use* (3/4 of the respondents each), followed by *protection of hunting activities* (12). Most of the respondents identify these motives as being 'occasionally' or 'often' behind incidents of wildlife poisoning).

Opinions are divided when it comes to *protection from pests*, *protection from stray dogs and cats* and *protection of apiaries from bears*, as motives for wildlife poisoning, but

slightly more of them believe that these motives are not behind wildlife poisoning incidents. Most of the respondents believe that *protection of agricultural land from birds of prey* and *protection of pigeons from birds of prey*, rarely or never lead to wildlife poisoning.

Table 3.6. Regions of Greece where wild animals are most frequently poisoned

Regions	Number of respondents
Eastern Macedonia and Thrace (Drama, Evros, Kavala, Thassos, Xanthi)	12
Crete (Heraklion, Chania, Lassithi, Rethymnon)	8
Western Macedonia (Grevena, Kastoria, Kozani, Florina)	6
Central Macedonia (Imathia, Thessaloniki, Kilkis, Pella, Pieria)	5
Epirus (Arta, Thesprotia, Ioannina, Preveza)	4
Thessaly (Karditsa, Larissa, Magnesia, Sporades, Trikala)	4
Western Greece (Etoloakarnania, Achaia, Ilia)	4
Central Greece (Boeotia, Evia, Evritania, Fokida, Fthiotida)	1
I don't know	2
Base: 17	

Employees from relevant institutions in Greece (somewhat less than three quarters of them) name Eastern Macedonia and Thrace as the key “hotspot” region in Greece, where wild animals are most frequently poisoned. Other regions that are identified as areas where poisoning frequently occurs are Crete (1/2 of respondents), Western Macedonia (6 respondents) and Central Macedonia (5 respondents).

Epirus, Thessaly, and Western Greece are each perceived as frequent poisoning sites by close to one quarter of the respondents.

Table 3.7. Period of the year when wildlife poisoning mostly occurs

Periods of the year	Number of respondents
Spring	8
Summer	5
Autumn	3
Winter	1
I don't know	3
Base: 17	

Close to half of the respondents believe that most animal poisoning incidents occur in the spring, while close to a third of them believe that summer is a period of frequent poisoning activity.

Table 3.8. Importance of the aggravating circumstances and obstacles

Aggravating circumstances and obstacles	Levels of importance (Number of respondents)				
	Entirely irrelevant	Mostly unimportant	Neither important nor unimportant	Mostly important	Extremely important
Difficulties with evidence procedures in court	/	/	3	7	7
Low penalties for wildlife poisoning	/	/	3	8	6
Complexity of the investigation	/	/	1	12	4
Bad law enforcement	/	/	3	10	4
Inadequate and unclear protocols for police action	/	3	3	7	4
Poor reporting of information from witnesses	/	1	3	10	3
Black market for banned poisons on Internet	/	2	6	6	3
Lack of control over the prescribed use of legal poisons, such as pesticides, rodenticides et al.	/	2	6	6	3
Expensive toxicological analysis	/	2	7	7	1

Base: 17

Representatives of relevant governmental institutions from Greece are unanimous in the belief that the *complexity of the investigation* is the greatest obstacle to the prevention and sanctioning of animal poisoning. The majority of them also identify *bad law enforcement, difficulties with evidence procedures in court, low penalties for wildlife poisoning, poor reporting of information from witnesses* and *inadequate and unclear protocols for police action* as important aggravating circumstances.

All the potential aggravating circumstances and obstacles are thought to be relevant by at least one half of the respondents (8 or more respondents). Compared to other potential hindrances, expensive toxicological analyses are perceived to be a less prominent obstacle (8 respondents).

Table 3.9. Personal attitudes towards reporting poisoning incidents to the relevant authorities

Statements related to reporting poisoning incidents	Levels of agreement (Number of respondents)				
	I completely disagree	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree
Every person should report to the police any information/knowledge about wildlife poisoning	/	/	1	4	12
Hunters should report to the police information/knowledge about wildlife poisoning more often	/	/	1	5	11
Veterinarians should report to the police information/knowledge about wildlife poisoning more often	/	/	2	4	11
People who report someone from their community for poisoning wild animals risk altercations and conflicts in their community	/	1	0	7	9
Poisoning mostly takes place in remote locations and therefore the perpetrators are rarely identified	/	1	5	6	5

People/citizens do not know who to report animal poisoning incidents to	1	4	3	8	1
It is known which individuals poison animals in this area, it is a „public secret“	/	1	8	7	1
Base: 17					

Most employees from relevant Greek institutions believe that it is the responsibility of all members of the general population (every person), as well as hunters and veterinarians as specific (occupational) groups, to report information about wildlife poisoning to the authorities. Nevertheless, most of them also believe that people who report someone from their community for poisoning wild animals risk altercations and conflicts in their community, which presents a serious barrier for reporting poisoning incidents.

It is significant to note that nearly two thirds of the respondents believe that poisoning happens in remote areas and that this is a barrier for the successful identification or perpetrators and that one half of them believe that people do not know who to report poisoning incidents to. These findings emphasize the need to raise more awareness regarding how and where poisoning incidents often happen, but also to provide citizens with the necessary information for reporting these cases.

The respondents' opinions are polarized when it comes to whether it is known, i.e., a "public secret" which individuals poison animals in hotspot areas.

Table 3.10. Groups that need to become more aware of wildlife poisoning

Groups	Number of respondents
Livestock breeders	7
Citizens in general	3
Hunters	3
Game wardens	2
Farmers	2
Base: 17	

Livestock breeders are identified (by 7 of the respondents) as the main target group, whose awareness about wildlife poisoning should be raised in order to reduce or further

prevent wildlife poisoning cases in the future. They are followed by citizens in general and hunters (3 respondents each). Raising awareness for game wardens and farmers is perceived as less important compared to the other groups.

Table 3.11. Personal attitudes towards investigation of wildlife poisoning incidents

Statements related to the investigation of wildlife poisoning incidents	Levels of agreement (Number of respondents)				
	I disagree completely	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree
Police should have specialized canine units for detecting poisonous substances used for wildlife poisoning	/	/	1	7	9
More people are needed on the field (police, environmental inspectors, rangers etc.) for timely detection of poisoning incidents	/	1	1	8	7
Lack of coordination among relevant institutions is a bigger problem than lack of resources	/	1	6	4	6
Specialized police units for environmental crime, including wildlife poisoning, are needed	/	2	4	8	3
Game wardens to often tolerate unlawful practices in hunting areas	2	5	5	2	3
In Greece there are sufficient laboratories with enough capacities to conduct needed toxicological analyses	1	8	3	4	1
Base: 17					

Most respondents believe that it is crucial to introduce *specialized canine units in the police, for detecting poisonous substances used for wildlife poisoning, to assign more people for the field* (police, environmental inspectors, rangers etc.), as well as to delegate *specialized police units for environmental crime*, in order to make advancements in the prevention, detection and sanctioning of wildlife poisoning.

Most of the respondents also consider the *lack of coordination among institutions to be a greater problem than a lack of resources*. Their opinions are divided when it comes to whether game wardens tolerate unlawful practices.

Half of them do not believe that there is a sufficient number of laboratories with enough capacities to conduct needed toxicological analyses in Greece and approximately one fifth of them are undecided as to whether the laboratory capacities are satisfactory.

Table 3.12. Personal attitudes towards legislation and legal processing of poisoning incidents

Statements related to the legislation and legal processing of poisoning incidents	Levels of agreement (Number of respondents)				
	I disagree completely	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree
Rarely are fines imposed under the Hunting Act	/	2	7	7	1
The legal framework for punishing the practice of poisoning animals is good, but the main problem is law enforcement	/	3	6	8	/
Existing legislation regulates biodiversity protection well enough	1	6	7	3	/
Public prosecutors are sufficiently educated for managing incidents related to poisoning of wild animals	2	6	6	3	/
Base: 17					

Respondents are not unanimous in their opinions about the legislation and legal processing of poisoning incidents. Half of them believe that fines are rarely imposed under the Hunting Act and a little less than half are undecided. Half of them also believe that the legal framework for punishing poisoning is good, but the problem is law enforcement, whereas one third are undecided.

When it comes to the readiness of public prosecutors for managing poisoning incidents, half of the respondents do not believe that they are sufficiently educated for managing incidents related to poisoning of wild animals, and one third are indecisive. The opinions are also divided when it comes to whether the existing legislation regulates biodiversity well enough, with 2/5 of respondents who do not believe that the existing legislation is adequate.

Table 3.13. Evaluating the cooperation between governmental institutions and civil society organizations regarding data collection about poisoning incidents

Estimate	Number of respondents
5 - Excellent cooperation	0
4	3
3	6
2	7
1 - Very bad	1
I don't know / I cannot evaluate	0
Base: 17	

Most respondents either consider the collaboration between governmental institutions and civil society organizations related to data collections about poisoning incidents as inadequate (8) or they are undecided whether it is good or bad (6).

Table 3.14. Knowledge of procedures and documentation related to wildlife poisoning

Procedures and documentation	Answers (Number of respondents)		
	Yes	No	I do not know, I am not informed
Is there a protocol defining procedures and jurisdictions for investigating wildlife poisoning	12	3	2
Is there a National action plan for combating wildlife poisoning in place	11	4	2

Is there a database for poisoning incidents of birds in Greece	7	4	6
Base: 17			

The majority of representatives from the relevant governmental institutions are informed regarding the existence of a protocol defining procedures and jurisdictions for investigating wildlife poisoning and a National plan for combating wildlife poisoning. However, they are relatively uninformed about the existence of a database for poisoning incidents of birds in Greece.

Table 3.15. Personal attitudes towards punishment of various unlawful actions damaging to animals and the environment

Statements related to the punishment of unlawful actions that damage the nature	Levels of agreement (Number of respondents)				
	I disagree completely	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree
Higher fines are needed for every type of poaching/illegal shooting	/	/	3	5	9
Rangers of protected areas should have the authority to arrest persons who poison animals, if they are caught in the act	2	/	2	4	9
Having poison baits should be a separate offense, regardless of whether it has been proven that an animal was killed	/	/	1	10	6
All forms of mass and non-discriminative killing of animals (trapping, poisoning, explosives et al.) should be punished as severely as possible	/	/	1	11	5
If poisoning of wild animals occurs in a commercial hunting area, the concessionaire should be deprived of the concession	3	1	7	2	4

Prison sentences should not be administered placing poison baits unless people are not put in danger, but only animals	4	7	3	2	1
Sentences for poisoning of animals should be only administrative (financial), but not imprisonment	4	8	2	3	0
Poisoning of animals should be a criminal offense only if it occurred in a protected area (nature park, national park)	12	2	3	0	0
Base: 17					

Respondents unanimously support enforcing the strictest punishment for all forms of mass and non-discriminatory killing of animals and believe that having poison baits should be treated and sanctioned as a separate offense regardless of whether any animals were killed. Most of them believe that higher fines are necessary for all forms of poaching and that rangers of protected areas should have greater authority so that they can arrest persons who poison animals.

They also do not consider that a sentence should be administered only when people are put in danger, but also when animals have been endangered and not humans, and they do not believe that poisoning should only be an offense if it occurred in a protected area. Institutions are in favor of including imprisonment as a form of sanctioning as opposed to only administrative (financial) sentences.

Table 3.16. Personal attitudes towards the capacities of the police

Statements related to the capacities of the police	Levels of agreement (Number of respondents)				
	I disagree completely	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree
The main is problem that incidents are not reported to the police	/	/	5	12	/

Police investigations about wildlife poisoning need expensive and sophisticated technology	/	3	5	8	1
Specialized police units should be introduced to deal with the crime of wildlife poisoning	1	2	6	7	1
Police investigations about wildlife poisoning should include representatives of the civil society organizations	1	4	4	7	1
The police do not take seriously the need to launch investigations into wildlife poisoning	2	2	11	2	/
The police is sufficiently equipped for investigating wildlife poisoning	2	10	3	2	/
The police is sufficiently educated for investigating incidents with wild animals	1	12	3	1	/
The police has better things to do and should not waste resources on investigating wildlife poisoning incidents	9	4	4	0	/
Base: 17					

Most respondents believe that investigative work related to wildlife poisoning is a significant part of the duties carried out by the police, and that their resources should be invested in wildlife poisoning investigations. However, they are indecisive and uncertain about whether the police take the need to launch investigations into wildlife poisoning seriously.

The main obstacles that they identify for carrying out police work related to the prevention and combating of wildlife poisoning, are that the police are not sufficiently educated, nor equipped for carrying these investigations out. Nevertheless, they believe that one of the main problems is that incidents are not reported to the police to start with. Opinions are divided when it comes to whether expensive and sophisticated technology is necessary to carry out this type of work. One half of them believe that this is true, and the rest are indecisive or do not believe this is true. When the questions of introducing specialized police units and including representatives of the civil society organizations in investigations are raised, close to half of the respondents (8 respondents each) advocate that this is necessary.

2.3 Measures related to wildlife poisoning

Table 4.1. What is necessary to use in police investigations of wildlife poisoning

Necessaries for police investigations	Number of respondents
Canine units	16
Toxicological analysis	15
Fingerprint analysis	12
Records of sale of legal poisoning substances (pesticides, insecticides, rodenticides...)	11
Confirming time of death of the animals	7
Forensic ballistics	6
Forensic entomology	5
Forensic psychology	3
Base: 17	

Representatives of relevant institutions in Greece unanimously recognize that canine units are necessary to use in police investigations of wildlife poisoning (16 respondents). The majority consider toxicological analysis (15), fingerprint analysis (12), and using the records of sale of legal poisoning substances (11) a necessity for the success of wildlife poisoning investigations.

Two fifths of the respondents consider confirming the time of death of the animal (7) to be important, and more than one third believe the same for forensic ballistics (6) when it comes to police inquiries in this field. Forensic psychology and forensic entomology are considered less significant for these investigations.

Table 4.2. Importance of undertaking some measures to prevent wildlife poisoning

Measures	Levels of importance (Number of respondents)				
	Entirely irrelevant	Mostly unimportant	Neither important nor unimportant	Mostly important	Extremely important

Work more on awareness raising among key stakeholders (livestock breeders, farmers, hunters, institutions)	/	/	1	5	11
Impose a stricter control of the trade of legal poisoning substances (pesticides, rodenticides et al.)	/	/	3	4	10
Work more on awareness raising of the general public	/	/	2	8	7
That the state/government financially compensates the damage to livestock breeders and farmers, caused by wild animals	/	/	2	9	6
Create more supplementary feeding sites for vultures	/	1	2	10	4
Ensure livestock breeders and farmers are provided with free shepherd and guard dogs	/	/	5	8	4
Resolve issues of the ownership of pastures and rights to use them	/	/	5	8	4
Better protect wild ungulate populations	/	1	3	10	3
Ensure free electric fences	/	1	6	8	2
Work of reducing the populations of allochthone animals	1	2	5	7	2
Completely ban logging in Greece for some time	6	6	4	1	/
Base: 17					

When it comes to measures that could lead to the prevention and reduction of wildlife poisoning incidents, respondents perceive most of the listed measures as mostly or extremely important.

They are in almost unanimous agreement regarding the importance of *working more on raising awareness among key stakeholders* (livestock breeders, farmers, hunters, institutions) as well as the *general public*. They also believe that a *stricter control of the trade of legal poisoning substances should be established*, and that *the government should financially compensate the damage to livestock breeders and farmers, caused by wild animals*.

More supplementary feeding sites for vultures, improved protection of wild ungulate populations, ensuring that farmers and livestock breeders are provided with shepherd and guard dogs, resolving problems related to pasture ownership and provision of free electric fences are measures considered important by most of the respondents.

The only measure which is not perceived as relevant for the prevention of wildlife poisoning is introducing a complete ban on logging in Greece for some time.

2.4 Attitudes towards nature

Table 5.1. Personal attitudes towards nature

Statements related to nature	Levels of agreement (Number of respondents)				
	I disagree completely	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree
Plants and animals have an equal right to exist just like humans	0	0	1	11	5
The natural balance is very delicate and easy to disturb	0	1	1	13	2
Earth is like a spaceship, with very limited space and resources	0	1	5	9	2
Humans are destined to rule over the rest of nature	10	3	4	0	0
Base: 17					

Employees from relevant institutions in Greece share a common belief that plants, and animals have an equal right to exist just like humans, and they recognize that the natural balance is very delicate and easy to disturb. In addition to this, the prevailing belief among them is that the Earth has limited space and resources. More than three fourths of the respondents do not believe that humans are destined to dominate over the rest of nature.

Annex XIV. Overview of poisoning incidents in North Macedonia confirmed by toxicological analysis.

Species	No. of poisoned individuals	Date/Period	Location	Type of poisoning	Main driver	Substance
Egyptian Vulture, Griffon Vulture	3, 1	2011	Vitacevo	unknown	unknown	Methomyl
Common Buzzard	1	April 2011	Vitacevo	unknown	conflicts with predators	Methomyl

Annex XV. Perception of the illegal practice of wildlife poisoning in local communities in North Macedonia – baseline report.

1. METHODOLOGY

1.1 Project background

The BalkanDetox LIFE project (LIFE19GIE/NL/001016) - Strengthening national capacities to fight wildlife poisoning and raise awareness about the problem in the Balkan countries is a project that is dedicated to the fight against illegal poisoning of wild animals which local citizens usually consider as pests, but which has serious negative consequences for the population of numerous endangered animal species, primarily vultures which eat poisoned animals or eat the poison themselves. The study will be conducted in two waves in 2021 and 2025, as a base line and follow up study aimed at measuring the current attitudes and practices, and attitudes and practices of target groups after the implementation of planned campaign and activities.

The project is being implemented at the multinational level in the Balkan region. The countries involved are: North Macedonia, Albania, Serbia, Greece, Bulgaria, Croatia and Bosnia and Herzegovina.

1.2 Key research topics

In this first phase, the aims of the research are:

- Measuring awareness of target groups (hunters, farmers, livestock breeders) about endangered species (vultures), methods of poisoning and individuals or groups responsible for poisoning on the territories of their respective countries.
- Measuring the current attitudes and practices of target groups connected with illegal poisoning of endangered species, i.e., vultures.

1.3 Methodological approach

1.3.1 Research technique



Quantitative research of the targeted groups in North Macedonia conducted by face-to-face PAPI (Paper and Pen Interviewing) and CAWI (Computer Assisted Web Interviewing) techniques.

1.3.2 Fieldwork

The fieldwork was conducted from September the 18th to October the 21st 2021.

1.3.3 Questionnaire length

Questionnaire length up to 10 minutes.

1.3.4 Sample - target group

The target group in the research were hunters, farmers and livestock breeders on the territory of North Macedonia, which perform their activities in the areas where vultures exist as members of endangered species.

Due to difficulties caused by COVID-19 pandemic, the sample included 31 respondents in total.

1.3.5 Sample Structure

Chart 1.1. Age structure

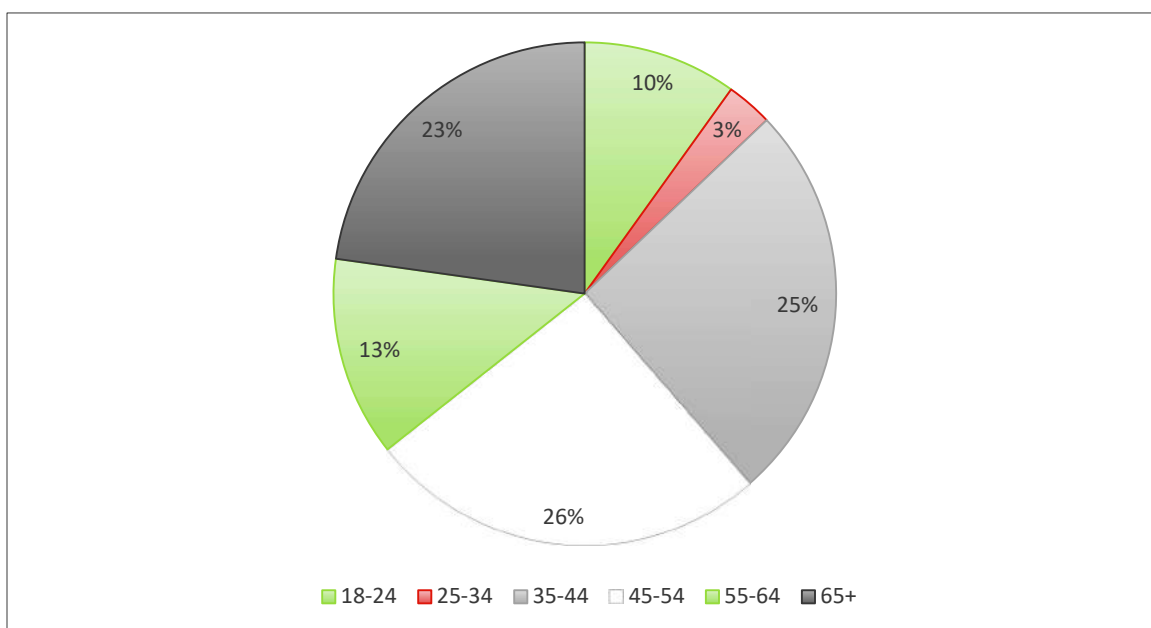


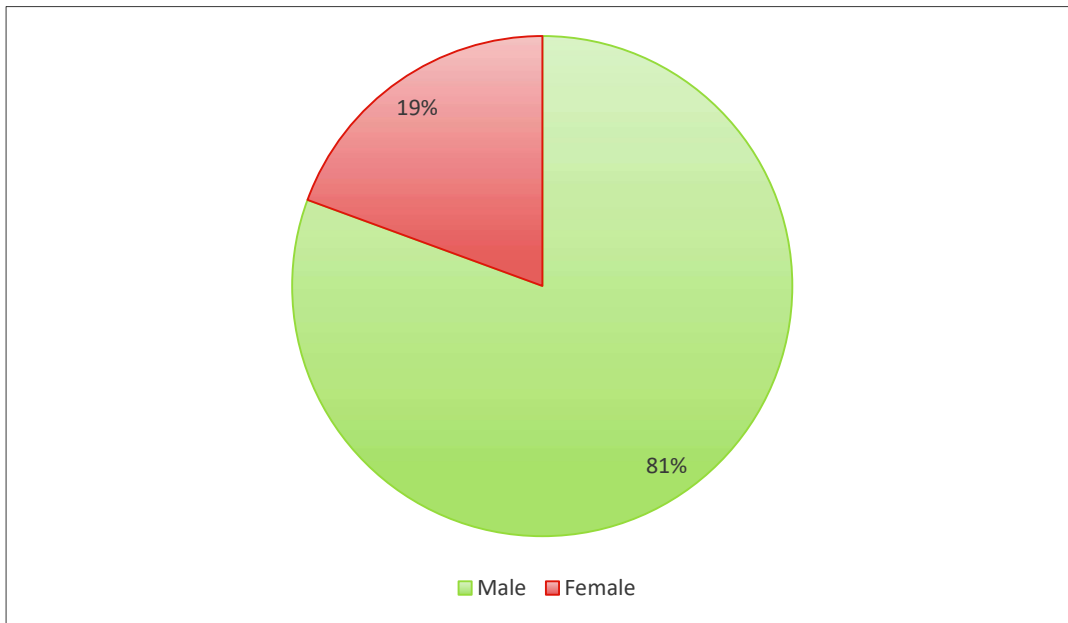
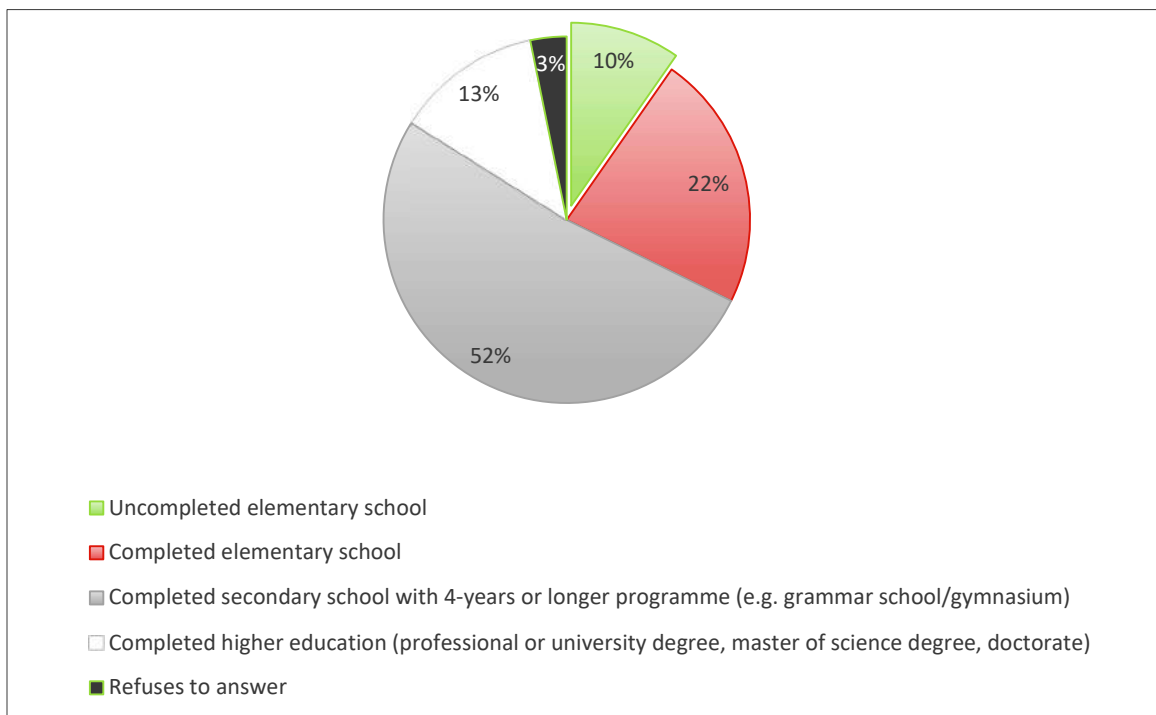
Chart 1.2. Gender*Chart 1.3. Education*

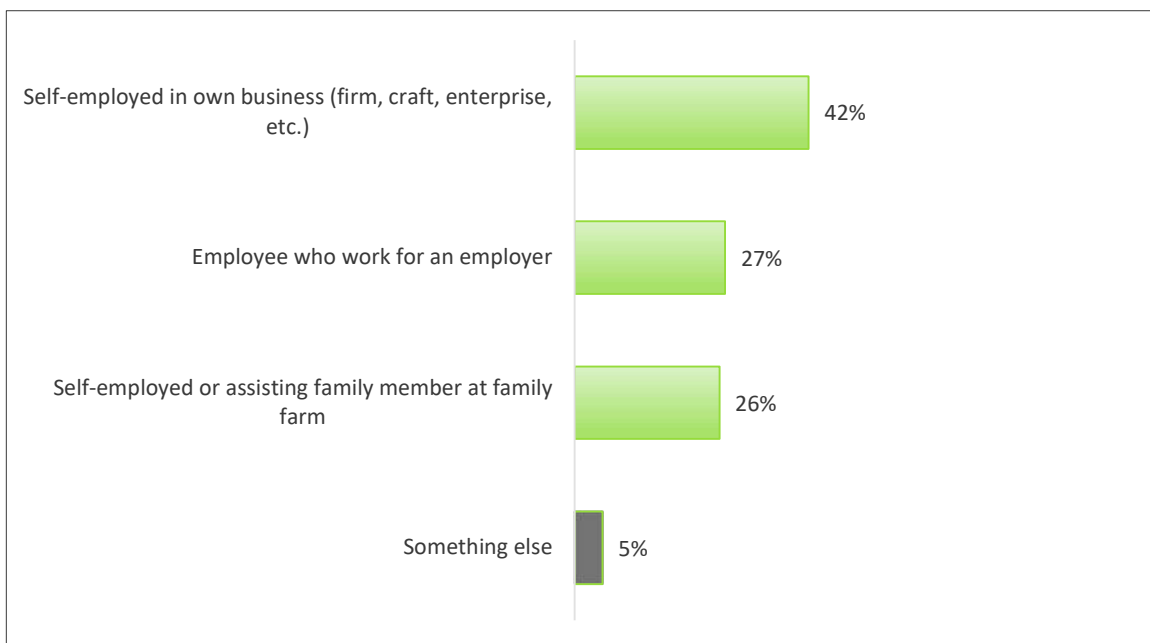
Chart 1.4. Employment status*Chart 1.5. Type of employment*

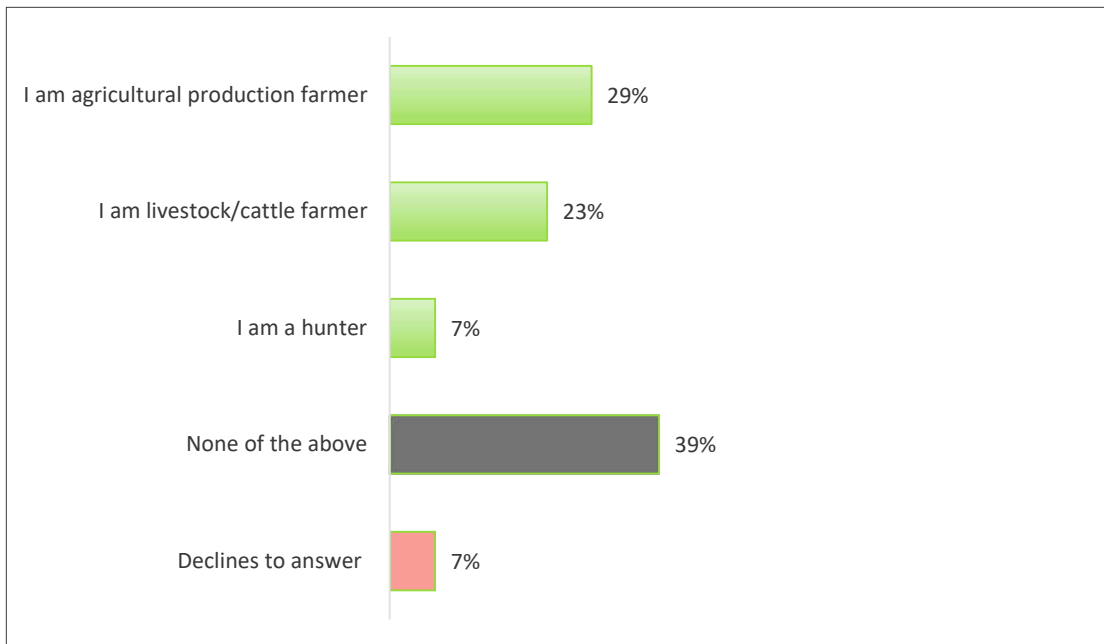
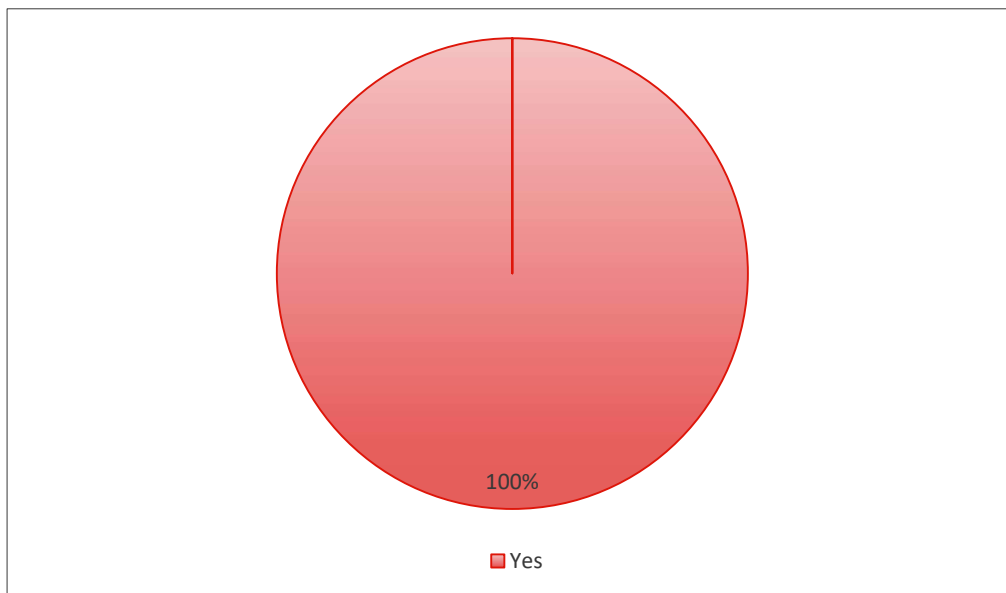
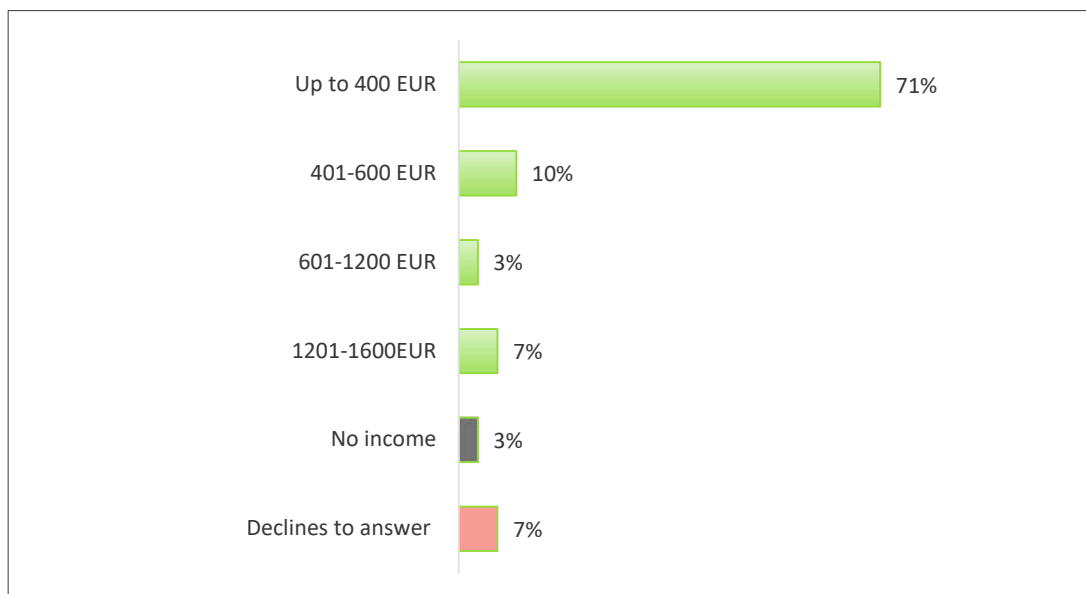
Chart 1.6. Jobs connected with nature*Chart 1.7. Hunting community*

Chart 1.8. Average monthly income of the household

Eight out of ten respondents were male, while every fifth was a female respondent. Regarding age distribution, about one-fourth of the sample are respondents aged 35-44, 45-54 and over 65 (25%, 26%, 23%, respectively). Younger respondents up to the age of 34 (13%) are represented in a smaller percentage.

Around a third of the sample (32%) had either uncompleted or completed elementary school, while more than a half (52%) had completed secondary school with 4 years or a longer program.

About 6 out of 10 respondents were employed, while every third declared themselves as a pensioner. Amongst the participants, most of them did not have a job connected with nature (39%). Those who had were in most cases agricultural production farmers (29%), followed by livestock/cattle farmers (23%) and hunters (7%). All hunters in the sample were part of a hunting community (2 respondents).

The vast majority of the respondents answered that they earn up to 400 EUR (71%), while there is a significantly smaller percentage of those with incomes between 400 and 600 EUR (10%) or above 600 EUR (10%).

1.3.6 Notes on data presentation and analysis

1.3.6.1 Indication of statistical significance

Statistical significance helps us to determine whether the result reflects real differences between groups (in this case female and male respondents, different age categories ...) and whether the obtained differences can be generalized to the entire sample population or should be treated as a consequence of chance.

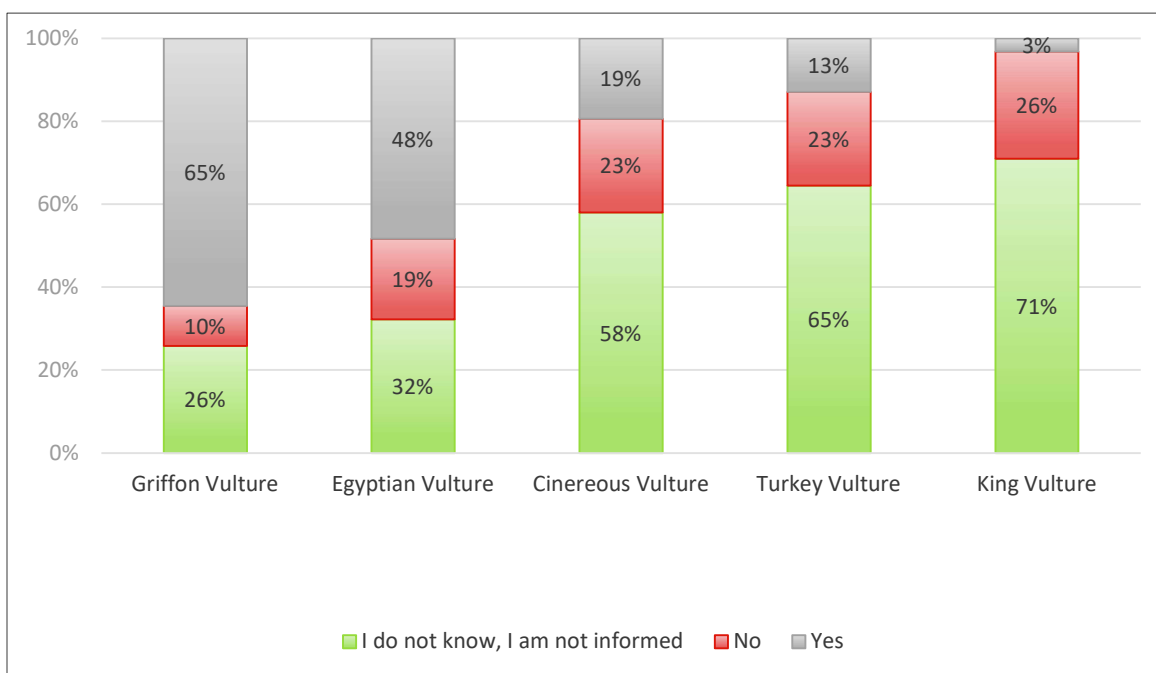
The usual significance levels of 0.95 were used in this study. This means that the finding (difference between groups) has a 95% chance of being true, and thus can be accepted as a reflection of realistically existing differences between groups.

Statistically significantly different values between groups were discussed through the analysis of the results, without graphical representation.

2. RESULTS OF QUANTITATIVE RESEARCH

2.1 Vultures in North Macedonia

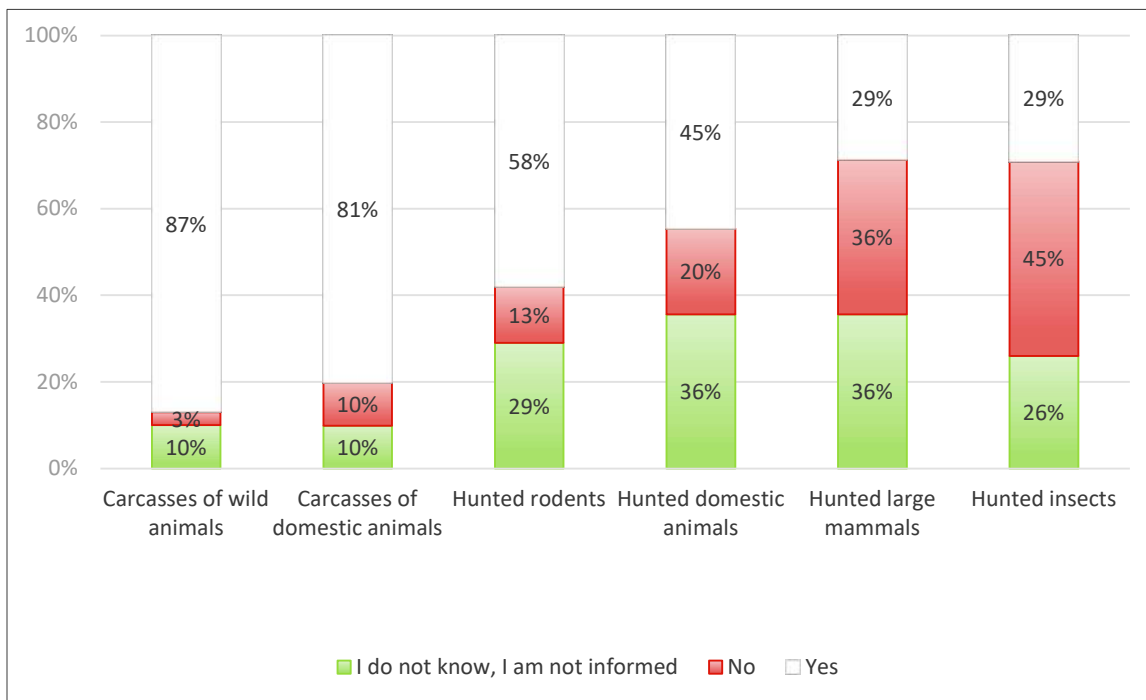
Chart 2.1. Awareness about the vulture species breeding in North Macedonia



Target groups from local communities are better informed about the breeding of Griffon Vulture (65%) and Egyptian Vulture (48%) in the territory of North Macedonia. However,

over 50% of respondents claim to be unaware whether other vulture species are present and nesting in North Macedonia (58-71%), while around one in four believes that Cinereous, Turkey and King Vulture aren't present in North Macedonia.

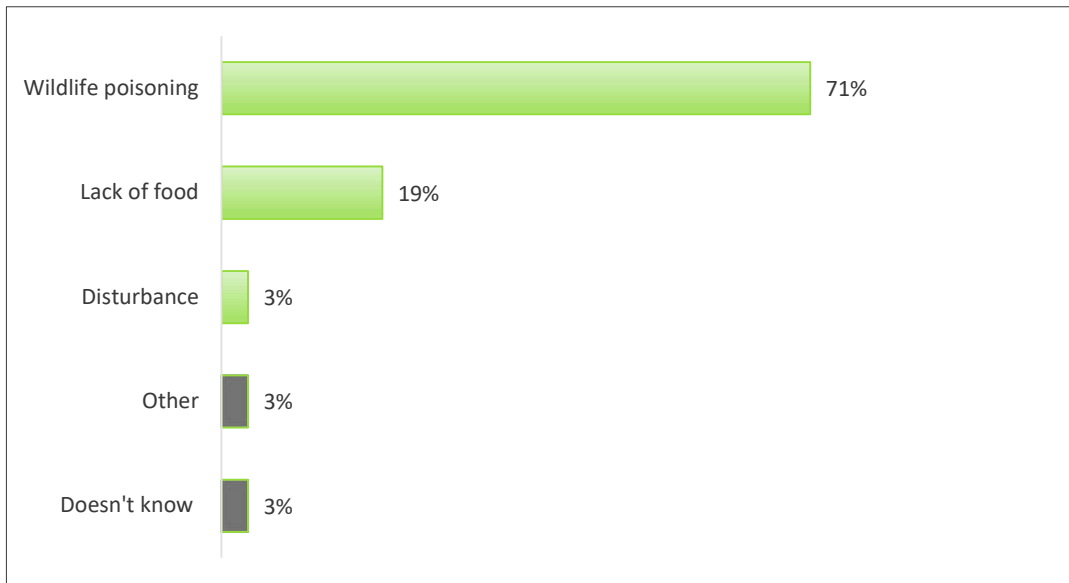
Chart 2.2. Awareness about the type of food which vultures feed on in North Macedonia



The carcasses of wild and domestic animals are perceived as important parts of the diet of vultures (over 80%). About half of the respondents believe that hunted rodents or domestic animals are also included in the diet of vultures (58% and 45%, respectively). On the other hand, while insects are generally not included in the diet of vultures, the perception about hunted large mammals is diverse as similar percentage of respondents claim they are not informed, or perceive that vultures eat or do not eat this type of food.

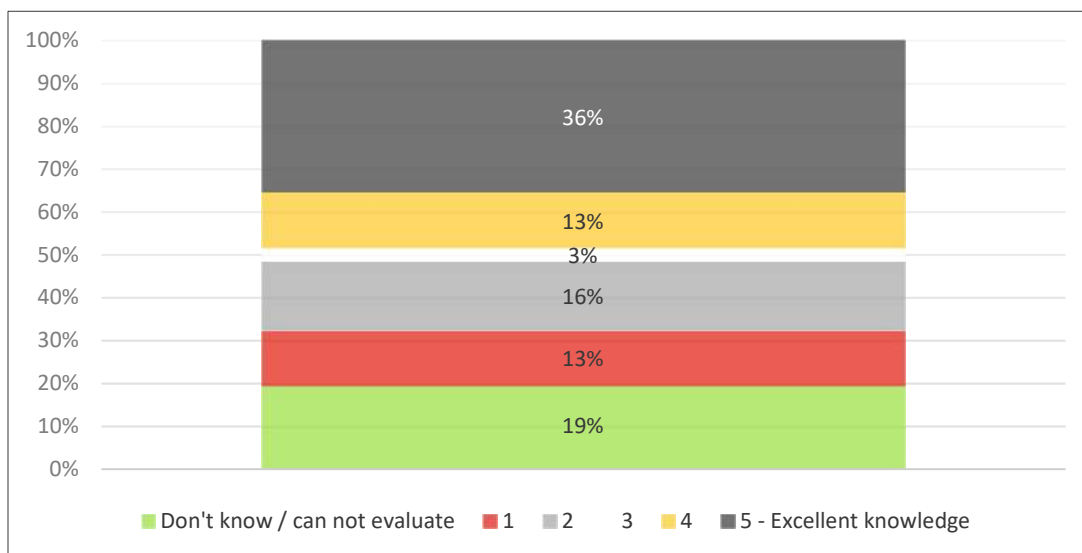
2.2 Problems behind vulture poisoning in North Macedonia

Chart 3.1. What endangers the vulture populations in North Macedonia the most?



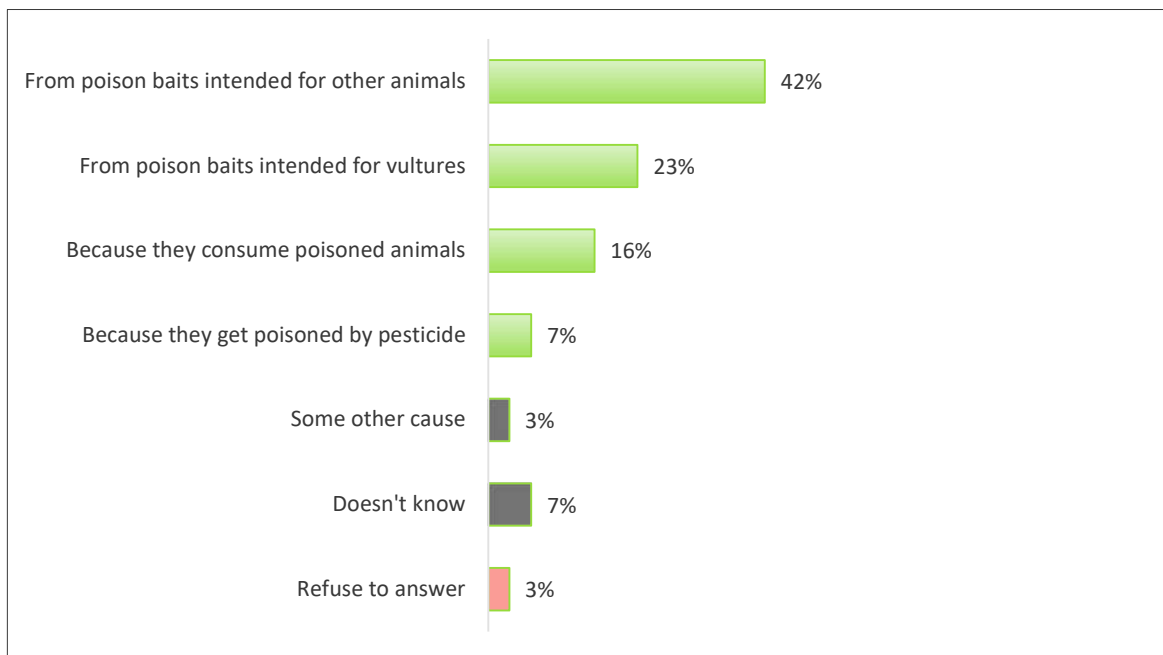
Wildlife poisoning is by far the most important perceived threat for vulture species present in North Macedonia (71%). Lack of food follows but with only one in five respondents among target groups who perceive this factor as endangering for the vulture population.

Chart 3.2. Evaluation of own knowledge about the issue of wildlife poisoning by inhabitants of local communities in North Macedonia

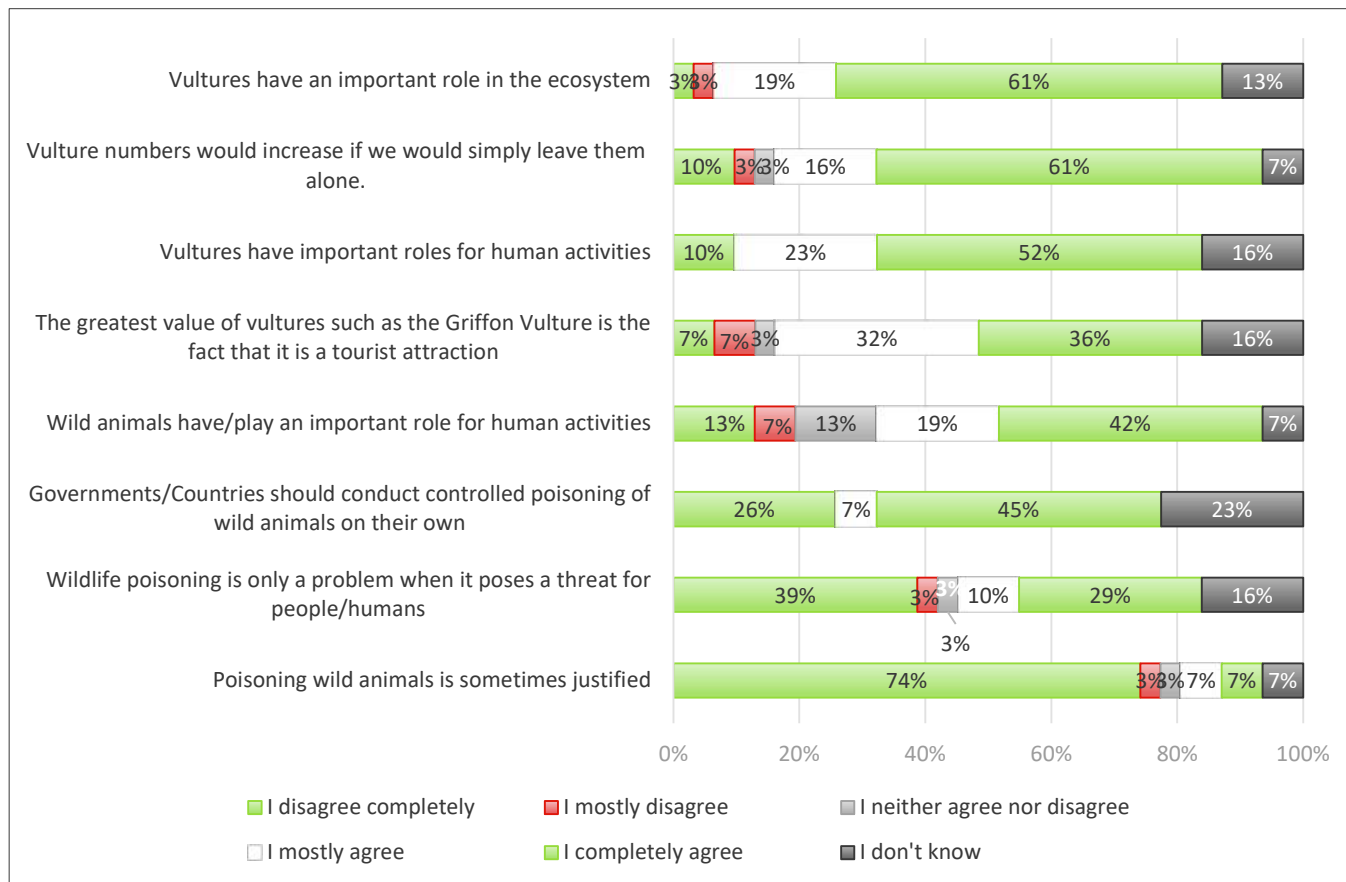


About half of the respondents from local communities in North Macedonia assess their knowledge about the issue of wildlife poisoning as very good or excellent (49% of respondents rate their knowledge with the highest marks 4 or 5, on a scale from 1 to 5). Close to 3 out of 10 respondents on the other hand evaluate their knowledge as inadequate.

Chart 3.3. Perceived key causes behind vulture poisoning



Close to 60% of farmers and hunters in North Macedonia consider *accidental poisonings* by poisonous baits intended for other animals (42%) and consumption of poisoned animals' carcasses (16%) to be the key causes of vulture poisoning. *Intentional poisoning* (by poison baits intended for these species specifically) falls behind as the key cause of vulture poisoning (23%).

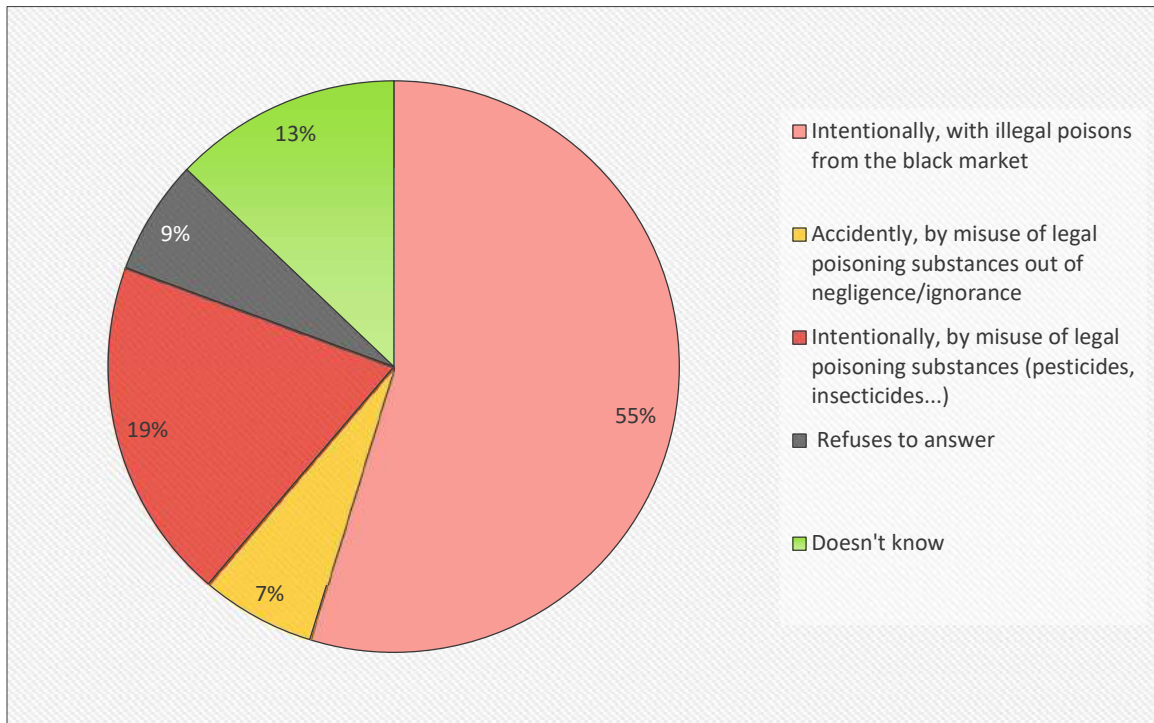
Chart 3.4. Personal attitudes towards vultures

Target groups in local communities perceive vultures as important for the environment as well as for humans and their activities (75-80%). They also believe in the potential for the vulture population to regenerate with human withdrawal and its impact (77%).

Two thirds of the respondents value the contribution of vultures to the development of tourism, this type of contribution is seen as a key benefit from the population of certain species of vultures, which underestimates their real impact and importance when it comes to both the nature and man.

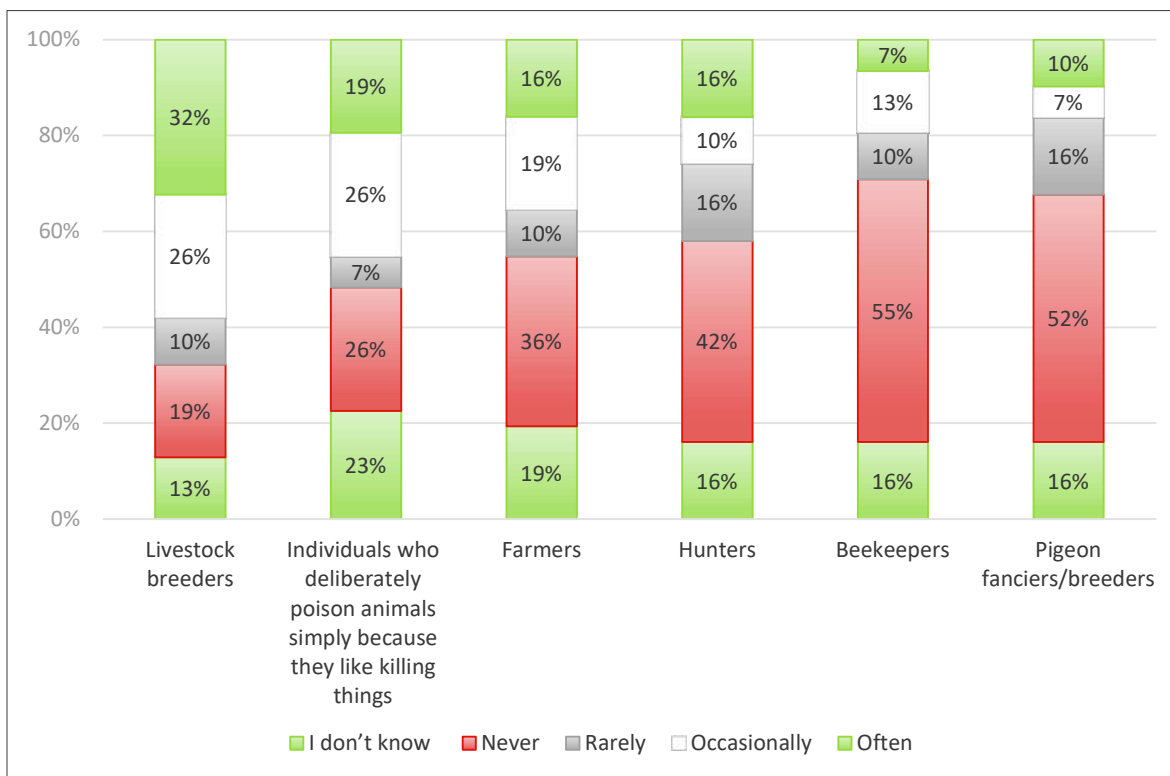
Still, about 50% of respondents believe that governments should carry out controlled wildlife poisoning, while poisoning alone is seen as justified by about 15% of respondents. People from local communities in North Macedonia seem to have a polarized attitude on the statement "Wildlife poisoning is only a problem when it poses a threat to people" (about 40% agree and a similar number disagree with this attitude).

Chart 3.5. Perception about how wildlife poisoning most commonly occurs



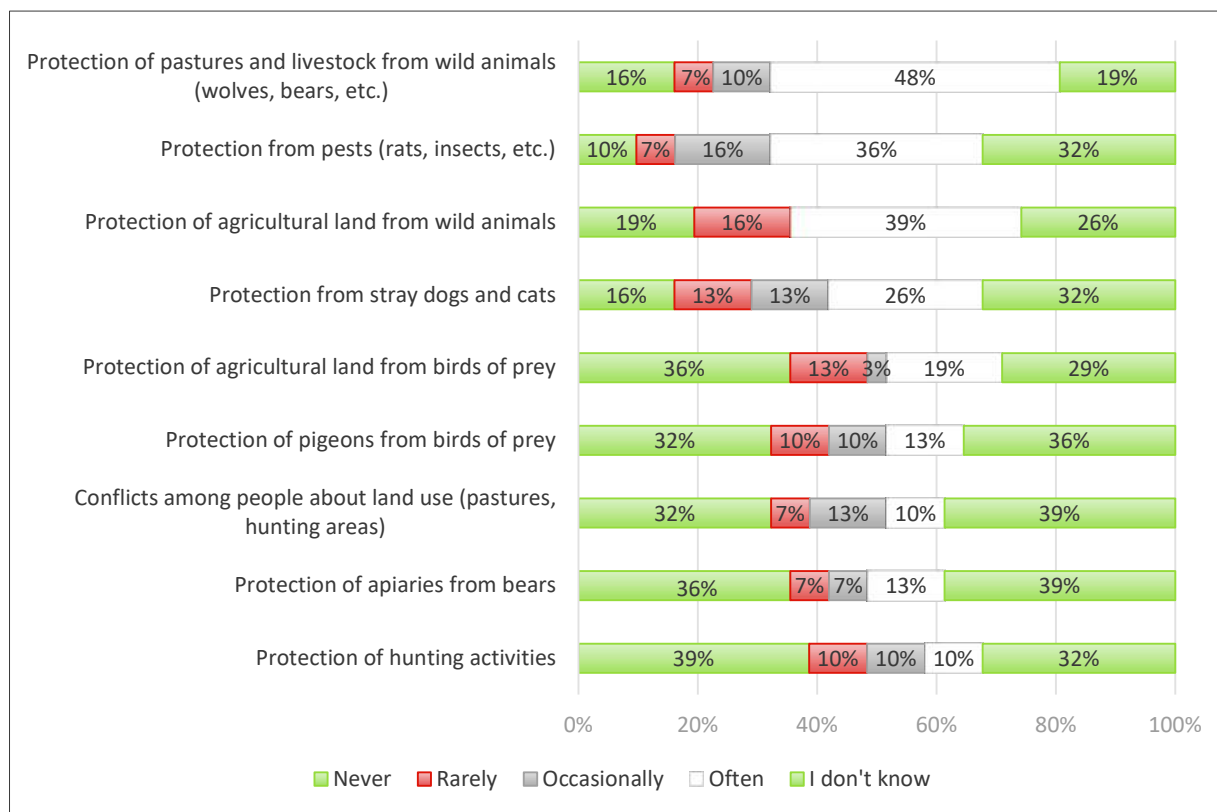
Three out of four respondents from North Macedonia believe that wildlife poisoning in general is the result of intentional actions, primarily through illegal poisons from the black market (55%) and by misuse of legal poisoning substances such as pesticides or insecticides, but to a lesser extent (19%).

Only 7% of members of targeted groups believe that poisoning is the result of accidental misuse of legal poisoning substances out of negligence/ ignorance.

Chart 3.6. Perception regarding groups responsible for wildlife poisoning

Groups that are perceived as the most responsible for wildlife poisoning are livestock breeders (6 out of 10 hot spots residents recognize them as occasionally or often responsible), followed by the individuals who deliberately poison animals out of aggressive and destructive impulses (45%). Slightly more than one third of farmers and hunters state that it is the farmers themselves who have an interest in poisoning wild animals.

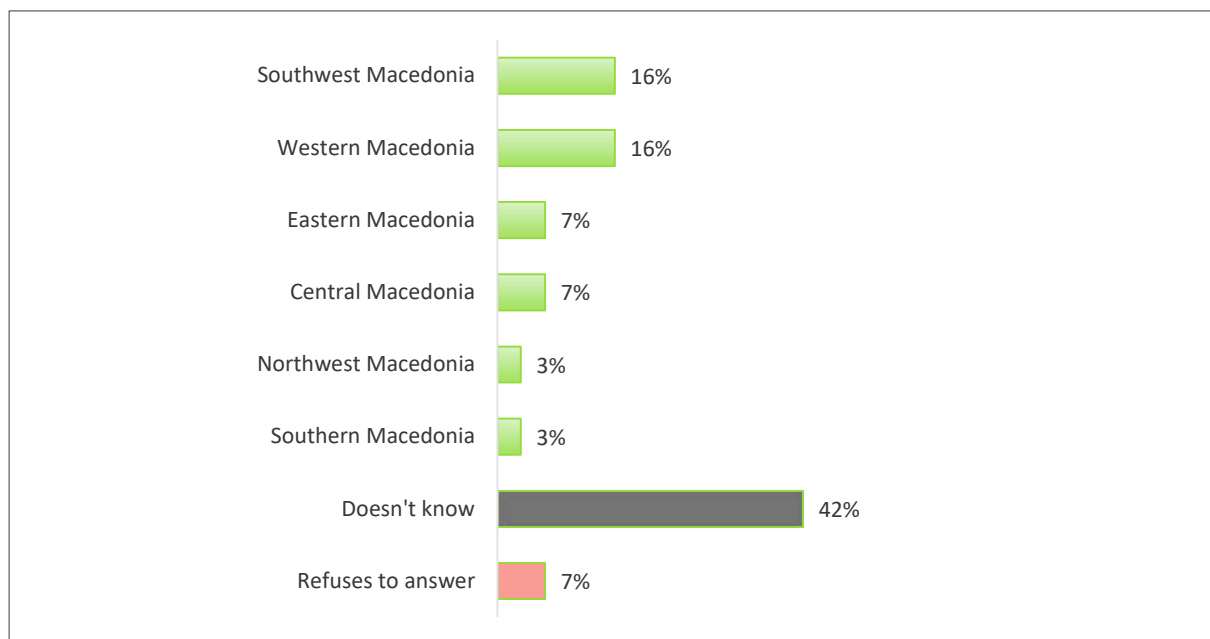
Hunters, beekeepers, and pigeon fanciers/breeders are perceived as less responsible groups for this problem (by on average 20-25% of target group members).

Chart 3.7. Perceived motives behind the poisoning of wild animals

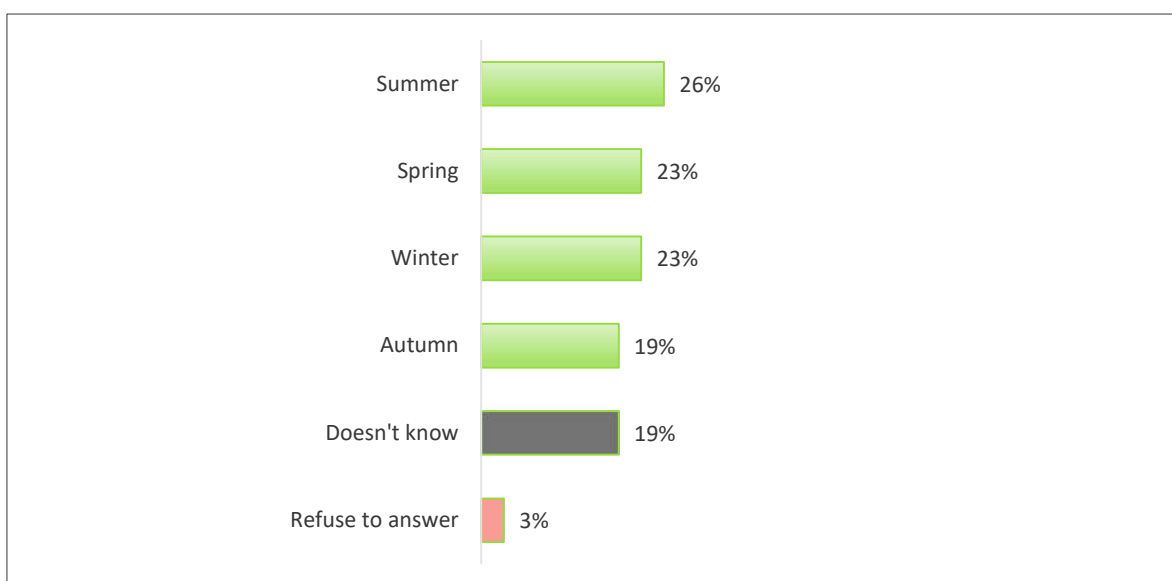
Protection of pastures and livestock from wild animals and *protection from pests* are the key motives behind wildlife poisoning (more than half of the respondents indicate that these are at least occasional, but mostly often reasons for poisoning).

Protection of agricultural land from wild animals and *from stray dogs and cats* follow with about 40% of those who identified them as motives leading to wildlife poisoning.

Other motives are relatively rarely perceived as driving forces for poisoning of wild animals (protection from birds of prey, conflicts among people about land use, protection of apiaries from bears, protection of hunting activities). Also, one fifth and more of the members of hot spots target groups failed to assess the key motives behind the poisoning of wild animals.

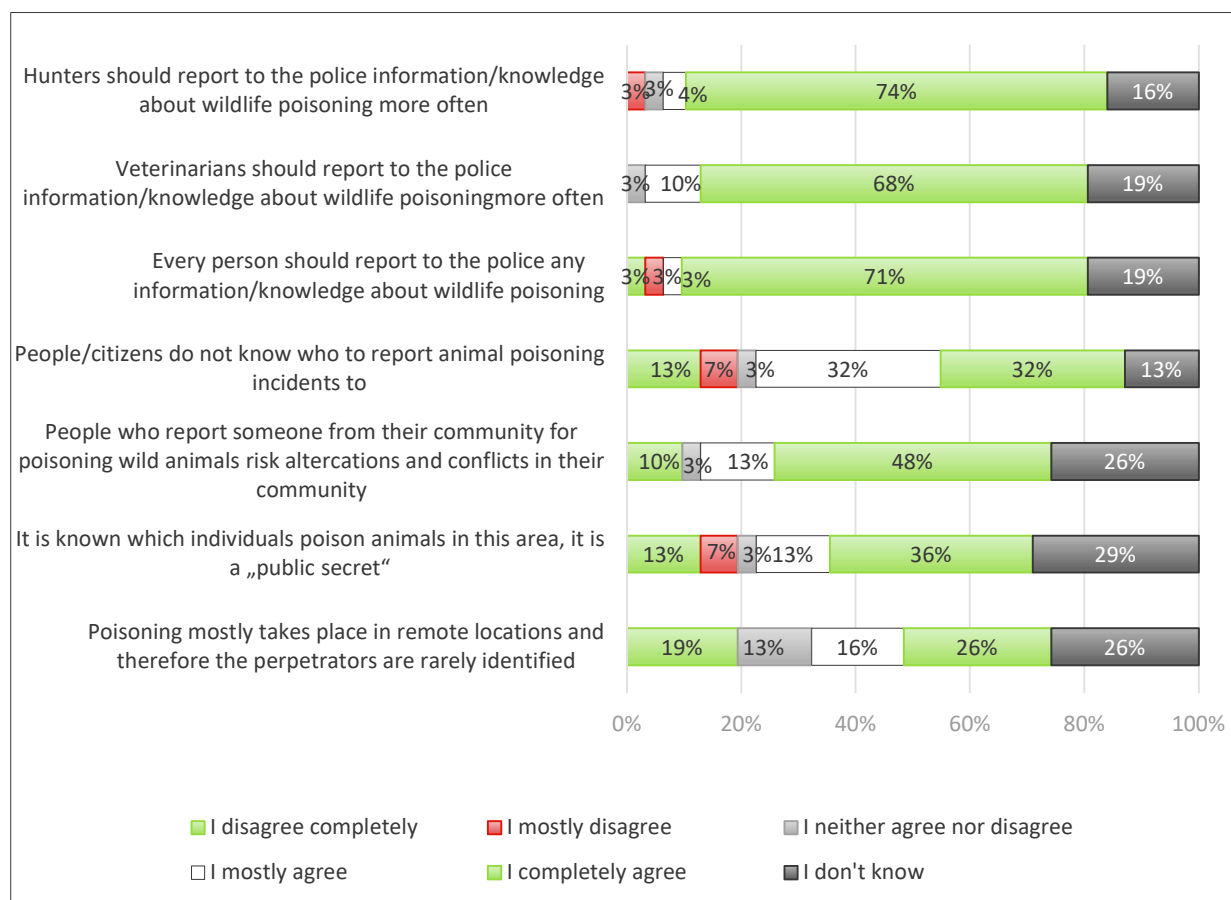
Chart 3.8. Regions of Macedonia where wild animals are most frequently poisoned

Most respondents are not informed in which regions of North Macedonia the poisoning of wild animals most frequently occurs (42%). Amongst those who expressed their opinion most stated that wild animals are frequently poisoned in Southwest Macedonia (16%) or Western Macedonia (16%).

Chart 3.9. Period of the year when wildlife poisoning mostly occurs

People from local communities in North Macedonia have a divided opinion regarding the period of the year in which wildlife poisoning usually occurs, since each season has been identified as a key period for such actions by 20-25% of respondents.

Chart 3.10. Personal attitudes towards reporting poisoning incidents to the relevant authorities

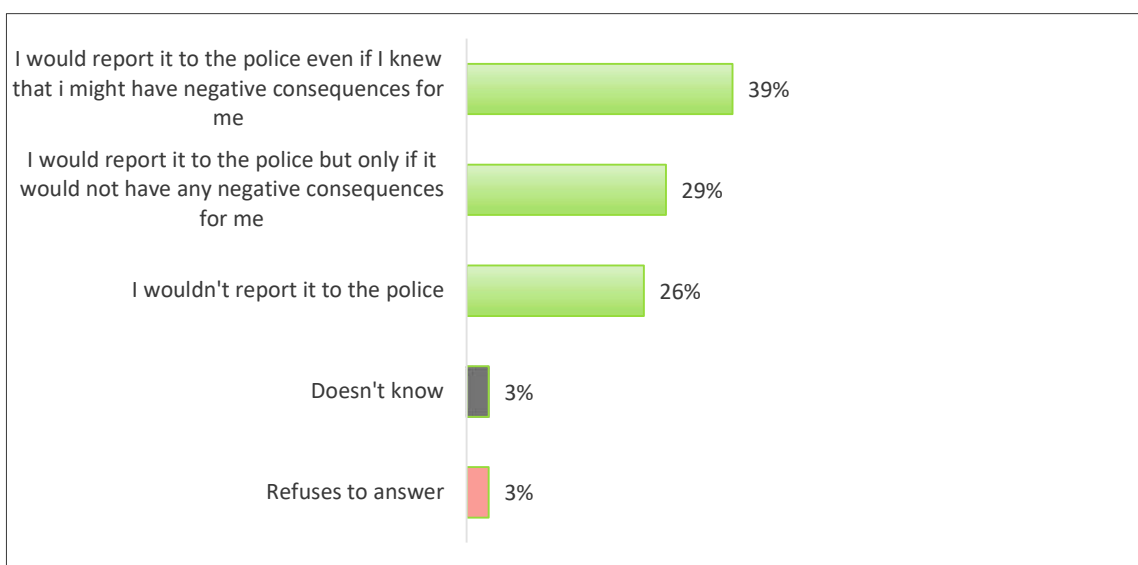


Hunters, veterinarians, and citizens in general (every person) are perceived as groups responsible for reporting of poisoning incidents to the relevant authorities with 74-78% of respondents who mostly or completely agree with this.

Respondents also point out that citizens do not have information on what the procedure of reporting looks like and who is responsible for these problems, and that reporting poisoning incidents poses risks of altercations or conflicts in the immediate environment (nearly two-thirds agree with these statements).

This indicates that it is necessary to continue and adjust the communication aimed at raising awareness about the importance of the identification of those responsible for wildlife poisoning as well as the communication aimed at the justification of the reporting of poisoning incidents in affected communities.

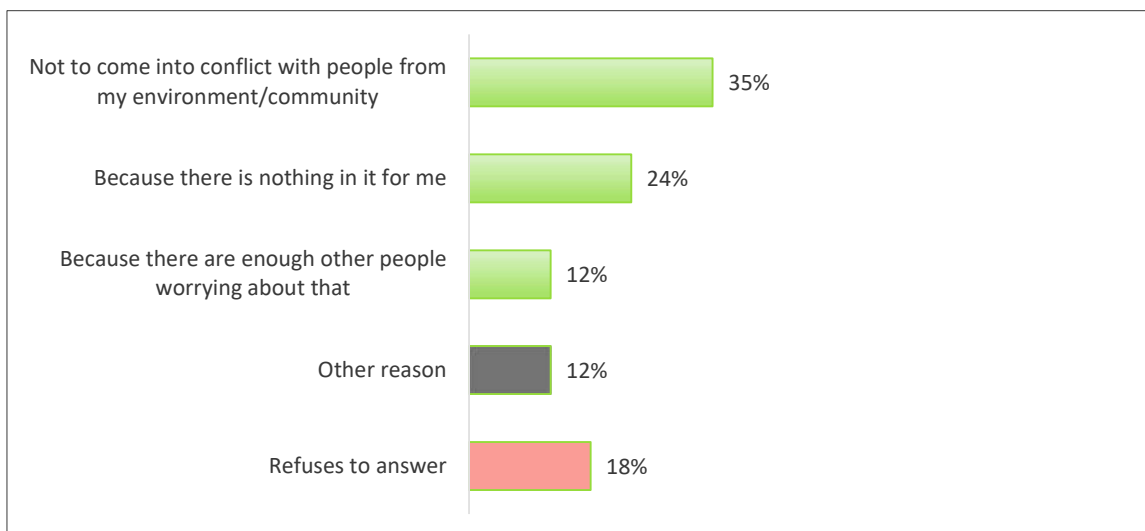
Chart 3.11. Steps one would take if he/she finds out some information about poisoning



Farmers and hunters in North Macedonia are relatively divided on whether and under what conditions they would report cases of wildlife poisoning to the police.

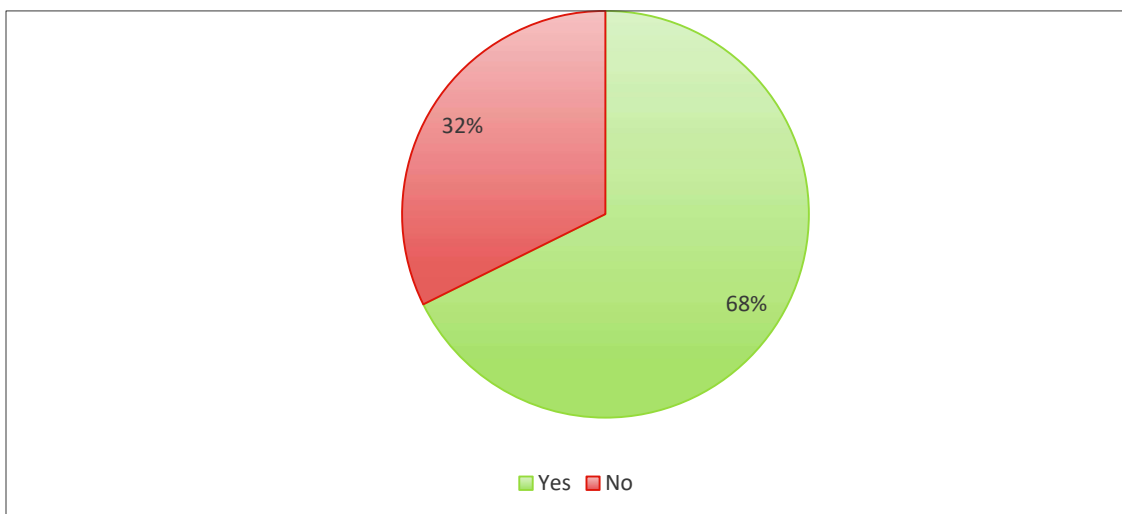
4 out of 10 would report such cases, regardless of the possible negative consequences for them personally, while 3 out of 10 wouldn't if there were a risk for interpersonal problems with members of the community.

About one quarter of the respondents do not show a readiness to participate in identifying those responsible for wildlife poisoning.

Chart 3.12. Reasons for not reporting poisoning

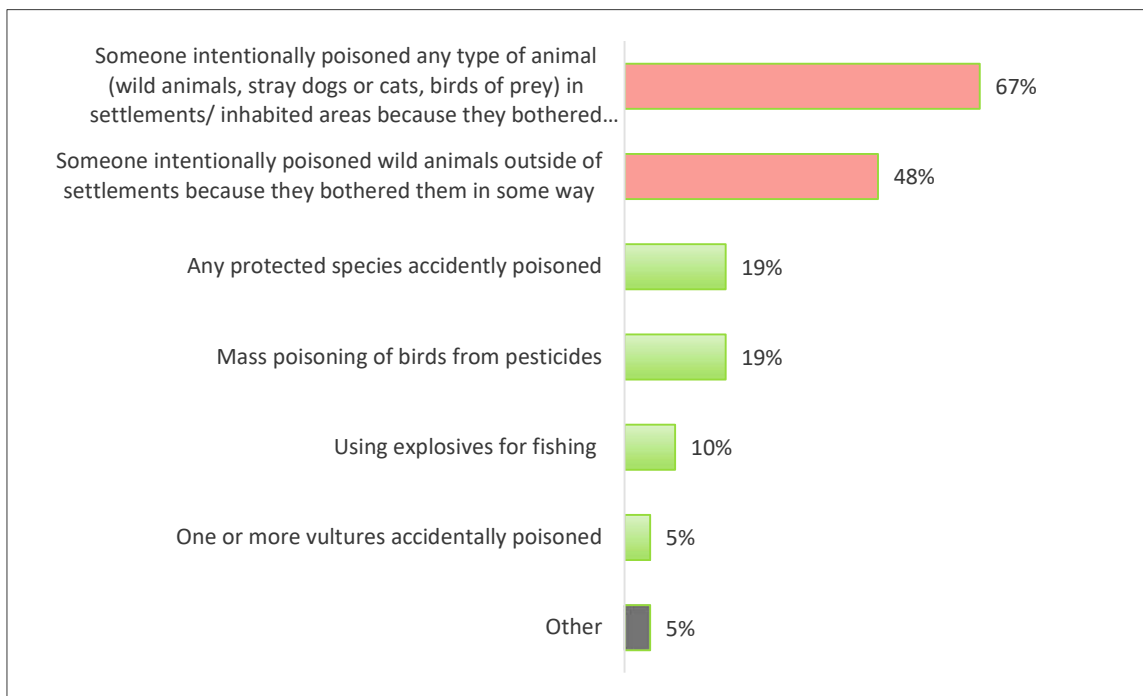
Base: 17 respondents who wouldn't report the poisoning or those who would, but only if that couldn't cause negative consequences

Those who show concerns about the consequences of reporting wildlife poisoning cases and those who would not engage in such a procedure cite the need to avoid conflicts and potential disapproval from people around them as the most important reasons for not reporting poisoning (35%), or simply do not see any personal benefit in this type of engagement (24%).

Chart 3.13. Knowledge about poisoning incidents

About two thirds of individuals who participated in the survey claim they are familiar with at least one case of poisoning in the past 10 years in their community.

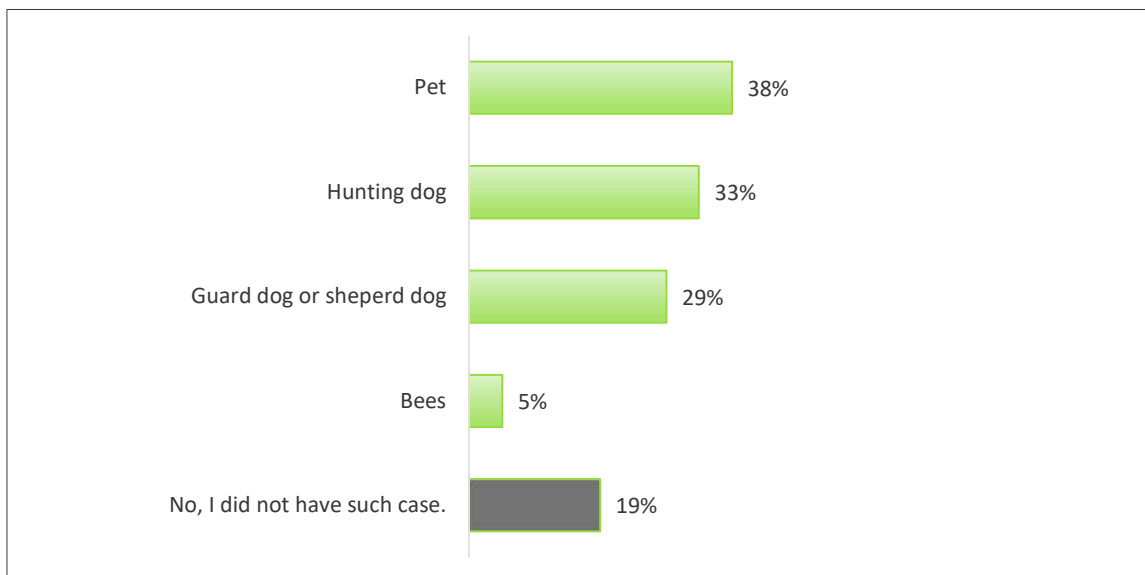
Chart 3.14. Poisoning incidents



Base: 21 respondents who heard for at least one case of poisoning

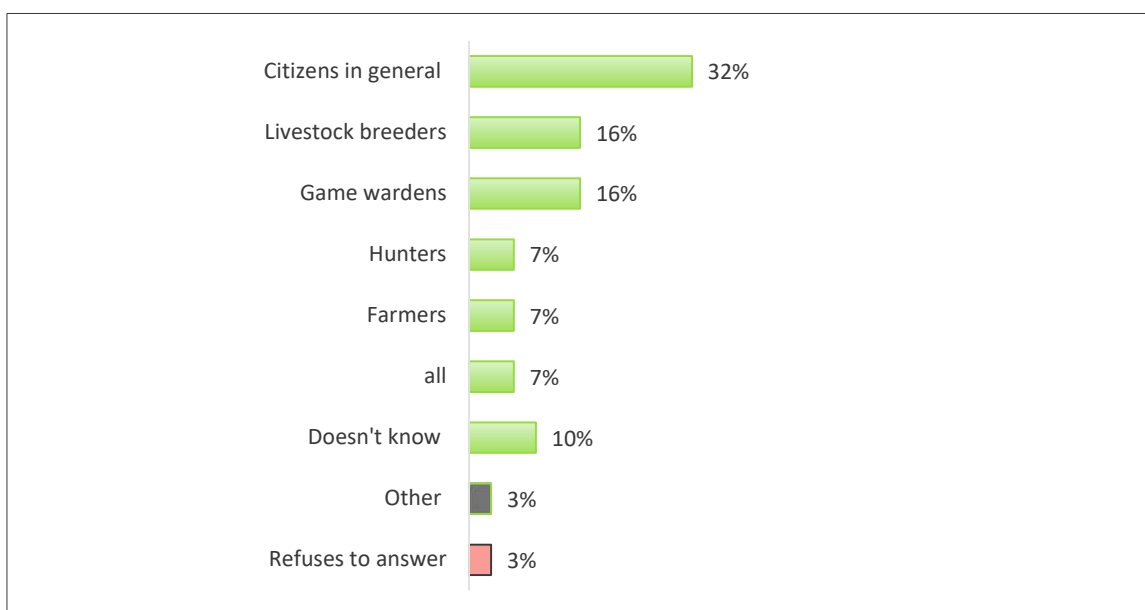
Among those respondents who have information about at least one poisoning incident with animals, most of them said that it occurred when someone intentionally poisoned any type of animal inside the settlement/inhabited area (67%), but also outside of a settlement just because a perpetrator was bothered in some way (48%).

Close to a fifth of the sample (19%) reported that they knew about accidental poisoning of protected wildlife and mass poisoning of birds from pesticides. Only one person claimed he is familiar with vultures being accidentally poisoned.

Chart 3.15. Personal or communal accidents involving poisoned animals

Base: 21 respondents who heard for at least one case of poisoning

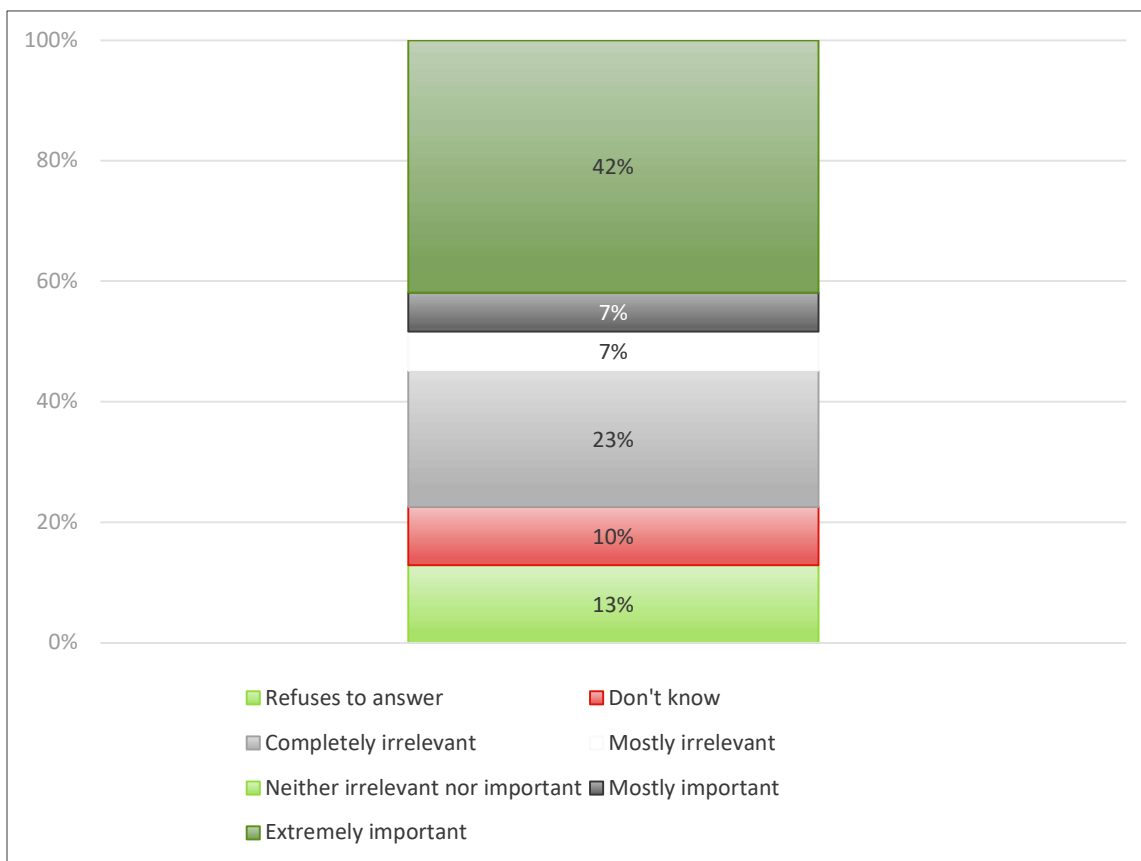
In most cases pets (38%), hunting dogs (33%) or guard/ shepherd dogs (29%) were victims of accidental poisoning in households or the immediate environment of the surveyed inhabitants.

Chart 3.16. Groups that need to become more aware of wildlife poisoning

Base: 31 respondents; Multiple answers

Citizens in general are identified as the target group for the awareness campaign about the threats of wildlife poisoning (32%), livestock breeders (16%) and game wardens (16%) follow.

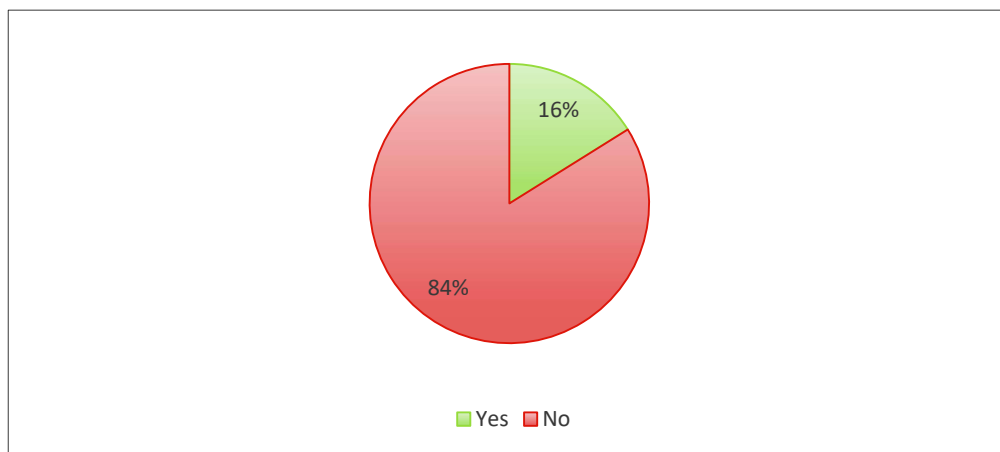
Chart 3.17. Importance of wildlife poisoning investigations, compared to other police work



About half of the members of target groups in local communities believe that compared to other police work, investigations related to animal poisoning are also mostly or extremely important. On the other hand, 3 out of 10 respondents do not think that investigations of this type are relevant compared to the other duties of police representatives.

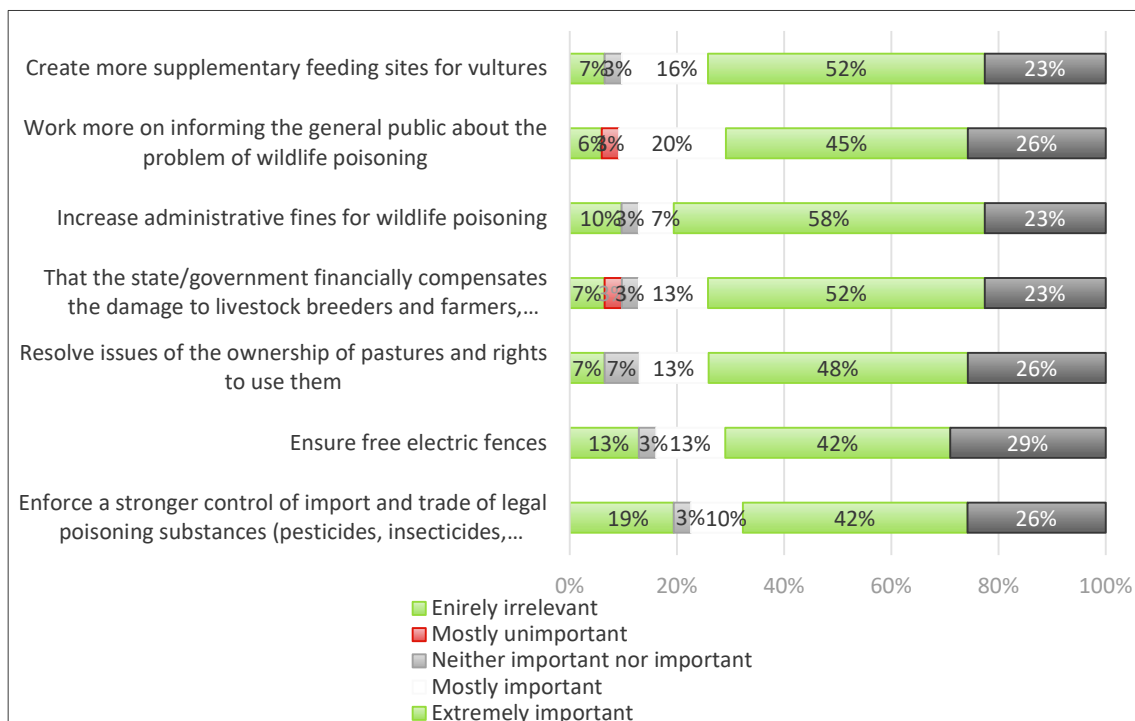
2.3 Measures related to wildlife poisoning

Chart 4.1. Awareness about a specific case of a police investigation for a wildlife poisoning incident



16% of respondents (5 persons) claim that they have knowledge of specific cases of wildlife poisoning investigations on the territory of North Macedonia. Others, i.e., the majority, have no information on such investigations.

Chart 4.2. Importance of undertaking the following measures



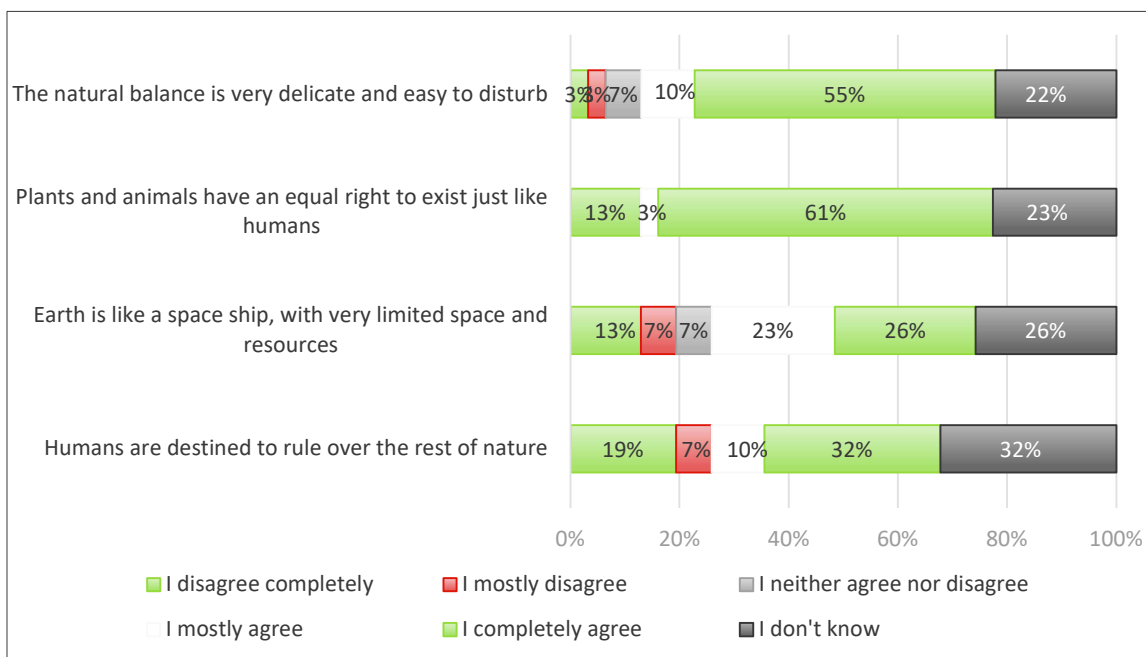
In general, none of the listed measures are considered unimportant, given that over 50% of respondents see each of them as mostly or extremely important.

Around two-thirds of respondents in North Macedonia believe it is important to add more supplementary feeding sites for vultures, put additional effort into informing the public about wildlife poisoning, increase administrative fines for cases of wildlife poisoning, and that financial compensation to livestock breeders and farmers for the damages caused by wild animals should be realized by government institutions.

The results however indicate that there is a notable percentage of respondents that do not have a clear attitude, as around a quarter of them could not determine the importance of each particular listed measure.

2.4 Attitudes towards nature

Chart 5.1. Personal attitudes towards nature



When expressing personal attitudes towards nature, close to two thirds of the respondents believe that natural balance is sensitive and difficult to maintain, and that

no distinction should be made between people, plants and animals. A slightly smaller percentage of respondents (49%) consider that Earth has limited space and resources.

The relationship between man and nature, that is, the decision of who has primacy over whom, causes a somewhat greater division among the respondents, with a third being not sure or not knowing, and 4 out of 10 believing that people are the ones who have the primacy, while a quarter disagree with this idea of human reign over nature.

Annex XVI. Perception of the illegal practice of wildlife poisoning within relevant governmental authorities in North Macedonia – baseline report.

1. METHODOLOGY

1.1 Project background

The BalkanDetox LIFE project (LIFE19GIE/NL/001016) - Strengthening national capacities to fight wildlife poisoning and raise awareness about the problem in the Balkan countries is a project that is dedicated to the fight against illegal poisoning of wild animals which local citizens usually consider as pests, but which has serious negative consequences for the population of numerous endangered animal species, primarily vultures which eat poisoned animals or eat the poison themselves. The study will be conducted in two waves in 2021 and 2025, as a base line and follow up study aimed at measuring the current attitudes and practices, and attitudes and practices of target groups after the implementation of planned campaign and activities.

The project is being implemented at the multinational level in the Balkan region. The countries involved are Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Greece, Northern Macedonia, and Serbia.

1.2 Key research topics

In this first phase, the aims of the research are:

- Measuring awareness of target groups of employees of relevant government services and institutions, law enforcement agencies and veterinary services about endangered species (vultures), methods of poisoning and individuals or groups responsible for poisoning on the territories of their respective countries. Measuring of the current perceptions and attitudes of target groups related to aggravating circumstances and obstacles as well as capacities of the state institutions to prevent, investigate and sanction wildlife poisoning cases.
- Measuring of the current perceptions of target groups related to legislations, procedures, documentation, and processing of wildlife poisoning cases.

1.3 Methodological approach

1.3.1 Research technique

Online Interviews of the targeted groups of relevant governmental services and institutions officials, law enforcement officials and veterinary services employees in North Macedonia.

1.3.2 Fieldwork

The fieldwork was conducted from September the 24th to November the 15st in 2021.

1.3.3 Questionnaire length

Questionnaire length up to 10 minutes.

1.3.4 Sample - target group

The target group in the research were employees of relevant governmental services and institutions, law enforcement agencies and veterinary services in North Macedonia.

Due to difficulties caused by the COVID-19 pandemic, the sample included 15 respondents in total out of 44 employees in targeted institutions.

1.3.5 Sample Structure

Table 1.1. Institutions where respondents are employed

Institutions	Number of respondents
Ministry of Internal Affairs / Forensic service agency	7
State Environmental Inspectorate	3
Faculty of Veterinary Medicine Skopje	3
Ministry of Environment and Physical Planning of the Republic of North Macedonia	2
Base: 15	

Table 1.2. Current job position

Job position	Number of respondents
Employee	7
Middle management level	6
Upper management level	2
Base: 15	

Table 1.3. Years of service in the institution where respondents currently work

Years of service - Institution	Number of respondents
Up to 5 years	3
6-10	3
11-15	5
16+	4
Base: 15	

Table 1.4. Years of service in the department where respondents currently work

Years of service - Department	Number of respondents
Up to 5 years	6
6-10	3
11-15	3
16+	3
Base: 15	

Table 1.5. Direct engagement with the issue of wildlife/animal poisoning in respondents' line of work

Involvement in the issue of wildlife/ animal poisoning animals	Number of respondents
No	6
Yes, both of wild and domestic animals	2
Yes, but only of domestic animals	1
Base: Respondents who don't directly deal with the issue of wildlife poisoning in their line of work, N = 9	

Table 1.6. Involvement in the issue of wildlife/ animal poisoning in respondents' line of work

Direct dealing with wildlife/ animal poisoning	Number of respondents
No	9
Yes, both of wild and domestic animals	4
Yes, but only of domestic animals	2
Base: 15	

Table 1.7. Evaluation of own knowledge about the issue of wildlife poisoning

Evaluation of own knowledge about wildlife poisoning	Number of respondents
5 - Excellent knowledge	0
4	4
3	7
2	1
1 - Very bad knowledge	1
I do not know / I cannot estimate	2
Base: 15	

Table 1.8. Attending educational programmes related to detection and processing of wildlife poisoning incidents

Educational programme attendance	Number of respondents
No	9
Yes	6
Base: 15	

Table 1.9. Educational programmes organizers

Organizers	Number of respondents
Macedonian Ecological Society	3
Civil society organization	1
Vulture Conservation Foundation	1
Balkan detox life	1
Base: Respondents who have attended some educational programme related to detection and processing of wildlife poisoning incidents, N = 6	

Close to half of the respondents (7) work at Ministry of Internal Affairs/ Forensic service agency, while the rest are almost equally split between State environmental inspectorate (3), Faculty of veterinary medicine Skopje (3) and Ministry of environment and physical planning of the Republic of North Macedonia (2).

Majority of respondents work either as employees and at the middle management level (7 and 6, respectively). Respondents differ in the years of service in the institution where they work from up to 5 years to 16 years and above. Majority work in their departments from the start, while a few works slightly less than in their respective institutions of employment.

Close to two thirds of respondents (9) directly deal with the issue of wildlife poisoning in their line of work. Among respondents who don't deal with the issue of wildlife poisoning directly, half (3) dealt with the issue of poisoning of either wild and domestic animals or only domestic animals in their work.

Close to half of the sample (7) evaluate their knowledge about the issue of wildlife poisoning with average grade. About quarter (4 respondents) evaluate their knowledge

with the high grade 4, while small number assesses their knowledge as poor, or they are unable to estimate (2 respondents, each).

Majority of respondents (9 out of 15) didn't attend any educational programme related to the detection and processing of wildlife poisoning incidents. Among respondents who attended at least one of these programmes, 3 respondents attended programmes that were organised by Macedonian ecological society. Others attended programmes organized by VCF or BalkanDetox LIFE project.

2. RESULTS OF ONLINE INTERVIEWS

2.1 Vultures in North Macedonia

Table 2.1. Awareness about vulture species breeding in North Macedonia

Vultures	Number of respondents
Griffon Vulture	12
Egyptian Vulture	7
Cinereous Vulture	2
King Vulture	2
Base: 15	

Majority of respondents recognize that the Griffon Vulture breeds in North Macedonia (12 out of 15). Close to half of the sample is also aware that the Egyptian Vulture breeds in the country. On the other hand, a small number of targeted institutions officials consider that Cinereous Vulture and King Vulture are also present in North Macedonia.

Table 2.2. Awareness of the types of food which vultures feed on in North Macedonia

Food	Number of respondents
Carcasses of wild animals	13
Carcasses of domestic animals	11
Hunted rodents	4

Hunted insects	3
Hunted domestic animals	2
Hunted large mammals	1
Base: 15	

Almost all respondents (13) state that vultures feed on the carcasses of wild animals, while majority also mentions carcasses of domestic animals (11 respondents). Other types of food are mentioned less often.

2.2 Problems of vulture poisoning in North Macedonia

Table 3.1. What endangers the vulture populations in North Macedonia the most?

The main danger	Number of respondents
Wildlife poisoning	7
Extensive use of legal toxic compounds (pesticides, insecticides, rodenticides)	6
Lack of food	1
Poaching	1
Base: 15	

Wildlife poisoning and extensive use of legal toxic compounds (pesticides, insecticides, rodenticides) are perceived as the key threat to the vulture populations in North Macedonia (by around half of the respondents). Other potential threats for the vulture population are identified to a much lesser extent.

Table 3.2. Perceived key causes behind vulture poisoning

Causes	Number of respondents
Because they eat poisoned animals/animals that died of poisoning	8
From poison baits intended for other animals	4
From poison baits intended for vultures	2

I don't know	1
Base: 15	

Secondary poisoning by consuming poisoned animals is perceived as the main cause for vulture poisonings (around half of the respondents). About quarter of respondents mention consuming poison baits intended for other animals.

Table 3.3. Perception about how wildlife poisoning most commonly occurs

The way wildlife poisoning occurs	Number of respondents
Accidentally, by misuse of legal poisoning substances out of negligence/ignorance	8
Intentionally, by misuse of legal poisoning substances (pesticides, insecticides...)	6
Intentionally, with illegal poisons from the black market	1
Base: 15	

The respondents have divided opinions about the way wildlife poisoning most commonly occurs. Half of the respondents claim that wild animals are poisoned accidentally, while the rest believe that they are intentionally poisoned, by misuse of legal poisoning substances such as pesticides or insecticides or by using illegal black-market poisons.

Table 3.4. Perception regarding groups responsible for wildlife poisoning

Groups	Levels of frequency (Number of respondents)			
	Never	Rarely	Occasionally	Often
Livestock breeders	2	3	4	6
Individuals who deliberately poison animals simply because they like killing things	/	7	2	6
Farmers	/	8	3	4
Hunters	/	6	7	2

Pigeon fanciers/breeders	4	7	3	1
Beekeepers	7	5	3	/
Base: 15				

Beekeepers and pigeon fanciers are in general perceived as groups that are rarely or never responsible for wildlife poisoning (12 and 11 respondents, respectively). Livestock breeders, hunters and individuals who intentionally kill animals out of aggressive impulses are on the other hand recognized as the groups the most responsible for poisoning of wild animals.

Table 3.5. Perceived motives behind the poisoning of wild animals

Motives	Levels of frequency (Number of respondents)			
	Never	Rarely	Occasionally	Often
Protection from pests (rats, insects et at.)	/	3	4	8
Protection of pastures and livestock from wild animals (wolves, bears, etc.)	/	4	6	5
Protection of agricultural land from wild animals	/	6	4	5
Protection of agricultural land from birds of prey	/	5	7	3
Protection from stray dogs and cats	/	6	6	3
Protection of hunting activities	1	5	7	2
Protection of pigeons from birds of prey	/	9	5	1
Conflicts among people about land use (pastures, hunting areas)	1	9	5	/
Protection of apiaries from bears	2	10	3	/
Base: 15				

The key motives for wildlife poisoning are protection from pests, protection of pastures, agricultural land and livestock from wild animals, protection of agricultural land from birds of prey, protection of hunting grounds and even protection from stray cats and dogs. On the other hand, protection of apiaries from bears and conflicts among people about the land use are rarely or never motives behind poisoning of wild animals.

Table 3.6. Regions of North Macedonia where wild animals are most frequently poisoned

Regions	Number of respondents
Eastern Macedonia	6
Central Macedonia	5
Western Macedonia	4
North-western Macedonia	3
Southwestern Macedonia	3
Southern Macedonia	2
North-eastern Macedonia	1
South-eastern Macedonia	1
I don't know	5
Base: 15	

Employees of relevant governmental institution are not well informed about the regions of North Macedonia where wildlife poisoning most frequently occurs. They most often mention Eastern and Central Macedonia (around one third of respondents). In addition, around one third of respondents claims to be uninformed about the region(s) where wild animals are most often poisoned.

Table 3.7. Period of the year when wildlife poisoning mostly occurs

Periods of year	Number of respondents
Spring	6
Summer	6
Autumn	3
Winter	2
I don't know	3
Base: 15	

Majority of respondents state that spring and summer are the periods of the year when wildlife poisoning mostly occurs.

Table 3.8. Importance of the aggravating circumstances and obstacles

Aggravating circumstances and obstacles	Levels of importance (Number of respondents)				
	Entirely irrelevant	Mostly unimportant	Neither important nor unimportant	Mostly important	Extremely important
Difficulties with evidence procedures in court	/	1	1	3	10
Complexity of the investigation	/	1	/	5	9
Bad law enforcement	/	1	1	5	8
Expensive toxicological analysis	2	1	/	4	8
Lack of control over the prescribed use of legal poisons, such as pesticides, rodenticides et al.	1	1	/	6	7
Low penalties for wildlife poisoning	1	/	2	6	6
Inadequate and unclear protocols for police action	/	3	2	4	6
Poor reporting of information from witnesses	/	1	2	8	4
Black market for banned poisons on Internet	2	/	3	6	4
Base: 15					

All listed aggravating circumstances and obstacles for prevention and sanctioning of wildlife poisoning are perceived as important by two thirds or more respondents in North Macedonia.

Almost all respondents identify as important the complexity of the investigation, difficulties with evidence procedures in court, inadequate law enforcement, lack of control over the prescribed use of legal poisons, such as pesticides, rodenticides et al., expensive toxicological analysis, low penalties for wildlife poisoning and poor reporting of information from witnesses.

Table 3.9. Personal attitudes towards reporting poisoning incidents to the relevant authorities

Statements related to reporting poisoning incidents	Levels of agreement (Number of respondents)				
	I completely disagree	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree
Veterinarians should report to the police information/knowledge about wildlife poisoning more often	/	/	2	3	10
Hunters should report to the police information/knowledge about wildlife poisoning more often	1	/	1	3	10
Every person should report to the police any information/knowledge about wildlife poisoning	1	/	1	4	9
People/citizens do not know who to report animal poisoning incidents to	1	/	1	10	3
People who report someone from their community for poisoning wild animals risk altercations and conflicts in their community	1	3	4	6	1
It is known which individuals poison animals in this area, it is a „public secret“	/	5	3	6	1
Poisoning mostly takes place in remote locations and therefore the perpetrators are rarely identified	2	1	2	10	/
Base: 15					

Almost all employees from relevant governmental institutions agree that veterinarians, hunters and every person should more often report to the police information about wildlife poisoning (13 respondents per each statement). In addition, similar number of respondents also agree that citizens don't know who to report animal poisoning incidents to.

Two thirds of the sample mostly agree that poisoning generally takes place in remote locations posing a serious barrier for identifying of the perpetrators.

Table 3.10. Groups that need to become more aware of wildlife poisoning

Groups	Number of respondents
Livestock breeders	7
Citizens in general	4
Game wardens	3
Hunters	1
Base: 15	

Close to half of the respondents believe that livestock breeders are identified as a group that needs to become more aware of wildlife poisoning. Citizens in general and game wardens follow.

Table 3.11. Personal attitudes towards investigation of wildlife poisoning incidents

Statements related to the investigation of wildlife poisoning incidents	Levels of agreement (Number of respondents)				
	I disagree completely	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree
Specialized police units for environmental crime, including wildlife poisoning, are needed	1	1	1	4	8
More people are needed on the field (police, environmental inspectors, rangers etc.) for timely detection of poisoning incidents	1	/	/	7	7
Lack of coordination among relevant institutions is a bigger problem than lack of resources	1	/	/	7	7
Police should have specialized canine units for detecting poisonous substances used for wildlife poisoning	1	1	1	6	6

In North Macedonia there are sufficient laboratories with enough capacities to conduct needed toxicological analyses	/	4	2	8	1
Game wardens to often tolerate unlawful practices in hunting areas	/	2	5	8	/
Base: 15					

Almost all respondents agree that the investigation of wildlife poisoning incidents should be improved by involving more people on the field as well as that the lack of coordination among relevant institutions is a bigger problem than lack of resources.

Majority of them also believe that the police forces should be strengthened by introducing specialized police units for environmental crime (including wildlife poisoning) as well as specialized canine units for detecting poisonous substances used for poisoning wild animals.

Table 3.12. Personal attitudes towards legislation and legal processing of poisoning incidents

Statements related to the legislation and legal processing of poisoning incidents	Levels of agreement (Number of respondents)				
	I disagree completely	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree
Rarely are fines imposed under the Hunting Act	/	1	4	5	5
The legal framework for punishing the practice of poisoning animals is good, but the main problem is law enforcement	/	1	4	8	2
Public prosecutors are sufficiently educated for managing incidents related to poisoning of wild animals	3	6	4	1	1

Existing legislation regulates biodiversity protection well enough	3	1	4	7	/
Base: 15					

Regarding legislation and legal processing of poisoning incidents, around two thirds of officials agree that law enforcement represents the main problem even though the legal framework for punishing the practice of poisoning animals is good. They also agree that the fines are rarely imposed under the specific legislation (i.e., Hunting Act).

large number of respondents trusts public prosecutors and their level of education for managing incidents related to the poisoning of wild animals. They are largely divided over whether the existing legislation regulates biodiversity protection well enough.

Table 3.13. Evaluating the cooperation between governmental institutions and civil society organizations regarding data collection about poisoning incidents

Estimate	Number of respondents
5 - Excellent cooperation	0
4	2
3	6
2	2
1 - Very bad	3
I don't know / I cannot evaluate	2
Base: 15	

Employees in target institutions evaluated the cooperation between governmental institutions and civil society organizations regarding data collection about poisoning incidents on the scale from 1, which represents 'very bad' to 5, which represents 'excellent cooperation'. Majority of respondents stated that the cooperation between governmental institutions and civil society organizations regarding data collection about poisoning incidents is either bad (marks 1 or 2), or they are undecided (mark 3).

Table 3.14. Knowledge of procedures and documentation related to wildlife poisoning

Procedures and documentation	Answers (Number of respondents)		
	Yes	No	I do not know, I am not informed
Is there a database for poisoning incidents of birds in North Macedonia	3	2	10
Is there a National action plan for combating wildlife poisoning in place	1	5	9
Is there a protocol defining procedures and jurisdictions for investigating wildlife poisoning	0	5	10
Base: 15			

In general, there is very little knowledge about the existence of National action plan for combating wildlife poisoning, a protocol defining procedures and jurisdictions for investigating wildlife poisoning and a database for poisoning incidents of birds. Only 3 respondents (out of 15) state that there is a database related to the wildlife poisoning and 1 stated that there is a National action plan.

Table 3.15. Knowledge of database for poisoning incidents

Database related questions	Answers (Number of respondents)		
	Yes	No	I do not know, I am not informed
Is there a clear protocol for documenting poisoning incidents in the database	1	1	1
Do you ever use data from the existing database for carrying out work within your jurisdiction	1	2	0

Do you consider that the existing database is adequately used for informing the public and raising their awareness about the problem of wildlife poisoning	0	2	1
Base: Respondents who state that there is a database for poisoning incidents of birds in North Macedonia, N = 3			

Respondents are divided about the existence of a clear protocol for documenting poisoning incidents in the database. Only 1 respondent claims using data from the existing database in his/ her line of work and none of the respondents consider that the existing database is adequately used for informing the public and raising their awareness about the problem of wildlife poisoning.

Table 3.16. Personal attitudes towards punishment of various unlawful actions damaging to animals and the environment

Statements related to the punishment of unlawful actions that damage the nature	Levels of agreement (Number of respondents)				
	I disagree completely	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree
Higher fines are needed for every type of poaching/illegal shooting	/	1	3	3	8
All forms of mass and non-discriminative killing of animals (trapping, poisoning, explosives et al.) should be punished as severely as possible	/	1	/	8	6
Having poison baits should be a separate offense, regardless of whether it has been proven that an animal was killed	1	/	1	8	5
Rangers of protected areas should have the authority to arrest persons who poison animals, if they are caught in the act	/	1	/	10	4

Poisoning of animals should be a criminal offense only if it occurred in a protected area (nature park, national park)	5	3	3	2	2
If poisoning of wild animals occurs in a commercial hunting area, the concessionaire should be deprived of the concession	/	1	4	10	/
Prison sentences should not be administered placing poison baits unless people are not put in danger, but only animals	5	4	3	3	/
Sentences for poisoning of animals should be only administrative (financial), but not imprisonment	6	4	2	3	/
Base: 15					

Almost all representatives of relevant governmental institutions that participated in the research would endorse severe punishments for all forms of mass and non-discriminative killing of animals (trapping, poisoning, explosives, etc.). They agree that rangers of protected areas should have the authority to arrest persons who poison animals, if they are caught in the act, and that having poison baits should be a separate offense, regardless of whether it has been proven that an animal was killed.

Majority of respondents also agree that higher fines are needed for every type of poaching/illegal shooting and that the concessionaire should be deprived of the concession if poisoning of wild animals occurs in a commercial hunting area. Similarly, most of them would favour imprisonment sentences for poisoning of animals as opposed to only administrative (financial) sentences.

Table 3.17. Personal attitudes towards the capacities of the police

Statements related to the capacities of the police	Levels of agreement (Number of respondents)				
	I disagree completely	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree

Specialized police units should be introduced to deal with the crime of wildlife poisoning	1	/	2	6	6
The police do not take seriously the need to launch investigations into wildlife poisoning	1	/	5	3	6
Police investigations about wildlife poisoning should include representatives of the civil society organizations	2	1	7	4	1
The main is problem that incidents are not reported to the police	/	2	3	10	/
Police investigations about wildlife poisoning need expensive and sophisticated technology	/	4	5	6	/
The police is sufficiently equipped for investigating wildlife poisoning	1	3	9	2	/
The police is sufficiently educated for investigating incidents with wild animals	3	7	4	1	/
The police has better things to do and should not waste resources on investigating wildlife poisoning incidents	7	5	3	/	/
Base: 15					

The capacities of the police when it comes to investigating and tackling the poisoning of wild animals are perceived as inadequate, both in terms of human capacities and in terms of education and training of police forces. Most respondents identify the needs for introduction of specialized police units to deal with the crime of wildlife poisoning and imply the need for additional training and education of police forces. Officials are however uncertain or divided about the level of equipment of the police for investigating wildlife poisoning and the need for expensive and sophisticated technology.

In addition, about two-thirds of respondents believe that some effort is needed to change the attitude of the police towards a more serious understanding of the need to investigate wildlife poisoning incidents. Also, similar number of representatives from relevant governmental institutions perceive the lack of reporting of poisoning incidents to the police forces as one of the impediments in the work of police.

2.3 Measures related to wildlife poisoning

Table 4.1. What is necessary to use in police investigations of wildlife poisoning

Necessaries for police investigations	Number of respondents
Toxicological analysis	15
Records of sale of legal poisoning substances (pesticides, insecticides, rodenticides...)	12
Forensic entomology	9
Canine units	9
Confirming time of death of the animals	8
Fingerprint analysis	6
Forensic ballistics	2
Forensic psychology	2
Base: 15	

All respondents state that toxicological analyzes are necessary in police investigations of wildlife poisoning incidents. In addition, almost all respondents recognize the necessity for the records of sales of legal poisoning substances.

Table 4.2. Importance of undertaking some measures to prevent wildlife poisoning

Measures	Levels of importance (Number of respondents)				
	Entirely irrelevant	Mostly unimportant	Neither important nor unimportant	Mostly important	Extremely important
Impose a stricter control of the trade of legal poisoning substances (pesticides, rodenticides et al.)	1	/	1	3	10

Work more on awareness raising among key stakeholders (livestock breeders, farmers, hunters, institutions)	1	1	1	2	10
Work more on awareness raising of the general public	1	/	1	4	9
Create more supplementary feeding sites for vultures	/	/	1	9	5
Completely ban logging in North Macedonia for some time	/	2	3	6	4
Better protect wild ungulate populations	2	/	1	9	3
That the state/government financially compensates the damage to livestock breeders and farmers, caused by wild animals	2	1	2	7	3
Resolve issues of the ownership of pastures and rights to use them	1	4	3	4	3
Ensure free electric fences	1	1	8	4	1
Work of reducing the populations of allochthone animals	/	1	12	1	1
Ensure livestock breeders and farmers are provided with free shepherd and guard dogs	/	3	8	4	/
Base: 15					

Almost all respondents identify creating additional supplementary feeding sites for vultures, imposing a stricter control of the trade of legal poisoning substances, further raising of awareness of the general public and key stakeholders and better protection of wild hoofed populations are the key preventive measures when it comes to wildlife poisoning.

2.4 Attitudes towards nature

Table 5.1. Personal attitudes towards nature

Statements related to the nature	Levels of agreement (Number of respondents)				
	I disagree completely	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree
The natural balance is very delicate and easy to disturb	/	1	/	5	9
Plants and animals have an equal right to exist just like humans	1	1	/	5	8
Earth is like a spaceship, with very limited space and resources	/	2	1	7	5
Humans are destined to rule over the rest of nature	4	6	3	2	/
Base: 15					

Almost all officials agree that the natural balance is very delicate and easy to disturb, that plants and animals have an equal right to exist just like humans and that Earth is like a closed system of the spaceship, with very limited space and resources. Two thirds of the respondents state that humans are not destined to rule over the rest of nature.

Annex XVII. Overview of poisoning incidents in Serbia confirmed by toxicological analysis.

Species	No. of poisoned individuals	Date/ Period	Location	Type of poisoning	Main driver	Substance
Peregrine Falcon	2	2005	Ovčar banja, Čačak	intentional	conflicts with birds of prey	Kreozan
Griffon Vulture	1	13.11.2005.	Goveđak, Sjenica	unintentional	conflicts with stray and feral dogs	Kreozan
Rook	1	24.06.2005.	Odžaci	unintentional	misuse of pesticides in agriculture	Carbofuran
White-tailed Eagle	1	2008	Stapar, Sombor	unknown	unknown	Carbofuran
Griffon Vulture	2	20.06.2008.	Trešnjica gorge, Ljubovija	unintentional	conflicts with stray and feral dogs	Kreozan
Roe deer, Common Pheasant, Wild boar	30, 1000, 3	2010	Kač, Novi Sad	unintentional	Misuse of pesticides	Carbofuran
Black-headed Gull, Mallard	70, 9	15.04.2011.	Ludaško jezero, Subotica	unknown	unknown	Carbofuran
White-tailed Eagle, Common Buzzard	1, 2	07.03.2012.	Farkaždin, Zrenjanin	intentional	conflicts with stray dogs	substance with traces of Arsenic
White-tailed Eagle	5	13.05.2012.	Vajska, Bač	unknown	unknown	Carbofuran
Common Buzzard, Raven, Magpie	6, 8, 2	01.12.2013.	Dobrodol, Irig	intentional	conflicts with predators	Carbofuran
Common Buzzard, Raven, Magpie	6, 7, 1	05.12.2013.	Dobrodol, Irig	intentional	conflicts with predators	Carbofuran
White-tailed Eagle, Common Buzzard, Magpie	8, 3, 7	21.02.2014.	Svilojevo, Apatin	unknown	unknown	Carbofuran
Feral pigeon	1	15.04.2014.	Bela Palanka	intentional	conflicts with birds of prey	Kreozan*
Common Crane	19	24.04.2014.	Sanad, Čoka	unintentional	misuse of pesticides in agriculture	Carbofuran
White-tailed Eagle, Mallard	1, 1	29.04.2014.	Svilojevo, Apatin	unknown	unknown	Carbofuran*
Feral pigeon	1	15.05.2014.	Ram, Veliko Gradište	intentional	conflicts with birds of prey	Carbofuran*
Song Thrush	1	07.10.2014.	Miljakovac, Rakovica	unintentional	conflicts with stray dogs	Kreozan

White-tailed Eagle, Common Buzzard, Magpie	3, 3, 7	14.03.2015.	Svilojevo, Apatin	unknown	unknown	Carbofuran
White-tailed Eagle	1	27.01.2016.	Mošorin, Titel	unknown	unknown	Carbofuran
Common Buzzard	6	22.02.2016.	Čantavir, Subotica	intentional	conflicts with predators	Carbofuran
White-tailed Eagle	2	19.02.2016.	Tovariševo, Bačka Palanka	unknown	unknown	Carbofuran
Common Buzzard	3	03.03.2016.	Sl. Aradac, Zrenjanin	unknown	unknown	Carbofuran
Marsh Harrier, Common Buzzard	3, 1	15.03.2016.	Hajdukovo, Subotica	intentional	conflicts with predators	Carbofuran
White-tailed Eagle	2	26.03.2016.	Erdevik, Šid	intentional	conflicts with predators	Carbofuran
Common Buzzard, Marsh Harrier, Raven	1, 1, 1	06.04.2016.	Temerin	unknown	unknown	Carbofuran*
Common Crane	5	21.04.2016.	Novi Kneževac	unintentional	misuse of pesticides in agriculture	Carbofuran
Common Buzzard	1	27.12.2016.	Bačka Topola	unknown	unknown	Carbofuran
Red Kite	1	02.11.2017.	Ritiševo	intentional	conflicts with predators	Carbofuran
Peregrine Falcon	1	29.11.2017.	NoviSad, Grbavica	intentional	conflicts with birds of prey	Carbofuran
White-tailed Eagle, Common Buzzard, Raven	2, 4, 3	17.12.2017.	Vitijevci, Ruma	unintentional	conflicts with predators	Carbofuran
Common Buzzard	1	18.12.2017.	Bačka Palanka	unknown	unknown	Carbofuran
White-tailed Eagle, Common Buzzard	2, 1	21.12.2017.	Vitojevci	unknown	unknown	Carbofuran
Imperial Eagle	1	08.01.2018.	Svilojevo, Apatin	unintentional	conflicts with predators	Carbofuran
Common Buzzard, Magpie	5, 2	11.01.2018.	Svilojevo, Apatin	unintentional	conflicts with predators	Carbofuran
White-tailed Eagle, Common Buzzard, Magpie	2, 1, 1	14.01.2018.	Svilojevo, Apatin	intentional	conflicts with predators	Carbofuran
White-tailed Eagle	2	01.02.2018.	Vitojevci	unknown	conflicts with predators	Carbofuran
Marsh Harrier	1	23.05.2019.	Novo Orahovo	unknown	unknown	Carbofuran
Common Starling, Collared dove, Feral	22, 10, 55	16.10.2018.	Vršac	unintentional	misuse of pesticides in agriculture	Carbofuran

pigeon						
Magpie	2	17.07.2019.	Srbobran	intentional	conflicts with stray dogs	Carbofuran
Common Buzzard	1	25.10.2019.	Novo Orahovo	unknown	unknown	Carbofuran
White-tailed Eagle	1	25.02.2020.	unknown	unknown	unknown	Carbofuran
Marsh Harrier	2	13.4.2020.	Bačka Topola	unknown	unknown	Carbofuran
Common Crane	5	21.4.2020	Novi Kneževac	unintentional	misuse of pesticides in agriculture	Carbofuran
Golden Jackal	1	13.1.2021.	Dobanovci	intentional	conflicts with predators	Carbofuran

* Poison detected in the bait;

Annex XVIII. Perception of the illegal practice of wildlife poisoning in local communities in Serbia – baseline report.

1. METHODOLOGY

1.1 Project background

The BalkanDetox LIFE project (LIFE19GIE/NL/001016) - Strengthening national capacities to fight wildlife poisoning and raise awareness about the problem in the Balkan countries is a project that is dedicated to the fight against illegal poisoning of wild animals which local citizens usually consider as pests, but which has serious negative consequences for the population of numerous endangered animal species, primarily vultures which eat poisoned animals or eat the poison themselves. The study will be conducted in two waves in 2021 and 2025, as base line and follow up study aimed at measuring the current attitudes and practices, and attitudes and practices of target groups after the implementation of planned campaign and activities.

The project is being implemented at the multinational level in the Balkan region. The countries involved are Albania, Serbia, Greece, Northern Macedonia, Bulgaria, Croatia and Bosnia and Herzegovina.

1.2 Key research topics

In this first base line phase, the aims of the research are:

- Measuring awareness of target groups (hunters, farmers, livestock breeders) about endangered species (vultures), methods of poisoning and individuals or groups responsible for poisoning on the territories of their respective countries.
- Measuring the current attitudes and practices of target groups connected with illegal poisoning of endangered species i.e., vultures.

1.3 Methodological approach

1.3.1 Research technique

Quantitative research of the targeted groups in Serbia conducted by face-to-face PAPI (Paper and Pen Interviewing) and CAWI (Computer Assisted Web Interviewing) techniques.

1.3.2 Fieldwork

The fieldwork was conducted from September the 18th to October the 21st 2021.

1.3.3 Questionnaire length

Questionnaire length up to 10 minutes.

1.3.4 Sample - target group

The target group in the research were hunters, farmers and livestock breeders on the territory of Serbia, which perform their activities in the areas where vultures exist as members of endangered species.

Due to difficulties caused by COVID-19 pandemic, the sample included 45 respondents in total.

1.3.5 Sample Structure

Chart 1.1. Age structure

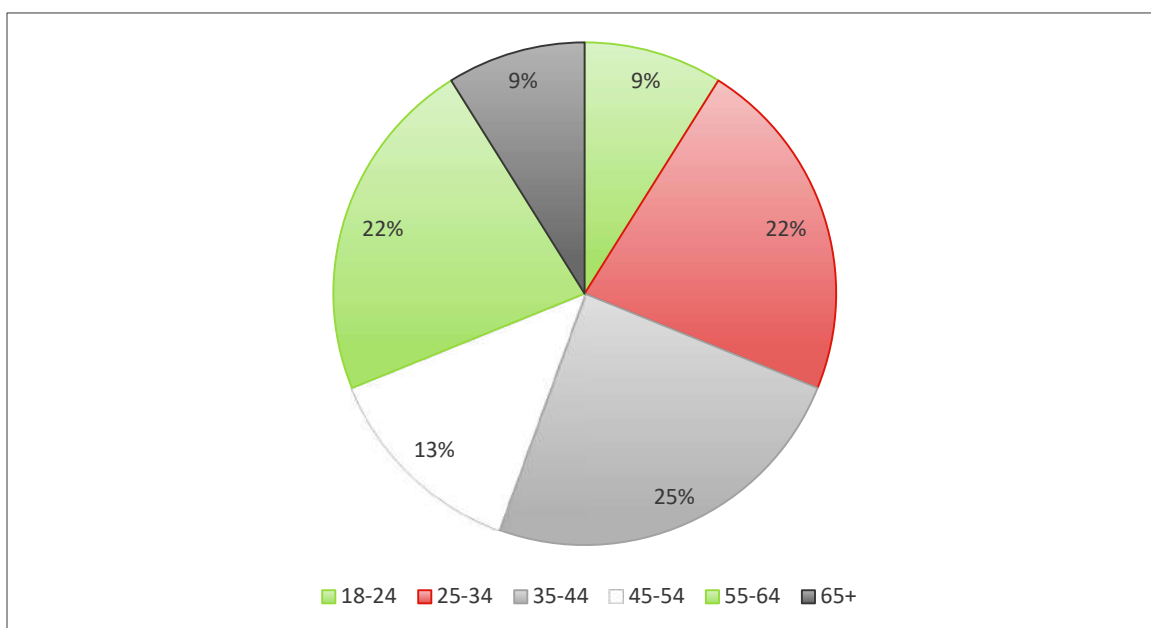


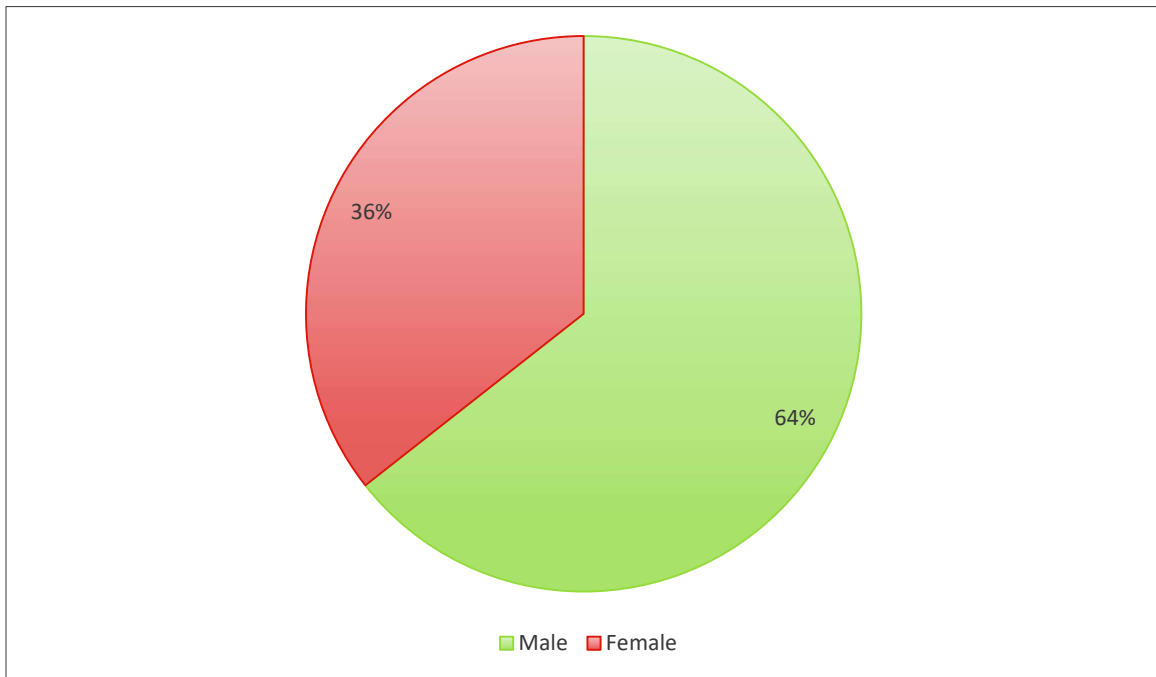
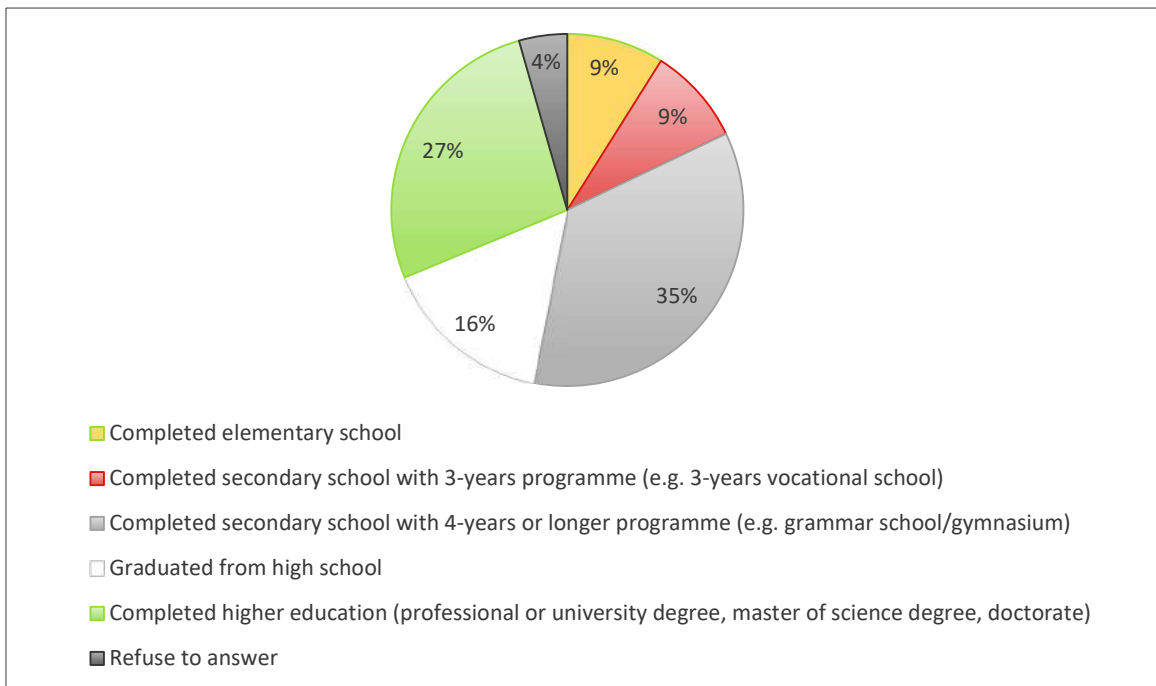
Chart 1.2. Gender*Chart 1.3. Education*

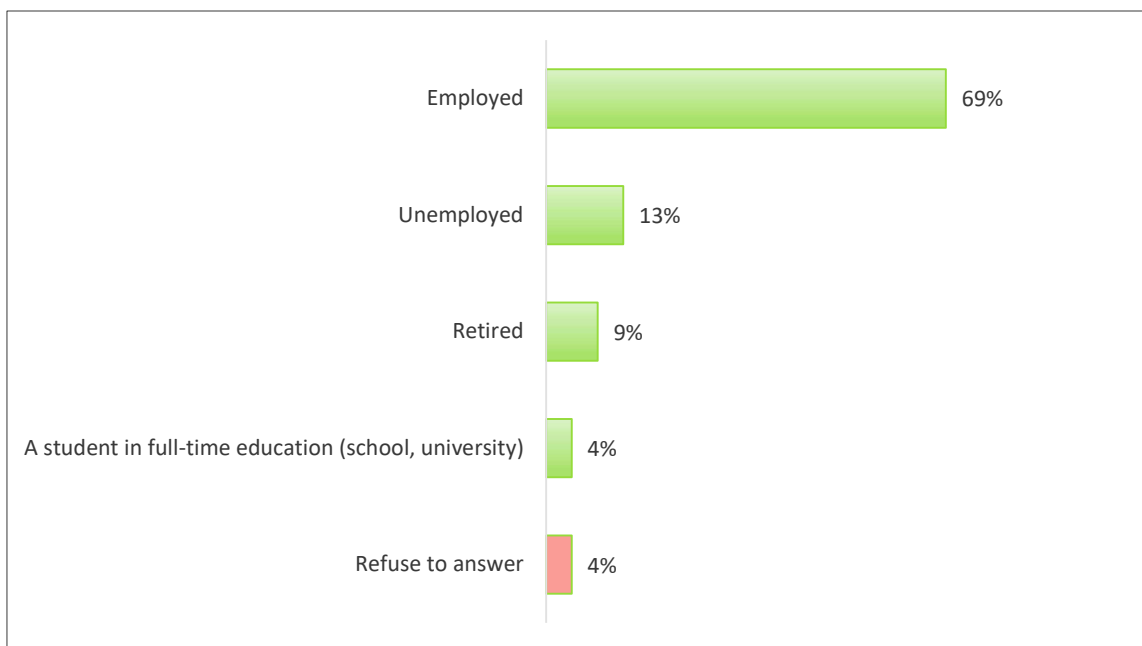
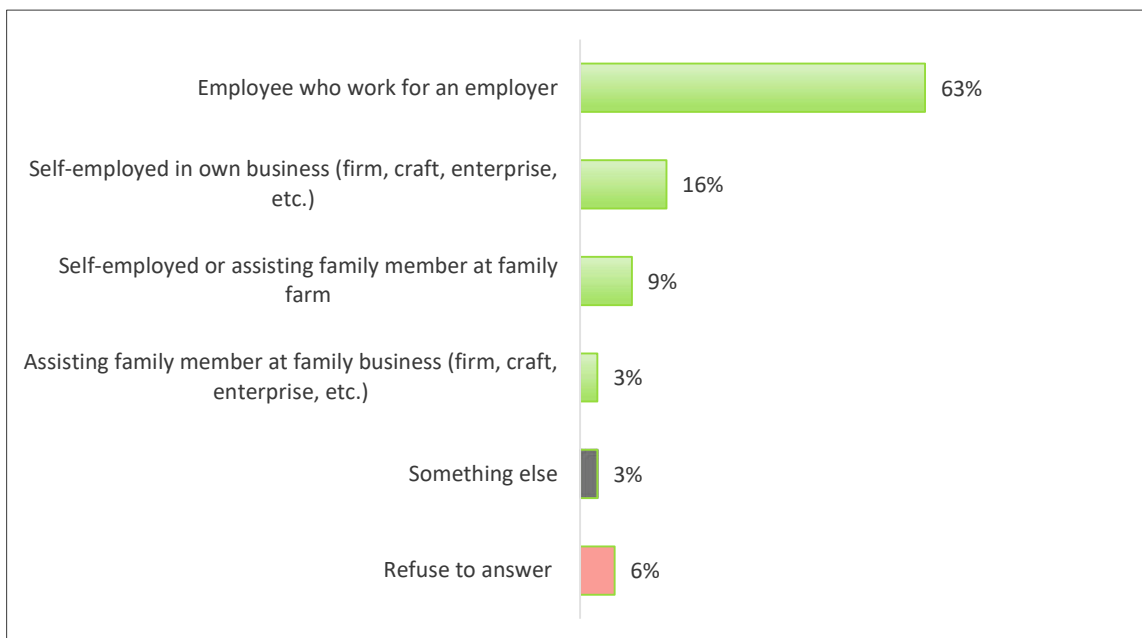
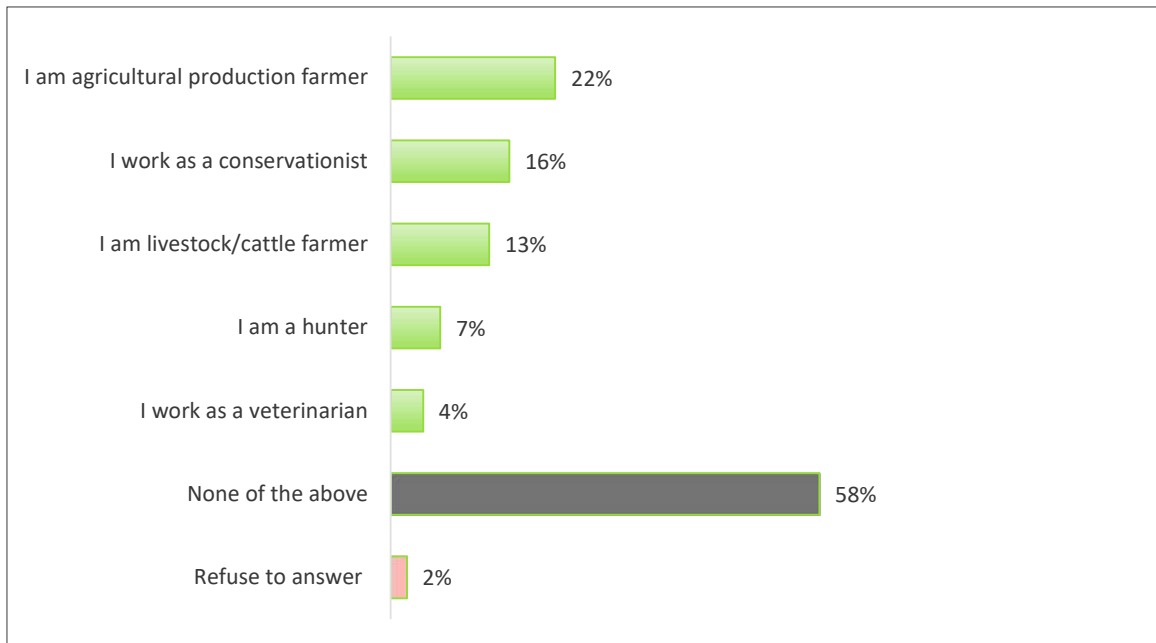
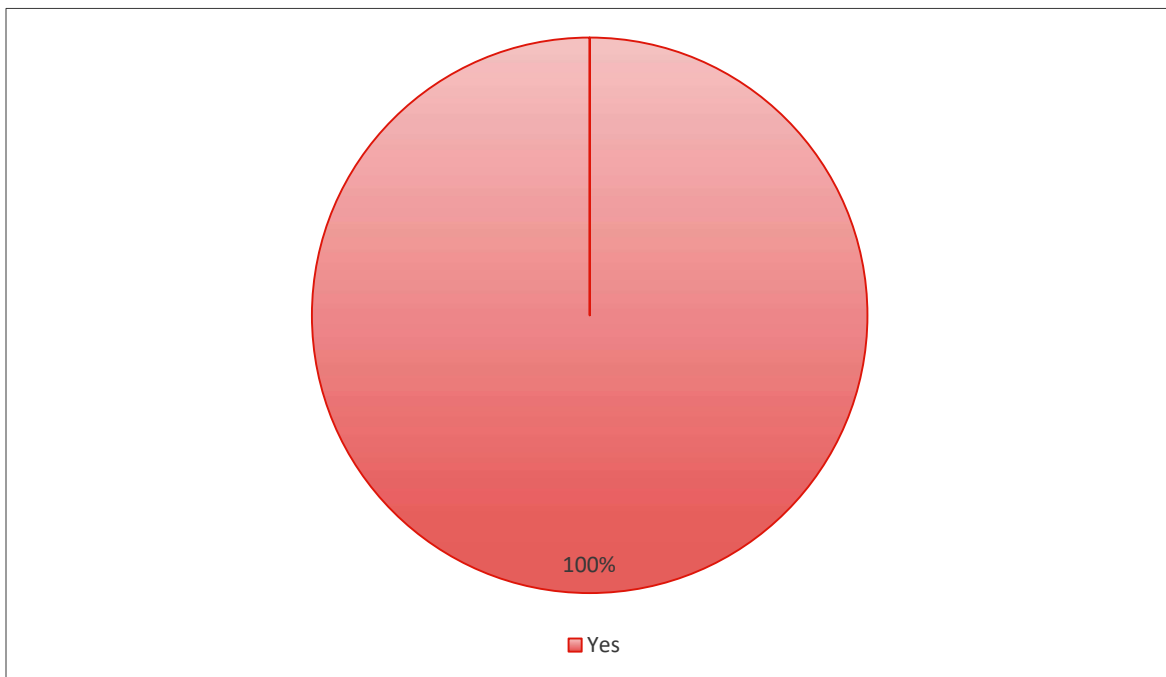
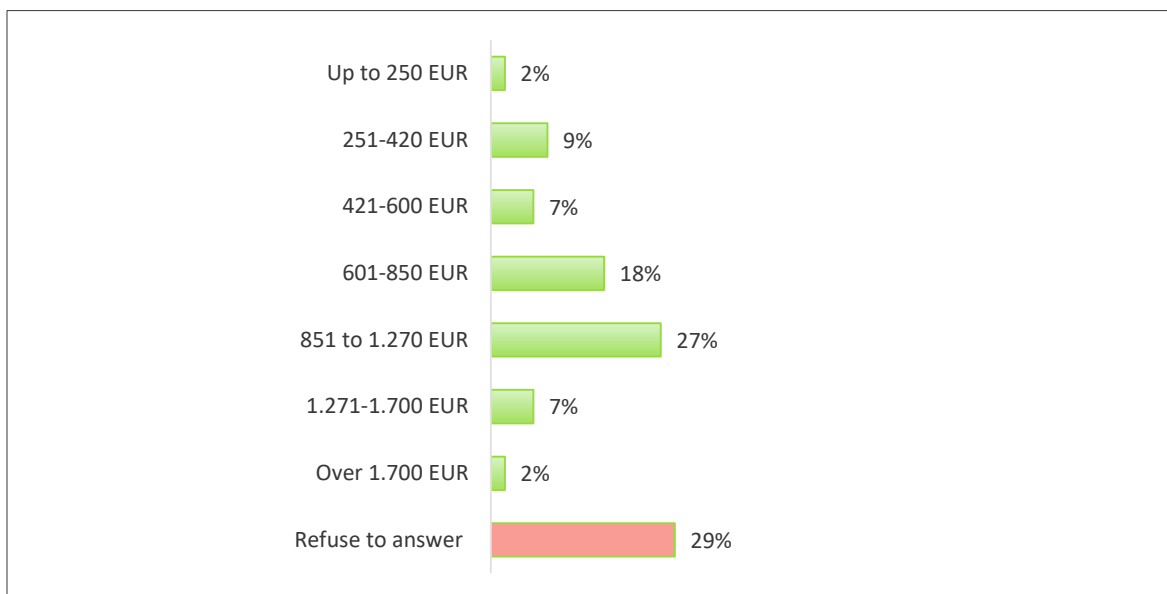
Chart 1.4. Employment status*Chart 1.5. Type of employment*

Chart 1.6. Jobs connected with nature*Chart 1.7. Hunting community*

Base: Hunters, 3 respondents

Chart 1.8. Average monthly income of the household

Almost two thirds of the respondents are men (64%). One fourth of the sample is between 35 and 44 years old. The categories 25-34 and 55-64 are equal in the percentage of respondents (22%). There are 13% of respondents who are between 45 and 54 years old. Other categories, which include the youngest (up to 24 years) and the oldest (older than 65 years) are equal in the percentage of respondents (9%)

The largest number of participants have finished secondary school with 4-years or a longer programme (35%). This category is followed by respondents who completed higher education and those who graduated from high school (27% and 16%, respectively). There is the same percentage of respondents who completed elementary school and secondary school with 3- years or longer programme (9%).

When it comes to jobs connected with nature, the largest number of them are agricultural production farmers (22%). They are followed by conservationists (16%) and livestock/cattle farmers (13%). The smallest number of respondents are hunters (7%), who are followed by those working as veterinarians (4%). All hunters (3 respondents) are members of hunting community. More than two thirds of sample are employed (69%). A similar percentage of respondents are unemployed (13%) and retired (9%). 4% of respondents are students. Among those who are employed, the largest percentage of them work for an employer (63%). They are followed by categories which consist of self-employed in own business (16%) and self-employed or those working by assisting a family member at a family farm (9%). The smallest percent of the sample is consisted of

respondents assisting a family member at a family business (3%). Near 30% of respondents have a monthly income between 851 and 1270 EUR (27%). Almost one fifth of respondents have a monthly income between 601 and 850 EUR. Other categories are consisted of less than 10% of respondents.

1.3.6 Notes on data presentation and analysis

1.3.6.1 Indication of statistical significance

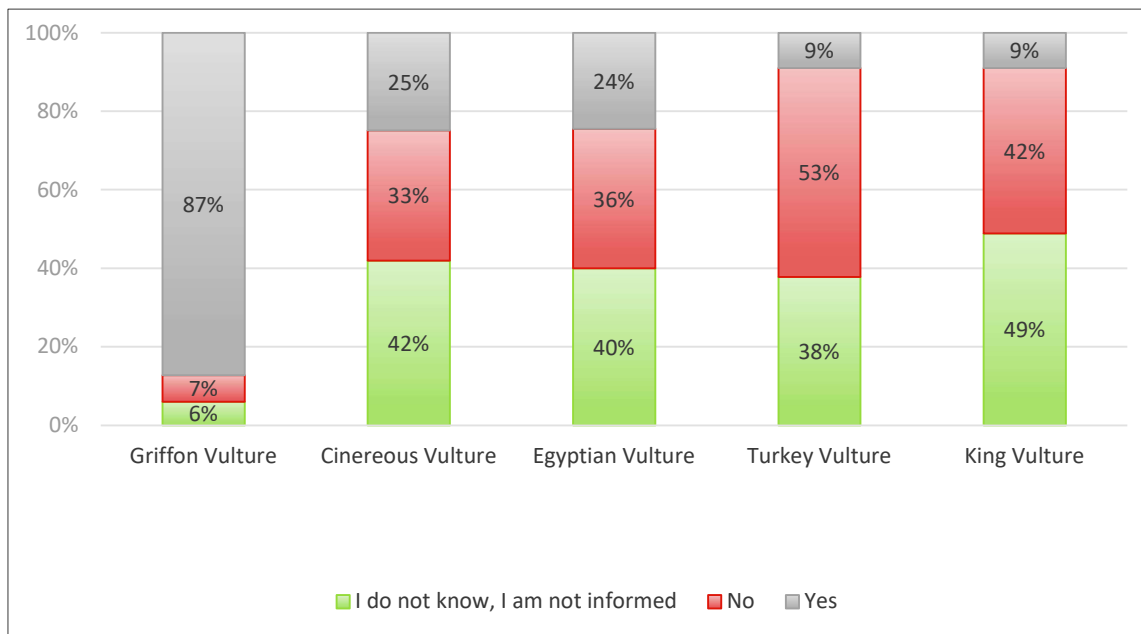
Statistical significance helps us to determine whether the result reflects real differences between groups (in this case female and male respondents, different age categories, etc.) and whether the obtained differences can be generalized to the entire population or should be treated as a consequence of chance.

The usual significance levels of 0.95 were used in this study. This means that the finding (difference between groups) has a 95% chance of being true, and thus can be accepted as a reflection of realistically existing differences between groups. Statistically significantly different values between groups were discussed through the analysis of the results, without graphical representation.

2. RESULTS OF QUANTITATIVE RESEARCH

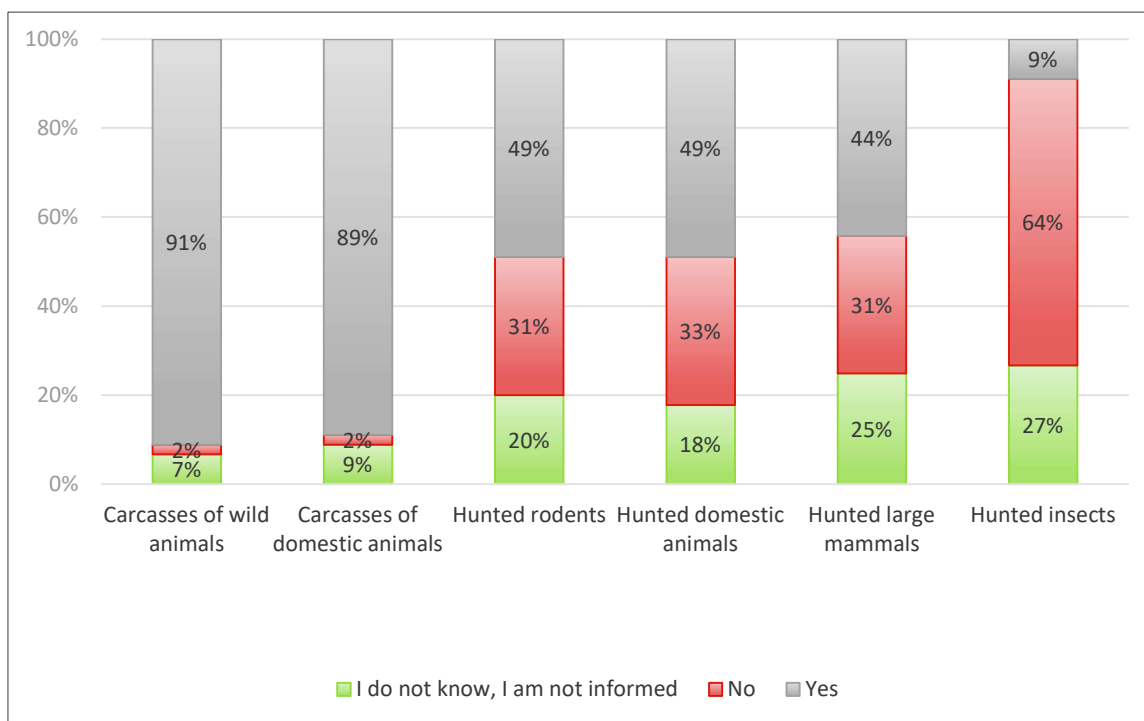
2.1 Vultures in Serbia

Chart 2.1. Awareness about the vulture species breeding in Serbia



In general, the majority of respondents in Serbia are not adequately informed about the presence and breeding of vulture species in Serbia (from 38% to 49% for specific species), except when it comes to the Griffon Vulture, about whom they are most informed about. The majority of respondents from target groups in local communities acknowledge that the Griffon Vulture breeds in Serbia (87%). Regarding the Cinereous Vulture and the Egyptian Vulture, 1 in 4 respondents believe that they still breed in Serbia.

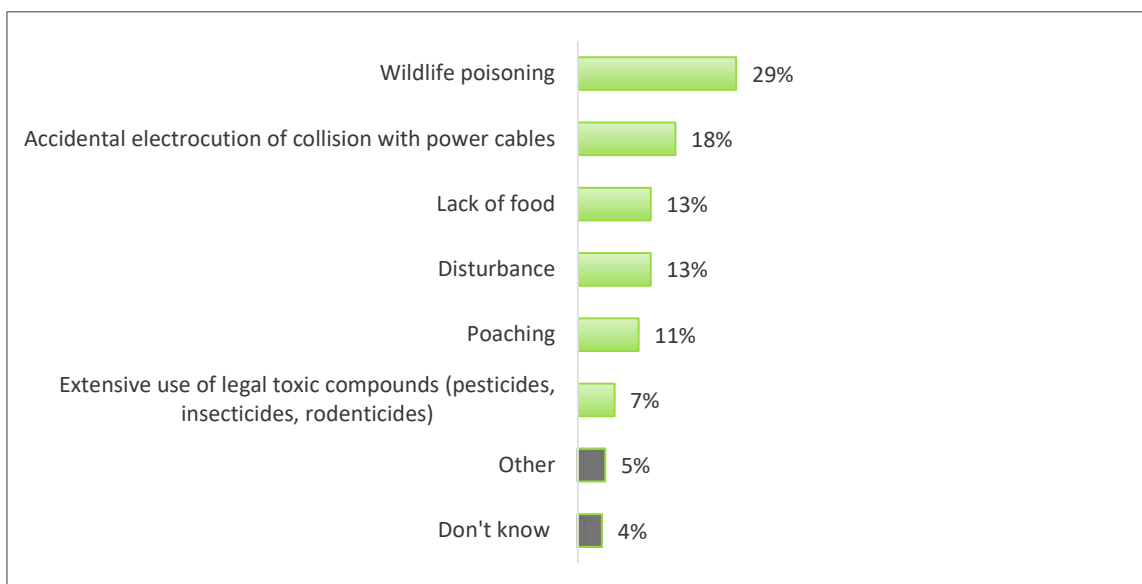
Chart 2.2. Awareness about the type of food which vultures feed on in Serbia



Almost all of the respondents from target groups in local communities in Serbia believe that vultures eat the carcasses of wild animals and the carcasses of domestic animals (91% and 89%, respectively). Groups of those who think that vultures eat hunted rodents and domestic animals are equal in size (49%). They are followed by those who believe that hunted large mammals are a part of the vulture diet (44%). The remaining type of food – hunted insects is perceived to be the least important, as it is considered a part of the vultures' diet by only 9% of respondents.

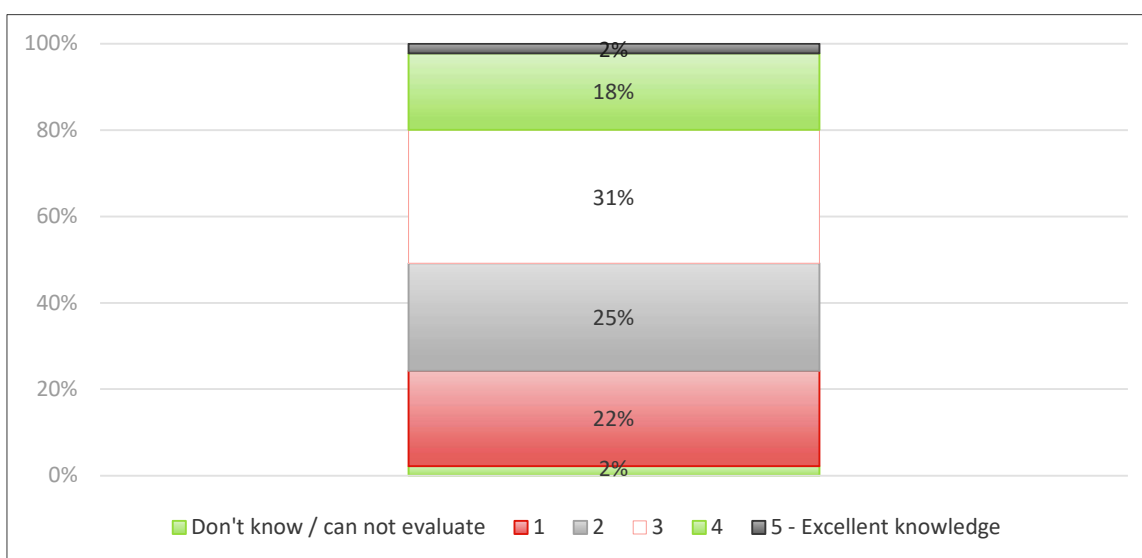
2.2 Problems of poisoning vultures in Serbia

Chart 3.1. What endangers the vulture populations in Serbia the most?



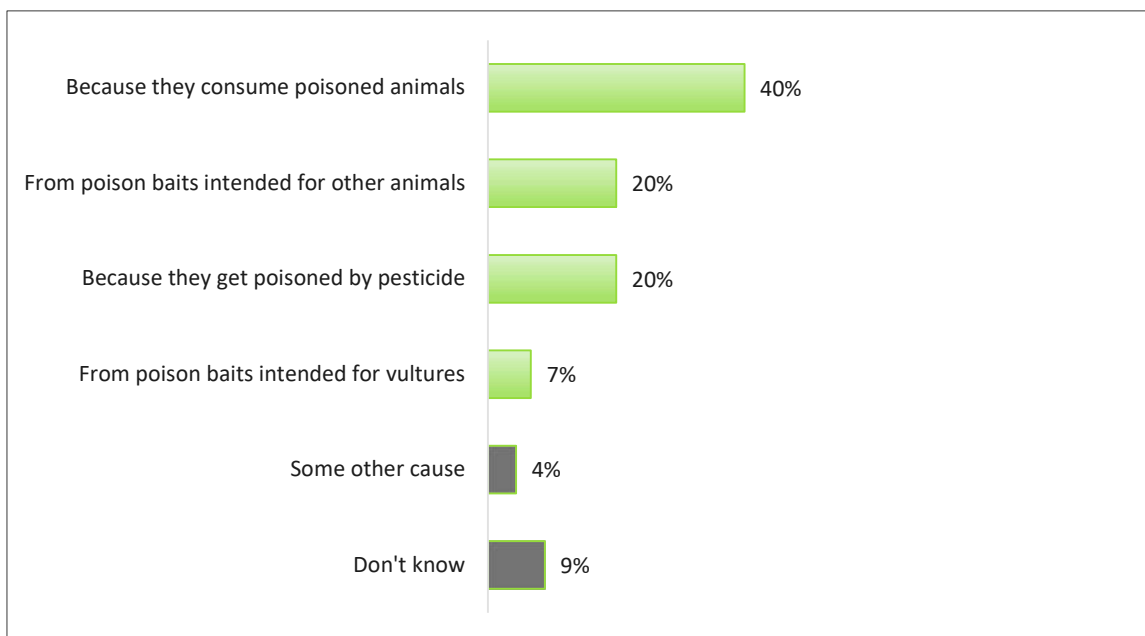
Wildlife poisoning is perceived to be the most important threat that vultures face in Serbia (29%). This is followed by accidental electrocution as a result of collision with power cables (18%). A similar percent of respondents identifies lack of food (13%), disturbance (13%) and poaching (11%) as the main factors which endanger vultures in their country. Extensive use of legal toxic compounds is considered to be the least important threat to vultures in Serbia (less than 1 in 10 respondents.)

Chart 3.2. Evaluation of own knowledge about the issue of wildlife poisoning by inhabitants of local communities in Serbia



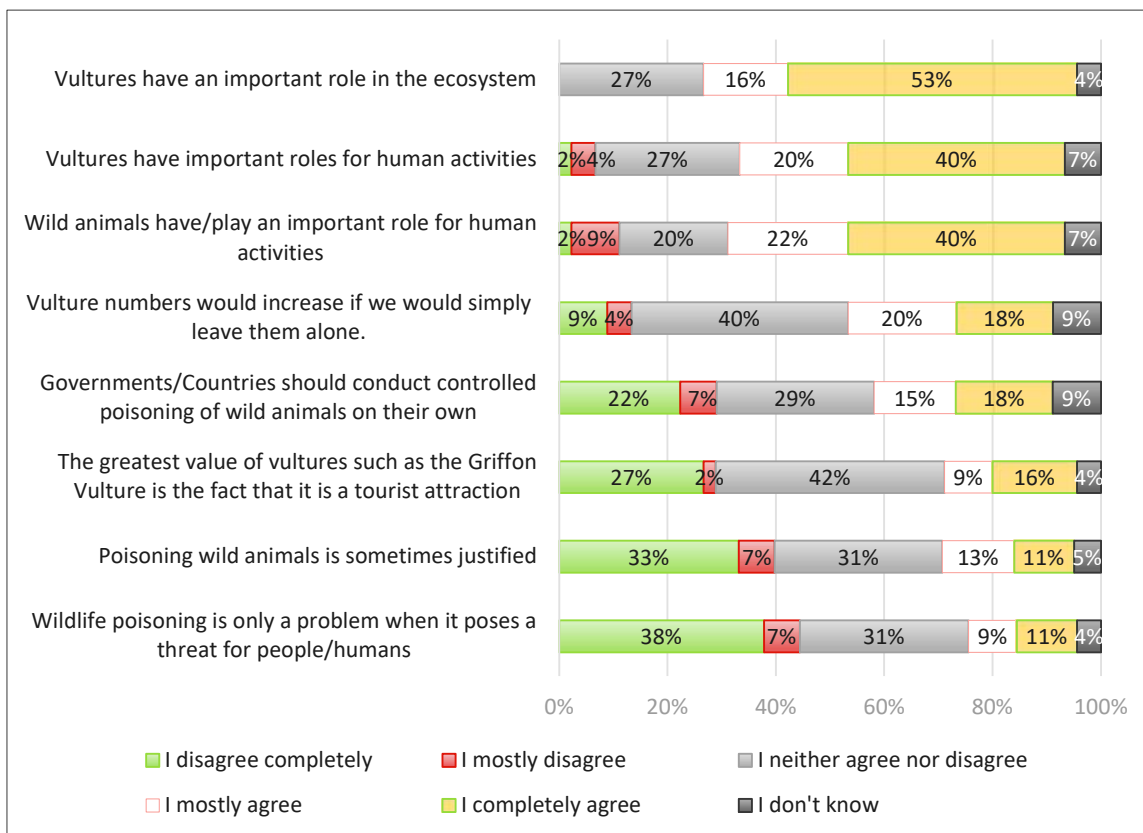
One fifth of the sample of our target groups would grade their own knowledge about the issue of wildlife poisoning with top marks – 4 or 5. Approximately a third of the respondents believe that they have average knowledge about wildlife poisoning. It is noteworthy that one half of the respondents evaluate their knowledge with the lowest grades, i.e., 1 or 2, indicating they are not sufficiently informed about this issue.

Chart 3.3. Perceived key causes behind vultures poisoning



Base: 45 respondents; Multiple answers

Most of the respondents from target occupational groups believe that vultures are not the intended targets of poisoning. The majority think that vultures get poisoned because they consume poisoned animals (40%). The same number of respondents think that the main factors that lead to vulture poisoning are poison baits intended for other animals and pesticides (20% each). Only 7% of respondents think that vultures are most commonly the victims of poison bait that is used for the intentional poisoning of vultures.

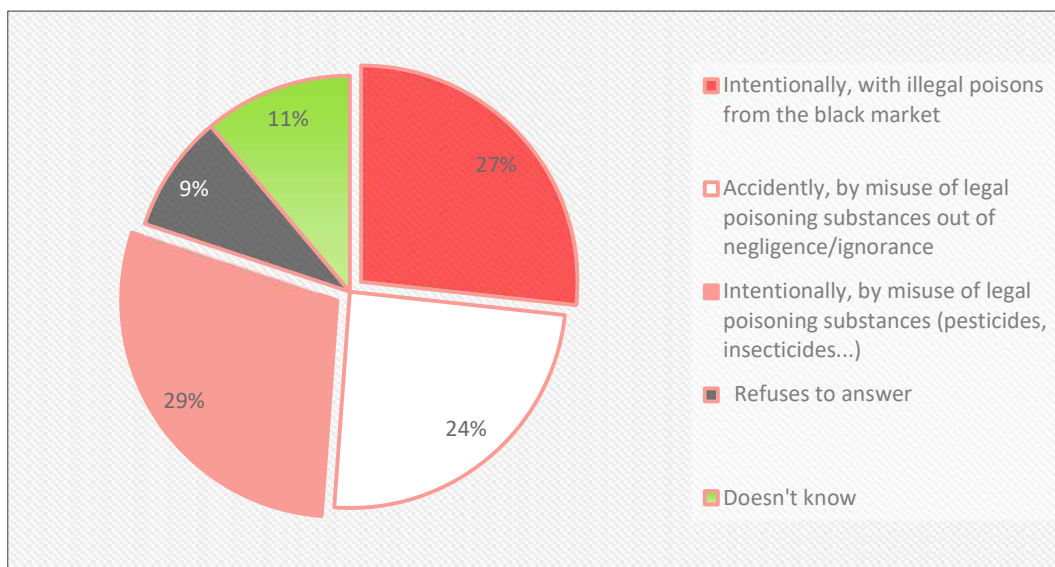
Chart 3.4. Personal attitudes towards vultures

Respondents from our target groups in local communities (agricultural production farmers, livestock breeders, conservations, hunters, and veterinarians) believe that vultures have an important role in the ecosystem (69% agree with this statement). Also, they consider vultures and wild animals in general to have an important role for human activities (60%-62% of respondents agree with these statements).

On the other hand, a third of respondents think that government-controlled poisoning of wild animals is acceptable (33% mostly or completely agree) and a quarter believe that the poisoning of animals is sometimes justified. However, respondents are divided when it comes to these attitudes, as nearly a third do not agree that governments should conduct poisoning of wild animals and 40% of respondents believe that the poisoning of wild animals is not justified.

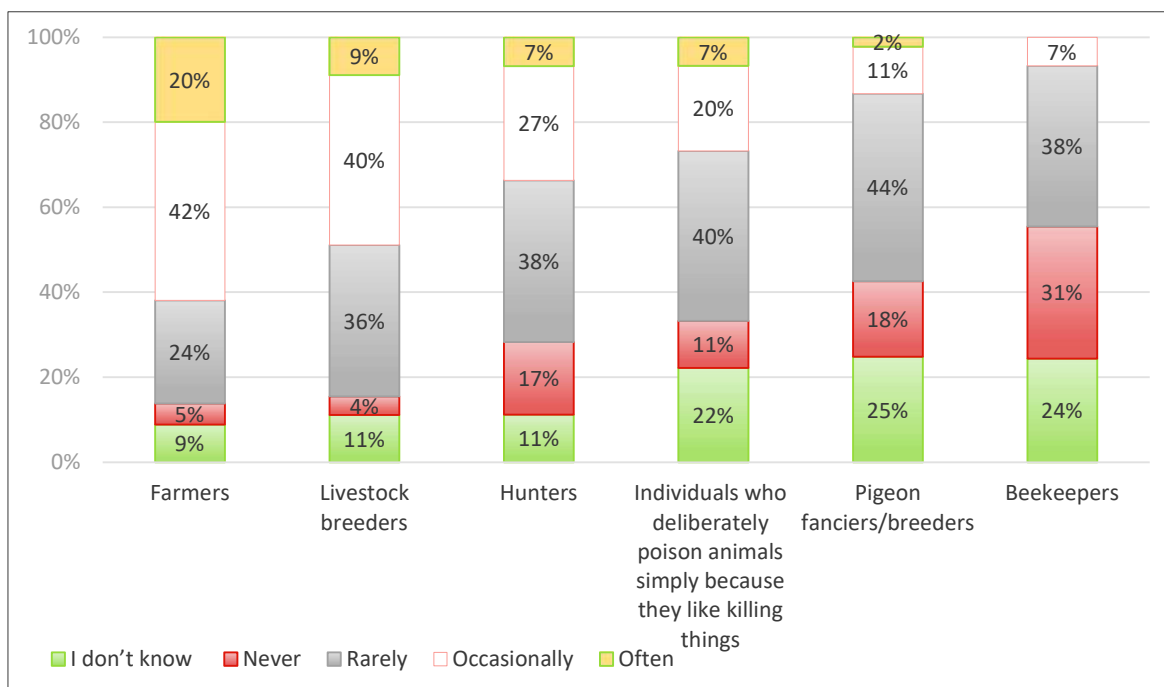
A little less than half of the participants from local communities look at the bigger picture and perceive wildlife poisoning as a wide problem, not only when it poses a threat to humans.

Chart 3.5. Perception how does wildlife poisoning most commonly occur



Nearly 60% of the respondents believe that wildlife poisoning occurs intentionally – either through the misuse of legal poisoning substances or with illegal poisons from the black market (29% and 27%, respectively). One quarter of the sample believe that wildlife poisoning occurs accidentally through the misuse of legal poisoning substances and out of negligence/ignorance.

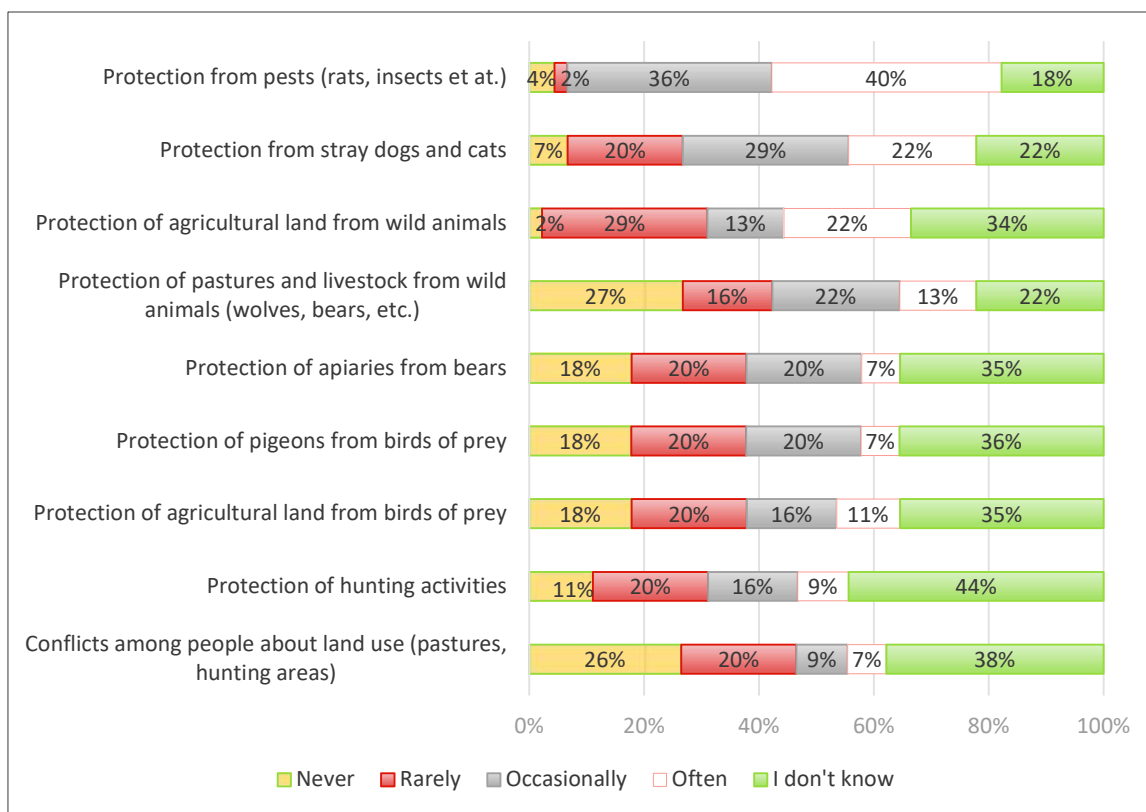
Chart 3.6. Perception regarding groups responsible for wildlife poisoning



Regarding responsibility for wildlife poisoning, 62% of respondents believe that farmers are often or occasionally responsible. Around 50% perceive livestock breeders to be occasionally or often the ones who are responsible. One third of the respondents identify hunters as the ones who are often or occasionally responsible for wildlife poisoning. They are followed by individuals who deliberately poison animals simply because they like killing things (27%).

Pigeon fanciers/breeders are not thought to be accountable for wildlife poisoning, only 13% of respondents think that they are occasionally or often behind wildlife poisoning and 62% of respondents consider them rarely or never responsible. Beekeepers are thought to be the least responsible - as only 7% of respondents think that they are occasionally responsible and 69% of respondents think that they are rarely or never responsible for wildlife poisoning.

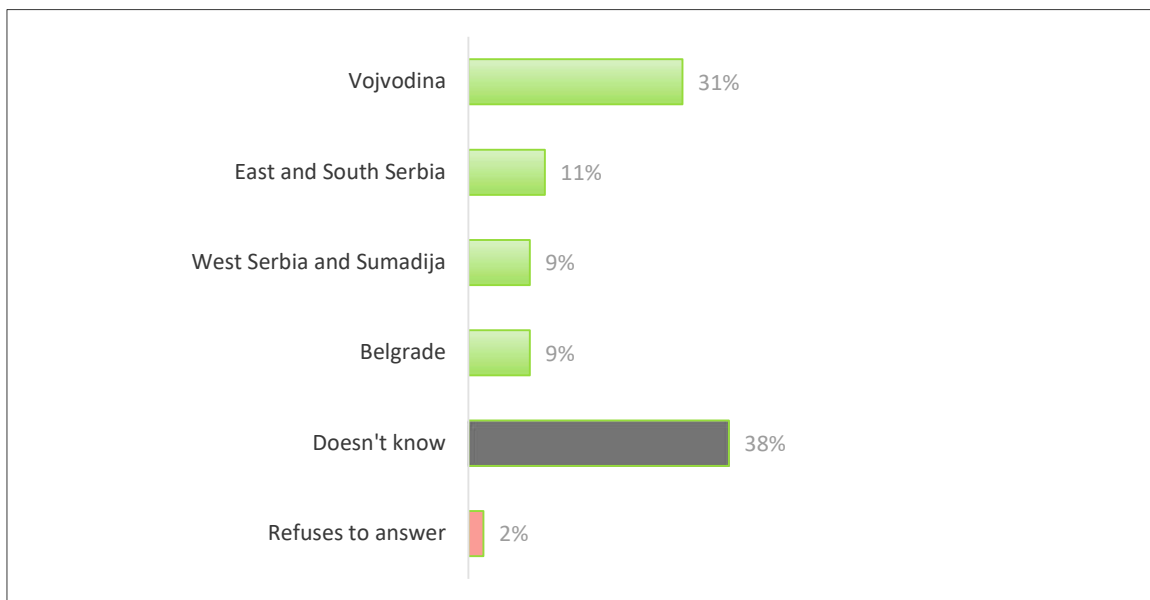
Chart 3.7. Perceived motives behind the poisoning of wild animals



The main motives behind the poisoning of wild animals are *protection from pests* (76% of respondents believe that this motive is 'occasionally' or 'often' behind poisoning), *protection from stray dogs and cats* (51%), followed by *protection of agricultural land and pastures and livestock from wild animals* (35%), *protection of apiaries from bears, pigeons from birds of prey and agricultural land from birds of prey* are perceived as less prominent motives (27% of respondents each believe that these are occasionally or often behind wildlife poisoning.)

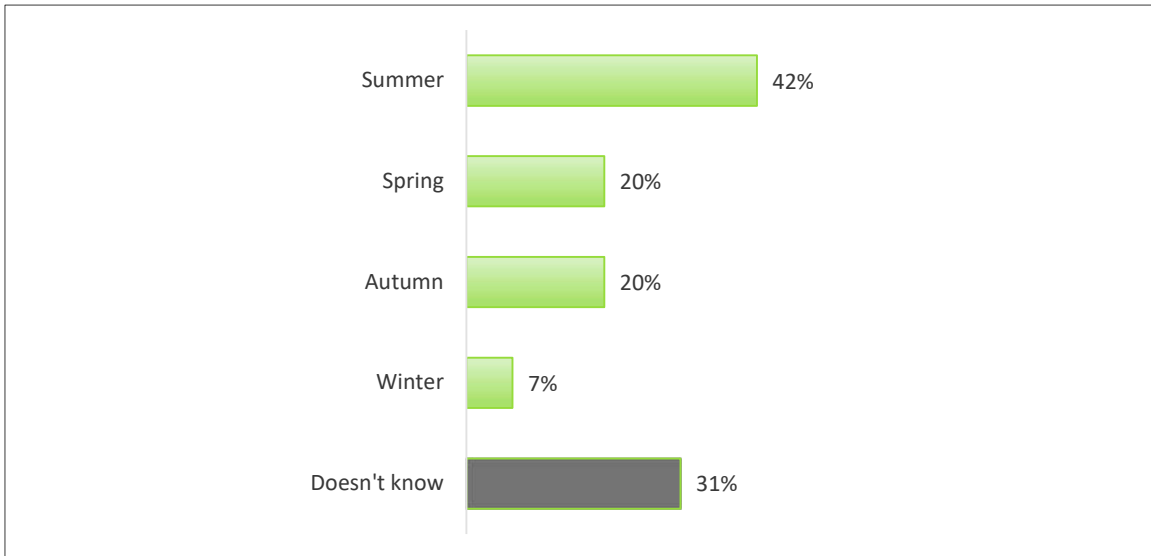
The motives identified by respondents from local communities indicate that there is a need to raise awareness about the detrimental effects of poisoning as a solution, but also to offer better and institutionally supported strategies of dealing with those issues.

Chart 3.8. Regions of Serbia where wild animals are most frequently poisoned



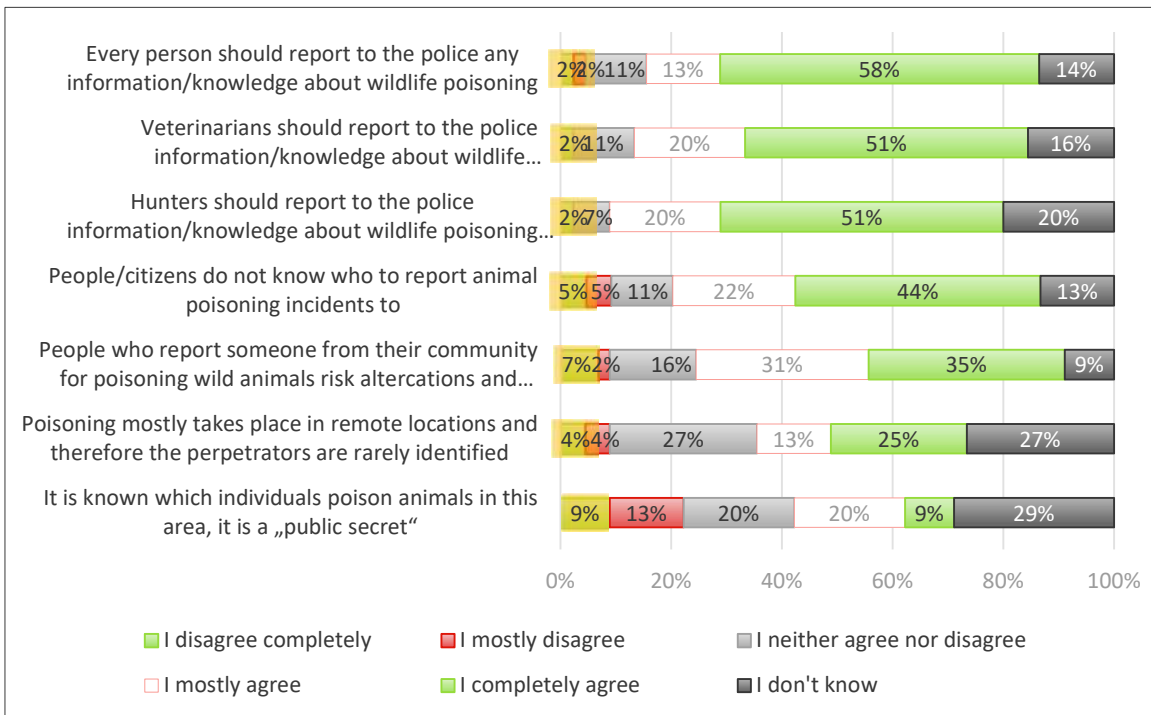
A third of the respondents identify Vojvodina as the region where the poisoning of wild animals most often occurs. Around 1/10 of respondents believe the same for each of the following regions: East and South Serbia, West Serbia and Sumadija, and Belgrade. Nearly 40% of respondents are not informed about this issue.

Chart 3.9. Period of the year when wildlife poisoning mostly occurs



The target occupational groups in hot spots believe that wildlife poisoning most commonly occurs in the summer (42%). This period of the year is followed by spring and autumn (20% each). 31% of respondents do not have knowledge regarding this question.

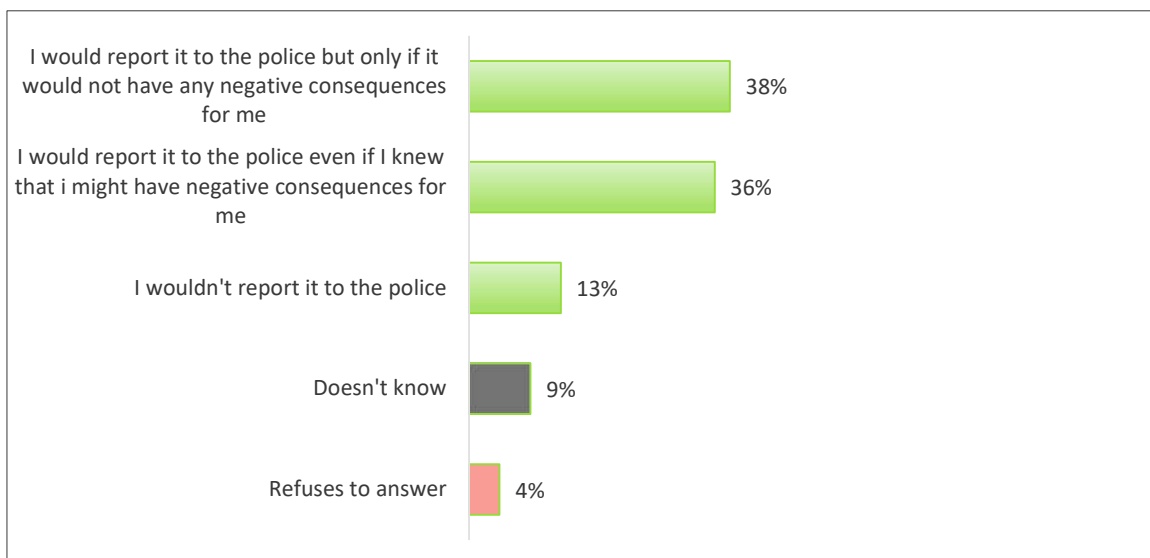
Chart 3.10. Personal attitudes towards reporting poisoning incidents to the relevant authorities



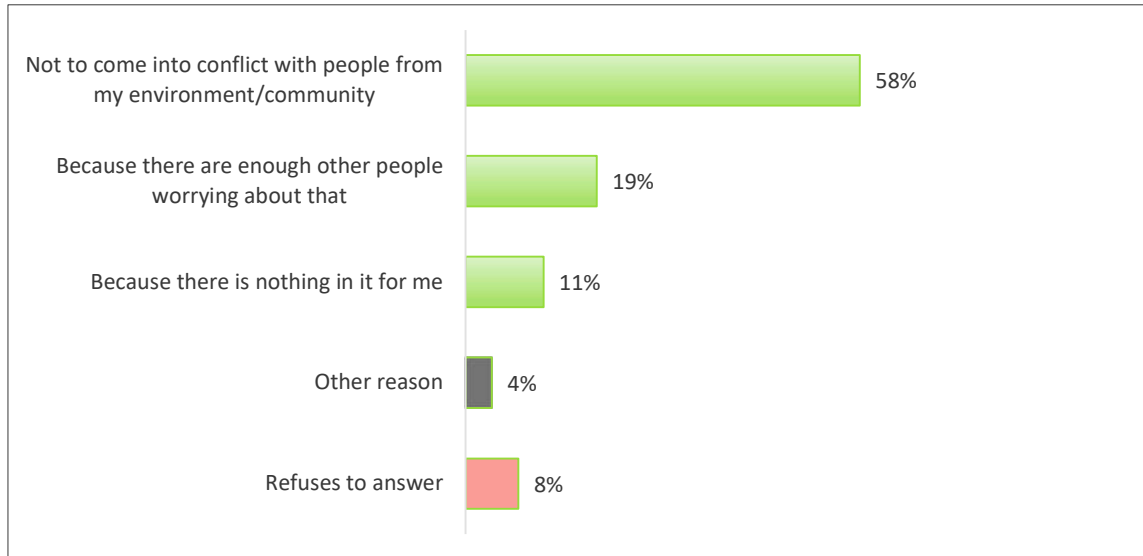
Regarding their personal attitudes towards the reporting of poisoning incidents to the relevant authorities, the majority of respondents (71%) believe that apart from veterinarians and hunters as responsible groups, every person should report information regarding wildlife poisoning to the police.

It is important to highlight that two thirds of the sample believe that people do not know whom to report animal poisoning incidents to, and it implies that the necessary information regarding the reporting process should be distributed to the general population. The same number of respondents also thinks that people who do report poisoning incidents put themselves at risk for altercations and conflicts with other members of their community. This belief could dissuade a number of people and citizens need to be encouraged to go ahead with reporting these cases to the authorities.

Chart 3.11. Steps one would take if he/she finds out some information about poisoning

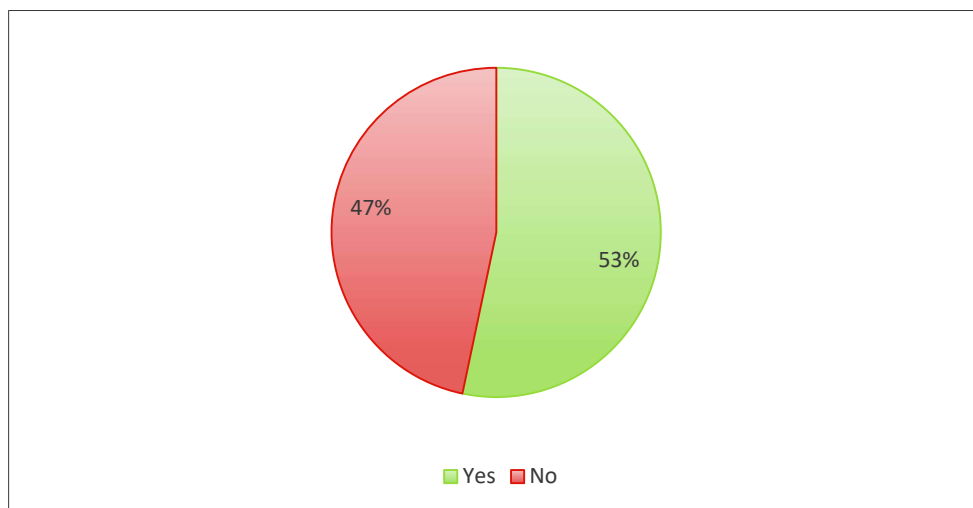


A fear of the potential consequences of reporting is evident among four out of ten respondents, who claim that they would report it to the police but only if it wouldn't have any negative consequences for them. However, a similar number of respondents state that they would report it to the police even if there could be negative consequences for them. Around one out of ten respondents from local communities would not report poisoning to the authorities.

Chart 3.12. Reasons for not reporting poisoning

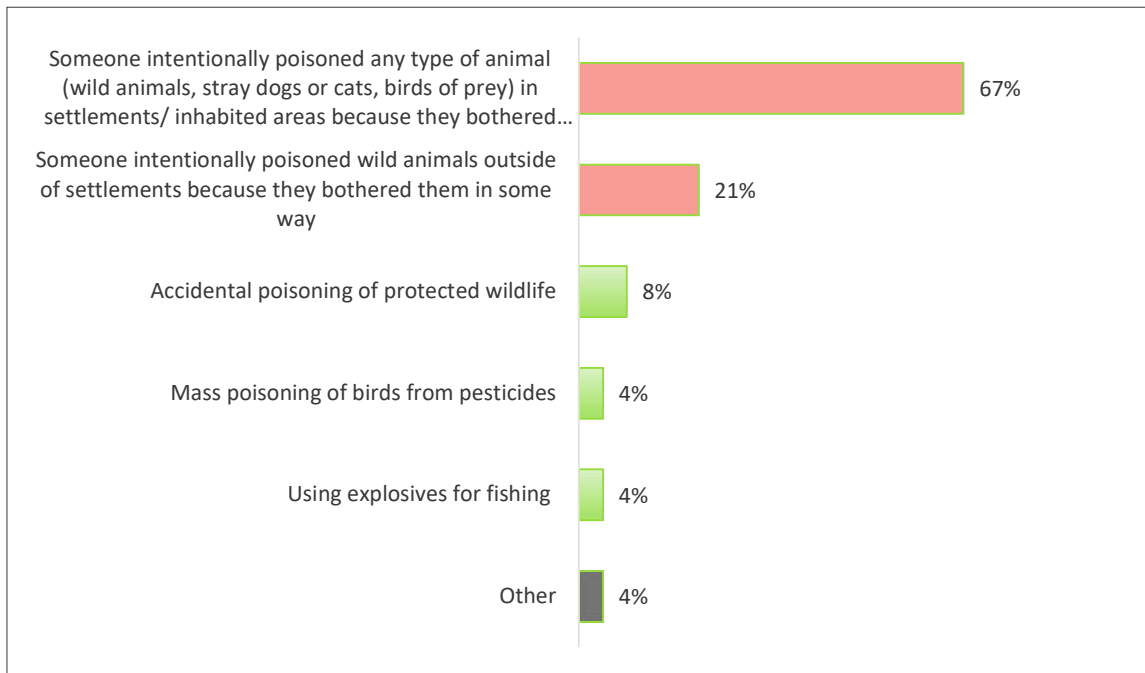
Base: 26 respondents who wouldn't report the poisoning or those who would, but only if that couldn't cause negative consequences; Multiple answers

Among those who wouldn't report poisoning, more than a half of them claim that the main reason for that is avoiding coming into conflict with people from their environment/community. Near 20% of respondents believe that they do not share responsibility for the reporting of poisoning, as there are enough other people worrying about that. A little more than 10% of respondents would not report poisoning as they see no personal gain in it for them.

Chart 3.13. Knowledge about poisoning incidents

More than half of respondents from the targeted groups in local communities (agricultural production farmers, livestock breeders, conservationists, hunters, and veterinarians) claim to know of at least one poisoning incident with animals in their environment/community that happened in the past 10 years.

Chart 3.14. Poisoning incidents

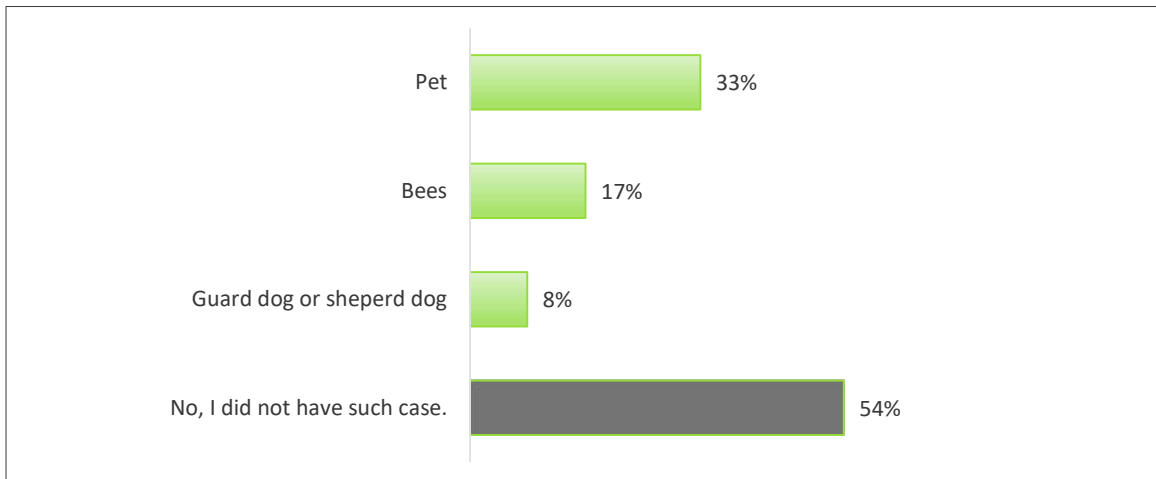


Base: 24 respondents who heard for at least one case of poisoning; Multiple answers

Amongst those respondents who know of at least one poisoning incident with animals in their environment/community that happened in the past 10 years, the majority state that it occurred when someone intentionally poisoned any type of animal in settlements.

More than one fifth of the sample claim that the poisoning occurred when someone intentionally poisoned wild animals outside of settlements because they bothered them in some way. This implies the need for educational campaigns oriented towards citizens in general.

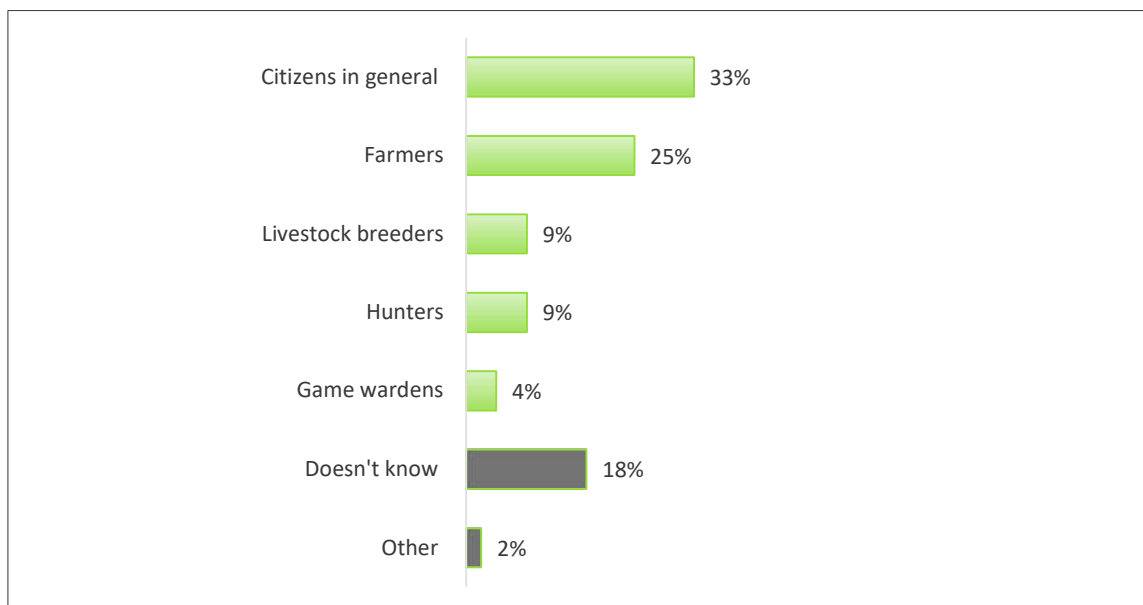
Chart 3.15. Personal or communal accidents involving poisoned animals



Base: 24 respondents who heard for at least one case of poisoning

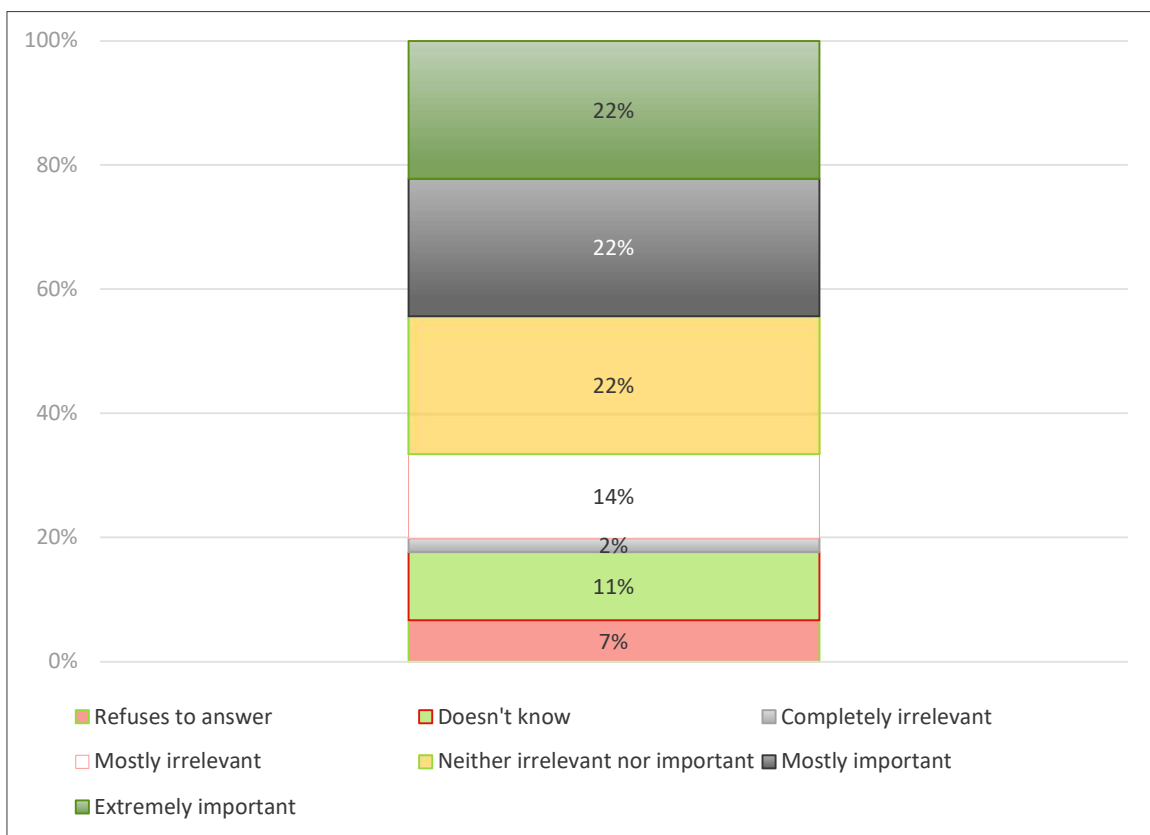
Most of the respondents who did hear of at least one case of poisoning (33%) encountered cases of pet poisoning. They are followed by bees (17%) and guard dogs (8%).

Chart 3.16. Groups that need to become more aware of wildlife poisoning



33% of respondents believe that it is primarily members of the general public – ordinary citizens, whose awareness needs to be raised when it comes to the issue of wildlife poisoning. Farmers follow as the second most important group (25% of respondents believe that they should become more aware of poisoning). Around 10% of respondents think that it is livestock breeders and hunters who should be the target group for awareness raising. Approximately one fifth of the respondents do not know which groups should be prioritized for awareness raising.

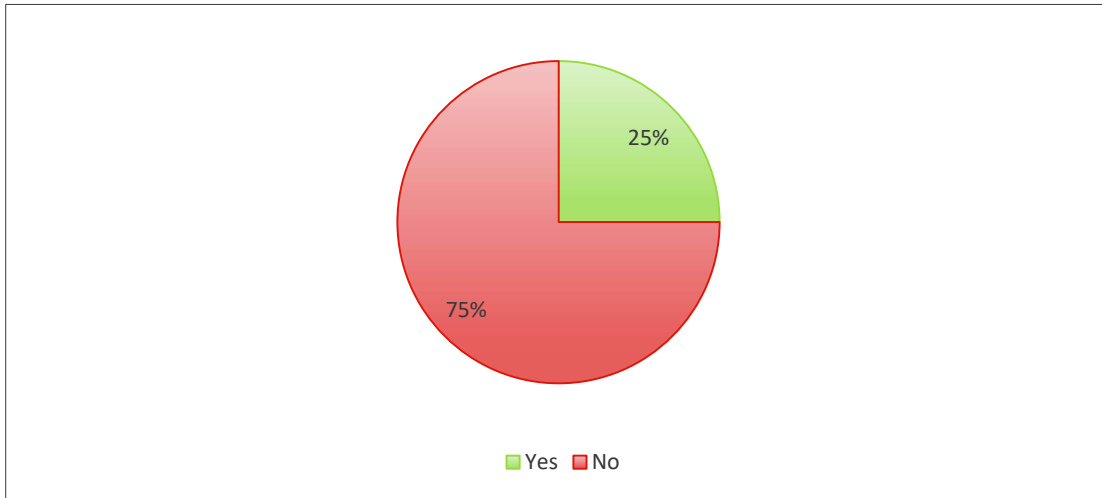
Chart 3.17. Importance of wildlife poisoning investigations, compared to other police work



44% of respondents believe that wildlife poisoning investigations are mostly or extremely important police work (in the context of other police duties). 22% of the sample is undecided on this question and 16% of respondents consider these investigations to be mostly or completely irrelevant.

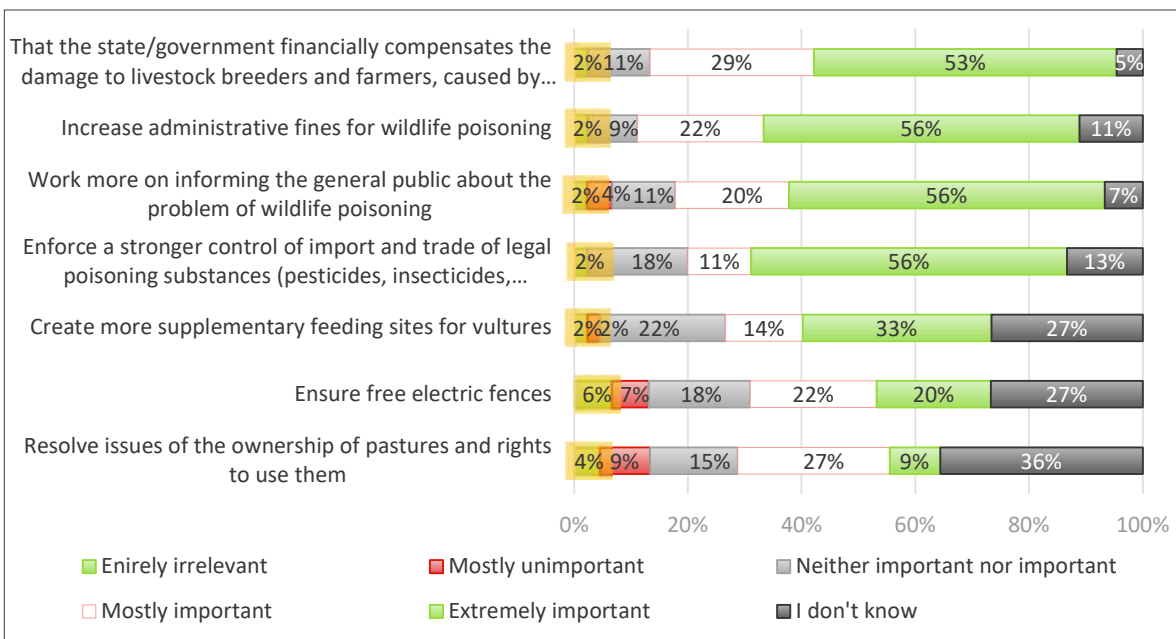
2.3 Measures related to wildlife poisoning

Chart 4.1. Awareness about a specific case of a police investigation for a wildlife poisoning incident



One fourth of the respondents claimed that they were familiar with a specific case of a police investigation for a wildlife poisoning incident. Whereas the majority of respondents (75%) claim that they are not aware of any such investigation.

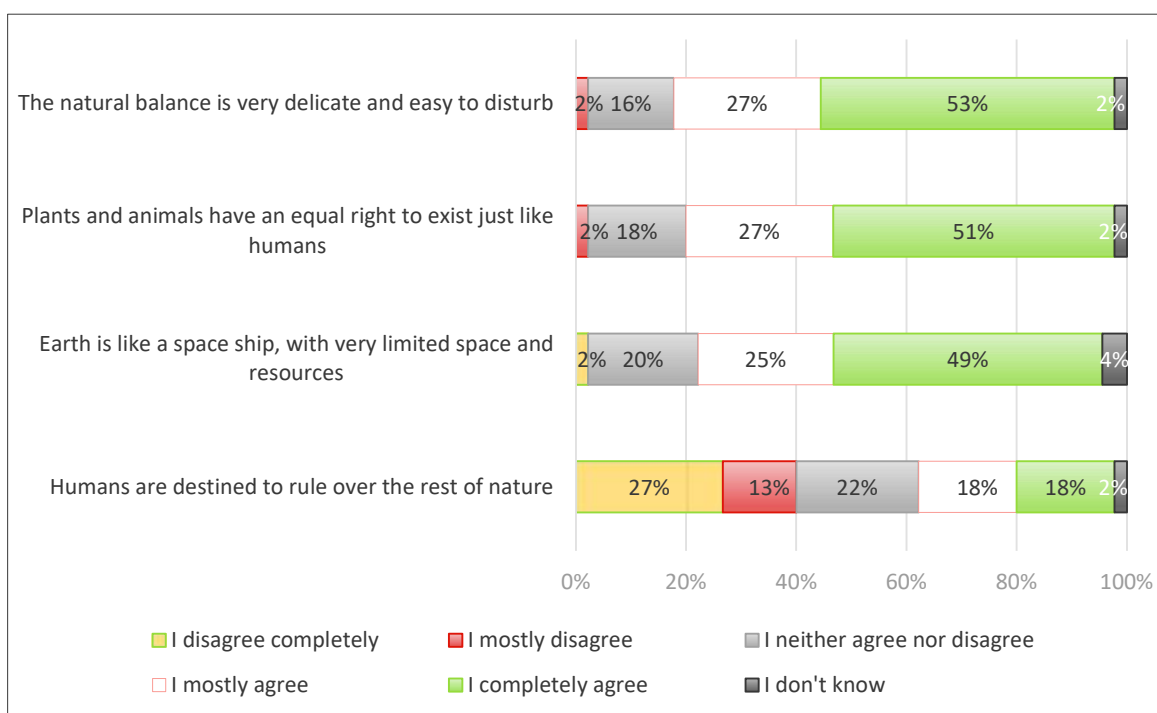
Chart 4.2. Importance of undertaking the following measures



When it comes to measures for prevention and combating wildlife poisoning, state financial compensation for damages to livestock breeders and farmers is perceived as the most important measure (82% consider it to be mostly or extremely important). This is followed by an increase of administrative fines (78% respondents rate it as mostly or extremely important) as well as making advances in informing the general public about wildlife poisoning (76%) and stronger control regarding import and trade of legal poisoning substances (67%). For the other proposed measures respondents are more divided in their opinions.

2.4 Attitudes towards nature

Chart 5.1. Personal attitudes towards nature



Regarding the attitudes that respondents have towards nature, the majority of them (80%) believe that the natural balance is delicate and easy to disturb, that plants, animals and humans have equal rights to exist (78%), and that the Earth has limited space and resources (74%). They express either mostly or completely agreeing with these opinions. In line with that, 40% of respondents mostly or completely disagree that humans are destined to dominate over the rest of nature.

Annex XIX. Perception of the illegal practice of wildlife poisoning within relevant governmental authorities in Serbia – baseline report.

1. METHODOLOGY

1.1 Project background

The BalkanDetox LIFE project (LIFE19GIE/NL/001016) - Strengthening national capacities to fight wildlife poisoning and raise awareness about the problem in the Balkan countries is a project that is dedicated to the fight against illegal poisoning of wild animals which local citizens usually consider as pests, but which has serious negative consequences for the population of numerous endangered animal species, primarily vultures which eat poisoned animals or eat the poison themselves.

The study will be conducted in two waves in 2021 and 2025, as a base line and follow up study aimed at measuring the current attitudes and practices, and attitudes and practices of target groups after the implementation of planned campaign and activities.

The project is being implemented at the multinational level in the Balkan region. The countries involved are Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Greece, Northern Macedonia, and Serbia.

1.2 Key research topics

In this first phase, the aims of the research are:

- Measuring awareness of target groups of employees of relevant government services and institutions, law enforcement agencies and veterinary services about endangered species (vultures), methods of poisoning and individuals or groups responsible for poisoning on the territories of their respective countries. Measuring of the current perceptions and attitudes of target groups related to aggravating circumstances and obstacles as well as capacities of the state institutions to prevent, investigate and sanction wildlife poisoning cases.
- Measuring of the current perceptions of target groups related to legislations, procedures, documentation, and processing of wildlife poisoning cases.

1.3 Methodological approach

1.3.1 Research technique

Online Interviews of the targeted groups of relevant governmental services and institutions officials, law enforcement officials and veterinary services employees in Serbia.

1.3.2 Fieldwork

The fieldwork was conducted from September the 24th to October the 21st in 2021.

1.3.3 Questionnaire length

Questionnaire length up to 10 minutes.

1.3.4 Sample - target group

The target group in the research were employees of relevant governmental services and institutions, law enforcement agencies and veterinary services in Serbia.

Due to difficulties caused by the COVID-19 pandemic, the sample included 30 respondents in total out of 187 employees in targeted institutions.

1.3.5 Sample Structure

Table 1.1. Institutions where respondents are employed

Institutions	Number of respondents
Ministry of Agriculture, Forestry and Water Economy, Serbia	14
Ministry of Environmental Protection, Serbia	7
Scientific Veterinary Institute "Novi Sad"	4
Faculty of Veterinary Medicine - University of Belgrade	3
Institute for Nature Conservation of Serbia	1
Institute for Nature Conservation of Vojvodina Province	1
Base: 30	

Table 1.2. Current job position

Job position	Number of respondents
Employee	9
Lower management level	3
Middle management level	13
Upper management level	4
Other	1
Base: 30	

Table 1.3. Years of service in the institution where respondents currently work

Years of service - Institution	Number of respondents
Up to 5 years	7
6-10	7
11-15	7
16+	9
Base: 30	

Table 1.4. Years of service in the department where respondents currently work

Years of service - Department	Number of respondents
Up to 5 years	10
6-10	6
11-15	7
16+	7
Base: 30	

Table 1.5. Direct engagement with the issue of wildlife/animal poisoning in respondents' line of work

Direct dealing with wildlife/animal poisoning	Number of respondents
No	16
Yes, both of wild and domestic animals	12
Yes, but only of domestic animals	2
Base: 30	

Table 1.6. Involvement in the issue of wildlife/animal poisoning in respondents' line of work

Involvement in the issue of poisoning animals	Number of respondents
No	9
Yes, both of wild and domestic animals	5
Yes, but only of domestic animals	2
Base: Respondents who don't directly deal with the issue of wildlife poisoning in their line of work, N = 16	

Table 1.7. Evaluation of own knowledge about the issue of wildlife poisoning

Estimates	Number of respondents
5 - Excellent knowledge	1
4	7
3	11
2	5
1 - Very bad	3
I do not know / I cannot estimate	3
Base: 30	

Table 1.8. Attending educational programmes related to detection and processing of wildlife poisoning incidents

Educational programme attendance	Number of respondents
No	24
Yes	6
Base: 30	

Table 1.9. Educational programmes organizers

Organizers	Number of respondents
Vulture Conservation Foundation	4
Societies for the Protection of Birds	1
Ministry of Environmental Protection (Group for CITES Convention implementation)	1
Arma dei Carabinieri – Comando Unità Forestali Ambientali e Agroalimentari (CUFA) - Raggruppamento Carabinieri CITES	1
Base: Respondents who have attended some educational programme related to detection and processing of wildlife poisoning incidents, N = 6	

Close to half of the respondents work at Ministry of Agriculture, Forestry and Water Economy in Serbia (14 respondents), while around one fourth works at Ministry of Environmental Protection in Serbia (7 respondents). These institutions are followed by the Scientific Veterinary Institute “Novi Sad” (4 respondents) and the Faculty of Veterinary Medicine (3 respondents). Close to half of the respondents work at the middle management level (13) and close to one third work as employees (9).

Respondents have different years of service in the institution where they work (relatively similar split from up to 5 years of service to above 16 years of service). Majority work in their departments from the start, while a few works slightly less than in their respective institutions of employment. Close to half of them directly deal with the issue of wildlife and domestic animals poisoning in their line of work (among them 2 respondents deal only with domestic animals poisoning). Among respondents who don't deal directly with the issue of wildlife poisoning (16 respondents), there are 7 respondents who have been

involved in the issue of poisoning of either both domestic and wild animals or only domestic animals in their line of work.

More than one third of the sample evaluate their own knowledge about the issue of wildlife poisoning with an average grade (grade 3 on the scale from 1 to 5). There is a similar number of respondents who evaluate their knowledge about this topic with the highest grades (4 or 5) and with the lowest grades (1 or 2).

Most respondents (24 out of 30) didn't attend any educational programmes related to the detection and processing of wildlife poisoning incidents. Among respondents who attended at least one of these programmes, 4 respondents attended programmes that were organised by Vulture Conservation Foundation.

2. RESULTS OF ONLINE INTERVIEWS

2.1 Vultures in Serbia

Table 2.1. Awareness about vulture species breeding in Serbia

Vultures	Number of respondents
Griffon Vulture	30
Egyptian Vulture	10
Cinereous Vulture	5
King Vulture	2
Turkey Vulture	1
Base: 30	

All respondents employed at relevant institutions acknowledge that the Griffon Vulture breeds in Serbia, while one third of them believe that the Egyptian Vulture breeds in Serbia as well (10 respondents). Close to one in five of respondents (5) think that the Cinereous Vulture breeds in the country. The King Vulture and Turkey Vulture are not recognized as species that are present in Serbia.

Table 2.2. Awareness of the types of food which vultures feed on in Serbia

Food	Number of respondents
Carcasses of domestic animals	29
Carcasses of wild animals	28
Hunted rodents	9
Hunted large mammals	4
Hunted domestic animals	3
Hunted insects	1
Base: 30	

Almost all of the respondents recognize that vultures feed on the carcasses of domestic and wild animals. A number of respondents believe that hunted animals are a part of the vultures' diet, close to one third (9 respondents) when it comes to hunted rodents and smaller number (3 to 4 respondents) when it comes to hunted large mammals and domestic animals. Hunted insects are mostly not included into the vultures' diet.

2.2 Problems of vulture poisoning in Serbia

Table 3.1. What endangers the vulture populations in Serbia the most?

The main danger	Number of respondents
Wildlife poisoning	14
Disturbance	6
Extensive use of legal toxic compounds (pesticides, insecticides, rodenticides)	5
Lack of food	3
Poaching	1
Accidental electrocution of collision with power cables	1
Base: 30	

Wildlife poisoning is perceived as the most important threat to the vulture population in Serbia (by close to half of the respondents). Disturbance and extensive use of legal toxic

compounds (pesticides, insecticides, rodenticides) follow with approximately every fifth respondent identifying each of these as the most important danger to the vulture population. Lack of food, poaching and accidental electrocution are considered to be less important problems according to the opinion of employees in relevant institutions.

Table 3.2. Perceived key causes behind vulture poisoning

Causes	Number of respondents
From poison baits intended for other animals	12
Because they eat poisoned animals/animals that died of poisoning	11
Because they get poisoned from pesticides	6
From poison baits intended for vultures	1
Base: 30	

The majority of representatives from the relevant governmental institutions believe that the key cause of vulture poisoning is accidental consuming of the poison, either through eating poison baits intended for other animals, or by eating poisoned animals that died of poisoning (somewhat above one third of the respondents). Pesticide poisoning is perceived to be the key cause of vulture poisoning by one in five respondents. Respondents did not include intentional poisoning from poison baits aimed at vultures among the key causes of vultures poisoning.

Table 3.3. Perception about how wildlife poisoning most commonly occurs

The way wildlife poisoning occurs	Number of respondents
Accidentally, by misuse of legal poisoning substances out of negligence/ignorance	14
Intentionally, with illegal poisons from the black market	8
Intentionally, by misuse of legal poisoning substances (pesticides, insecticides...)	8
Base: 30	

Regarding the question of whether wildlife poisoning occurs accidentally or intentionally the opinions of respondents are divided, with about half of the sample going each way. Close to half of institutions employees believe that wildlife poisoning happens accidentally by misuse of legal poisoning substances out of negligence. Among those who think that wildlife poisoning happens mostly intentionally, half believe that it happens with illegal poisons from the black market and the other half believe that it happens through misuse of legal poisoning substances (pesticides, insecticides, rodenticides).

Table 3.4. Perception regarding groups responsible for wildlife poisoning

Groups	Levels of frequency (Number of respondents)			
	Never	Rarely	Occasionally	Often
Farmers	1	3	14	12
Individuals who deliberately poison animals simply because they like killing things	1	7	12	10
Hunters	1	7	17	5
Pigeon fanciers/breeders	9	11	3	7
Livestock breeders	1	13	10	6
Beekeepers	18	9	3	/
Base: 30				

Majority of representatives of relevant governmental institutions in Serbia identify farmers, hunters and individuals who deliberately poison animals simply because they like killing things as the most responsible groups for wildlife poisoning. When it comes to the responsibility of livestock breeders, the respondents are divided. Pigeon fanciers are thought to be rarely or never responsible by two thirds of respondents, and beekeepers are the group that is thought to be the least responsible for wildlife poisoning, as majority of respondents believe that they are never responsible for wildlife poisoning.

Table 3.5. Perceived motives behind the poisoning of wild animals

Motives	Levels of frequency (Number of respondents)			
	Never	Rarely	Occasionally	Often
Protection from pests (rats, insects et at.)	-	5	10	15
Protection of agricultural land from wild animals	1	4	15	10
Protection of pastures and livestock from wild animals (wolves, bears, etc.)	1	7	17	5
Protection from stray dogs and cats	3	7	12	8
Protection of agricultural land from birds of prey	6	7	10	7
Protection of pigeons from birds of prey	5	13	2	10
Conflicts among people about land use (pastures, hunting areas)	2	13	12	3
Protection of hunting activities	6	14	9	1
Protection of apiaries from bears	8	17	4	1
Base: 30				

The respondents consider *protection from pests* and *agricultural land from wild animals* (25 respondents), *protection of pastures and livestock from wild animals* (22 respondents) and *protection from stray dogs and cats* (20 respondents), to be the most prominent motives behind wildlife poisoning. These motives are believed to be often or occasionally behind the poisoning of animals. Half of the respondents believe that conflicts among people about land use (pastures, hunting areas) are a motive for wildlife poisoning. Approximately two thirds of respondents believe that protection of hunting activities and protection of pigeons from birds of prey are not motives that are relevant for wildlife poisoning and the least common motive for wildlife poisoning is thought to be protection of apiaries from bears.

Table 3.6. Regions of Serbia where wild animals are most frequently poisoned

Regions	Number of respondents
Vojvodina	18

Western Serbia and Šumadija	12
Belgrade	8
Eastern and Southern Serbia	4
I don't know	9
Base: 30	

Above half of the institutions' employees state that Vojvodina is the region of Serbia, where wild animals are most frequently poisoned. Somewhat less than half of the respondents believe that these regions are Western Serbia and Šumadija. On the other hand, a third of the respondents don't know the answer to this question.

Table 3.7. Period of the year when wildlife poisoning mostly occurs

Periods of year	Number of respondents
Spring	13
Autumn	12
Summer	5
Winter	5
I don't know	7
Base: 30	

Respondents identify spring and summer as the seasons when wildlife poisoning occurs most often (12-13 respondents, each). Close to one fourth of the respondents don't know the answer.

Table 3.8. Importance of the aggravating circumstances and obstacles

Aggravating circumstances and obstacles	Levels of importance (Number of respondents)				
	Entirely irrelevant	Mostly unimportant	Neither important nor unimportant	Mostly important	Extremely important
Bad law enforcement	/	1	1	7	21

Low penalties for wildlife poisoning	/	/	1	9	20
Lack of control over the prescribed use of legal poisons, such as pesticides, rodenticides et al.	/	/	3	7	20
Complexity of the investigation	/	/	1	10	19
Difficulties with evidence procedures in court	/	/	1	11	18
Inadequate and unclear protocols for police action	/	/	2	12	16
Black market for banned poisons on Internet	/	/	4	12	14
Poor reporting of information from witnesses	/	/	3	15	12
Expensive toxicological analysis	/	5	4	9	12
Base: 30					

Employees in relevant governmental institutions believe that each of the aggravating circumstances and obstacles for the prevention and sanctioning of wildlife poisoning is important. The overwhelming majority of respondents believe that these circumstances are mostly or extremely important. Expensive toxicological analyses are perceived as the least important, although they are thought to be important by more than two thirds of respondents.

Table 3.9. Personal attitudes towards reporting poisoning incidents to the relevant authorities

Statements related to reporting poisoning incidents	Levels of agreement (Number of respondents)				
	I completely disagree	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree
Hunters should report to the police information/knowledge about wildlife poisoning more often	/	/	2	4	24

Every person should report to the police any information/knowledge about wildlife poisoning	/	/	2	5	23
Veterinarians should report to the police information/knowledge about wildlife poisoning more often	1	/	3	4	22
People who report someone from their community for poisoning wild animals risk altercations and conflicts in their community	1	/	2	10	17
People/citizens do not know who to report animal poisoning incidents to	6	1	4	10	9
It is known which individuals poison animals in this area, it is a „public secret“	1	2	8	12	7
Poisoning mostly takes place in remote locations and therefore the perpetrators are rarely identified	5	2	10	6	7
Base: 30					

Respondents believe that all members of the population (every person) should share the responsibility for reporting information about wildlife poisoning to the police. Specific groups that are also thought to be responsible for reporting these cases to the authorities are hunters (28 respondents) and veterinarians (26). However, the majority of respondents (27) also agree that people who report someone from their community for poisoning wild animals risk altercations and conflicts in their environment which could be an important barrier for reporting these cases. It is also noteworthy that close to two thirds of the respondents believe that citizens do not know who to report animal poisoning incidents to.

Table 3.10. Groups that need to become more aware of wildlife poisoning

Groups	Number of respondents
Citizens in general	17
Farmers	7
Livestock breeders	3

Game wardens	2
Other groups	1
Base: 30	

Citizens in general are identified as the most important group (by above half of the respondents) whose awareness needs to be raised concerning the issue of wildlife poisoning. Followed by farmers, who are thought to be the target for awareness raising by around one quarter of the respondents.

Table 3.11. Personal attitudes towards investigation of wildlife poisoning incidents

Statements related to the investigation of wildlife poisoning incidents	Levels of agreement (Number of respondents)				
	I disagree completely	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree
More people are needed on the field (police, environmental inspectors, rangers etc.) for timely detection of poisoning incidents	/	/	1	6	23
Specialized police units for environmental crime, including wildlife poisoning, are needed	3	2	4	3	18
Lack of coordination among relevant institutions is a bigger problem than lack of resources	/	1	1	12	16
Police should have specialized canine units for detecting poisonous substances used for wildlife poisoning	/	1	3	11	15
Game wardens too often tolerate unlawful practices in hunting areas	/	2	3	14	11
In Serbia there are sufficient laboratories with enough capacities to conduct needed toxicological analyses	4	10	11	3	2
Base: 30					

Most respondents agree that in order to improve the prevention, detection and sanctioning of wildlife poisoning, key actions to be taken are putting more people (police, environmental inspectors, rangers etc.) in the field, introduction of specialized canine units for detecting poisonous substances and specialized police units for environmental crime.

Almost all the respondents believe that a lack of coordination among relevant institutions is a bigger problem than lack of resources and that game wardens too often tolerate unlawful practices in hunting areas. When it comes to laboratories for toxicological analyses the respondents are divided – close to half of them do not believe that there are sufficient laboratories with enough capacities, more than one third are undecided while close to one fifth believe that there are satisfactory laboratory capacities.

Table 3.12. Personal attitudes towards legislation and legal processing of poisoning incidents

Statements related to the legislation and legal processing of poisoning incidents	Levels of agreement (Number of respondents)				
	I disagree completely	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree
The legal framework for punishing the practice of poisoning animals is good, but the main problem is law enforcement	3	4	3	12	8
Rarely are fines imposed under the Hunting Act	1	/	14	8	7
Existing legislation regulates biodiversity protection well enough	4	2	13	10	1
Public prosecutors are sufficiently educated for managing incidents related to poisoning of wild animals	6	12	8	3	1
Base: 30					

Most employees from the relevant institutions consider the legal framework for punishing the practice of poisoning animals to be good but believe that main problem lies in law enforcement. This is an important barrier for the efficient prevention and sanctioning of wildlife poisoning. In addition, above half of the respondents do not believe that public prosecutors are sufficiently educated for managing incidents related to poisoning of wild animals, while more than one fourth are undecided. Their opinions are divided when it comes to the question of fines imposing under the Hunting act, with half of them agreeing that the fines are rarely imposed and half of them undecided.

Close to half of the respondents do not have a clear opinion on whether existing legislature regulates biodiversity protection well enough, while close to one third believe that it does.

Table 3.13. Evaluating the cooperation between governmental institutions and civil society organizations regarding data collection about poisoning incidents

Estimate	Number of respondents
5 - Excellent cooperation	1
4	1
3	10
2	4
1 - Very bad	6
I don't know / I cannot evaluate	8
Base: 30	

Most respondents evaluate the cooperation between governmental institutions and civil society organizations regarding data collection about poisoning incidents as inadequate or are undecided and think that they cannot evaluate it.

Table 3.14. Knowledge of procedures and documentation related to wildlife poisoning

Procedures and documentation	Answers (Number of respondents)		
	Yes	No	I do not know, I am not informed

Is there a database for poisoning incidents of birds in Serbia	4	3	23
Is there a National action plan for combating wildlife poisoning in place	3	6	21
Is there a protocol defining procedures and jurisdictions for investigating wildlife poisoning	3	8	19
Base: 30			

The respondents from the relevant institutions are mostly uniformly uninformed when it comes to the existence of database for poisoning incidents of birds in Serbia, National action plan for combating wildlife poisoning and protocol defining procedures and jurisdictions for investigating wildlife poisoning (more than two thirds of respondents per each category).

Table 3.15. Knowledge of database for poisoning incidents

Database related questions	Answers (Number of respondents)		
	Yes	No	I do not know, I am not informed
Is there a clear protocol for documenting poisoning incidents in the database	2	2	0
Do you ever use data from the existing database for carrying out work within your jurisdiction	2	1	1
Do you consider that the existing database is adequately used for informing the public and raising their awareness about the problem of wildlife poisoning	0	3	1
Base: Respondents who state that there is a database for poisoning incidents of birds in Serbia, N = 4			

Among the respondents who acknowledge that there is a database for poisoning incidents of birds in Serbia, the majority (3 respondents) believe that the existing database is not adequately used for informing the public and raising their awareness about the problem of wildlife poisoning. Half of the respondents (2) claim that they use the data from the existing database for carrying out work within their jurisdiction. They are divided when it comes to the question of whether there is a clear protocol for documenting poisoning incidents in the database.

Table 3.16. Knowledge of the protocol that defines procedures and protocols for investigating wildlife poisoning

Protocol related questions	Answers (Number of respondents)		
	Yes	No	I do not know, I am not informed
Is the existing protocol clear enough?	3	0	0
According to the protocol, must the reports about poisoning incidents include an impact analysis of a single poisoning incident to the environment and biodiversity?	1	0	2
Should the existing protocol be improved?	0	1	2
Base: Respondents who state that there is a protocol defining procedures and jurisdictions for investigating wildlife poisoning, N = 3			

The representatives of the relevant institutions state that there is a protocol defining procedures and jurisdictions for investigating wildlife poisoning all believe that the existing protocol is clear enough. The majority (2) are undecided as to whether the existing protocol should be improved. The same number of officials state that they are not informed on whether according to the protocol, the reports about poisoning incidents must include an impact analysis of a single poisoning incident to the environment and biodiversity.

Table 3.17. Personal attitudes towards punishment of various unlawful actions damaging to animals and the environment

Statements related to the punishment of unlawful actions that damage the nature	Levels of agreement (Number of respondents)				
	I disagree completely	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree
All forms of mass and non-discriminative killing of animals (trapping, poisoning, explosives et al.) should be punished as severely as possible	/	/	1	2	27
Higher fines are needed for every type of poaching/illegal shooting	/	/	3	1	26
Rangers of protected areas should have the authority to arrest persons who poison animals, if they are caught in the act	1	1	6	3	19
Having poison baits should be a separate offense, regardless of whether it has been proven that an animal was killed	2	1	2	8	17
If poisoning of wild animals occurs in a commercial hunting area, the concessionaire should be deprived of the concession	/	2	7	10	11
Sentences for poisoning of animals should be only administrative (financial), but not imprisonment	14	7	3	3	3
Poisoning of animals should be a criminal offense only if it occurred in a protected area (nature park, national park)	21	4	/	2	3
Prison sentences should not be administered placing poison baits unless people are not put in danger, but only animals	19	5	3	1	2
Base: 30					

Respondents endorse the most severe forms of punishment for all forms of mass and non-discriminative killing of animals (trapping, poisoning, explosives et al.) and they

believe that higher fines are needed for every type of poaching/illegal shooting. The majority of them also believe that the possession of poison baits should be considered a separate offence, regardless of whether it has been proven that an animal was killed. Officials mostly agree that rangers of protected areas should have the authority to arrest persons who poison animals, if caught in the act, and that the concessionaire should be deprived of the concession if poisoning of wild animals occurs in a commercial hunting area.

They also consider that poisoning of animals should not only be a criminal offense if it occurs in a protected area (nature park or national park) and that the sentences should correspondingly include imprisonment (as opposed to solely administrative sentences) for not only affecting the humans but also endangering the animals.

Table 3.18. Personal attitudes towards the capacities of the police

Statements related to the capacities of the police	Levels of agreement (Number of respondents)				
	I disagree completely	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree
The police do not take seriously the need to launch investigations into wildlife poisoning	/	/	4	14	12
Specialized police units should be introduced to deal with the crime of wildlife poisoning	2	1	3	13	11
Police investigations about wildlife poisoning should include representatives of the civil society organizations	1	4	6	11	8
The main problem is that incidents are not reported to the police	1	2	7	13	7
Police investigations about wildlife poisoning need expensive and sophisticated technology	1	9	10	9	1
The police is sufficiently equipped for investigating wildlife poisoning	8	9	10	2	1

The police is sufficiently educated for investigating incidents with wild animals	9	14	5	1	1
The police has better things to do and should not waste resources on investigating wildlife poisoning incidents	19	8	1	2	/
Base: 30					

The employees of relevant institutions in Serbia believe that investigating wildlife poisoning incidents is important part of police work and that the police should take the need for launching investigations in this field seriously.

They believe that there is a need to introduce specialized police units to deal with the crime of wildlife poisoning and that representatives of the civil society organizations should be included in wildlife poisoning investigations. The respondents perceive that the bigger problem poses insufficient education of the police forces for investigating these incidents compared to the level of equipment. They are indecisive and not completely sure about the need for expensive and sophisticated technology in police investigations of wildlife poisoning. In addition to this, three quarters of the respondents believe that a big obstacle for carrying out police work related to the prevention and combating of wildlife poisoning is that incidents are not reported to the police.

2.3 Measures related to wildlife poisoning

Table 4.1. What is necessary to use in police investigations of wildlife poisoning

Necessaries for police investigations	Number of respondents
Toxicological analysis	29
Records of sale of legal poisoning substances (pesticides, insecticides, rodenticides...)	23
Canine units	18
Forensic entomology	15
Fingerprint analysis	14

Confirming time of death of the animals	14
Forensic psychology	8
Forensic ballistics	7
Base: 30	

Respondents unanimously recognize the necessity for toxicological analysis in police investigations of wildlife poisoning. The vast majority also believe that records of sales of legal poisoning substances are important for these investigations, and in addition canine units that would help the investigations of wildlife poisoning. Half of the respondents also consider forensic entomology, fingerprint analysis and confirming the time of death to be necessary aspects of investigations. Forensic ballistics and forensic psychology are perceived as less important factors for the success of these investigations.

Table 4.2. Importance of undertaking some measures to prevent wildlife poisoning

Measures	Levels of importance (Number of respondents)				
	Entirely irrelevant	Mostly unimportant	Neither important nor unimportant	Mostly important	Extremely important
Work more on awareness raising among key stakeholders (livestock breeders, farmers, hunters, institutions)	/	/	1	2	27
Impose a stricter control of the trade of legal poisoning substances (pesticides, rodenticides et al.)	/	/	1	3	26
Work more on awareness raising of the general public	/	/	1	8	21
That the state/government financially compensates the damage to livestock breeders and farmers, caused by wild animals	/	/	1	11	18
Create more supplementary feeding sites for vultures	1	/	1	12	16

Better protect wild ungulate populations	/	1	5	13	11
Completely ban logging in Serbia for some time	3	4	6	7	10
Resolve issues of the ownership of pastures and rights to use them	2	1	7	15	5
Ensure free electric fences	2	1	6	17	4
Work of reducing the populations of allochthone animals	1	3	12	10	4
Ensure livestock breeders and farmers are provided with free shepherd and guard dogs pro	3	2	7	15	3
Base: 30					

When it comes to measures for preventing wildlife poisoning, respondents are in agreement in recognizing the importance of the following measures: *raising awareness among key stakeholders* (livestock breeders, farmers, hunters, institutions) as well as the *general public*, *imposing a stricter control of the trade of legal poisoning substances* (pesticides, rodenticides, etc.) and *financial compensation from the state/government for the damages to livestock breeders and farmers caused by wild animals*.

Measures that are also considered to be important by the majority of officials are: *creating more supplementary feeding sites for vultures*, and *better protection of wild ungulate populations*.

About two thirds of representatives of relevant governmental institutions recognize that *providing free electric fences*, *resolving the issue of the ownership of pastures and the rights to use them* and *ensuring that farmers and livestock breeders are provided with shepherd and guard dogs* could help resolve environmental and economic issues caused by poisoning of wildlife. Banning logging and reducing populations of allochthone animals provoke indecisive opinions and are not considered to be relevant measures.

2.4 Attitudes towards nature

Table 5.1 Personal attitudes towards nature

Statements related to the nature	Levels of agreement (Number of respondents)				
	I disagree completely	I mostly disagree	I neither agree nor disagree	I mostly agree	I completely agree
Plants and animals have an equal right to exist just like humans	/	/	3	3	24
The natural balance is very delicate and easy to disturb	/	1	2	5	22
Earth is like a spaceship, with very limited space and resources	1	1	3	8	17
Humans are destined to rule over the rest of nature	19	3	7	1	/
Base: 30					

Respondents are mostly in agreement when it comes to their attitudes towards nature. The vast majority believe that plants and animals have an equal right to exist just like humans and that the natural balance is very delicate and easy to disturb. Majority of respondents also perceive the Earth to be like a spaceship, with very limited space and resources. Close to three fourths of the sample believe that humans aren't destined to rule over the rest of nature.

Annex XX. Socio-economic analysis – baseline report.

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1. Introduction

1.1 Objectives of the baseline report

The main objective of the Balkan Detox LIFE project is to improve management of poisoning incidents and achieve significant reduction of mortality of vultures and other affected species caused by wildlife poisoning by ensuring real and continued engagement of relevant governmental authorities in combating this issue and labelling it as a socially unacceptable occurrence in the eyes of the public.

This baseline report strives to provide an overview of the relevant institutional and legislative context and (currently) available socio-economic indicators in order to carry out monitoring in preparation for the socio-economic evaluation of the project impact that will be carried out in 2025. The aim of the socio-economic monitoring is to help identify and assess the impacts of the project and how they will change the attitudes of the relevant stakeholders towards the use of poison baits.

2. Methodology

In order to achieve the main goals of this baseline report, a mixed methodology will be applied. We will combine desk research using relevant legal documentation, as well as the results of previous research on this topic, with the quantitative results of the survey that will be conducted with the two relevant target groups of stakeholders – hunters, farmers and livestock breeders, and government services and institutions officials.

2.1 Desk research

The desk research includes the secondary analysis of existing data from previous research and articles on illegal wild bird poisoning in Serbia, as well as an outline and summary of legislation, official documents and regulations concerning this issue.

In the appendix we have noted a comprehensive list of the documents used for desk research, organized per country.

2.2 Survey

A survey measuring the **attitudes and practices** of **two relevant groups of stakeholders** was conducted in the 6 countries included in the study: Albania, Bosnia and Herzegovina, Bulgaria, Greece, North Macedonia, and Serbia.

The two target groups were interviewed using PAPI (pen and paper interviewing, face to face interviewing) and online interviewing.

The survey will be administered in two waves, the **baseline phase in 2021** – measuring the current attitudes and practices and again as a **follow up in 2025** measuring the attitudes and practices after the project has been implemented and planned campaign and activities have been carried out.

2.3 Socio-economic indicators

For the purpose of the socio-economic monitoring and impact evaluation of the project the following indicators were proposed. A baseline overview will be provided for all the countries individually.

- Number of regulations and their content related to wildlife and pests poisoning, number of regulations in preparation and their content and compliance with EU regulations for countries outside of EU
- Fields of knowledge baseline level and new fields of knowledge introduction into the sector
- Target groups knowledge baseline level and level after the campaign: hunters, farmers, livestock breeders' knowledge and government services and institutions officials, law enforcement officials and veterinary services employees' knowledge and expertise
- Number of stakeholders and key actors involved
- Feedback from stakeholders and key actors (follow up phase 2025)
- Understandable and straightforward information generated during the project aimed at target groups awareness (follow up phase 2025)
- Types of activities aimed at information and awareness raising of the general public (workshops and other local events, project website and social media, etc.) (follow up phase 2025)
- Estimated economic impacts of illegal poisoning of wild animals through continuation, replication or transfer of the project activities (follow up phase 2025)

3. Baseline report for Albania

3.1 Institutional and Legal Framework in Albania

The following governmental institutions have legislative authority regarding anti-poisoning work in Albania:

- Ministry of Tourism and Environment - Biodiversity and Protected Areas Directive
- Ministry of Agriculture and Rural Development – Food Safety and Veterinary Institute (ISUV)s

On the other hand, when law enforcement and investigative procedures are concerned, the relevant institutions for the Republic of Albania are:

- Ministry of Agriculture and Rural Development – Food Safety and Veterinary Institute
- State Inspectorate for Environment and Forests
- Regional Agencies of Protected Areas
- Faculty of Veterinary Medicine University of Tirana
- National Inspectorate for the Protection of territory

When it comes to stakeholders in the civil society sector, the following organizations deal directly with nature conservation in Albania:

- **Albanian Ornithological Society (AOS):** is an Albanian NGO founded in March 2015 that aims to provide for a sustainable and consistent framework environment for birds through conserving biodiversity and restoring and protecting wildlife and its natural habitats. AOS is a conservation non-governmental organization for the protection of birds and their habitats in Albania.
- **Protection and Preservation of national environment in Albania (PPNEA):** is a non-governmental environmental organization that operates nationwide, known to be the first environmental organization in Albania. It was officially established on 13th June 1991, with a special decree of the Albanian Academy of Sciences at the time. PNEA is particularly concerned with conservation and sustainable development issues and its main areas of

interest are wildlife management and endangered species conservation, local sustainable projects and initiatives and landscape conservation.

3.2 Legislation in the republic of Albania

Up until 2018 the use of poisonous substances or poison bait in the environment for the purpose of capturing or killing of animals was not specified within Albanian national legislation as an illegal activity. (Bino, Sevo, Topi in Pantovic, Andevski, 2018).

In the existing national legislative, the following law refers directly to the conservation of wild avian species:

- **Law No. 10 006, dated 23.10. 2008 “On wild fauna protection”**

Bino and Sevo (Bino & Sevo, 2018) single out the following articles of this law as relevant for the issue of wild bird poisoning:

Article 13. of Chapter III - regarding specific measures for the conservation of wild birds, states that the conservation and adaptation of wild birds in the territory of the Albanian Republic is enhanced by ensuring a favourable ecological, scientific and cultural conservation status that prohibits killing or intentional trapping by any kind of method. Poisoning might be included in the above-mentioned law as it refers to killing of birds with any kind of method.

Article 19. (Chapter IV) - in regard to prohibited activities, states that extermination of wild fauna and their populations is also prohibited

However, as of 2019 significant steps were made to amend the national legal framework of Albania² when it comes to the issue of wildlife poisoning. As a result of the efforts of the AOS who lobbied for the amendment³ of the **Law No. 10 006, dated 23.10. 2008 “On wild fauna protection”**, the Albanian parliament adopted the proposed amendments that aimed for:

² Intentional poisoning of wildlife is now a crime in Albania, AOS website, retrieved on 03.03.2022, <https://aos-alb.org/intentional-poisoning-of-wildlife-is-now-a-crime-in-albania/>

³ In synergy with “**Balkan Anti-Poisoning Project**” supported by VCF and MAVA Foundation, “Illegal Killing and Taking of Birds” supported by **EuroNatur** and MAVA Foundation and the “**Egyptian Vulture New Life**” supported by BSPB and EU

- a) **explicitly stating that poisoning and particularly the use of poison baits is by law a prohibited action**
- b) **explicitly stating that the use of agricultural chemicals, veterinary drugs and services is a potential threat to wild fauna** - in case they are used contrary to the current legislation covering agricultural chemicals, veterinary drugs, and services.

These amendments to the Law on fauna protection, were followed by further amendments to the **Penal Code**, which criminalized the killing and destruction of wild fauna and specified the legal sanctions for these acts.

Article 202 “Harming of protected species of flora and fauna” - provides now that *“Killing, destruction, possession, acquisition or trade of specimens of protected species of wild flora and fauna or their parts or by-products, in breach of the requirements of specific national legislation or relevant permit, unless such a case has occurred over a negligible amount of these specimens from the biological point of view of the group belonging to the protected species, and has no significant impact on the conservation status of the species, constitutes criminal contravention and is punishable by a fine or imprisonment of two to seven years.”*

These legal amendments were an important requirement for further conservation activities in Albania concerning the fight against wildlife poisoning.

3.3 International treaties and conventions that have significance for the preservation of wild birds in Albania

When it comes to international legislation, the Republic of Albania is a signatory of the following conventions which have relevance for the issue of wildlife poisoning and anti-poisoning work (Bino, Sevo, 2018):

- Convention on the Conservation of European Wildlife and Natural Habitats (Bern, 1979)
- Convention on the Conservation of Migratory Species of Wild Animals (Bonn, 1979)
- Agreement on the Conservation of African-Eurasian Migratory Waterbirds (Hague, 1995)

Convention on the Conservation of European Wildlife and Natural Habitats (Bern, 1979): Albania became a signatory of this convention in 1995 and it was ratified by Albania in 1999. The Bern convention prohibits the use of any non-selective means of capture or

killing as well as of means that may induce local extinction or heavily disturb the populations of a species, namely means listed in Annex IV”, while in Annex IV of the same Law, which is entitled “Prohibited means and methods of hunting and other forms of exploitation”, “Poisons and poison or tranquilizing baits” are included.

Convention on the Conservation of Migratory Species of Wild Animals (Bonn, 1979): This convention was ratified by Albania in 2001, and it acknowledges the importance of migratory species being conserved and of Range States agreeing to take action to this end whenever possible and appropriate, paying special attention to migratory species the conservation status of which is unfavourable, and taking individually or in co-operation appropriate and necessary steps to conserve such species and their habitat.

Agreement on the Conservation of African-Eurasian Migratory Waterbirds (Hague, 1995): The Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA) is an intergovernmental treaty dedicated to the conservation of migratory waterbirds and their habitats across Africa, Europe, the Middle East, Central Asia, Greenland and the Canadian Archipelago.

3.4 Stakeholders’ attitudes toward legislation and law enforcement

With regard to their attitudes towards legislation and the legal processing of poisoning incidents, the institutions officials that were interviewed in the BalkanDetox LIFE project consider the existing legal framework for punishing the practice of poisoning animals to be good, but they believe that the main problem is in the enforcement of existing laws. They also agree that fines are rarely imposed under the Hunting Act.

A large number of respondents think that public prosecutors aren’t sufficiently educated for managing incidents related to the poisoning of wild animals. However, the participants are divided about the question if the existing legislation regulates biodiversity protection well enough.

Other relevant aggravating circumstances and barriers for the prevention and sanctioning of wildlife poisoning are low penalties for wildlife poisoning and inadequate and unclear protocols for police action which are identified by vast majority of respondents. Poor reporting of information from witnesses, complexity of the investigation and expensive toxicological analysis are also identified as very important. Also, an important barrier is also believed to be that people do not know who to report animal poisoning incidents to.

Regarding the capacities of the police, officials recognize the need for the introduction of more people in the field for timely detection of poisoning incidents, while almost all agree that specialized police units for environmental crime, including wildlife poisoning,

and specialized canine units for detecting poisonous substances used for wildlife poisoning are required.

The majority of respondents also believe that lack of coordination among relevant institutions is a bigger problem than lack of resources.

On the other hand, more than half of institutional employees, state that Albania does not have sufficient laboratories with enough capacities to conduct necessary toxicological analyses.

Institutions employees recognize the importance of the following specific measures for preventing wildlife poisoning:

- further **raising of awareness** among **key stakeholders** (livestock breeders, farmers, hunters, institutions), as well as among the **general public**
- imposing a **stricter control of the sales of legal poisoning substances**
- providing **compensation to livestock breeders and farmers** for the **damages caused by wild animals**
- creating **additional supplementary feeding sites** for vultures
- better **protection of wild ungulate populations**

3.5 EU compliance of regulations in Albania

The **Albania report**⁴ which is part of the **2020 Communication on EU Enlargement Policy**, addresses the progress made by the Republic of Albania when it comes to EU compliance of regulations. **Chapter 27** of this report deals with Environment and Climate Change; thus, this chapter is relevant for the conservation of wild birds and all national legislation that touches upon this issue.

According to Chapter 27, it is stated that Albania shows some **level of preparation** in this area. Furthermore, the report asserts that **limited progress** was achieved aligning policies and legislation with the *acquis*, in the following areas: **waste and water management, environmental crime** and **civil protection**.

The report further declares that when it comes to the **area of nature protection** there is **well advanced alignment with the *acquis* in the field**, in particular the **Habitats and Birds**

⁴ Accompanying the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions.

Directives, but policy and law enforcement remain generally weak despite numerous capacity building activities and technical assistance. The Law on protected areas was amended in 2018 to put greater emphasis on the planning and development of such areas. The National Protected Areas Agency still has very limited capacities and financial instruments, as it is forbidden by law from becoming financially autonomous.

3.6 Number of relevant stakeholders involved

When it comes to the first target group of stakeholders for this study which includes government services and institutions officials, it encompasses an estimated total of 49 relevant employees, employed across 5 institutions⁵ in the Republic of Albania.

When it comes to veterinary services employees, the total estimated universe is 5 employees in one relevant region – Gjirokaštër County, the municipality of Gjirokaštër. Regarding law enforcement officials, the estimated universe is 4 officials in Gjirokaštër County, across two municipalities – Gjirokaštër and Dropull.

Concerning the second target group – farmers, hunters and livestock breeders, there is an estimated total of 6 233 stakeholders in one region - Gjirokaštër County, across two municipalities - Gjirokaštër and Dropull. In Gjirokaštër 815 of which 390 livestock breeders, 370 farmers and 55 hunters. The municipality of Dropull has approximately 5 418 stakeholders, the majority of which are livestock breeders 4000 of them, whereas there are approximately 1 400 farmers and 18 hunters.

Due to difficulties caused by the COVID-19 pandemic the number of respondents that was included in the research from the first target group - government services and institutions officials, law enforcement officials and veterinary services employees in Albania was 22, and the number of respondents from the second target group – livestock breeders, hunters and farmers was 100.

⁵ The full list of relevant institutions which has been previously noted in the section “Institutional and Legal Framework in Albania” includes: Ministry of Tourism and Environment - Biodiversity and Protected Areas Directive, Ministry of Agriculture and Rural Development – Food Safety and Veterinary Institute (ISUV)s Ministry of Agriculture and Rural Development – Food Safety and Veterinary Institute, State Inspectorate for Environment and Forests, Regional Agencies of Protected Areas, Faculty of Veterinary Medicine University of Tirana, National Inspectorate for the Protection of territory

3.7 Fields of knowledge baseline level

Compiling data on the illegal poisoning of wild birds in Albania

Until 2019, one of the biggest obstacles to combating wildlife poisoning was a lack of national legislation that prohibits the use of poison baits and poisonous substances to capture or kill animals. Consequently, it led to deficiencies of official records and databases related to the poisoning of wild animals (Bino, Sevo, 2018).

Brochet et al. (2016) presented the data showing that the average number of illegally killed birds in Albania is 265,000 per year during the period 2004-2014. Acts included in illegal killing are poisoning and use of other prohibited methods and activities, killing protected species and killing species in protected areas, as well as hunting species during the closed season.

In the document “National Anti-Poisoning Road Map for Albania (2018-2025)” the data on wildlife poisoning are presented. One of the more recent cases of poisoning is recorded in the region of Kurvelesh, in southern Albania. The data show that in 2016, a Golden Eagle and around 6 other birds of prey consumed poisoned substances.

In accordance with BirdLife International’s methodology, used for similar purposes, the effects of illegal killing of birds on vultures in Albania were estimated in 2018. The results showed that 1-3 vultures were killed illegally per year.

Educational activities regarding illegal bird poisoning in Albania

On February 17, 2022, the Albanian Ornithological Society (AOS) uploaded a video, created within the framework of the [Balkan Anti-Poisoning Project](#)⁶. The purpose of the video is raising the awareness of wildlife poisoning in Albania among the public as well as promoting the response of the public and stakeholders from institutions in order to combat poisoning.

Protection and Preservation of Natural Environment in Albania (PPNEA) organized a workshop in Gjirokaster in November 2021 (implemented within the framework of the [Egyptian Vulture New LIFE](#) and BalkanDetox LIFE projects). Participants of the workshop were members of the network “Savers of the Egyptian vulture”, which was also created

⁶New video explores the phenomenon of wildlife poisoning in Albania through the years, February 21 2022, Balkan Detox Life website, retrieved on 04.03.2022.

<https://balkandetoxlife.eu/2022/02/21/new-video-explores-wildlife-poisoning-in-albania-through-the-years/>

by PPNEA and includes shepherds, vets, farmers and hunters. The focus of the workshop was Egyptian Vulture and awareness raising among participants⁷ about effects of using poison baits and poisoning substances as well as alternative methods that can be used in resolving conflicts between wildlife and humans.

In September, 2021, AOS organized informative-educational meetings (within the framework of [BalkanDetox LIFE](#) project and the [Egyptian Vulture New LIFE](#) project) in Radat and Sofratika, with the aim of raising awareness among groups which are frequently in conflict with wildlife.

Gjirokastra Marathon (GjiroRun) is an event organized by PPNEA in collaboration with RAPA Gjirokastër in 2020. Frameworks of the event were [World Migratory Bird Day](#), and "Egyptian Vulture New LIFE". It is also a part of the international project campaign "A Mile for the Egyptian Vulture". Participants were 38 students of "Pandeli Sotiri" school, who ran 1.6 km, were wearing T-shirts with an emblem of Egyptian Vulture and by doing that, the students took part in awareness raising about risk for the only vulture species that was left in their country.

Within the frameworks of [Balkan Anti-Poisoning Project](#) and the [Egyptian Vulture New LIFE](#) project, a national workshop was organized in Albania on January, 2020 by AOS, [Ministry of Tourism and Environment](#) and the Embassy of Spain in Albania. The aim of the workshop was raising the awareness of scale, causes and consequences of wildlife poisoning among stakeholders in relevant national institutions.

PPNEA organized two events in 2019, dedicated to International Vulture Awareness Day. The first event was held on 27 September and involved two primary schools of Progonat and Nivice. It comprised a presentation with topics related to Egyptian vulture, ecology, threats and implemented PPNEA activities focused on the recovery of this vulture species. Additionally, in collaboration with teachers from mentioned schools, PPNEA organized Vultures Festival on 2 October in Progonat village. Pupils of 6-9 grades were engaged in different activities - artwork dedicated to vultures, with the focus on the Egyptian Vulture, learning about monitoring the vultures and importance of protected areas.

Recent and current/ongoing projects concerning wildlife poisoning

⁷ Relevant stakeholders (representatives from RAPA Gjirokaster, National Inspectorate for Protection of Territory and Food Safety and Veterinary Institute Gjirokaster) also took part in and informed participants about the legal framework related to the topic.

- BalkanDetox Life project - Strengthening national capacities to fight wildlife poisoning and raise awareness about the problem in the Balkan countries (2020-2025)
- Adriatic FlyAway Conference - Fighting poisoning - reducing vulture and other scavengers and predators) mortality because of the use of poison baits and lead ammunition across the Mediterranean (2014-2022)
- EV New Life - Reduce the major threats for the Egyptian Vulture in breeding grounds (evidence-based approach) (2017-2022)
- M7 - Reducing mortality of migratory birds and vultures - supporting the conservation of Mediterranean cultural landscapes, their biodiversity and the ecosystem services they provide to Mediterranean people (2020-2022)
- Actions Towards Reduction of Wild Birds Poisoning in Albania - Awareness raising of the poisoning effects, strengthening stakeholders' capacities related to combating wildlife crime and sustainable hunting (2018-2021)
- Anti-Poisoning on Wildlife in Albania project (part of Balkan Anti-Poisoning Project,- Awareness raising and strengthening the resources of national responsible authorities in order to combat wildlife poisoning (2018-2020)
- Balkan Anti-Poisoning Project - Combating wildlife poisoning in six Balkan countries by using joined efforts of relevant stakeholders from included countries (2018-2020)

3.8 Target groups knowledge – baseline level

Hot spots residents knowledge baseline level

Regarding knowledge of breeding species in Albania, over one third (39%) of targeted groups in hot spots in Albania, livestock and agricultural production farmers, rangers, veterinarians and policemen rated their own knowledge of this issue as below average. Near one in a five claims that their knowledge is on an average level and a similar number consider having impressive knowledge associated with this problem. Thus, further activities should be focused on informing and educating these groups.

Albania has experienced the extinction of almost all of its vulture species, nevertheless, targeted groups in hot spots in Albania remain mostly uninformed about the presence and breeding of vulture populations in their country. Still, more than a half of hot spots target group members believe that Egyptian Vulture nests in Albania. With regards to other species - a vast number of hot spots target groups dwellers are not informed

about their conservation status. This can be associated with above-mentioned extinction of these species in Albania.

Hot spots residents acknowledge that the diet of vultures consists of wild and domestic animal, and a smaller number of them believe that vultures feed on hunted animals as well (rodents for example).

The use of poison in the natural environment is something that until recently was not clearly defined as an illegal activity in the national law of Albania and in part as a consequence of this, wildlife poisoning is not perceived as a key threat to the vulture population. Only one tenth of farmers, rangers, veterinarians, and policemen see wildlife poisoning as the biggest danger that vultures face. In addition to education activities with stakeholder groups, further adaptation of current national legislation related to nature conservation and familiarizing the general public with the relevant legislative, could be an effective way to maintain a sustainable environment for vultures, but also help raise awareness about this issue.

Information is not easily available and knowledge about this topic is limited, while official data show that the intentional use of poison in the natural environment remains the most frequent cause of death of vultures. Most respondents in this survey identify poison baits intended for other animals and consumption of poisoned animals by vultures, as key causes of vulture poisoning. Although poisoning under the above described circumstances is accidental, simultaneously every second respondent thinks that wildlife poisoning is intentionally done, mostly by illegal poisons from the black market or abuse of legal poisoning substances such as pesticides, insecticides, etc.

Respondents identify the groups responsible for wildlife poisoning with moderate success. Half of them consider livestock breeders to be responsible and only one third name farmers as the accountable group. Hunters are identified by around one fifth of the respondents.

The combat against wild predators and resolving conflicts with stray and feral dogs may be the starting point of extinction of vultures in Albania, but further education about the possibility of affecting other species by placement of poison baits in nature can reduce this lack in the knowledge Albanian livestock breeders.

Also, the reality is that there exists a misuse and inadequate application of various pesticides and rodenticides by Albanian people in rural areas, but further investigation should be provided for veterinary products used in livestock breeding (Bino, Sevo, Topi, 2018).

When it comes to the motivation behind wildlife poisoning, respondents accurately name - protection from pests, protection of pastures and livestock from wild animals as well as protection from stray dogs and cats and conflicts among people about land use as key motivations for poisoning animals.

The vast majority of hot spots residents do not have knowledge about the regions that represent poisoning hot spots in Albania. The region of Gjirokastër which is a region of high poisoning activity is not acknowledged by respondents as a hot spot.

On the other hand, when the season of poisoning is concerned – most respondents consider spring or summer to be periods of the year when poisoning occurs. In reality wildlife poisoning quite often occurs during the winter.

Institutions officials knowledge – baseline level

The fact that Egyptian Vulture still breeds in Albania is familiar to the vast majority of the officials employed in the relevant institutions in Albania. On the other hand, even though the other vulture species that used to breed in Albania have gone extinct, close to one in two respondents state that Griffon Vulture and close to one in five respondents state that Cinereous Vulture still breed in their country.

When it comes to the types of food which vultures feed on in Albania, almost all respondents recognize vultures as scavengers, i.e. they are believed to eat carcasses of wild animals. In addition, nearly one in two respondents state that vultures feed on carcasses of domestic animals. However, slightly more than a third of respondents state that vulture diet encompasses hunted rodents as well as hunted insects.

In accordance with the data, more than half of the institution officials in Albania perceive wildlife poisoning as the act that endangers vultures in their country the most. A few respondents state that the main threat is extensive use of legal toxic compounds, which is in accordance with indications that rodenticides and pesticides can be a danger for vultures. However, the results emphasize the necessity of raising the awareness of poisoning of wild animals as the main threat to vultures among institution officials in Albania.

Vultures aren't perceived as the target of the poisoning – close to half of respondents state that a key cause of vultures poisoning are poison baits intended for other animals and more than a fourth of respondents believe that eating poisoned animals or animals that died of poisoning is the main cause of the vultures poisoning.

Institution officials' beliefs that livestock breeders and farmers are mostly responsible for wildlife poisoning are in accordance with the data which show that conflicts between

livestock breeders and farmers, on the one side and wildlife that damages livestock and agricultural land, on the other side, are the main causes of the use of poison substances.

Motives that are recognized as the key drivers for wildlife poisoning by institution officials in Albania partly match the ones that are indicated by data. Three fourths of the employees in the relevant institutions state that the main driver is protection of agricultural land from wild animals. In addition, more than half of the sample recognize protection of pastures and livestock from wild animals or protection from pests as motives behind the poisoning of wild animals. However, even though there are indications that poison is used in order to resolve various conflicts – with stray and feral dogs as well as with neighbors, more than third of the sample recognize protection from stray dogs and cats as a motive, while more than fourth of respondents believe that the motive are conflicts among people about land use.

When it comes to the region of Albania where wild animals are most frequently poisoned, more than one in two institution officials state that this region is Gjirokastër. Results from the previous research show that region of Gjirokastra represents the hotspot and also a place where Egyptian Vulture is present. Furthermore, more than third of respondents don't have the knowledge of regions where wildlife poisoning most frequently occurs. So, awareness of the hotspots should be raised among those employed in relevant institutions.

There is a lack of knowledge of procedures and documentation related o wildlife poisoning among the respondents – more than half of them state that they aren't informed about the existence of National action plan for combating wildlife poisoning in place, protocol defining procedures and jurisdictions for investigating wildlife poisoning or database for poisoning incidents of birds in Albania. Besides, around third of the sample believe that these procedures and documentation don't exist. However, things are making progress in this field – development of National anti-poisoning road map for Albania, establishment of National Anti-poison Working Group which initiated the preparation of National action plan and including the records of wildlife poisoning in Albania in the Database ⁸which is available online. These results indicate the necessity of informing the employees of relevant institutions about the real state in this field as well as engaging them in establishing and enforcing procedures that will enhance combating wildlife poisoning.

⁸ <https://balkandetoxlife.eu/mortality-database/>

4. Baseline report for Bosnia and Herzegovina

4.1 Institutional and Legal Framework in Bosnia and Herzegovina

The institutions that have legislative responsibility for the endangerment of wild species in Bosnia and Herzegovina are:

- The Ministry of Foreign Trade and Economic Relations – Directorate for plant protection
- Ministry of Agriculture, Water Management and Forestry of the Federation of Bosnia and Herzegovina
- Ministry of Environment and Tourism of the Federation of Bosnia and Herzegovina
- Ministry of Agriculture, Forestry and Water Management of Republika Srpska
- Ministry of Spatial Planning, Construction and Ecology of Republika Srpska

Relevant institutions that have a role in investigative and/ or law enforcing activities related to wildlife poisoning cases are:

- Republic Directorate for inspection affairs (Republika Srpska)
- Federal Directorate for inspection affairs
- Cantonal Inspectorates
- Agricultural institute of Republika Srpska⁹
- Faculty of Veterinary Medicine - Institute for sanitary control of food and environmental protection¹⁰
- Federal Police Directorate
- Police Directorate of Republika Srpska
- Border Police

Important civil society organizations that contribute to study and protection of birds in Bosnia and Herzegovina are:

⁹ Conduction of toxicological analysis

¹⁰ Conduction of necropsies and toxicological analysis.

- Ornithological Society "Naše ptice" (founded in 2003; involved in the fields of ornithology, ecology, bird ringing and protection and monitoring of birds and birds' habitats)
- Society for Research and Protection of Biodiversity (DIZB; founded in 2011 in Banja Luka, Republika Srpska; the main goal of the society is research and data collection about wildlife in Bosnia and Herzegovina, education of the public about the importance of biodiversity and natural resources, as well as the protection of natural habitat in general)
- Youth club "Novi val" (founded in 2001; one of the basic activities implemented by the New Wave is the reintroduction of griffon vultures in Bosnia and Herzegovina)
- Association for the Protection of Birds and Nature "Čaplja"
- Biological research organizations "Južnjačko plavo nebo" (founded in 2006; responsible for launching a project to return vultures to the territory of Bosnia and Herzegovina)
- Center for Environment (CZZS; founded in 1999 with the aim to influence and contribute to the improvement of the environment through its active and proactive actions)

4.2 Legislation in the republic of Bosnia and Herzegovina

Wildlife poisoning and the use of poisonous substances are regulated by several laws in Bosnia and Herzegovina. There are some distinctions in existing laws in relation to specific entities of Bosnia and Herzegovina (Federation of Bosnia and Herzegovina, Republika Srpska, Distrikt Brčko).

Federation of Bosnia and Herzegovina laws

1. **The law on nature protection** – Zakon o zaštiti prirode („Službene novine Federacije BiH”, br. 33/2003, 66/2013-dr.zakon)
2. **The hunting law** - Zakon o lovstvu (Službene novine Federacije BiH, broj: 4/2006, 8/2010 i 81/2014)
3. **The law on environmental protection** – Zakon o zaštiti okoliša FBIH ("Službene novine Federacije BiH”, br. 33/2003, 39/2009)

Republika Srpska laws



1. **The law on nature protection** – Zakon o zaštiti prirode RS („Službeni glasnik RS“ broj 20/2014)
2. **The hunting law** – Zakon o lovstvu („Službeni glasnik RS“ br. 60/2009)
3. **The law on environmental protection** - Zakon o zaštiti životne sredine („Službeni glasnik RS br, 71/2012, 79/2015, 70/2020)
4. **Regulation on strictly protected and protected wild species** - Uredba o strogo zaštićenim i zaštićenim divljim vrstama (“Službeni glasnik Republike Srpske” br. 65/2020)

Brčko district laws

1. **The law on nature protection** – Zakon o zaštiti prirode (“Službeni glasnik Brčko distrikta BiH”, br. 24/2004, 01/2005, 19/2007, 09/2009)
2. **The hunting law** – Zakon o lovstvu Brčko distrikta Bosne i Hercegovine (“Službeni glasnik Brčko distrikta BiH”, br. 1/2015, 52/2018 – izmene, 26/2021 – izmene)
3. **The law on environmental protection** - Zakon o zaštiti životne sredine (“Službeni glasnik Brčko distrikta BiH”, br. 24/2004, 01/2005, 19/2007, 09/2009)

Federation of Bosnia and Herzegovina

According to Kotrošan and Dervović (Kotoršan & Dervović, in Pantović & Andevski, 2018) killing wild animals and intentional poisoning are prohibited by the following regulations:

- **Law on nature protection:** Article 119. of this law prohibits the use of all methods for capturing and killing of wild animal species which can cause local extinctions or severe disturbances of population of those species, including the usage of poison baits.
- **Hunting law:** Article 29. of this law prohibits the intentional poisoning of game animals. Exceptionally, the Federal Minister, based on request from interested parties (inspectorate, hunting association etc.), may authorize the use of poison for elimination of certain species of game animals if they threaten human health, health of domestic animals or survival of protected species of game animals. This authorization must state the method, timeframe and persons responsible for placing poison baits. Additionally, Article 84. determines the penalty of 1.000-1.500 KM for all citizens who violate Article 29. According to Article 52. of the same Law, unethical

methods of hunting, which among other means and methods includes the use of poison baits, are prohibited.

Republika Srpska

According to Kotoršan and Dervović (Kotoršan & Dervović, in Pantović & Andevski, 2018) the disturbance of populations of wild species and their illegal poisoning are prohibited by the following laws in the region of Republika Srpska:

- **Law on nature protection:** Prohibits all activities which contribute to disturbance of the favorable condition of populations of wild species, destroying or damaging their habitat, litter, nesting or disturbing their life cycle, or favorable condition, among other things, by the use of poison baits.
- **Hunting law:** According to Article 16., it is prohibited to use poison baits as a method for hunting or control of populations of game animals.

In addition to previously mentioned laws, Article 5. of **Regulation on strictly protected and protected wild species** states that restraining, holding or killing a strictly protected species animals at all stages of the biological cycle, damage or the destruction of their developmental forms, eggs, nests and litters, as well as areas of their reproduction, rest and endangering or destroying their habitats is prohibited. Furthermore, article 12. of this Regulation prescribes the envisaged fines if something from the previously mentioned article is violated.

District Brčko

Similarly, according to Kotoršan and Dervović (Kotoršan & Dervović, in Pantović & Andevski 2018) in the District Brčko, there are also laws which prohibit disturbance of wild species and their existence, for example, by using the poison baits:

- **Law on nature protection:** This law prohibits all activities which contribute to the disturbance of the favorable condition of populations of wild species, destroying or damaging their habitat, litter, nesting or disturbing their life cycle, or favorable condition, among other things, by the use of poison baits.
- **Hunting law:** Article 13. of this law prohibits the use of poison baits as a method for hunting or control of populations of game animals.

4.3 International treaties and conventions relevant for the conservation of wild birds in Bosnia and Herzegovina

“The Convention on the Conservation of European Wildlife and Natural Habitats, Bern Convention” was ratified in Bosnia and Herzegovina in 2008¹¹.

In Article 8 of this convention, it is stated that contracting parties shall prohibit the use of all indiscriminate means of capture and killing and the use of all means capable of causing local disappearance of, or serious disturbance to populations of a species. This applies in particular to the means that are listed in Appendix IV of this treaty. Appendix IV of the Bern Convention is concerned with “Prohibited means and methods of killing, capture and other forms of exploitation” and under these means poison, poisoned and anaesthetic bait are listed.

4.4 Stakeholders’ attitudes toward legislation and law enforcement

In Bosnia and Herzegovina, poisoning of wild animals and the use of poisonous substances for such purposes are considered illegal activities, as stated by Kotrošan and Dervović (Kotrošan & Dervović, in Pantović & Andevski, 2018).

On the other hand, Bosnia and Herzegovina has a very complex administrative apparatus, with different levels of governance and multiple institutions, that often have inconsistent legal frameworks and are lacking a sufficient level of cooperation (Kotrošan & Dervović, in Pantović & Andevski, 2018). This impedes the efforts to precisely define jurisdictions and to develop and legally adopt the protocols for processing cases of wildlife poisoning, but also to adopt more effective enforcement of anti-poison legislation.

Poisoning of wild animals and vultures is mostly done by farmers as a means of protection from “pests” that was inherited from the times of state approved and utilized usage of poisons to control wildlife populations. Applied poisons have a widespread but not sufficiently informed and controlled usage in agriculture. They can also be obtained in the black market of such substances present in Bosnia and Herzegovina.

According to Kotrošan & Dervović (Kotrošan & Dervović, in Pantović & Andevski, 2018), the thing that would contribute to a more successful eradication of the usage of poisons in wildlife control, as well as prosecution of those responsible for wildlife poisoning are protocols that would clearly state the responsibilities of each relevant institution. More

¹¹ Konvencija o zaštiti evropskih divljih vrsta i prirodnih staništa/ Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) - („Službeni glasnik Bosne i Hercegovine“ - MU broj 08/2008)

comprehensive engagement on this issue is necessary, as well as detecting poisoning cases as soon as possible, and more effective and stricter implementation of existing laws. Additionally, although there are protocols that specify adequate ways and permitted amounts of use of chemical substances (pesticides), as stated they are violated to a significant extent, among other things, due to insufficient knowledge and possession of information among farmers who use them. Therefore, educational activities that will be aimed at highlighting adequate uses of the aforementioned substances or pointing out alternative ways of solving problems in agriculture (bio-agriculture) can be a step that will contribute to reducing poisoning of wild species, including vultures (Kotrošan & Dervović, in Pantović & Andevski, 2018).

Government services and institutions officials who took part in the online survey as a part of BalkanDetox LIFE project also recognized the barriers related to the enforcement of existing laws and pointed out certain aspects that could contribute to more successful processing of wildlife poisoning cases.

Officials who participated in the BalkanDetox LIFE survey also state, that the existing laws are inadequately implemented and consider this as the one of the key barriers for sanctioning of wildlife poisoning incidents. According to their perception and attitudes, imposing the fines, application of strict punishments for all forms of mass and non-discriminatory killing of animals, higher penalties, and declaring animal poisoning a criminal offense in general and not just if it occurred in a protected area (i.e. nature or national parks) could contribute to better wildlife protection.

They also highlight stricter control over the trade of legal poisoning substances such as pesticides, which is remarked by Kotrošan and Dervović (Kotrošan & Dervović, in Pantović & Andevski, 2018).

The police is recognized as one of the important institutions that should have crucial role in wildlife poisoning investigations. Areas for improvement of the capacity of police are related to equipping them with specialized canine units and sophisticated technology, but also increasing the police forces with environmental inspectors and rangers who would be involved in the process of detecting cases of wildlife poisoning. Insufficient training of the police officers to conduct wildlife poisoning investigations, in addition to insufficient equipment, has also been identified as a space for improvement.

Employees of relevant institutions in Bosnia and Herzegovina have also recognized some specific measures that could prevent poisoning of wild species:

- **inclusion** of representatives of **civil society organizations** in the police investigations

- better **coordination among relevant institutions** (as emphasized by Kotrošan & Dervović, in Pantović & Andevski, 2018)
- **raising awareness** of the general public and key stakeholders (livestock breeders, farmers, hunters, institutions) (as emphasized by Kotrošan & Dervović, in Pantović & Andevski, 2018)
- larger number of **feeding grounds for vultures**
- better **protection of wild ungulate populations**
- resolving the issues of **pasture ownership** and the right to use them
- ensuring **free electric fences** and
- **state/ government financial compensation** for the damages caused by wild animals to livestock breeders and farmers

4.5 EU compliance of regulations

In **The Bosnia and Herzegovina 2020 Report**, as a part of the **2020 Communication on EU Enlargement Policy**, it is stated that Bosnia and Herzegovina is at an early stage of preparation in the area of environment and climate change (Chapter 27, that is considered as relevant for the issue of protection of wild birds among other areas of environment and climate change).

Alignment with the EU *acquis* on the nature protection, in particular with the Habitats and Birds Directives, **is very limited**. There is **no progress** on the pending adoption of the list of potential **Natura 2000** sites and secondary legislation. There has been no progress in establishing a system in Bosnia and Herzegovina for collecting information on and systematically monitoring biodiversity.

In general, Bosnia and Herzegovina needs to designate institutions, ensure the necessary human and financial resources and establish structures for implementing the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

4.6 Fields of knowledge baseline level

Compiling data on the illegal poisoning of wild birds in Bosnia and Herzegovina

According to Kotrošan and Dervović (Kotrošan & Dervović, in Pantović & Andevski, 2018) the last massive poisoning of vulture species on the territory of Bosnia and Herzegovina

was recorded at the beginning of the final decade in the 20th century. During this incident the last thirty Griffon vultures were poisoned after feeding on an animal carcass laced with poison aimed at stray and feral dogs and since then, no vulture has been seen breeding in this country.

However, until now, no survey or systemic data collection related to specific causes of vulture poisoning was conducted in Bosnia and Herzegovina, and there is no organized database for capturing individual cases of wildlife poisoning.

Educational activities regarding illegal bird poisoning in Bosnia and Herzegovina

Ornithological Society "Naše Ptice" conducted educational workshops in hotspot areas in Bosnia and Herzegovina, as part of the BalkanDetox LIFE project during 2021. The aim of the workshops was to raise awareness about the importance of wildlife species, and the to warn of the consequences of their poisoning.

Recent and current/ongoing projects concerning wildlife poisoning

- **Balkan Vulture Protection Action Plan** - activities implemented from 2005 to 2008, in cooperation with the "Fund for the Protection of Black Vultures" (BVFC) and the Ornithological Society "Naše Ptice" from Sarajevo related to the return of vultures to the territories where they once nested (Kotrošan, 2009).
- **Eco-development in rural areas of Bosnia and Herzegovina and Serbia** - the action plan for vultures in Serbia was expanded to a broader project "Eco-development in rural areas of Bosnia and Herzegovina and Serbia" (phases I-II) during the two year period (2007-2009). The goal of this project was to join the interests in the protection of vultures and nature with development of rural communities (Grubač, 2008).
- **Support to the implementation of the Birds Directive and the Habitats Directive in BiH** - project conducted 2012-2015 involving the institutions of Bosnia and Herzegovina, Republika Srpska, Federation of Bosnia and Herzegovina and Brcko District, including the Republic Institute for the Protection of Cultural, Historical and Natural Heritage. The key contribution of this project was a list of potential Natura 2000 sites with areas, species and habitats.
- **Adriatic Flyway 4** - Fighting poisoning – reducing vulture (and other scavengers and predators) mortality due to the use of poison baits and lead ammunition across the Mediterranean (2018-2022).

4.7 Number of relevant stakeholders involved

The current BalkanDetox LIFE project focuses on two target groups: the first includes stakeholders, government services and institution officials, while the second consists of hotspots dwellers - farmers, hunters and livestock breeders.

The estimated number of employees in specific institutions whose field of work touches upon the problem of vulture poisoning and wildlife protection is 29, and they operate in ten different institutions¹² on the territory of Bosnia and Herzegovina.

Two hotspots were identified and focused upon in BalkanDetox LIFE project: Hercegovnačko-neretvanska County (županija) and Hercegovbosanska County (županija). In the first region Hercegovnačko-neretvanska županija, there are 6 veterinary services employees, while in the Hercegovbosanska županija there is one person who performs this type of service. Currently, there are no official data regarding the number of law enforcement officials in these two regions.

Across mentioned hotspots counties, the total number of farmers, hunters and livestock breeders is estimated at 325. Among 190 stakeholders In Hercegovnačko-neretvanska županija there are 150 hunters, 30 farmers and 10 livestock breeders, while Hercegovbosanska županija counts 100 hunters, 20 farmers and 15 livestock breeders.

Due to difficulties caused by the COVID-19 pandemic the number of respondents that was included in the research from the first target group - government services and institutions officials, law enforcement officials and veterinary services employees in Bosnia and Herzegovina, was 9, and the number of respondents from the second target group – livestock breeders, hunters and farmers was 27.

4.8 Target groups knowledge – baseline level

¹² The full list of relevant institutions which has been previously noted in the section “Institutional and Legal Framework in Bosnia and Herzegovina” includes: Ministry of Spatial Planning, Construction and Ecology of Republika Srpska, Ministry of Foreign Trade and Economic Relations of the Federation of Bosnia and Herzegovina / Sector for Water Resources, Tourism and Environmental Protection, Republic Administration for Inspection Affairs / Inspectorate of Republika Srpska, Ministry of Agriculture, Water Management and Forestry of the Federation of Bosnia and Herzegovina, Federal Administration for Inspection Affairs, Ministry of Agriculture, Forestry and Water Management of Republika Srpska, Ministry of Environment and Tourism of the Federation of Bosnia and Herzegovina, Ministry of Education and Culture, PI Veterinary Institute of the Republika Srpska "Dr. Vaso Butozan", Banjaluka Veterinary Faculty

Hot spots residents knowledge baseline level

Generally, when it comes to self-assessment of knowledge regarding wildlife poisoning in Bosnia and Herzegovina, nearly a third of targeted residents of hot spots - farmers, rangers, and veterinarians assess their own knowledge as insufficient, which implies the need for further communication and education about this problem. One third states that they have average knowledge about the issue of wildlife poisoning in their country. On the other hand, slightly above one-fifth of the targeted groups estimate their knowledge as good or excellent.

Livestock/cattle and agricultural production farmers, rangers, and veterinarians assess their level of information as inadequate, more specifically they are not familiar with the presence and nesting of different species of vultures in Bosnia and Herzegovina. 10-15% of them believe that Griffon and Egyptian vultures are present and breeding in the country. On the other hand, almost every other respondent believes that Griffon vultures and Cinereous vultures do not breed in their country. The low level of knowledge about the presence of different species of vultures is somewhat understandable, since currently none of the four species of European vultures breed in Bosnia and Herzegovina, although they previously populated in this country.

When it comes to vultures' diet, respondents are well informed about their eating habits – they are aware that vultures feed on carcasses of wild and domestic animals. Close to third believe that vultures hunt rodents, while every fifth thinks that domestic animals are part of their diet which also implies the space for their further informing about this topic.

The majority of hot spots residents recognize wildlife poisoning as one of the three key threats to the vulture population in Bosnia and Herzegovina, apart from poaching and the lack of food, indicating the need for further awareness raising about the main causes of vultures' mortality.

However, vultures are not perceived as primary targets of poisoning, but mostly as unintentional victims from poison baits intended for other animals, victims of secondary poisoning where vultures themselves consume poisoned animals or are victims of pesticide poisoning. About a quarter of respondents believe the poisoning of vultures is intended and executed by poison baits prepared specifically for them.

The majority of livestock/ cattle and agricultural production farmers, rangers, and veterinarians recognize the importance of the vulture population for both humans and the ecosystem in its entirety and do not justify the poisoning of wild animals. On the other hand, 4 out of 10 hot spots dwellers consider controlled institutionally conducted

poisoning of wild animals as a proper means to control the pests which emphasizes the need for further informing about consequences of wildlife poisoning.

Hunters and individuals who deliberately poison animals because of their aggressive impulses are identified as the main groups which utilize the practice of wildlife poisoning, while in reality poisonous substances are mostly used by farmers for protection from “pests” and due to an insufficient level of information about proper usage and application of poisoned substances (Kotrošan & Dervović, in Pantović & Andevski, 2018). Still, around half of the hot spots residents also identify farmers and livestock breeders as groups who are responsible for wildlife poisoning.

Hot spots dwellers are generally well informed about perceived motives behind the wildlife poisoning. Protection from pests and protection of pastures, livestock and agricultural lands from wild animals are addressed as the most frequent motives behind poisoning which implies the need for better solutions to these problems farmers and livestock breeders face. Also, protection from stray dogs and cats and protection of agricultural land from birds of prey follow, and they potentially pose a significant threat for vultures foraging in Bosnia and Herzegovina. For these reasons, it is necessary to educate and inform people about the proper use and application of various types of poisons, as well as to control their illegal sales.

Krajina region in Bosnia and Herzegovina is perceived as a region where wild animals are most frequently poisoned by a third of respondents. Herzegovina, the region where was the last incident of massive poisoning of vultures in Bosnia and Herzegovina is recognized as a hot spot by 15% of respondents, while Posavina follows as the “red spot” but to a lesser extent (11%).

The majority of hot spots dwellers identify spring as the period of the year when wildlife poisoning mostly occurs, while summer is perceived as the key poisoning season by more than a third of respondents. In reality the majority of poisoning cases occur in winter.

Institutions officials knowledge – baseline level

Relevant institution officials in Bosnia and Herzegovina show a certain lack of knowledge about vulture species that breed in this area. Despite the fact that no vultures currently breed in the country apart from isolated sightings of passing Griffon vultures, most institution employees consider that this vulture species still nests in Bosnia and Herzegovina (while a small number of institution officials also believe that other types of vultures also breed in the country).

On the other hand, institutions employees in this country are relatively well informed when it comes to food consumed by vultures. Almost all of them state that carcasses of wild and domestic animals are part of the vultures` diet. However, a part of them believes that vultures feed on hunted rodents (hunted insects are considered as part of their diet rarely).

Extensive usage of legal toxic compounds (pesticides, insecticides, rodenticides) and wildlife poisoning are recognized as the main threat to the vulture population.

Institution officials are divided when it comes to intentionality in wildlife poisoning. While half of respondents state that it occurs accidentally, by misuse of legal poisoning substances, out of negligence or ignorance, the other half perceive wildlife poisoning incidents as results of intentional actions (illegal poisons from the black market or abuse of legal poisoning substances).

Among specific groups that are mainly responsible for wildlife poisoning the key role is attributed to persons who deliberately poison animals out of aggressive or destructive instincts, livestock/ cattle and agricultural production farmers are perceived as the second responsible group. According to Kotrošan and Dervović and available data, poisonous substances are mostly used by farmers (Kotrošan & Dervović in Pantović & Andevski, 2018), indicating the need for better informing on those responsible for such cases, in order to react in time and implement adequate measures.

Still, government services and institutions officials are aware of the main motives driving actions related to wildlife poisoning. They identify protection from pests, protection of pastures, livestock and agricultural lands from wild animals as motives that drive such actions. When it comes to the protection of agricultural lands from birds of prey and conflicts among people about land use (pastures, hunting areas), institution officials mainly have divided opinions.

Compared to the other target group, institution officials are more informed that wildlife poisoning incidents are often done in the region of Herzegovina. However, above half of the employees from the relevant institutions in Bosnia and Herzegovina are not informed about the areas of most common wildlife poisoning.

Respondents employed in institutions are aware of the evident lack of data on the sales of legal poisonous substances (pesticides, insecticides, rodenticides) and of systematical databases on poisoning incidents, they are also informed about the national action plan to combat poisoning or a protocol defining procedures and responsibilities in investigations into wildlife poisoning. There is however a certain number of respondents who are still uninformed, indicating the need for adequate and

timely informing and education in order to improve their engagement and activities on these important institutional and management issues.

5. Baseline report for Bulgaria

5.1 Institutional and Legal Framework in Bulgaria

Relevant institutions in Bulgaria that have legislative responsibilities related to Anti-Poison engagement and activities in the country are (Stoynov et al., 2018):

- Ministry of Environment and Water¹³
- Executive Environment Agency (ExEA)¹⁴

Additionally, institutions that are responsible for law enforcement concerning wildlife poisoning are:

- Regional Inspectorates of Environment and Water¹⁵
- Bulgarian Food Safety Agency (BFSA)¹⁶
- The Ministry of the Interior (Mol)¹⁷
- Prosecutor's Office¹⁸
- Executive Forests Agency (EFA)¹⁹
- Union of Hunters and Fishermen in Bulgaria²⁰

¹³ Conducting the activities of controlling and maintaining that secure the environmental sustainability by maintaining and controlling of the National Ecological Network

¹⁴ Legislative and law enforcement responsibilities

¹⁵ In charge of imposing fines, financial penalties and compulsory administrative measures, sending distressed protected species to a rescue center for specific pre-trial proceedings or cases with written or oral advice

¹⁶ In charge of the authorisation regime for plant protection and veterinary medicinal products, undertakes official control of plant protection products and animal health and welfare

¹⁷ In charge of detection, investigation (pre-trial proceedings) and detention of offenders

¹⁸ In charge of investigation, prosecution and upholding the prosecution in criminal cases of a general nature

¹⁹ In charge of detection, assistance in detecting and investigating incidents, issuing 'cease and desist' orders, issuing a certifying protocol for an administrative offence report (in the case of poisoning) and reporting to and assisting the Ministry of Interior authorities (in the case of evidence of a crime)

Some of the important civil society organizations active in the fields of studying and protecting vultures are:

- Bulgarian Society for the Protection of Birds - engaged in preventing illegal killing of birds in Bulgaria, as well as compiling the database in order to monitor wildlife incidents
- Green Balkans - engaged in the area of preventing violations of nature conservation legislation and combat against poaching, while focusing on improving law enforcement; Specialized unit of Green Balkans is The Wildlife Rescue Centre, responsible for the rehabilitation, treatment, recovery, and release of rare wild animals or species threatened with extinction
- Fund For Flora and Fauna - part of *Anti-poison program*, assisting in tracking and collection of illegal poisoning incidents data, also maintaining a database of chemicals used in poisoning in cooperation with Toxicology Lab of the National Veterinary Institute in Sofia
- WWF Bulgaria - seeking to protect plant and animal species by tackling the root causes of the many serious threats; collecting data associated with wildlife crime and providing databases on wildlife offences, among other activities
- BALKAN Wildlife Association - studying, protecting and restoring flora and fauna in natural ecosystems and promoting environmental issues among the general public
- Bulgarian biodiversity foundation - engaged in preserving the nature and changing attitudes towards protected areas and species

5.2 Legislation in the republic of Bulgaria

The protection and reproduction of the environment, the conservation of nature, including bird species, is ensured by the Constitution of the Republic of Bulgaria - Article 15.

²⁰ Involved in process of preventing and sanctioning use of poisoning baits

National regulations related to the production, distribution, possession and use of substances that can be harmful for animals (i.e. poisons) make wildlife poisoning illegal through following sections:

1. **Biological Diversity Act (BDA)** - State Gazette No 77/2002, amended
2. **Law for hunting and protection game** - State Gazette No 78/2000, amended 26/2001, amended 77/2002, amended 79/2002
3. **Veterinary Medicine Act (VMA)** - Art., 151, Para 1
4. **Animal Protection Act (APA)** - Art. 7, Art. 151
5. **Penal Code** - According to article 237. - State Gazette No 28/28, 89/26, 86/91, 85/97, amended, 92/02
6. **Act on the Protection from the Harmful Impact of Chemical Substances and Mixtures (APHICSM)** - Art. 2, Art. 27
7. **Plant Protection Act (PPA)** - Regulation (EC) No. 1107/2009, Art. 105, Art. 28, Para 2

Several basic issues regarding the protection of living animals are regulated by the **Animal Protection Act**. Protection is provided by: protection of animals' life, health, and good general conditions, as well as protection from inhumane, cruel, and extremely cruel treatment, and also ensuring of proper care and living conditions, adapted to their concrete needs.

The illegal use of poisons is strictly and explicitly forbidden by the following legislation:

- **Biological Diversity Act** - Art. 44, Appendix 5, Para 1 states that the use of poison baits and poisons is prohibited.
- **Hunting and Game Conservation ACT (HGCA)** - Article 109, Para 3 of this Regulation prohibits the use of highly toxic preparations harmful to game or illegally dosed weakly toxic preparations.

When it comes to animal poisoning, the penalties are defined according to the Criminal Code. The capturing or killing in places and times, where and when it is prohibited, is punishable by a prison sentence of up to six months or by a fine between one 100 and 300 hundred levs. In addition to this, cruelty to and killing of vertebrate animals is punishable by imprisonment, with a sentence of up to three years and a fine in the range of 1000 to 5000 lev.

From the agricultural point of view, according to the preliminary data for the year 2020, The Ministry of Agriculture, Food and Forestry (Ministry of Agriculture, Food and Forestry, 2021, 1) states that „The agricultural census in Bulgaria was conducted from September 1 to December 18, 2020. This is the largest census in agriculture, conducted every 10 years on the recommendation of the Food and Agriculture Organization of the United Nations (FAO). The rules for its conduct are established by Regulation (EU) 2018/1091 of the European Parliament and of the Council and by the Agricultural Census Law in the Republic of Bulgaria 2020.“

Preliminary results of the Agricultural Census (Ministry of Agriculture, Food and Forestry, 2021) show the overall decrease in the number of agricultural estates which is accompanied by an increase in the utilized agricultural area (UAA), the average size of the UAA and increase in the average number of animals kept on the estates. It is clear that the growth of agriculture is followed by the growth of pesticide use.

In 2017 The European Commission requested that Member States undertake more actions to guarantee the sustainable use of pesticides and protect human health and the environment.

The Directive 2009/128/EC defines a set of actions to achieve sustainable pesticide use in the EU.

„The Sustainable Use of Pesticides Directive” (European Parliament and Council of European Union, 2009) establishes special requirements for Member States concerning:

- access to initial and additional training for professional users of plant protection products, distributors and advisors and a certification system for individuals possessing the required knowledge;
- sales of pesticides;
- information and awareness programmes relating to pesticides;
- systems for collecting information relating to cases of acute and chronic pesticide poisoning;
- inspection of the equipment used to apply pesticides;
- aerial spraying;
- protection of the aquatic environment and drinking water;

- reduction of pesticide use or risks in specific areas;
- handling of pesticides, their packaging and unused quantities of plant protection products;
- storage of pesticides;
- integrated pest management;
- risk indicators.“

A National Action Plan for the Republic of Bulgaria (Council of Ministers, 2012) was created in 2012 with regard to sustainable pesticide use. There are several bodies that are responsible for monitoring the adherence to the National Action Plan for Sustainable Pesticide Use. This action plan follows two main goals:

I. Reducing the risks and impact of pesticide use on human health and the environment, including:

→ Protection of human health:

1. preventive protection of consumers – by reducing pesticide residues in food of plant origin;
2. reducing the risk of pesticide residues in food intended for children, as the most vulnerable consumer group;
3. avoiding and/or reducing the risk of pesticide residues in drinking water and bottled water;
4. protection of professional users, operators and agricultural workers – by reducing exposure to pesticides;
5. protection of residents and bystanders (people who happen to be present or passing by) in areas where pesticides are used – by avoiding and/or reducing their exposure to pesticides;
6. protection of the general public and vulnerable population groups – by avoiding and/or reducing the risks of pesticides in public spaces and recreational zones;
7. protection of non-professional users using pesticides on their own crops, gardens, yards, etc.

→ Environmental protection:

1. avoiding and/or reducing pesticide pollution of water and soil;
2. avoiding and/or reducing the risk of pesticide residues in water sources – both surface and groundwater;
3. avoiding and/or reducing the impact of pesticides on biodiversity, with special attention paid to bees and other non-target organisms.

II. Promoting integrated pest management and alternative approaches or methods, including:

1. Developing integrated pest management systems and alternative plant protection approaches or methods.
2. Introducing integrated pest management – through information campaigns and incentives, including financial incentives, for agricultural producers applying general and/or specific principles of integrated pest management;
3. Encouraging the use of non-chemical alternatives to pesticides wherever possible.

An updated National Action Plan for Sustainable Pesticide Use (Council of Ministers, 2020) was adopted and brought into force in 2020, which outlines measures for the monitoring and implementation of the National Action Plan. These measures include:

- training of professionals for working with pesticides and recognizing the usage of illegal and unregulated pesticides
- the introduction of mandatory requirements which must be fulfilled in order to have the possibility of selling pesticides
- rules for handling, storing, and re-packaging of pesticides
- inspection of equipment for the application of pesticides
- the prohibition of aerial spraying of pesticides (which is only allowed under certain conditions and with special permits)
- ***integrated pest control***
- reduction of pesticide residue in plant based foods (manufactured in Bulgaria)
- special measures for the protection of bodies of water and drinking water
- additional measures for the protection of the natural environment

- notifying the public about areas that are treated with pesticides
- informing and awareness raising about the influence of pesticides on human health and the environment
- Reduction of the usage of pesticides or risk in certain areas
 - This also includes areas like „Natura 2000 sites protected in accordance with Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds and Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora.“

One of the listed indicators for the success of the implementation of the Action Plan is also „ the number of proven cases of pesticide poisoning of animals, birds and other non-target organisms.“

In addition to the Ministry of Agriculture, Food and Forestry, the environment is also protected by legislation for hunting brought into force in 2016, and supported by the implementation of the regulations of the Hunting and Game Protection Law.

The aim of all these laws and action plans, is, among others, to help reduce the mortality of vultures who breed in the natural environment. Vultures living in nature, feed on the carcasses of animals, thus reducing the risk of pathogen microorganisms, and affect the entire ecosystem. Taking into consideration the way that vultures feed, secondary poisoning comes up as reason for the dwindling numbers of individual birds in nature, especially if we take into consideration that vultures feed in (big) groups.

5.3 International treaties and conventions relevant for the conservation of wild birds in Bulgaria

“The Convention on the Conservation of European Wildlife and Natural Habitats, Bern Convention” was ratified in Bulgaria in 1999.

In Article 8 of this convention, it is stated that contracting parties shall prohibit the use of all indiscriminate means of capture and killing and the use of all means capable of causing local disappearance of, or serious disturbance to populations of a species. This applies in particular to the means that are listed in Appendix IV of this treaty. Appendix IV of the Bern Convention is concerned with “Prohibited means and methods of killing, capture and other forms of exploitation” and under these means poison, poisoned and anaesthetic bait are listed.

Also, the same activities have been prohibited for the Member States of the European Union under **Directive 2009/147/EC on the conservation of wild birds** and **Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora**. Member states are obligated by Directive 209/147/EC to ban the use of all methods of mass culling and indiscriminate trapping and killing of birds, and methods that may lead to the extinction of local species (Article 8). In Annex IV of the Directive, the use of poison or anaesthetic baits is one of the prohibited methods. The text of Article 15 and point (a) of Annex VI of the Directive 92/43/EEC imposes the same prohibitions. Likewise, Member States have defined environment protection steps through criminal law focusing on killing, destruction or possession of specimens of protected plants and animals, according to Article 3(f) of **Directive 2008/99/EC of the European Parliament and of the Council** of 19 November 2008.

The aim of the **Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention; CMS)** is protection of migratory wild animals, including combating wildlife poisoning. Resolution 11.15 Preventing Poisoning of Migratory Birds includes recommendations and requirements for countries which are members of CMS. Some of them are focused on combating the use of poisons by developing national strategies and forbid the use of drugs that harm scavenging birds. Bulgarian Ministry of Environment and Water approved in 2021 National Action Plan to Combat the Illegal use of Poisons in the Wild 2021-2030 (Dobrev, Nikolov, 2021), which was undertaken within the framework of the "Conservation of Black and Griffon Vultures in the Rhodopes" (LIFE14 NAT/NL/000901) and "Egyptian Vulture New LIFE" (LIFE16 NAT/BG/000874), implemented by the Bulgarian Society for the Protection of Birds (BSPB).

Furthermore, Bulgaria ratified **Rotterdam Convention on the 'Prior Informed Consent' Procedure for International Trade in Certain Hazardous Chemicals and Pesticides** as a treaty that initiates and improves informed decision-making by countries regarding harmful chemicals. In other words, every country that wants to export chemicals that are listed under the Convention or subject to a ban or severe restrictions by the importing country, must get consent of the importing country regarding the trade itself.

5.5 Stakeholders' attitudes toward legislation and law enforcement

Efforts to protect wildlife and especially vultures have led to the conclusion that the key substances that require a greater degree of control are pesticides used in agriculture and illegally imported and purchased substances.

As mentioned, Bulgarian national legislation strictly prohibits the use of poisonous baits to kill hunting and protected species, while possession of highly toxic substances without a permit is considered illegal. However, the activity of setting up poisonous baits

is poorly described and processed in the existing legislation and thus differently interpreted and often inapplicable. The existing measures in the legislation of Bulgaria are not sufficient and additional explanations and justifications should be included in the existing laws.

Also, the need for a well-described protocol for dealing with incidents of wildlife poisoning that has occurred or could occur has been identified, as well as the need for all relevant parties to be thoroughly informed about it. Bulgaria is one of the few countries in the region that has developed such protocols in the past. Updating and further developing and legally enacting such a protocol, which would describe the proper procedure for processing poisoning incidents and the responsibilities of each relevant stakeholder, would greatly facilitate the judicial process of these cases and their perpetrators.

The key aggravating circumstances and obstacles for the prevention and sanctioning of wildlife poisoning identified among institutions officials participating in The Balkan Anti-Poisoning (BalkanDetox LIFE) Project survey are the complexity of the investigation, difficulties with evidence in the court, the insufficient education of public prosecutors for handling cases related to poisoning of wild animals, and insufficient or rare application of penalties based on the laws governing hunting grounds.

Institutions officials are also suspicious about the quality of the legal framework for punishing animal poisoning and whether the existing legislation regulates conservation of biodiversity well enough, they recognize inadequate law enforcement and point out to the low penalties for wildlife poisoning.

Employees in target institutions additionally point out the following specific measures for preventing wildlife poisoning:

- introduction of the specialized police units that would deal with the crimes of wildlife poisoning
- police reinforcement with specialized canine units for detecting poisonous substances used for wildlife poisoning
- additional police force education and training for investigating wildlife incidents
- facilitating reporting of poisoning incidents to police
- imposing of a stricter control of the trade of legal poisoning substances (pesticides, rodenticides, etc.),

- raising awareness of the general public and key stakeholders (livestock breeders, farmers, hunters, institutions)
- enforcing severe punishments for all forms of mass and non-discriminatory killing of animals, as well as higher penalties for every form of poaching/ illegal shooting,
- resolving issues of the ownership of pastures and rights to use them
- state / government financial compensation for the damages caused by wild animals to livestock breeders and farmers
- increased number of feeding grounds for vultures, and better protection of wild ungulate populations

After the poisoning incident in Kresna Gorge with the estimated death toll of more than 30 vultures, the researchers and activists pointed out to the need for about 10% of the birds in each colony to be tracked with GPS/GPRS transmitters, enabling locating of their feeding grounds and urgent reaction if a poisoning is suspected (Stoynov & Peshev 2011, 2012, 2013, 2014, in Peshev, Stoynov, Vangelova and Grozdanov, 2018). Other identified conservation activities based on proven practices in reinstating the vulture colonies are feeding of vultures and insulation of dangerous power-lines, while long-term measures should include restoration of food sources for vultures, release of immature birds, anti-poison activities, the compensation programme to residents (for loss due to predation) and continued public awareness activities.

5.5 EU compliance of regulations

As a member of the European Union, Bulgaria has been implementing laws and policies to protect air, water and safeguard nature that are coordinated by the EU as principal environmental objectives that have to be attained. Related to this, the European Commission started the **Environmental Implementation Review** (EIR), the tool that pursues to enhance implementation of EU environmental policies and legislation by identifying the causes of implementation gaps and addressing systemic obstacles to environmental integrations across policy sectors. By mapping the key challenges for each Member State, it provides the existing good practices and points of excellence.

Regarding the EIR 2019, Bulgaria has taken steps for streamlined environmental check by including appropriate assessment under the Habitats Directive, pollution prevention and control (IPPC) permitting process and the “Seveso” process for chemical safety in its EIA procedures. Also, substantial progress in mapping and assessing ecosystems

and developing natural capital has been made, but the proper implementation of nature protection legislation remains an undertaking.

Main challenges are divided in three categories: urban wastewater, air quality and nature protection. Obligations that are associated with nature protection are not yet realized, and Bulgaria has to define site-specific conservation objectives as well as set up conservation measures in order to restore/maintain species and habitats. Although one third of Bulgarian territory is included in *Natura 2000*, there is space left for setting up effacement management structures for this European network of protected natural areas where certain species of animal and their natural habitats are protected. Urban and infrastructure development threatens to disturb biodiversity in Bulgaria by deprivation of habitats. Modification of *Green List of Protected areas* could be a good way for providing betterment of Natura 2000 management on site level in near future, while there are almost all the protected areas included in the Bulgarian *Natura 2000* network.

5.7 Fields of knowledge baseline level

Compiling data on the illegal poisoning of wild birds in Bulgaria

According to Stoynov and others (Stoynov, et al., 2018, in Pantović & Andevski, 2018), surveys on poisoned wildlife animals in Bulgaria were not conducted, nor records of such incidents kept, until the 90s, when BSPB (Bulgarian Society for Protection of Birds) members started to conduct toxicological analyses of dead vultures in the Eastern Rhodopes.

The number of registered dead Griffon Vulture counts 38 during the period 1979-2011 16 of them are consequence of poisoning (Demerdzhiev et. al. 2014, in Pantović & Andevski, 2018). The biggest single incident with massive vulture poisoning in Bulgaria occurred, as mentioned, in March 2017 in Kresna gorge (Peshev et al. 2018, in Pantović & Andevski, 2018).

In June 2021, a Cinereous vulture that was released into the wild as part of a long-term program to restore species in the country also suffered as a result of illegal poisoning.

Educational activities regarding illegal bird poisoning in Bulgaria

In February 2022, part of the Egyptian Vulture New LIFE project team in Bulgaria organized several meetings in the city of Varna. Members of local climbing clubs, representatives of the municipality of Razdelna, the Regional Inspectorate for Environment and Water and the Archaeological Museum of Varna were participants in these meetings. The purpose was to start and reason the measures to be undertaken by

local stakeholders in order to eliminate the disturbance on the breeding vultures in the region.

Green Balkans develops educational programs and works with educational institutions. They organize presentations in schools, kindergartens, and universities, photo exhibitions, quizzes, and competitions in order to educate and raise awareness of the topic of nature conservation among students. The members of this organization carried out educational initiatives in more than 50 settlements, involving around 30,000 students and young people.

Recent and current/ongoing projects concerning wildlife poisoning:

- **The BSPB's nest guarding campaign (2021)** - implies engagement of the guardians of the Egyptian vultures' nests in the most vulnerable period for the juveniles.
- **The Vultures reintroduction Program** – under this program, Bulgarian nature conservation NGO „Fund for wild flora and fauna“ has been implementing several projects since 2000 (Transportation, adaptation and releasing of vultures in the wild; Supporting vultures feeding by providing service of carcass transportation from 150 farms; Tagging and GPS tracking of 130 vultures: Anti-poison activities improvement of grassland habitat; Building artificial nests for Cinereous vultures...)
- **The LIFE FOR KRESNA GORGE project LIFE11 NAT/BG/000363 (2012-2016)** - aimed to restore the populations of birds of prey and other emblematic species in southwest Bulgaria.
- **The Vultures back to LIFE project LIFE14 NAT/BG/000649 (2015-2022)** - aims to facilitate the return of the Eurasian black vulture to Bulgaria.
- **Natura 2000 Project in Bulgaria - New Horizons LIFE17 GIE / BG / 371 / LIFEforBgNATURA /** - aims at a significant / overall change in attitudes and public awareness of NATURA 2000, through the use of "flag" and easily recognizable species from the Habitats and Birds Directive.
- **Return of the Neophron, LIFE10 NAT/BG/000152 (2011-2016)** – with a focus on the urgent measures to secure the survival of the Egyptian Vulture (Neophron percnopterus) in Bulgaria and Greece.
- **LIFE RE-Vultures, LIFE14 NAT/NL/000901 (2016-2021)** – aimed at conservation of Black and Griffon Vultures in the cross-border Rhodopes mountains

- **Egyptian Vulture New LIFE, LIFE16 NAT/BG/000874 (2017-2022)** – with urgent action to strengthen the Balkan Population of the Egyptian Vulture and secure their flyway
- **101 Vultures Project in synergy with EV New LIFE Project** – for which HOS and Bulgarian Society for the Protection of the Birds received grant from Disney Conservation Fund. This two-year project aims to monitor the Egyptian vulture population trends; mitigate main threats like poisoning, electrocution and collision, provide food availability, implement educational programs, increase networks of local stakeholders against wildlife poisoning and promote positive behaviours toward vultures (“Disney Conservation Fund Supports The Egyptian Vulture Conservation In The Balkans”, 2021).

5.8 Number of relevant stakeholders involved

Government services and institutions officials are one of the groups of stakeholders included into BalkanDetox LIFE Project in Bulgaria related to wildlife poisoning. This group consists of 8 relevant employees, who work either at the Ministry of Environment and Waters (3 employees) or in Regional Inspectorate of Environment and Water (5 employees).

When it comes to law enforcement officials and veterinary services in both municipalities of Blagoevgrad Province, they number between 48 and 68 employees. Both municipalities, Kresna and Simitli, have the same distribution of the employees, i.e. each municipality has the total number of the employees between 24 and 34, of which between 20 and 30 work as law enforcement officials and 4 work in veterinary services.

Among the total estimated number of 3400 farmers, livestock breeders and hunters, 2150 are residents of Simitli, and the rest are from Kresna (1250). In the first municipality, there are 250 livestock breeders, 1250 farmers and 650 hunters, while the second counts 750 farmers, 350 hunters and 150 livestock breeders.

Due to difficulties caused by the COVID-19 pandemic, 5 employees from the Ministry of Environment and Waters and Regional Inspectorate of Environment and Water took part in this research.

5.9 Target groups knowledge - baseline level

Institutions officials knowledge – baseline level



Institution officials in Bulgaria have very good knowledge of vulture species that breed in their country. Egyptian Vulture is unanimously recognized as such species, while almost all respondents agree on the fact that Griffon Vulture breeds in this region, as well.

Perception of vultures as birds that feed on carcasses of wild and domestic animals is widespread. On the other hand, between 2 and 4 respondents believe that vultures' diet include hunted animals such as domestic animals, large mammals and rodents.

Wildlife poisoning is not recognized as a major threat to vultures in Bulgaria by the vast majority of the employees in relevant institutions. These results indicate the necessity of conducting educational programs which will raise awareness about this problem and engage relevant stakeholders in resolving it.

Vultures are perceived as a group of animals that is accidentally poisoned, either by eating poisoned animals/animals that died of poisoning or consuming pesticides.

Institution officials show a lack of knowledge of groups that are responsible for wildlife poisoning. Pigeon breeders are believed to be rarely responsible, even though the data indicate that this group kills birds of prey by putting poison on the feathers of decoy pigeons. Additionally, livestock breeders, hunters, farmers and individuals who like killing animals are said to be accountable for poisoning of wild animals by less than half of respondents, each. The results emphasize a need for workshops and other programs that will enhance the knowledge of this topic, in line with studies that indicate responsibility of hunters, game keepers, livestock breeders, dove and pigeon keepers, farmers, or people with aggressive and destructive impulses (described often as being on the margins of the society) (Pantović & Andevski, 2018).

When it comes to the motives for wildlife poisoning, almost all respondents are aware of protection of pastures and livestock from wild animals, such as wolves, bears, etc. This is in accordance with the data showing that wolves are frequently the primary target of poisoning, because they cause damage to cattle and domestic animals. In addition, protection of hunting grounds is also identified as a key motive for the use of poisoning substances and poison baits. Apart from that, protection of pigeons from birds of prey, protection from stray dogs and cats and protection of agricultural land from wild animals are perceived as motives that are behind wildlife poisoning at least rarely.

Somewhat more than half of respondents are aware of the valley of the river Struma, Rila and Pirin as areas where wildlife poisoning most frequently occurs. On the other hand, close to half of the institution officials state that they don't have knowledge of the hotspots. The relevant stakeholders should be more thoroughly informed about different areas where poisoning of wild animals mostly takes place as activities of the NGOs

show that poisoning can be effectively combated by focusing of anti-poison actions in hotspots areas, as well as by a national anti-poisoning campaign involving all relevant stakeholders (Pantović & Andevski, 2018).

In general, employees in relevant institutions don't have up to date information on documentation and procedures related to poisoning of wild animals - they are unfamiliar with National action plan for combating wildlife poisoning, a database for poisoning incidents of birds in their country and a protocol defining procedures and jurisdictions for investigating wildlife poisoning. Awareness of the documentation and procedures related to wildlife poisoning should be raised among relevant stakeholders as these enhance their capacities in combating wildlife poisoning incidents.

6. Baseline report for Croatia

6.1 Institutional and Legal Framework in Croatia

The relevant institutions that have legislative responsibilities for dealing with wildlife poisoning in Croatia are (Sušić & Lucić, 2018, in Pantović & Andevski, 2018):

- Ministry of Environment and Energy (Directorate for Nature protection and Directorate for Inspectional Affairs)
- Ministry of Agriculture (Directorate for Forestry, Hunting and Wood Industry)
- Croatian Ministry of Economy and Sustainable Development (taking part in designing the protocol which will improve the efficiency of processing cases related to committing a crime against the nature and improving the capacities of Croatian law enforcement agencies)

Investigation and law enforcement related to the field of wildlife poisoning are the responsibilities of the following authorities (Sušić & Lucić, 2018):

- Inspectorate for nature conservation
- Environmental inspectorate
- Ranger service of protected areas and nature reserves²¹
- Ministry of the Interior

²¹ In charge of detection and law enforcement.

- State's Attorney Office of the Republic of Croatia
- Center for forensic research "Ivan Vučetić"²²
- Croatian Agency for the Environment and Nature (operates Injury and Mortality reporting system for the strictly protected species and is responsible for development of reporting protocols)
- Croatian Veterinary Institute²³
- Faculty of Veterinary Medicine Zagreb
- Teaching Institute for Public Health "Dr. Andrija Štampar" (implementation of health care measures and providing health services)
- Republic of Croatia State Inspectorate (taking part in designing the protocol which will improve the efficiency of processing cases related to committing a crime against the nature and improving the capacities of Croatian law enforcement agencies)
- Primorje-Gorski Kotar county authorities - Tourism, entrepreneurship and rural development department (law enforcement, proposal and enforcement of measures in the field of hunting and animal protection)
- Lika-Senj county authorities (protection of the nature and protection and improvement of the environment)
- Split-Dalmatia county authorities (protection of the environment by drawing reports, conducting analyses, proposing and designing documentation drafts)
- Public Institution of Učka Nature Park (management of Učka Nature Park, where a feeding site for Griffon Vulture is built)

More public institutions with different responsibilities related to wildlife poisoning are listed below:

- Public institution "Priroda" (protection of the environment and supervising of the County's protected areas)

²² In charge of toxicological analysis

²³ In charge of making diagnoses and conducting analyses of animal diseases

- Public Institution for nature protection in Lika-Senj County (protection, maintenance and promotion of the protected natural areas)
- Public institution Sea and Karst (protection, maintenance and promotion of the protected natural areas in Split-Dalmatia county)

The following civil society organizations are also relevant stakeholders related to combating wildlife poisoning:

- Association BIOM (founded in 2006 with the aim of researching and protecting wildlife and raising public awareness of biodiversity, endangered species and habitats, sustainable development and nature protection)
- Croatian Society for Bird and Nature Protection (founded in 1984, activities related to protection of the birds)
- Hunting Association of Croatia (founded in 1925, activities related to protection of the nature by working in the field of hunting)
- Beli Visitor Centre and Rescue Centre for Griffon Vultures (started by "Priroda" Public Institution in 2014, responsible for the vultures recuperating and tracking)

6.2 Legislation in the republic of Croatia

National legislation of Croatia includes several laws related to the protection of nature, placing poison substances in nature and wildlife poisoning, which also encompasses penalties and punitive damages if the law is broken.

When it comes to the protection of the vulture population and illegal poisoning, the following laws, amendments and acts are relevant:

1. **Nature Protection Act** – Zakon o zaštiti prirode ("Narodne novine", broj [80/2013](#), [15/2018](#), [14/2019](#) i 127/2019); this Act envisages **Regulation on strictly protected species** (Pravilnik o strogo zaštićenim vrstama) based on article 151. of the Nature Protection Act, as additional rules for marking strictly protected species, exceptions to the prescribed methods of marking, dealing with the death, escape or other loss of a marked animal, dealing with damage or loss of the original mark, and which among others lists vultures as strictly protected species.
2. **Hunting Act** – Zakon o lovstvu ("Narodne novine", broj 99/2018, 32/2019, 32/2020)

3. **Animal Protection Law** - Zakon o zaštiti životinja ("Narodne novine", broj 102/2017, 32/2019)
4. **Environment Protection Law** – Zakon o zaštiti okoliša ("Narodne novine", broj [80/2013](#), 153/2013, [78/2015](#), [12/2018](#) i [118/2018](#))
5. **Croatian Criminal Code** – Kazneni zakon ("Narodne novine", broj 125/2011, 144/2012, 56/2015, 61/2015, 101/2017, 118/18, 126/2019, 84/2021)

According to Article 66 of **Hunting Act**, it is forbidden to hunt wild animals by using poison as well as poison and intoxicating baits. According to Article 5 of the **Animal Protection Law**, it is contrary to this law to expose animals to poison substances and chemical treatments. In the **Environment Protection Law** it is stated that acts which have scientifically proved or probable harmful and permanent harmful effect on the environment, especially on biodiversity and landscape should not be carried out (Article 10 paragraph 7). Article 11 paragraph 3 of the same law doesn't allow the acts that can harm biodiversity and landscape diversity unless it is decided differently during the act which is in accordance with this law.

Sušić and Lucić (2018) mention the following national legislation related to wildlife poisoning:

- **Nature Protection Act:** This Act regulates the system of protection and complete preservation of nature and its parts and other related issues. It also transposes the Birds Directive into Croatian legal system and is the general framework for wild birds protection (Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds OJ L 20, 26.1.2010). It prohibits the use of all means, arrangements or methods that can cause the local disappearance or a significant decline in population numbers of a species. Article 66 prohibits the use of poison and poison baits, and Article 227 prescribes punishments for law-breaking by fines that don't exceed 500,000.00 HRK for legal entity and 50,000.00 HRK for natural persons. In addition, Article 228 prescribes punishments for deliberate killing and capturing by any method which is not in accordance with this act, by a fine that doesn't exceed 200,000.00 HRK for a legal entity or 30,000.00 HRK for natural persons.
- **Hunting Act:** Article 64 prohibits large-scale or non-selective means and methods, including poison, for hunting game and Article 96 prescribes punishments for the law-breaking by a fine that doesn't exceed 100,000.00 HRK. However, this act is replaced by the new Hunting Act (2018) and is not

valid anymore except in cases that have been started while the previous Hunting Act was still relevant.

According to **Croatian Criminal Code**, destruction of protected natural values, game poaching and killing or torture of animals are acts with legal consequences. Killing or destroying a specimen of a strictly protected species or another protected part of nature, contrary to regulations, is punishable by imprisonment that doesn't exceed three years (Article 200 paragraph 1). Significant decline in the number of specimens in the population or their extinction by acting in the way described in paragraph 1 of this Article is punishable by imprisonment from six months to five years (Article 200 paragraph 2). Hunting game in such a manner or by such means that cause their massive destruction or by using prohibited accessory equipment is punishable by imprisonment that doesn't exceed three years (Article 204 paragraph 2). Killing an animal without a justified reason or severely maltreating it, inflicting unnecessary pain on it or putting it through unnecessary suffering is punishable by imprisonment that doesn't exceed one year, or two years if the offense is committed out of greed (Article 205).

6.3 International treaties and conventions relevant for the conservation of wild birds in Croatia

The Republic of Croatia has signed the Convention on the Conservation of European Wildlife and Natural Habitat (Bern Convention) in 2000²⁴. **The Bern Convention (1979)**²⁵ is a binding international legal instrument for nature conservation that covers the natural heritage of the European continent and some African states. The principal aims of the Convention are to ensure conservation as well as protection of wild plant and animal species and their natural habitats.

The countries that ratify the Convention undertake, in Article 8, to prohibit the use of all indiscriminate means of capture and killing and the use of all means capable of causing local disappearance of, or serious disturbance to, the population of species, and in particular, the means specified in Appendix IV. In this sense, Appendix IV lists the "prohibited means and methods of killing, capture and other forms of exploitation" under the Bern Convention and this is strictly associated with a list of poison, poisoned and anaesthetic baits.

6.4 Stakeholders' attitudes toward legislation and law enforcement

²⁴ The Law on Ratification of the Convention on the Conservation of European Wildlife and Natural Habitats. ("Narodne Novine, Zakon o potvrđivanju Konvencije o europskim krajobrazima", br. 1088/2)

²⁵ Text of the Bern convention, Council of Europe website, retrieved on 30.11.2021.

<https://www.coe.int/en/web/conventions/full-list?module=treaty-detail&treatyid=104>

According to Sušić and Lucić (Sušić & Lucić, 2018, in Pantović & Andevski, 2018), Croatia has good legislation related to the use of poisonous substances in the natural environment. Poison use has been banned in Croatia by the National Hunting Act of 1972, and poisoning of wild animals is defined as an illegal activity punishable by the criminal law. Although the use of poisons is banned, they are still widely used in Croatia. The failure of the government to enforce the legislation related to the removal of introduced and invasive game animals (wild boar) can be considered as a reason for their further use. Also, the local livestock breeders, the shepherds and farmers, are still using baits in an attempt to eliminate stray dogs, wolf packs, jackals, bears or wild boars. On the other hand, further difficulties arise due to the abolition of certain institutions that deal with solving the problem of wild animal poisoning. One example is the Committee for the Problem of Illegal Poisoning in Nature established by the Ministry of Environmental and Nature Protection, which was abolished in 2003 when political changes affected the structure of the ministries. Also, another important problem is that various banned substances (especially carbofuran) can still be easily obtained on the black market from neighbouring countries.

Employees of relevant institutions in Croatia participating in the BalkanDetox LIFE project perceive that the legal framework for punishing the practice of poisoning animals is good, but there are issues concerning the enforcement of existing laws, as well as with rare imposing of the fines under the Hunting Act.

The need for stricter punishment of all forms of mass and non-discriminative killing of animals, as well as higher fines for every type of poaching / illegal shooting are also pointed out to in the attitudes of government services and institutions officials who were included in the BalkanDetox LIFE survey.

The lack of specialized police units for environmental crime and human resources such as environmental inspectors and rangers for timely detection of poisoning incidents are perceived as the main barriers for control and processing of poisoning. In other words, institutional officials point to the need to increase the number of employees involved in the process of detecting cases of wildlife poisoning but also to improve the coordination among relevant institutions.

Another important problem that stands out is that unlawful practices in hunting areas are too often tolerated.

Institutions officials in Croatia also acknowledge and agree on the importance of the following specific measures that could prevent poisoning of wild species:

- **raising awareness** of stakeholders (livestock breeders, farmers, hunters, institutions) and the general public
- increasing **control of the trade of legal poisoning substances**
- **state/ government financial compensation** for the damages caused by wild animals to livestock breeders and farmers
- larger number of **feeding grounds for vultures**
- ensuring **free electric fences**
- resolving the issues of **pasture ownership** and the right to use them

6.5 EU compliance of regulations

The primary obligation the Republic of Croatia as a part of the process of accession to the European Union was to establish an ecological network, i.e. the verification of the Agreement on stabilization and association. In this accession period, Europeanization in Croatia was present up to its entry in 2013. By establishing **NATURA 2000**²⁶, Croatia provided a reason to implement international obligations into the national law. At the EU level, the system of nature protection is based on international obligations of sustainable development. The **Directive on Protection of Natural Habitats and Wild Fauna and Flora**²⁷ is the most important and demanding EU regulation in the field of nature protection. For achieving these goals it is crucial to enable the non-governmental actors the access to information and the opportunity to take a part in decision-making, as these principles are an integral part of the **Aarhus Convention**²⁸.

Croatia has completed full transposition of the EU Habitats Directive and Birds Directive, but national authorities still need to make further efforts in order to fully implement

²⁶ The goal of NATURA 2000 program is the preservation of important species and habitats in good condition.

²⁷ In NATURA 2000 program, the basis of nature protection in the EU is derived from: Habitats Directive (Council Directive 92/43/EEC) and Wild Birds Directive (Council Directive 79/409/EEC)

²⁸ The Aarhus Convention (AC) includes the Directives on public access to environmental information, public participation in decision-making and the EC Regulation on access to justice in environmental matters.

these Directives and effective conservation of threatened species and habitats to be achieved on the ground²⁹.

6.6 Fields of knowledge baseline level

Compiling data on the illegal poisoning of wild birds in Croatia

Unlike other countries where this project is being implemented, as Sušić and Lucić state, Croatia has a greater availability of existing data related to poisoning and mortality of vultures, as well as the certain systematic databases owned by various NGOs (Sušić & Lucić, in Pantović & Andevski, 2018). Further improvement in data collection involves the creation of a centralized database that would include all relevant data in one place.

Massive poisoning of vultures, documented as the last case of its kind, occurred on the Island of Rab in December 2004, during which 17 Eurasian Griffons were poisoned (Pavoković and Sušić, 2005; Ćurić et al., 2008, in Pantović & Andevski, 2018).

In the course of 2016 and 2017, several individual cases of poisoning were recorded, during which one to two Griffon vultures were poisoned on the island of Krk (Pantović & Andevski, 2018).

A number of researches were conducted in order to determine the exact type of poisons used, which were the cause of vulture poisoning, i.e. various toxicological analyses (Ćurić et al. 2008 in Pantović & Andevski, 2018).

After the previously mentioned incident on the Island of Rab, a ten-year anti-poisoning campaign followed, which helped reduce the rate of poisoning of wild species (Sušić & Lucić, in Pantović & Andevski, 2018).

Educational activities regarding illegal bird poisoning in Croatia

A workshop related to preventing wildlife poisoning was organized in Zagreb in 2018, within the Balkan Anti-Poisoning Project (a part of the Mediterranean Anti-Poison Project). Relevant employees from the Public Institution "Priroda" and "Beli" Visitor Centre and Rescue Centre for Griffon Vultures also attended this workshop.

²⁹ The State of Implementation of the Birds and Habitats Directives in the EU

https://wwf.eu.awsassets.panda.org/downloads/Nature_Scorecards_Report_March2018.pdf

Regular thematic workshops related to the acquisition of knowledge about Griffon vultures, their endangerment and the need for their protection among young people are organized by the Visitor Center “Beli”.

Recent and current/ongoing projects concerning wildlife poisoning:

- **Anti-poisoning campaign and Campaign for the removal of alien species** – organized by BPCS “Grifon” during nine year period (2001-2010).
- **Campaign for the removal of alien species from Kvarner islands** – a union of NGOs focused on raising awareness about illegal poisoning of wildlife population among the general public, as well as relevant authorities.
- **Adriatic Flyway 4 - Fighting poisoning** – the program aimed at reducing vulture (and other scavengers and predators) mortality due to the use of poison baits and lead ammunition across the Mediterranean (2018-2022); a regional workshop aspiring to enhance cooperation and implementation of AEWA for countries situated along the Adriatic Flyway was realized in 2016 in Samobor, Croatia, and included plenary discussions, interactive lectures, group work, discussions, role plays.
- **Life against bird crime** - the project aimed at strengthening the international fight against the illegal killing, capture and trafficking of wild birds (2018-2022).

6.7 Number of relevant stakeholders involved

In the Republic of Croatia, the estimated number of stakeholders, government services and institutions officials employed in relevant institutions, belonging to the first target group in BalkanDetox LIFE survey is 51.

When it comes to the number of relevant veterinary employees, there are 6 of them, 2 in each of three regions (Split-Dalmatia county, Primorje-Gorski kotar county, Lika-Senj county).

There is no available data on the country level about the estimated number of law enforcement officials that are, among other duties, responsible for the investigation of poisoning in hot spot areas.

The total estimated size of target groups in so called hotspots areas including farmers, hunters and livestock breeders is 35 521. From the total of 18 165 stakeholders in Split-Dalmatia county, 3 715 are livestock breeders, 8 950 are farmers and 5 500 are hunters. In the second region, Primorje-Gorski Kotar county, among 7 176 relevant persons, 1 558

are livestock breeders, 2 418 farmers, and 3 200 people whose occupation is related to hunting activities. Lika-Senj county includes 10 180 stakeholders (4 401 livestock breeder, 3 792 farmers and 1 987 hunters).

The number of respondents that took part in the survey among stakeholders, government services and institutions officials that make up the first target group is 62, while from the second target group which includes farmers, hunters and livestock breeders, 394 of them contributed to the research. One of the barriers that made it difficult to collect the data are measures and consequences of the still ongoing Covid-19 pandemic.

6.8 Target groups knowledge – baseline level

Hot spots residents knowledge baseline level

Among hot spot residents in Croatia, including livestock and agricultural farmers, hunters, veterinarians and conservationists somewhat more than a third evaluate their own knowledge regarding wildlife poisoning in this country as average, while a fifth perceive they have good or excellent knowledge related to this topic. On the other hand, more than one third believes that their level of education and knowledge of the problems and consequences of wildlife poisoning is at a low level, implying the need for activities that would contribute to a better level of information of relevant groups of residents.

When it comes to the awareness about different vulture species that are currently breeding in Croatia and their conservation status, hot spots target groups are well informed. More than 70% know that Griffon vultures nest in Croatia, and according to the red data book of birds of Croatia (Barišić et al., 2013), these vultures are one of the endangered breeding birds. A small number of hot spots residents (approximately every tenth) are of the opinion that other species of vultures are also present on the territory of their country. According to the available data, Egyptian and Cinereous Vulture are species that used to breed in this area, but they have become extinct (Barišić et al., 2013).

Additionally, residents are well informed about the type of food that is part of vultures` diet. The vast majority recognize carcasses of domestic and wild animals as a specific type of food consumed by vultures. However, more than half of hot spots target groups believe that these endangered species also eat different hunted animals, including domestic animals, rodents and large mammals, while two out of five think that vultures consume hunted insects as well. These results indicate that there is a need for further education of hot spots residents about vultures` consumption of food.

Extensive usage of legal toxic compounds (pesticides, insecticides, rodenticides) and wildlife poisoning are perceived as the threats that endanger the vulture population in Croatia the most. However, since less than a fifth recognize wildlife poisoning as the main cause of vultures death, it is necessary to raise awareness about the importance and consequences, that this practice, for example of using baits, has on the extinction of vulture species.

Half of the respondents are aware that vultures are not the primary targets of poisoning, i.e. their death is a consequence of poison baits aimed at other animals or eating poisoned animals. On the other hand, every fourth hotspots citizen, including farmers, hunters, veterinarians and conservationists, mention pesticide poisoning as the main way that vulture species get poisoned.

The majority of respondents recognize that vultures play an important role in the ecosystem. Nevertheless, significant number among hotspots residents agree that animal poisoning is sometimes justified (about a fifth), while more than a third perceive poisoning animals as a problem only when it poses a danger to humans. In line with that, further education about the negative impact of wildlife poisoning, in general, is recommended. Hunters, as one of the hot spots target groups, are more inclined to attitudes that recognize the importance of vultures, and on the other hand, cattle breeders and farmers are more inclined to perceive wildlife poisoning as sometimes justified.

Individuals who deliberately poison animals out of aggressive or destructive instincts are perceived as a group that is responsible for wildlife poisoning incidents by more than half of hot spots respondents. It is, on the other hand, important to note that half of the relevant hotspots residents believe that livestock breeders are never or rarely behind these activities, although, according to the available data, massive poisoning of vultures that happened on the Island of Rab is a result of a sheep carcass with poison laced by one shepherd (Pavoković and Sušić, 2005; Ćurić et al., 2008, in Pantović & Andevski, 2018).

Protection from pests (rats, insects et at.) in general, and protection of agricultural land, pastures and livestock from wild animals (wolves, bears, etc.) are recognized as the key motives behind poisoning of wildlife, although, as previously mentioned, the shepherds commonly used sheep carcasses in order to save their pastures and livestock from different wild animals (Sušić, & Lucić, 2018 in Pantović & Andevski, 2018).

It is important to notice, that more than half of agricultural production farmers, livestock/cattle farmers, conservationists, hunters, and veterinarians are not informed about the main hotspots areas in Croatia affected by the practice of wildlife poisoning.

Approximately every tenth recognizes Lika-Senj county and Split-Dalmatia county as a “red spot”, while 5% is aware that Primorje-Gorski Kotar county is also one of the main areas in which poisoning of wild species is commonly recorded.

Although close to half of hotspots residents in Croatia recognize spring as a season when wildlife poisoning mostly occurs, and every fourth identifies autumn, one fifth of them claims being uninformed about the main seasons when wildlife poisoning occurs.

Institutions officials knowledge – baseline level

Employees of relevant institutions in Croatia show good knowledge about vulture species that breed on the territory of their country. The majority (92%) are aware that Griffon Vulture breeds in Croatia, as the only remaining species of vultures in this country. Every tenth respondent states that Cinereous Vulture also nests in Croatia, showing that a certain number of institutions employees are not aware of the extinction of this species in their country.

The representatives of key institutions are also well informed about vultures' diet. Almost all institutional employees state that vultures feed on the carcasses of dead wild and domestic animals. On the other hand, a quarter believes that vultures eat hunted rodents, while a smaller number think that vultures hunt and eat domestic animals.

Institutional officials recognize wildlife poisoning as a major threat to vultures. However, as only one third is aware of the dangers of poisoning wild animals for the life and existence of vultures, it is necessary to organize activities to further raise awareness of the dangers of this threat and its impact on the vulture population.

Government services and institutional officials are divided when it comes to the deliberate wildlife poisoning. Although most believe that vulture poisoning occurs accidentally, by misuse of legal poisoning substances out of negligence or ignorance, about one third states that vultures are intentional victims, killed by misuse of legal poisoning substances (such as pesticides and insecticides).

Majority of institutions officials in Croatia identify farmers and livestock breeders as the key groups that are the most responsible for wildlife poisoning in the country. According to Sušić & Lucić (Sušić & Lucić, 2018, in Pantović & Andevski, 2018), livestock breeders in an effort to save their animals from wild boars are one of the main dangers to the vultures population, which indicates that institutional employees have a good perception of the main group responsible for wildlife poisoning in the country.

When it comes to the main motives driving wildlife poisoning activities, according to the representatives of the target institutions, the most important are the protection against

pests and the protection of pastures and livestock from wild animals. Protection of agricultural land is also an important motive related to the poisoning of wild animals and consequently the vultures themselves.

Also, representatives of institutions, from the three counties that are the most affected by the problem of wildlife poisoning, mostly identify Lika-Senj County as a hot spot, and least recognize this problem in the Split-Dalmatia County. Almost half of the institutional respondents claim they are unfamiliar where poisoning of wild animals usually happens.

Institutional employees mostly lack information whether the database for animal poisoning incidents, the National action plan for combating wildlife poisoning and protocol defining procedures and jurisdictions for investigating wildlife poisoning exist in their country (more than two thirds of respondents). However, a quarter of institution employees is aware of the fact that Croatia lacks all three documents and tools, except for some internal protocols and internal databases of wildlife poisoning of certain institutions.

7. Baseline report for Greece

7.1 Institutional and Legal Framework in Greece

The institutions responsible for legislation in the field of wildlife poisoning in Greece are (Ntemiri et al., in Pantović & Andevski, 2018):

- Ministry of Environment, Energy and Climate Change
- Ministry of Rural Development and Food
- Ministry of Citizen Protection

Investigation and law enforcement related to the field of wildlife poisoning are the responsibilities of the following authorities (Ntemiri et al., in Pantović & Andevski, 2018):

- Forest Service (with the responsibility to detect incidents, as well as provide information and campaigns related to best practices in reducing losses inflicted by wildlife)
- Veterinary Service³⁰

³⁰ In charge of carcass removal

- The Center of Athens Veterinary Institutions³¹
- Public Prosecutor's Office

The following civil society organizations are also relevant to combating illegal wildlife poisoning:

- ARCTUROS (founded in 1992; the main goal is the protection of wildlife fauna and natural habitat in Greece and abroad)
- Hellenic Society for the Protection of Nature (founded in 1951; responsible for establishing national parks, protecting habitats and threatened species of fauna and flora, and modernizing and implementing environmental legislation)
- Hellenic Ornithological Society (HOS) (founded in 1982; the mission of the organization is to protect IBAs, globally threatened species and priority habitats in Greece; to advocate sustainable development; to provide advice to government authorities; and to promote interest in the conservation of wild birds through public awareness programmes)
- Callisto (founded in 2004, with the aim to study, protect and manage the populations and habitats of large carnivores, bears and wolves and other endangered species of wildlife)
- WWF Greece (founded in 1994; their mission is to stop the degradation of the Earth's natural environment and to build a future in which humans live in harmony with nature by conserving the world's biological diversity, ensuring that the use of renewable natural resources is sustainable and by promoting the reduction of pollution and wasteful consumption)
- Hellenic Wildlife Care Association ANIMA (founded in 2005; ANIMA is a non-profit association active in the field of natural environment, with its main activity being the nursing and rehabilitation of wild animals in their natural environment)

7.2 Legislation in the republic of Greece

Legislation concerning the ban on the use of poison baits are of national, union or of international origin (*National Strategy Against Wildlife Poisoning Draft*, 2016).

³¹ In charge of necropsies and toxicological analysis.

When it comes to the protection of the vulture population and illegal poisoning, the following laws, amendments and acts are relevant:

6. **Presidential Decree 67/1981**
7. **Penal code**
8. **Law 1300/1982-On preventing and suppressing animal stealing and animal killing**
9. **Joint Ministerial Decision 37338/1807/E.103/01.09.10**

The use of poison baits is prohibited by national legislation, with special provisions which regulate details and terms of the legal use of poison. The legal framework is regulated by **Presidential Decree 67/1981** "On the protection of indigenous Flora and Wild Fauna and on the determination of the coordination procedure and the Control on their Research" (OGG 23/v. A'/30.01.1981), which was issued under the authorization of article 16 of Law 998/79. Article 9 of P.D. 67/1981 provides that "Toxic substance or any other poison use for the elimination of identified harmful species is prohibited, as these substances endanger protected species of wild fauna and indigenous flora" (Ntemiri et al., in Pantović & Andevski, 2018).

When it comes to legal ramifications in illegal poisoning cases, "Poisoning of livestock fodder", **penal code** implies that any person who intentionally poisons pastures, meadows, lakes or other sites of livestock watering is sentenced to a minimum of six months imprisonment. In case of death or serious and permanent damage to the livestock of another person, the maximum sentence is ten years of prison. "2. Any person who is unintentionally found guilty of the criminal act of par. 1 is sentenced to a maximum of two years imprisonment or to pay a fine."

According to Ntemiri et al., the following legislation is also relevant for this topic (Ntemiri et al., in Pantović & Andevski, 2018):

- **Law 1300/1982**-On preventing and suppressing animal stealing and animal killing: animal killing is punished under the provisions of article 1 par.2 Law 1300/1982 with a minimum sanction of a two (2) year imprisonment and a fine (OGG 129/v. A'/13.10.1982).
- **Joint Ministerial Decision 37338/1807/E.103 /01.09.10** «Definition of measures and procedures on the conservation of wild birds and their habitats, in compliance with the provisions of Directive 79/409/EEC, "On the conservation of wild birds" of the European Council of April 2nd 1979, as codified by Directive 2009/147/EC, (OGG 1495 / v. B' /

06.09.2010): Article 8, par. 1 (Prohibited hunting gear/means) states that during hunting, capturing or killing birds, the use of any means, installation or method of mass and non-selective capturing or killing that may cause local extinctions of a species is prohibited, especially these means, installations or methods cited in Annex III (case 1) of article 14. Poison bait or tranquilizer use is among these methods. According to article 11 par. 2.a.c., offenders of the aforementioned article are sentenced to a fine of 100 to 300 Euros. Moreover, according to article 11 par. 2.b.c., offenders of the aforementioned article are sentenced to up to a year of imprisonment and a fine.

7.3 International treaties and conventions relevant for the conservation of wild birds in Greece

The Republic of Greece has signed the Convention on the Conservation of European Wildlife and Natural Habitat (Bern Convention) in 1983³². **The Bern Convention (1979)**³³ is a binding international legal instrument for nature conservation that covers the natural heritage of the European continent and some African states. The principal aims of the Convention are to ensure conservation as well as protection of wild plant and animal species and their natural habitats.

The countries that ratify the Convention undertake, in Article 8, to prohibit the use of all indiscriminate means of capture and killing and the use of all means capable of causing local disappearance of, or serious disturbance to, the population of species, and in particular, the means specified in Appendix IV. In this sense, Appendix IV lists the “prohibited means and methods of killing, capture and other forms of exploitation” under the Bern Convention and is strictly associated with a list of poison substances, poisoned and anaesthetic baits.

In 2014 Greece adopted *National Biodiversity Strategy and Action Plan* as the response to its commitments according to Article 6 of the Convention of Biological Diversity (FAOLEX Database, n.d). This cross-sectoral strategy with action plan for 2014-2029 period is aligned with the *EU 2050 vision*³⁴, and, among broader goals, aims to halt country's biodiversity loss and promote biodiversity as natural capital. Some of specific goals include increase of knowledge of biodiversity status, conservation of nature capital and restoration of ecosystems, enhancement of international cooperation for biodiversity conservation, upgrading the quality and efficiency of public administration

³² Law 1335/1983 “Ratification of International Convention on the conservation of European wildlife and natural habitats” (OGG 32/v. A'/14.03.1983)

³³ Text of the Bern convention, Council of Europe website, retrieved on 30.11.2021.
<https://www.coe.int/en/web/conventions/full-list?module=treaty-detail&treatynum=104>

³⁴ European Commission's vision of climate neutral economy by 2050.

on biodiversity conservation, integration of biodiversity conservation into the value system of society and inclusion of citizen participation in biodiversity. The Strategy analysis recognized use of poisoning baits as one of the main threats to the survival of certain species, including large birds of prey. The main institution responsible for implementation of the National Biodiversity Strategy and Action plan is the Ministry of Environment, Energy and Climate Change; this ministry also coordinates other Ministries and Agencies involved in the process.

7.4 Stakeholders' attitudes toward legislation and law enforcement

The national legislation in Greece has strictly prohibited the use of poisonous baits due to the extensive negative consequences for wildlife, especially rare and endangered species. In addition, there are special provisions that regulate everything about the legal use of poisons.

The specificity of Greece in relation to other Balkan countries are also anti-poison dog units, Canine Teams - used for preventive measures, to raise awareness about this problem and as an assistance with pretrial institutional work in collecting evidence. Two canine teams were formed in 2016 under the LIFE + Nature program "Emergency measures to ensure the survival of *Asproparus* (*Neophron percnopterus*) in Bulgaria and Greece "[LIFE10 NAT / BG / 000152] ("Cretan Dog Teams Against Poisoned Bait", 2021) as a result of cooperation between the Hunting Federation of Crete & Dodecanese (A' KOKD) and the University of Crete - Natural History Museum of Crete (UoC-NHMC). Dogs are supervised by two Federal Gamekeepers. Advantages of such an arrangement are that Federal Gamekeepers are constantly present in the field, they have the knowledge and citizens trust them. From 2016 to 2019 these teams found around 800 poisoned baits and 260 dead animals. In the first two years after being formed the teams detected 28% of total poisonings in the country (Ntemiri, et al., in Pantović & Andevski, 2018).

Compensation policy including minimal reimbursement and slow payment process discourages stockbreeders to demand compensation in case of suffering from losses, which further encourages the use of illegal ways to fight wildlife (*National Team Against Poisoned Baits*, 2012).

The complexity of the investigation is perceived as the greatest obstacle for the prevention and sanctioning of animal poisoning among institutions officials participating in The Balkan Anti-Poisoning Project survey. Other obstacles are related to inadequate law enforcement (although half of the respondents believe that the legal framework for punishing poisoning itself is good), difficulties with evidence procedures

in the court, low penalties for wildlife poisoning, poor reporting of information from witnesses and inadequate and unclear protocols for police action.

Introduction of specialized canine units in the police forces aimed at detecting poisonous substances used for wildlife poisoning, more numerous human forces in the field (i.e. police officers, environmental inspectors and rangers), as well as specialized police units for environmental crime are perceived as important aspects that could contribute to timely detection and preventing of wildlife poisoning incidents.

Further improvement in managing incidents of this type should also be focused on more adequate education of public prosecutors.

Employees in target institutions additionally point out the following specific measures for preventing wildlife poisoning:

- **campaigns for raising awareness** among the general public and key stakeholders (livestock breeders, farmers, hunters, institutions)
- imposing a **stricter control of the trade of legal poisoning substances** (pesticides, rodenticides, etc.)
- **state/ government financial compensation** to livestock breeders and farmers for the damages caused by wild animals
- creating more **supplementary feeding sites for vultures**
- providing **free shepherd and guard dogs**
- resolving problems related to **pasture ownership**

7.5 EU compliance of regulations

Greece is making good progress in aligning its wildlife protection legislation with European regulations.

In Greece, the **Natura 2000** network covers 27.3% of the terrestrial area. Greece has met the percentage coverage of area specified by **Aichi target 11**³⁵ and has one of the most

³⁵ The Aichi target 11 states that by 2020, at least 17% of terrestrial and inland water, and 10% of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas

extensive Natura 2000 networks in the European Union. Moreover, the current network is demonstrably superior to the random placement of the sites and of 1288 protected areas in Greece 446 sites are part of the Natura 2000 network, including 239 Special Areas of Conservation, 181 Special Protection Areas, and 26 sites that are both (Spiliopoulou et al., 2021).

However, there is a need for further alignment and improvement of legislation in this area, because it fails to adequately represent all endangered species that are a priority for protection at the global level, with 27 endemic species that are completely unrepresented. Expansion of the network to encompass populations of these species would put Greece at the forefront of countries fulfilling their **EU's Biodiversity Strategy for 2030**, and their responsibility to conserve global biodiversity, which would be an outstanding result given the concentration of endemic and endangered species of biodiversity in Greece.

7.6 Fields of knowledge baseline level

Compiling data on the illegal poisoning of wild birds in Greece

In November 2021 Hellenic Ornithological Society (HOS) released a statement after a new case of wild bird poisoning, calling the government to immediate action, and underlying importance of zero tolerance toward wildlife poisoning.

According to the HOS, in the last two decades more than 210 vultures and more than 40 brown bears were poisoned, many in protected areas. As stated on HOS website³⁶, Anti-Poison Task Force requested from the Greek State immediate implementation of specific actions in the fight against the use of poisonous baits.

Mass-poisoning incident in the Straits in Nestos, propelled foundation of the *Anti-Poison Task Force* in 2012. The organization consists of **environmental NGOs** (ARCTUROS, Hellenic Society for the Protection of Nature, Hellenic Ornithological Society (HOS), Callisto, WWF Greece and Hellenic Wildlife Care Association ANIMA) and the Natural History Museum of Crete. Main goals of the Task Force are:

- to promote proposals and institutional changes to eradicate illegal poisonings

and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.

36 Article "Wildlife Poisoning: Urgent call for action against poisoned baits", 2021.

- to educate public about extent of the problem and consequences it brings, locally and state-wide
- to maintain and manage poisoning database

Greece is the first Balkan country to propose *National Strategy Against Wildlife Poisoning*, developed by the Anti-poison Task Force and submitted to the Greek Ministry of Environment. The Strategy was developed under the scope of the Return of the Neophron Life Project and is modelled on Spanish National Strategy against Use of Poison baits in the Natural Environment, which, again, followed directions of the program "European Network Against Environmental Crime – ENEC". The necessity for this document emerged from the practical difficulties concerning implementation and interpretation of existing legislation in relevant cases. It specifically includes measures to "improve existing knowledge, prevention of the phenomenon, the efficient coordination of those involved services and agencies, effective criminal prosecution, while through continuous information and public awareness will aim at its cultivation zero tolerance for the crime of poisoning." (*National Strategy Against Wildlife Poisoning*, Draft 2016).

Educational activities regarding illegal bird poisoning in Greece

Hellenic Ornithological Society (HOS), among other undertakings, organizes and implements awareness activities and programs, and designs specialized educational materials for children and adults, as well as for teachers. Some of them are mentioned below.

According to HOS website, over 90 teachers and 1,700 students have become members of the school "Action Team for Asproparis" (Egyptian Vulture) organized by the educational team of ORNITHOLOGY. Within the framework of the LIFE program "LIFE for Asproparis", HOS designed educational material "Asproparis rescue mission: together yesterday, today and tomorrow", which includes 15 activities for children aged 9-11 and 12-15 years. It also incorporates the "Guide for the teacher, activity sheets for the teacher and the children", the floor game "The game of Asproparis", as well as the supporting and / or supplementary material for the implementation of the activities ("Rescue mission of Asproparis", n.d). Within the aforementioned LIFE program, the organization has also published the "Identification guide for Asproparis".

HOS roati also include "Stories of poisoned baits", an information booklet on the dangers and motives behind the usage of poisoned baits, as well as instructions on how to fill a lawsuit in case of poisoning.

For five years in a row, WWF Greece in collaboration with Educational centers Soufli and Maronia and five local schools (160 students and 8 teachers) has planned and implemented activities to inform students and local population about threats of poison baits to vultures. Informative material consisted of leaflets, questionnaires and out door communication (posters, billboards). ("Tomorrow's Greek vultures will depend on today's Greek children", 2017)

At the end of November 2021, The Poisoned Bait Detection Team of Central Greece of the Hellenic Ornithological Society, under the LIFE-IP 4 NATURA Program, organized and carried out preventive patrols in Western Greece, targeting areas with the highest occurrence levels of poisoning in the past. One canine team searched Mount Arakynthos and the wider area of Messolonghi, in collaboration with the Forest Service of Messolonghi. Aim of this action was not only locating and elimination of poisoned-baits, but also education of land users and prevention of future incidents ("Specially trained dog to detect poisoned baits", 2021).

For Christmas holidays of 2021, as a part of the biggest Christmas Park in Greece in Trikala, HOS organized special photo exhibition dedicated to Egyptian and other vulture species that can be found in Greece ("The Egyptian Vulture At The Greatest Christmas Park Of Greece!", 2021.). With 23 photos and informational banners, the exhibition also pointed to the problem of poison baits, and their threat to vulture survival. The HOS team also informed visitors about local and international actions implemented through "Egyptian Vulture New LIFE Project".

Recent and current/ongoing projects concerning wildlife poisoning

In the past twenty years, several projects targeting endangered species and poisoning issue have been implemented in Greece:

- **Innovation against poison, LIFE09 NAT/ES/000533 (2009-2012)** – Aimed at innovative actions against illegal poisoning in EU Mediterranean pilot areas.
- **Return of the Neophron, LIFE10 NAT/BG/000152 (2011-2016)** – With focus on the urgent measures to secure survival of the Egyptian Vulture (*Neophron percnopterus*) in Bulgaria and Greece.
- **LIFE Natura Themis, LIFE14 GIE/GR/000026 (2015-2021)** – Contracted by the University of Crete - Natural History Museum of Crete and partnered with SYGAPEZ, the Greek Nature Protection Society (EPPF), the Bar Association of Chania and the Heraklion Bar Association, this project, among other goals, aimed to "inform and raise awareness of stakeholders, targeted audiences and the

general public in Crete about environmental crime and wildlife crime, in particular, as a special case of prosecution; provide stakeholders and target audiences with the appropriate skills to engage in the prosecution procedure for wildlife crime, to require measures for remediation of damage to biodiversity and to integrate biodiversity issues in regional and local policy; highlight the wider benefits of conserving Natura 2000 sites – healthy ecosystems rich in flora and fauna are an opportunity for sustainable development, shared revenue and social cohesion; communicate the importance of EU environmental legislation implementation for human health to other Natura 2000 site managers in Greece.” (*European Commission*, n.d.)

- **LIFE RE-Vultures, LIFE14 NAT/NL/000901 (2016-2021)** – Aimed at conservation of Black and Griffon Vultures in the cross-border Rhodopes mountains
- **Egyptian Vulture New LIFE, LIFE16 NAT/BG/000874 (2017-2022)** – With urgent action to strengthen the Balkan Population of the Egyptian Vulture and secure their flyway
- Three projects targeting conservation of brown bear - **PINDOS/GREVENA - LIFE07 NAT/GR/000291, ARCTOS/KASTORIA - LIFE09 NAT/GR/000333 and LIFE ARCPIN - LIFE12 NAT/GR/000784**
- **LIFE-IP 4 NATURA, LIFE16 IPE / GR / 000002 (2018-2025)** – Aimed at "integrated actions for the conservation and management of Natura 2000 network areas, species, habitats and ecosystems in Greece". This program is specifically tailored for Greece, with the goal to protect its nature and ensure the country's compliance with European legislation.
- **101 Vultures Project** in synergy with *EV New LIFE Project* – for which HOS and Bulgarian Society for the Protection of the Birds received grant from *Disney Conservation Fund*. This two-year project aims to monitor the Egyptian vulture population trends; mitigate main threats like poisoning, electrocution and collision, provide food availability, implement educational programs, increase networks of local stakeholders against wildlife poisoning and promote positive behaviours toward vultures (“Disney Conservation Fund Supports The Egyptian Vulture Conservation In The Balkans”, 2021).

7.7 Number of relevant stakeholders involved



BalkanDetox LIFE project targets two main groups of stakeholders: the first consists of government services and institutions officials, while the second includes hotspots dwellers - farmers, hunters and livestock breeders.

When it comes to the first target group, the estimated number of employees in specific institutions in Hellenic Republic is 44, employed in 4 institutions³⁷.

The estimated number of law enforcement officials and veterinary services employees in the total estimated universe is about 46 employees in two target regions. In the Prefecture of Tirkala there is 28 institutional employees in total, of which around 20 are law enforcement officials, while 8 are veterinary services employees (5 regional, 3 local vet service employees). In the Prefecture of Aetoloakarnania there is similar estimated number of law enforcement officials and veterinary services employees, out of which around 20 are employed in law enforcement and 8 in veterinary services.

The total number of farmers, hunters and livestock breeders is estimated at 3880. The Prefecture of Tirkala has approximately 3 300 stakeholders, consisting of 2 000 livestock breeders, 1 000 farmers and 300 hunters. Among 580 respondents in the Prefecture of Aetoloakarnania there is 170 livestock breeders, 330 farmers and 80 hunters.

Due to difficulties caused by the COVID-19 pandemic the total number of respondents that were included in the research from the first target group - government services and institutions officials, law enforcement officials and veterinary services employees in Greece, was 17, while the number of respondents from the second target group – livestock breeders, hunters and farmers was 43.

7.8 Target groups knowledge – baseline level

Hot spots residents knowledge baseline level

Most of the poisonings in Greece happen in rural areas with stock-farming and hunting activity - as mentioned above - making farmers, livestock breeders, rangers and hunters primary stakeholders, along with veterinary professionals. More than half of

³⁷The full list of relevant institutions which has been previously noted in the section “Institutional and Legal Framework in Greece” includes: Hellenic Ministry of Environment and Energy, Hellenic Ministry of Rural Development and Food, Ministry of Citizen Protection and Athens Veterinary Foundations Center

respondents from the hot spots group estimated their knowledge as high, choosing top marks (4 or 5), while one fourth believes that they have average knowledge about the wildlife poisoning problem. However, significant indication that educational programs and actions are still needed, is the finding that 1 out of 5 hot spots dwellers in Greece estimate their level of knowledge as low (1 or 2).

These groups are mostly aware of vulture species breeding in their country. They are most informed about the presence and breeding of Griffon Vultures (86%), as well as Egyptian Vulture (74%). Nearly half of respondents are informed about the breeding of the Cinereous (Black) Vulture in Greece, while, on the other hand, about half of the target group (44-60%) is not informed about the presence of this breed. About fifth believe that Turkey and King vulture (considered New World vultures), also inhabit Greece. Such finding brings up the question whether the data represent real situation of stakeholders' knowledge of species that really exist in their area.

However, hot spots residents do have general knowledge of the type of food vultures feed on. Almost all respondents recognized carcasses of domestic and wild animals as vultures' primary food source, although about half of the sample believes that avian scavengers also hunt rodents, while between 19% and 26% think that hunted domestic animals, insects and large mammals are also part of the diet of scavenger birds.

It is encouraging and good starting platform for further activities that this group of stakeholders is also aware of poisoning as main cause of vulture decline – 75% perceive this factor as the greatest danger to vulture population. Majority of respondents believe, as well, that most of the poisonings occur intentionally, whether by misuse of legal or usage of illegal substances.

All participants believe that vultures play an important role in the ecosystem; however, they also think that wildlife poisoning is only a problem when it poses a threat for humans. It is informative that the attitude that wild animals have an important role in human activities and one that governments should conduct controlled poisoning of wild animals on their own are equally distributed (98%, each). More than 90% still believe that poisoning of pests can be justified under particular circumstances, which makes it clear that although residents of hot spots in Greece recognize the importance of vultures for the ecosystem, and how the usage of toxic substances endangers them, they also put human interests first and believe in government-controlled activities in regulation of pests.

Farmers, rangers, hunters and veterinarians in Greece perceive livestock breeders as the key group recognized as responsible for wildlife poisonings (3 of 4 named them as main perpetrators). This group is followed by hunters, since two thirds of respondents

identified them as responsible. They are followed by farmers (58%) and individuals who deliberately poison animals simply because they like killing things (49%). On the other hand, close to 60% of the respondents think that beekeepers are rarely or never responsible for wildlife poisoning, while the biggest lack of knowledge respondents have about pigeon fanciers, since 61% of hot spot respondents don't see them as a threat.

The respondents have good understanding of the motives for poisoning. As the main motive behind the usage of toxic substances, 79% of hot spot dwellers recognize protection from stray dogs and cats, which is in line with attitude about main perpetrators. Among the key reasons are also protection from pests and protection of pastures and livestock from wild animals (72%), while protection of hunting activities is seen as a frequent motive by around two thirds of respondents.

However, there is no clear knowledge among the group about the territories the most affected by poisonings, with less than one fourth of hot spot dwellers recognizing Western Greece and Thessaly as endangered regions. Eastern Macedonia and Thrace are identified as poisoning hot spots by 12% of respondents.

On the other side, they do correctly identify spring as the season when the most poisonings occur (every other respondent). Autumn was mentioned by the third of the group.

Institutions officials knowledge – baseline level

Other important group of stakeholders in BalkanDetox LIFE project is comprised of members of the state institutions, namely employees of the Ministry of Environment and Energy, Ministry of Rural Development and Food and Ministry of Citizen Protection/Police.

Although majority of the group claims that they professionally deal directly with poisonings, both of domestic and wild animals, this group in general estimates their knowledge on the subject as average.

When it comes to knowledge of the species of vultures that nest in Greece, officials employed in relevant Greek institutions unanimously recognize that Egyptian Vulture breeds in Greece, and great majority are also informed that Griffon Vulture and Cinereous Vulture inhabit the country.

Members of relevant institutions are well informed about feeding habits of local avian scavengers, as well. Majority of them knows that vultures feed on carcasses of wild and domestic animals, and only 2 out of 17 respondents believe that vultures also hunt rodents and large mammals.

Wildlife poisoning, by eating dead poisoned animals or baits, is perceived as main danger to domestic scavenger bird population. Still, there is more room for educating group of institutional members on this subject, since only one respondent acknowledged extensive use of legal toxic compounds (pesticides, insecticides, rodenticides) as a threat to the vultures.

Prevalent opinion in this stakeholders' group is that wildlife poisonings are intentional (15 out of 17 respondents), but that actual vulture poisonings occur accidentally, by eating poisoned-baits laid out for other animals (10 respondents) or ingesting poisoned animals (6 respondents).

Livestock breeders are correctly perceived as main perpetrators by almost all questioned institutional members. Hunters (14 respondents) and farmers (mentioned by 12 respondents) follow.

Institutional members, acknowledge protection of pastures and livestock from wild animals (15 out of 17 respondents) as leading motive behind wildlife poisoning, followed by protection of agricultural land from wild animals and conflicts among people about land use ($\frac{3}{4}$ each). Protection of hunting activities is also perceived as common motive by 12 out of 17 respondents. Institutional stakeholders' opinions are divided when it comes to protection from pests, dogs and cats and protection of apiaries from bears, as motives for wildlife poisoning. Again, as in the case of hot spots residents, members of relevant institutions mostly believe that protection of agricultural land from birds of prey and protection of pigeons from birds of prey, rarely or never lead to wildlife poisoning.

Eastern Macedonia and Thrace are seen as the key hot spots by majority of stakeholders (12 out of 17 respondents), followed by Crete which is mentioned by almost half of the respondents. Western and north Macedonia are perceived as a hot spots by more than one third of surveyed. Thessaly is on the other hand seen as critical region by only the quarter of respondents, along with Western Greece and Epirus.

Institutional stakeholders show lower level of information considering the season when poisonings are the most frequent, noting that spring (close to half) and summer (close to one third) are critical seasons.

This target group unanimously claims that complexity of the investigation is the greatest obstacle to the prevention and sanctioning of animal poisoning. Inadequate enforcement of the existing laws, difficulties with evidence procedures in court, low penalties for wildlife poisoning, poor reporting of information from witnesses and inadequate and unclear protocols for police action are also perceived as important aggravating circumstances.

The great majority of institutional employees believe that it is the responsibility of all members of the general population, as well as the hunters and veterinarians as specific groups, to report information about wildlife poisoning to the authorities. However, most of the respondents also believe that people who report someone from their community for the poisoning of wild animals risk altercations and conflicts in their surroundings, which presents a serious barrier for gathering information and evidence on poisoning incidents.

Stakeholders of relevant Greek institutions are mostly well informed about existence of the protocol defining procedures and jurisdictions for investigating wildlife poisoning and a National plan for combating wildlife poisoning - 12 out of 17 knows there is a relevant protocol in place, and 11 of them are familiar with the existence of the National strategy. However, they are relatively uninformed about the existence of a database for poisoning incidents of birds in Greece, since less than half knows of its existence.

In conclusion, collected data indicate the need for further activities and programs to help both groups of stakeholders widen their knowledge of the issue, especially having in mind their directly involvement in the matter of protection of wildlife and particularly scavenger birds.

8. Baseline report for North Macedonia

8.1 Institutional and Legal Framework in Northern Macedonia

In the Republic of North Macedonia, the national institutions with legislative authority concerned with the issue of wildlife poisoning are:

- The Ministry for Environment and Physical Planning
- The Ministry of Agriculture, Forestry and Water Economy

With regard to investigative and law enforcement authority, the relevant institutions for the Republic of North Macedonia are:

- a. Ministry of Interior/Department for forensic technical examinations and expertise
- b. Faculty of Veterinary Medicine Skopje

- c. Agency for Food and Veterinary³⁸
- d. State Environmental Inspectorate
- e. State inspectorate for Forestry and Hunting
- f. Police³⁹

The following organizations are relevant stakeholders from the civil society sector, when it comes to conservation activities and research of vultures in Northern Macedonia:

- The Macedonian Ecological Society – is a civil society organization working actively working in the areas of ecology and environmental protection and nature conservation. MES activities include: implementation and participation in projects, organization of professional and scientific gatherings, strengthening capacities by training members and empowering young scientists⁴⁰
- Nature Conservation Association AQUILA (formerly the Fund for Wild Flora and Fauna – Kavadarci/FWFF)

8.2 Legislation in the republic of North Macedonia

The republic of North Macedonia has good national legislation in place regarding the use of poisonous substances in the natural environment. The use of poison baits was declared illegal in 1985 and wildlife poisoning remains an illegal activity which is sanctioned according to Criminal Law (Petrovski, Veleviski, Lisičanec, in Pantovic, Andevski, 2018).

There are several laws in North Macedonia that are concerned either with the protection and wellbeing of animals, refer to wildlife poisoning directly, or alternatively deal with the application of toxic substances in agriculture or the natural environment generally.

The following laws comprise the national legislation which is relevant for the problem of wildlife poisoning in North Macedonia:

1. **Hunting law** – Закон за ловството („Службен весник на Република Македонија“ бр.26/09, 82/09-исправка, 136/11, 1/12, 69/13, 164/13 и 187/13)

³⁸ In charge of conduction of necropsies and toxicological analysis.

³⁹ Also in charge of pre-investigative procedures

⁴⁰ About MES, MES website, retrieved on 28.02.2022. <http://mes.org.mk/en/about-mes/>

2. **Law on nature protection** – Закон на заштита на природата („Службен весник на Република Македонија“ бр.67/2004, 14/2006; 84/2007; 35/2010; 47/2011; 148/2011 ,59/2012 и 13/2013).
3. **Law on plant protection products** – Закон за производи за заштита на растенијата („Службени весник на Република Македонија “бр. 110/2007, 20/2009, 17/11, 53/11, 69/13, 10/15, 129/15 и 39/16)
4. **The law on the protection and welfare of animals** – Закон за заштита и благостојба на животните („Службени весник на Република Македонија “бр. 149/2014)
5. **Criminal Law of the Republic of North Macedonia** – Кривичен законик („Службени весник на Република Македонија “бр.80/99, бр.4/2002, бр. 43/2003, бр. 19/2004, бр. 81/2005, бр. 60/06, бр. 73/06, бр. 7/08, бр.139/08, бр.114/09, бр. 51/11, бр. 135/11, бр. 185/11, бр. 142/12, бр.166/12, бр.55/13, бр. 82/13, бр. 14/14, бр. 27/14, бр. 28/14, бр. 115/14 и бр. 132/14.

When it comes to the protection of the wellbeing of animals in the Republic of North Macedonia, the current **Law on the protection and welfare of animals** which was put into effect from 2014⁴¹, defines terms and requirements that are of particular importance for the general treatment of animals (Batrićević, Stanković, 2015). Article 2. of this law defines the objectives of this law and states that animals should be treated as conscious beings, and in such a way that is most adequate for meeting their needs. Article 4. lists behaviors towards animals that are forbidden and Article 5. provides instructions for behaviors towards animals that are in line with good practice for the treatment of animals.

Especially relevant for the issue of wildlife poisoning, the designated body for the implementation of the administrative and professional affairs determined by this law is the Agency for Food and Veterinary. Article 10. of this law declares the forming of the Commission for the protection and welfare of animals. The responsibilities of the Commission include: the exchange of information concerning the wellbeing of animals with member states of the European Union, giving scientific and professional opinions in line with this, recommendations for the enforcement of the law and bylaws that regulate the wellbeing of animals (Batrićević, Stanković, 2015).

⁴¹ This law replaced the previous law one from 2007 with amendments from 2011 Закон за заштита и благостојба на животните („Службени весник на Република Македонија“бр. 113/2007 i 136/2011)

According to Petrovski, Velevski and Lisičanec (Petrovski, Velevski, Lisičanec, in Pantovic, Andevski, 2018) the following laws represent the key legislative framework which is relevant for the issue of wildlife poisoning in the Republic of North Macedonia:

Hunting Law: Article 54. of this law states that all means of hunting that lead to massive losses to populations of game animals are prohibited, including the use of poisonous substances.

Law on Nature Protection: Article 43. states that indiscriminate means of shooting and capturing wild species are prohibited, as well as the use of substances which may cause the local depletion or serious disturbance of the populations of those species, in accordance with international agreements ratified by the Republic of North Macedonia. This applies in particular to: poison and tranquilizing substances and poison and tranquilizing baits.

Law on plant protection products: This law does not specifically refer to wildlife poisoning, however it is significant because it regulates the legal usage and application of toxic substance in agriculture. The inadequate use and application of these products is often a source of unintentional wildlife poisoning.

Criminal Law of the Republic of North Macedonia: Article 230. of this law is concerned with persons who store, disintegrate or keep hazardous waste that has the property of explosiveness, reactivity, inflammability, extravagance, toxicity, infectivity, carcinogenicity, mutagenicity, teratogenicity, ecotoxicity, or toxicity release property through chemical reactions and biological reproduction. These acts are liable to be penalized through administering a prison sentence from 1 to 5 years.

In their study “The protection of animals in comparative law – laws, practices and ecological policies” Batrićević and Stanković (Batrićević, Stanković, 2015) refer to following articles of the North Macedonian Criminal Law as well:

Article 228. of the Criminal Law of the Republic of North Macedonia refers to acts of illegal hunting and their ramifications. As the third and most severe form of this act this law defines the hunting of game animals with means that lead to the massive destruction of populations of game animals. The legal sanctions for this form of the act include either a fine or jail sentence up to three years.

Article 233. is concerned with the criminal act of animal torture, which is committed by any individual who commits gross abuse of an animal, exposes the animal to

unnecessary torment, inflicts unnecessary pain or exposes the animal to suffering. The perpetrator of this act shall be punished by a fine or by imprisonment up to six months.

8.3 International treaties and conventions that have significance for the preservation of wild birds in North Macedonia

North Macedonia became a signatory of “The Convention on the Conservation of European Wildlife and Natural Habitats, Bern Convention” in 1998. This convention was ratified in 1998 and entered into force in 1999⁴². The Law on Ratification was issued in 1997, in the Official Gazette of the Republic of Macedonia no. 49/97⁴³.

The Bern convention is a binding international legal instrument in the field of nature conservation. This convention aims to conserve wild flora and fauna and their natural habitats.

In Article 8 of this convention, it is stated that contracting parties shall prohibit the use of all indiscriminate means of capture and killing and the use of all means capable of causing local disappearance of, or serious disturbance to populations of a species. This applies in particular to the means that are listed in Appendix IV of this treaty. Appendix IV of the Bern Convention is concerned with “Prohibited means and methods of killing, capture and other forms of exploitation” and under these means poison, poisoned and anaesthetic bait are listed.

8.4 Stakeholders’ attitudes toward legislation and law enforcement

Petrovski, Velevski and Lisičanec assert that North Macedonia has good national legislation in place, however, they also call attention to an existing overlap and uncertainties in jurisdiction between legal bodies when it comes to the prevention, control, and investigation of poison use (Petrovski, Velevski, Lisičanec, in Pantovic, Andevski, 2018).

The problem lies first of all, in an unclear procedure regarding which are the designated institutions that need to be contacted first for reporting wildlife poisoning cases. There is a need for precise and efficient protocols concerning responsibilities in reporting,

⁴² Chart of signatures and ratifications of treaty 104, Council of Europe website, retrieved on 28.02. 2022. <https://www.coe.int/en/web/conventions/full-list?module=signatures-by-treaty&treatynum=104>

⁴³ Конвенција за заштита на дивниот растителен и животински свет и природните живеалишта во Европа (Берн) Закон за ратификација, (“Службен весник на РМ” 49/97)

investigating, and processing of cases of wildlife poisoning, to be defined and distributed among all the relevant institutions. Communication and coordination among the relevant responsible institutions need to be further developed and enhanced.

The authors emphasize that the development of protocols and security measures, as well as additional funding towards equipment is required when existing government laboratories are considered. However, in addition to all the above mentioned, it also necessary to continue with awareness raising among stakeholders and decision makers (Petrovski, Velevski, Lisičanec, in Pantovic, Andevski, 2018).

Most of the issues that have been highlighted by North Macedonian conservationists are also identified by officials employed in institutions that were included in the BalkanDetox LIFE survey, and their attitudes are generally aligned.

When it comes to their attitudes in terms of legislation and legal processing of poisoning incidents, the officials that were interviewed emphasize that the problem lies in inadequate law enforcement, as well as a lack of coordination among relevant institutions. They also mention the significance of low penalties for wildlife poisoning and sporadic imposing of fines (i.e. under the Hunting Act). They, however, believe that the existing legal framework is good and mostly trust public prosecutors and their level of education.

The other important exacerbating circumstances and obstacles for the prevention and sanctioning of wildlife poisoning that officials consider crucial, are difficulties with evidence procedures in court, and a lack of control over the prescribed use of legal poisons, such as pesticides, rodenticides, etc.

When it comes to the capacities of the police, institutions employees assess their capacities as inadequate in terms of their human capacities and in terms of education and training of police forces for handling wildlife poisoning incidents. The majority of them believe that the police should be strengthened by the introduction of additional forces (people) in the field for timely detection of poisoning incidents. Strengthening of the police forces would also imply the need to introduce specialized police units for environmental crime, which includes wildlife poisoning, and the introduction of specialized canine units for detecting poisonous substances.

Institutions employees acknowledge the importance of the following specific measures for preventing wildlife poisoning:

- creating additional **supplementary feeding sites for vultures,**

- imposing a **stricter control of the trade of legal poisoning substances** (pesticides, rodenticides, etc.)
- **raising awareness** among key stakeholders (livestock breeders, farmers, hunters, institutions) as well as the general public
- better **protection of wild hoofed populations**
- **financial compensation from the state/government** for the damages to livestock breeders and farmers caused by wild animals

8.5 EU compliance of regulations in North Macedonia

The **North Macedonia report**⁴⁴ which is part of the **2020 Communication on EU Enlargement Policy**, addresses the progress made by the Republic of North Macedonia when it comes to EU compliance of regulations. Environment and Climate Change are addressed in **Chapter 27** of the report, hence, this chapter has direct relevance for the protection and conservation of wild birds and all national legislation concerned with this issue.

In the summary of chapter 27, it is stated that North Macedonia is at **some level of preparation** in this area. The report maintains that **limited progress** was achieved in the areas of nature protection, civil protection, and climate change. However, the main conclusion is that **implementation in all sectors is still lagging behind**.

When it comes to **nature protection**, some progress was made on mapping natural habitats and identifying potential NATURA 2000 sites⁴⁵. Valorisation studies and management plans have been prepared for several protected areas, but long-term funding is still missing. A five-year national programme for biodiversity monitoring was developed. The implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora is still at an early stage. Special attention should be paid, and considerable efforts are necessary for implementing UNESCO conclusions

⁴⁴ Accompanying the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions.

⁴⁵ The Natura 2000 Network is a coordinate ecological network of nature conservation areas. The creation of this network is at the heart of the two nature directives (The Habitats and Birds directive). All EU member states have designated Natura 2000 sites.

regarding the natural and cultural heritage of the Ohrid region (in order to prevent it from being included on the danger list of world heritage⁴⁶).

8.6 Number of relevant stakeholders involved

The first target group of stakeholders for this study which includes government services and institutions officials, consists of an estimated total of 46 relevant employees, employed across 4 institutions⁴⁷ in the Republic of North Macedonia.

When it comes to veterinary services employees, the total estimated universe is 3 employees across two regions. One veterinary service employee in Pelagonia and two of them in the Vardar region. Regarding law enforcement officials, there are no official data on the number of law enforcement officials in these two regions.

Regarding the second target group – farmers, hunters and livestock breeders, there is an estimated total of 573 stakeholders across two regions. In Pelagonia 500, of which 110 livestock breeders, 30 farmers and 360 hunters. The region of Vardar, Kavadarci area, has approximately 73 stakeholders, the majority of which are hunters, 50 of them, whereas there are approximately 13 livestock breeders and 10 farmers.

Due to difficulties caused by the COVID-19 pandemic the number of respondents that was included in the research from the first target group - government services and institutions officials, law enforcement officials and veterinary services employees in North Macedonia, was 15, and the number of respondents from the second target group – livestock breeders, hunters and farmers was 31.

⁴⁶ **Article 11 of the text of the Convention Concerning the Protection of the World Cultural and Natural Heritage, WHC UNESCO website, retrieved on 28.02.2022.**
<https://whc.unesco.org/en/conventiontext/#Article11.4>

⁴⁷ The full list of relevant institutions which has been previously noted in the section “Institutional and Legal Framework in North Macedonia” includes: The Ministry for Environment and Physical Planning, The Ministry of Agriculture, Forestry and Water Economy, Ministry of Interior/Department for forensic technical examinations and expertise, Faculty of Veterinary Medicine Skopje, Agency for Food and Veterinary, State Environmental Inspectorate, State inspectorate for Forestry and Hunting, Police

8.7 Fields of knowledge baseline level

Documenting of poisoning incidents in North Macedonia

In the Balkan Vultures Poison Study, Petrovski, Velevski, and Lisičanec assert that wildlife poisoning is well documented in North Macedonia (Petrovski, Velevski, Lisičanec, in Pantovic, Andevski, 2018). The relevant institutions keep records of all legally processed cases of wildlife poisoning, whereas the Macedonian Ecological Society (MES) monitors cases of poisoning and suspected poisoning incidents, and mortality of birds of prey which has occurred in the past 15 years. In addition to this, MES has compiled all the available data regarding vulture poisoning incidents that have occurred in the past 30 years.

Nearly 20 years ago, Velevski (Velevski, 2003) compiled all existing data about threats faced by vultures in Macedonia. Each threat was analyzed separately for each species and their importance was assessed. This study was carried out to aid the preparation of the National Action Plan of Recovery and Conservation of Vultures. Velevski asserted that poisoning was the most serious reason for vulture decline in Macedonia and declared poisoning to be of potentially critical importance for the Bearded and Cinereous Vulture, and of very high importance for the Griffon and Egyptian Vulture.

Educational and anti-poisoning activities regarding illegal bird poisoning in North Macedonia

Since 2006 anti-poison activities including workshops and educational lectures have been held for various groups of stakeholders in North Macedonia. In 2006, 4 workshops were held for representatives of different inspectorates (120 attendees in total), parallel to this, 20 educational lectures were held in villages. In 2010 again, two workshops were held for the inspectorates (for approximately 60 more people). Educational lectures for villagers in vulture regions that were defined by the scope of the Balkan Vulture Action Plan were continued during the period of 2008-2009.

When they discuss the training and educational activities that were held for all state inspectors of hunting and the environment, a significant number of veterinary inspectors and limited number of police inspectors, Velevski, Lisičanec E. and Lisičanec T., conclude that this action is thought to provide good results only if implemented on regular basis (Velevski, Lisičanec E., Lisičanec T., in Andevski, 2013).

When it comes to veterinary professionals, a capacity-building training was held for veterinarians in 2012 at the Veterinary Faculty in Skopje, concerning anatomopathological analyses and basic toxicological analyses (Petrovski, Velevski, Lisičanec, in Pantovic, Andevski, 2018).

Previous and current/ongoing projects concerning wildlife poisoning

- **Egyptian Vulture New Life** - Reinforcement of the easternmost population of the Egyptian vulture (*Neophron percnopterus*) in Europe by delivering urgent conservation measures towards eliminating major known threats in the breeding grounds and along the flyway.

Organization: Macedonian Ecological Society

Time frame: 2018-2022

- **Balkan Anti-Poisoning Project** - Preparation of a national strategy addressing wildlife poisoning incidents by involving competent institutions, extending institutional capacity and raising public awareness.

Organization: Macedonian Ecological Society

Time frame: 2018 - 2020

- **Vulture Conservation Project in Macedonia** - Vulture conservation in the Balkans and the neighbouring countries.

Organization: Macedonian Ecological Society

Time frame: 2002-2008

8.8 Target groups knowledge – baseline level

Hot spots residents knowledge baseline level

When asked to self-evaluate their knowledge about the issue of wildlife poisoning, one half of hunters and farmers from poisoning hot spots in North Macedonia consider their knowledge regarding wildlife poisoning to be good or excellent. However, nearly one third of them consider their knowledge to be inadequate and one fifth are unable to evaluate their own knowledge. This implies that there is a need as well as an openness for continued educational activities with stakeholders.

On the topic of knowledge regarding the different vulture species that are still present and nesting on the territory of North Macedonia, members of hot spots target groups are to some extent informed about these species. They are somewhat more informed about the presence of the Griffon Vulture than of the Egyptian Vulture. However, when it comes

to other Balkan species of Vultures, such as the Cinereous Vulture, more than half of them are not adequately informed about their conservation status.

The vast majority of them also have a good understanding of what constitutes the diet of vultures – as over 80% recognize that vultures feed on the carcasses of wild and domestic animals. However, around half of the respondents think that in addition to this vultures eat hunted animals – including hunted rodents and domestic animals. This indicates that the respondents do not grasp the significance of the availability of carrion for the survival of vultures as obligate scavengers, and also that they might consequently foster the wrong perception that vultures can endanger their domestic animals.

Hot spots residents in North Macedonia unanimously recognize wildlife poisoning as the most significant threat to the existence of vultures in North Macedonia. This threat is singled out by nearly $\frac{3}{4}$ of respondents. Lack of food is also considered an important threat, but only by one in five respondents.

The majority of hunters and farmers in hot spots areas in North Macedonia recognize vultures as the unintentional victims of poisoning who succumb to poison ingested through poison baits or eating the poisoned carcasses of dead animals. However, nearly one quarter of the respondents also believe that vultures are intentional victims of poisoning and that they perish due to eating poison bait laid out for them.

The vast majority of hunters and farmers in North Macedonia (80% of them) acknowledge the important part that vultures play in the environment, and three quarters of them also believe that vultures have important roles for human activities. Nevertheless, it is concerning that more than half of them believe that governments should carry out controlled poisoning of wild animals on their own. This finding indicates the need for continued anti-poisoning activities and awareness raising. The same need is emphasized by Petrovski, Velevski and Lisičanec in the Balkan Vultures Poisoning Study (Petrovski, Velevski, Lisičanec, in Pantovic, Andevski, 2018).

Three quarters of hot spots residents perceive wildlife poisoning in general to be the result of intentional actions, and that it occurs primarily through illegal poisons from the black market and to a somewhat lesser extent by misuse of legal poisoning substances such as pesticides or insecticides. Secondary poisoning through pesticides was identified as a threat by Velevski in the study he compiled “Study on the Threats to Vultures (Aegypiinae) in Macedonia”, however, he also remarked that the use of pesticides in agriculture was on the decline (Velevski, 2003).

Hunters and farmers in poisoning hot spots in North Macedonia correctly identify the responsible groups for carrying out the practice of wildlife poisoning. Although, livestock breeders are identified as a responsible group to a greater extent, by 60% of respondents, and farmers by a little more than a third of them. Hunters are also less readily named as a responsible group, by around a quarter of the respondents. Interestingly, beekeepers and pigeon breeders are only named responsible by one fifth of respondents.

In line with the identified groups, the main motivation for wildlife poisoning that is singled out by more than half of the respondents is protection of pastures and livestock from wild animals by and protection from pests, this is followed by protection of agricultural land (around 40%). Protection of hunting activities is considered to be a motive by only one fifth of respondents. Other potential motives are rarely seen as drivers for wildlife poisoning.

Regarding regions that represent poisoning hot spots in North Macedonia, it is noteworthy that more than 40% of respondents have no knowledge about which regions are critical in this respect. Southwest Macedonia and Western Macedonia are recognized as regions with a frequency of poisoning incidents by 16% of respondents each.

When we consider the seasons when wildlife poisoning most commonly occurs we can remark that the respondents are inadequately informed – one fifth of respondents are uninformed and the rest are divided in their belief about which season is a key period for poisoning activities.

Institutions officials knowledge – baseline level

When it comes to knowledge of the species of vultures that nest in North Macedonia, officials employed in relevant institutions almost unanimously recognize that the Griffon vulture breeds in North Macedonia and around half of them acknowledge that the Egyptian Vulture still breeds in North Macedonia.

Officials employed in institutions in North Macedonia are relatively well informed on the diet of vultures. The vast majority of them know that the carcasses of wild and domestic animals are consumed by vultures. One quarter of them believe that vultures eat hunted rodents as well. However, we can conclude that the majority have a good understanding of the diet of vultures as obligate scavengers.

Wildlife poisoning is identified by institutions officials as the most important threat to vultures and it is followed by extensive use of legal toxic compounds. However, poisoning is singled out by one half of the respondents as the threat that endangers

vultures the most, therefore, awareness needs to be raised about the extent of this threat and become more widespread among those who work in relevant government institutions.

Institutions officials are aware that vultures are generally speaking the unintentional victims of poisoning, who perish as a result of secondary poisoning, due to either eating poisoned animals or eating poison baits that were intended for other animals who are the primary poisoning targets.

Institutions officials are relatively well informed when it comes to responsible groups for wildlife poisoning. The majority of them identify livestock breeders and hunters as those who are often accountable for incidents of wildlife poisoning, and half of them consider farmers to be accountable for wildlife poisoning.

Officials employed in relevant institutions in North Macedonia are relatively well informed about the key motives for wildlife poisoning. They single out all of the following as relevant motives: protection from pests, protection of pastures, agricultural land and livestock from wild animals, protection of agricultural land from birds of prey, protection of hunting grounds and even protection from stray cats and dogs.

Institutions officials lack knowledge about the about the regions of North Macedonia where wildlife poisoning most frequently occurs. It is significant to point out that a third of the respondents claim to be uninformed about the regions where the poisoning incidents most often occur. The rest of them most often mention Eastern and Central Macedonia as critical regions (around one third of respondents each).

In general, when it comes to the existence of a database for poisoning incidents of birds in North Macedonia, as well as a National action plan for combating wildlife poisoning and protocol defining procedures and jurisdictions for investigating wildlife poisoning, the interviewed employees have very little knowledge about this. Only one fifth of respondents state that there is a database related to the wildlife poisoning and only 1 respondent (out of 15) stated that there is a National action plan. This indicates that there is a need to familiarize and educate employees in relevant institutions about the existing resources that are at their disposal and strategies and protocols that are defined for this domain.

9. Baseline report for Serbia

9.1 Institutional and Legal Framework in Serbia

The relevant Institutions of the republic of Serbia that have legislative authority concerning wildlife poisoning are:

- Ministry for Environmental Protection and
- Ministry of Agriculture, Forestry and Water Management

On the other hand, when it comes to investigation and law enforcement with regard to wildlife poisoning incidents the relevant authorities are (Ružić, Grubač, in Pantović, Andevski, 2018):

- Veterinary inspection⁴⁸
- Hunting inspection
- Environmental inspection
- Police⁴⁹
- Institute for Nature Conservation of Serbia
- Institute for Nature Conservation of Vojvodina Province
- Scientific Veterinary Institute of Novi Sad
- Faculty of Veterinary Medicine, University of Belgrade
- Military Medical Academy

The following civil society organizations are relevant stakeholders when it comes to the study and conservation of vultures in Serbia:

- Bird Protection and Study Society of Serbia (BPSSS) which as of 2018 is a full-fledged member of the BirdLife International network.

⁴⁸ In charge of conduction of necropsies and toxicological analysis.

⁴⁹ Also in charge of pre-investigation procedures.

- The Birds of Prey Protection Fund (organizes its programs in cooperation with the University of Belgrade, the Institute for Biological Research “Siniša Stanković” and the Serbian Biological Society)

9.2 Legislation in the republic of Serbia

In the context of existing national legislation, Serbia has several laws which touch upon the protection of wildlife and the illegal use of poisonous substances in the natural environment, as well as the legal and criminal repercussions of these activities.

When it comes to the protection of birds and their habitat, the right to a healthy environment, which includes birds as an inherent part of it, is guaranteed first and foremost by **The Constitution of the Republic of Serbia** – article 74 (Ružić et al., 2017).

The following laws, amendments and chapters of the criminal code are applicable and relevant for the conservation of wild birds and their protection against illegal poisoning:

6. **The law on environmental protection** – Zakon o zaštiti životne sredine (“Sl. glasnik RS”, br. 135/2004, 36/2009, 36/2009 - dr. zakon, 72/2009 - dr. zakon i 43/2011 - odluka US i 14/2016)
7. **The law on game and hunting** – Zakon o divljači i lovstvu (“Sl. Glasnik RS”, br.18/2010 i 95/2018 – dr. zakon)
8. **The law on nature protection** – Zakon o zaštiti prirode (“Sl. glasnik RS”, br. 36/2009, 88/2010, 91/2010 - ispr., 14/2016, 95/2018 - dr. zakon i 71/2021)
9. **The law on the wellbeing of animals** – Zakon o dobrobiti životinja (“Sl. glasnik RS”, br. 41/2009)
10. **Criminal law of the Republic of Serbia** – chapter twenty four (“Sl. Glasnik RS”, br. 85/2005, 88/2005 – ispr., 107/2005 – ispr., 72/2009. 111/2009, 121/2012,104/2013, 108/2014, 94/2016 i 35/2019)

Chapter two of the **Law on the wellbeing of animals** is concerned with the general protection of animal welfare, and according to article 7. it is forbidden to use poisons and other chemical substances that cause the pain and suffering of animals, except with the goal of control of rodent populations and conducting experiments on animals for the purpose of scientific research.

According to Ružić and Grubač (Ružić, Grubač, 2018) the illegal poisoning of birds is explicitly prohibited by the following laws:

- **Law on nature protection:** Article 79. prohibits the use of certain means of catching and killing wild animal species, endangering, and harassing their populations and/or habitats, disrupting their well-being and that can cause their local disappearance. These include the use of poison or tranquilizing baits.
- **Law on game and hunting:** Article 22. prohibits the use of phytosanitary substances and other chemical substances in quantities and dosages that can cause damages to game animals, as well as intentional poisoning of game animals.

With regard to the legal ramifications and sanctions for the illegal poisoning of wild birds, the **Criminal Law of The Republic of Serbia** regulates the consequences of these acts. According to article 269., whoever, by violating these regulations, kills, hurts, tortures or otherwise abuses animals, shall be punished by a fine or imprisonment not exceeding one year. If under any circumstances the acts described in the first paragraph of this article have led to the killing, torturing or hurting of a greater number of animals, or the act has been done to an animal that belongs to a specially protected species, the perpetrator shall be punished by a fine or by imprisonment up to three years.

In addition to this, according to article 276. of the same law, whoever hunts game animals whose hunting is forbidden or who hunts without a special permit a particular game animal for which hunting requires such a permit or who hunts in a manner or means that inflicts mass destruction of game animals, shall be punished by imprisonment for a term not exceeding three years.

9.3 International treaties and conventions relevant for the conservation of wild birds in Serbia

In 2007 Serbia ratified "The Convention on the Conservation of European Wildlife and Natural Habitats, Bern Convention"⁵⁰. **The Bern Convention (1979)** is a binding international legal instrument in the field of nature conservation⁵¹. This convention aims to conserve wild flora and fauna and their natural habitats.

⁵⁰ The Law on Ratification of the Convention on the Conservation of European Wildlife and Natural Habitats ("Sl. Glasnik RS – Međunarodni ugovori", br.102/2007)

⁵¹ Text of the Bern convention, Council of Europe website, retrieved on 30.11.2021.

<https://www.coe.int/en/web/conventions/full-list?module=treaty-detail&treaty-num=104>

In Article 8 of this convention, it is stated that contracting parties shall prohibit the use of all indiscriminate means of capture and killing and the use of all means capable of causing local disappearance of, or serious disturbance to populations of a species. This applies in particular to the means that are listed in Appendix IV of this treaty. Appendix IV of the Bern Convention is concerned with “Prohibited means and methods of killing, capture and other forms of exploitation” and under these means poison, poisoned and anaesthetic bait are listed.

9.4 Stakeholders’ attitudes toward legislation and law enforcement

Ružić and Grubač (Ružić, Grubač, in Pantović, Andevski, 2018) remark that Serbia has good national legislation that refers to the use of poison substances in the natural environment. Wildlife poisoning is clearly defined by these regulations as an illegal activity which is punishable under Criminal law. However, they emphasize that in order to combat wildlife poisoning successfully, there is a need for much stricter enforcement of the existing legislation by relevant government authorities. This applies particularly for legislation pertaining to the control, production, trade and application of pesticides and similar chemical compounds used in agriculture. Another significant problem is that the reported cases of illegal bird poisoning are not efficiently legally processed (Ružić et al., 2017). Even though there have been many reports made in the last decade, Ružić remarks that in Serbia we are still waiting for the first verdict in a case of illegal bird poisoning to be made (Ružić et al., 2017). The problem lies in a lack of clearly defined protocol, and coordination between the relevant institutions, as well as a low public awareness. These circumstances make it harder for the cases to be processed from beginning to end, and thus yield a preventive effect.

The issues concerning the enforcement of existing laws and inefficient legal processing of wildlife poisoning cases are also present in the perception and attitudes of government services and institutions officials who were included in the BalkanDetox LIFE project.

When it comes to the important exacerbating circumstances and obstacles for the prevention and sanctioning of wildlife poisoning, institutions officials identify a set of circumstances that are in line with what conservationists in Serbia highlight as well. These circumstances are linked to the inadequate enforcement of laws, low penalties, and rare imposing of fines for wildlife poisoning, as well as inadequate and unclear protocols for police action, complexity of the investigations and difficulties with evidence procedures in court.

Institutions officials also believe that the inadequate education of prosecutors to handle incidents related to the poisoning of wild animals is significant, as well as the lack of

control over the prescribed use of legal poisons (such as pesticides) and the online black market for banned poisons. Several aspects of the capacity of the police that need to be improved have also been identified, from the need to introduce specialized police units for environmental crime and specialized canine units for detecting poisonous substances, to introducing additional personnel (police, environmental inspectors, rangers etc.) in the field. They also recognize the need for further training and education of police forces, as well as the need to involve representatives of civil society organizations in wildlife poisoning investigations.

Institutions employees acknowledge the importance of the following specific measures for preventing wildlife poisoning:

- **raising awareness** among key stakeholders (livestock breeders, farmers, hunters, institutions) as well as the general public
- imposing a **stricter control of the trade of legal poisoning substances** (pesticides, rodenticides, etc.)
- **financial compensation from the state/government** for the damages to livestock breeders and farmers caused by wild animals
- creating more **supplementary feeding sites for vultures**
- better **coordination among relevant institutions**

9.5 EU compliance of regulations

The **2020 Serbia report**⁵² which is part of the **2020 Communication on EU Enlargement Policy**, addresses Serbia's progress when it comes to EU compliance of regulations. **Chapter 27** of the report deals with Environment and Climate Change thus, it is relevant for the conservation of wild birds and all national legislation concerned with this issue. In this chapter, the report asserts that Serbia has achieved **some level of preparation** in the area of **environment and climate change**. However, the overall conclusion is that Serbia has made **limited progress** in the past year, and mainly in **strategic planning**.

⁵² That accompanies the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions.

Furthermore, the document states that alignment with the EU *acquis* in the field of **nature protection**, in particular with the **Habitats and Birds Directive**⁵³, **remains moderate**. Serbia needs to fully incorporate EU standards on prohibited means of capturing and killing wild animals throughout its entire legislation, including in legislation on hunting. Progress on establishing Natura 2000⁵⁴ sites is slow. Institutional and human resource capacities at national and local level remain weak, in particular as regards enforcement, and wildlife trade.

9.6 Fields of knowledge baseline level

Compiling data on the illegal poisoning of wild birds in Serbia

According to Ružić (Ružić et al., 2017) the first assessments of the illegal perishing of wild birds in Serbia were done in 2014. as a part of the project “Review the scale, scope and impact of illegal killing of birds in the Mediterranean “. They showed that 120 000 - 170 000 wild bird individuals of 64 species perish annually, due to illegal killing, poisoning and catching.

In addition to this project, in 2014 the BPSS created the “Bird Crime Task Force” within their organization and consequently they have conducted annual surveys in the region of Vojvodina during the wintertime, which is a period when a high frequency of poisoning incidents occurs.

As a part of the project “Civil Society as a Force for a Change in the Serbia's EU Accession Process” the process of digitalization was initiated – and a data base created for the registered individual cases of illegal killing, poisoning and catching of wild birds. Effectively the Bird Protection and Study Society of Serbia compiled and analysed all the available materials and data when it comes to the illegal killing or harming of birds which includes cases of poisoning. This data was made public in their Report on illegal shooting, poisoning, trapping, possessing and trade of wild birds in the Republic of Serbia for the period 2000-2017 (Ružić et al., 2017).

⁵³ The objectives of these two directives is to ensure that rare, threatened or endemic species of wild animals and plants (often collectively referred to as species of European importance) and rare habitat types that they protect are maintained or restored to a favourable conservation status throughout their natural range in the EU.

⁵⁴ The Natura 2000 Network is a coordinate ecological network of nature conservation areas. The creation of this network is at the heart of the two nature directives (The Habitats and Birds directive). All EU member states have designated Natura 2000 sites.

Educational activities regarding illegal bird poisoning in Serbia

As part of the project “Balkan Vulture Action Plan” in Serbia, which lasted throughout the four-year period of 2004-2008, the Institute for Nature Conservation in Serbia organized anti-poison activities which were mainly related to awareness raising. These included: educational presentations, distribution of promotional materials (leaflets)

in order to engage with relevant stakeholders (farmers, hunters, inspection, policy and media) and sampling of poisoned birds (Ružić, Grubač, in Pantović, Andevski, 2018).

Recent and current/ongoing projects concerning wildlife poisoning

- **PannonEagle Life** - Conservation of the eastern imperial eagle by decreasing human-caused mortality in the Pannonian Region. LIFE15 NAT/HU/000902 (2016 – 2021)
- **Stop the poisoning of the birds of prey in Serbia** – safe environment for

birds and people (2018)

- **Adriatic Flyway 4** - Fighting poisoning – reducing vulture (and other scavengers and predators) mortality due to the use of poison baits and lead ammunition across the Mediterranean (2018-2022)

9.7 Number of relevant stakeholders involved

When it comes to the first target group of stakeholders, government services and institutions officials the estimated total number of relevant employees is 187, employed in 7 institutions⁵⁵ in the Republic of Serbia.

Regarding law enforcement officials and veterinary services employees, the total estimated universe is 155 employees across two regions. In Šumadija and West Serbia, Zlatiborski district a total of 92, of which 50 are law enforcement officials and 42 are

⁵⁵The full list of relevant institutions which has been previously noted in the section “Institutional and Legal Framework in Serbia” includes: Ministry for Environmental Protection, Ministry of Agriculture, Forestry and Water Management, Institute for Nature Conservation of Serbia, Institute for Nature Conservation of Vojvodina Province, Scientific Veterinary Institute of Novi Sad, Faculty of Veterinary Medicine, University of Belgrade, Military Medical Academy

veterinary services employees, and 63 of them in Vojvodina and West Bačka district, of which 60 law enforcement officials and 3 veterinary service employees.

For the second target group – farmers, hunters and livestock breeders, there is an estimated total of 3 360 stakeholders across two regions. In Šumadija and West Serbia, Zlatiborski district 2 260, of which 1 900 livestock breeders, 100 farmers and 260 hunters. The region of Vojvodina and West Bačka district has approximately 1 100 stakeholders, the majority of which are farmers, 950 of them, whereas there are approximately 100 livestock breeders and 50 hunters.

Due to difficulties caused by the COVID-19 pandemic the number of respondents that was included in the research from the first target group - government services and institutions officials, law enforcement officials and veterinary services employees in Serbia, was 30, and the number of respondents from the second target group – livestock breeders, hunters and farmers was 45.

9.8 Target groups knowledge – baseline level

Hot spots residents knowledge baseline level

Before taking a detailed look at the baseline knowledge of hot spots residents regarding wildlife poisoning in Serbia, it is relevant to note that when it comes to their self-assessment of their own knowledge, close to half of the targeted residents of hot spots – livestock and agricultural farmers, hunters, veterinarians and conservationist, evaluate their own knowledge as insufficient. One third believe that their knowledge is on an average level and one fifth believe that they have good or excellent knowledge regarding this problem. This implies that there is a significant space and openness for awareness raising and educational activities concerning this issue.

Regarding the knowledge of hot spots target groups about different vulture species, we can first of all remark that they are well informed about the presence of the Griffon Vulture in Serbia, as the vast majority of them acknowledge that the Griffon Vulture still nests in Serbia. This is understandable considering the strong population of breeding pairs of Griffon Vultures that are still nesting in Serbia (Pantović, Andevski, 2018), as well as their historical presence on the territory. However, when it comes to other species of Balkan vultures, they are not adequately informed about their conservation status. Between 2/5 and one half of respondents claim that they are uninformed about the other mentioned species, and around a quarter of them believe that both the Cinereous and the Egyptian Vulture still breed in Serbia. Both of these species are currently extinct on the territory of Serbia.

They are also well informed when it comes to what constitutes the diet of vultures, as they unanimously recognize that vultures feed on the carcasses of dead domestic and wild animals. Nevertheless, close to half of the respondents think that in addition to this vultures eat hunted animals – including hunted rodents, large mammals and domestic animals, implying that half of the stakeholders lack the specific knowledge that vultures as obligate scavengers rely on the availability of dead animal carcasses for their survival.

Although, wildlife poisoning is singled out as the most important danger that vultures in Serbia face, implying that there is awareness about the importance of this threat, knowledge about the scope and impact of wildlife poisoning needs to become more widespread among citizens in hot spots, since it is recognized as the greatest threat to vultures' existence by only a third of the hot spots target groups.

There is a widespread awareness that poison bait is not used for the intentional poisoning of vultures, and vultures are identified by the majority of farmers, hunters, veterinarians and conservationists as the unintentional victims of poisoning who perish due to eating poison baits or poisoned animals. One fifth of the respondents also believe that vultures fall victim to pesticide poisoning.

Agricultural production farmers, livestock/cattle farmers, conservationists, hunters, and veterinarians in large part (close to 70% of them) acknowledge the important role which vultures play in the ecosystem. However, the fact that one third of them believe that government-controlled poisoning of wild animals is sometimes justified indicates that citizens should be informed on the consequences of wildlife poisoning and its impact on the entire ecosystem.

When it comes to the groups that are responsible for perpetuating the practice of wildlife poisoning, farmers and livestock breeders are more easily identified as the perpetrators than hunters and pigeon fanciers/breeders. Close to half of hot spots residents recognize livestock breeders to be a responsible group and more than 60% of residents recognize farmers as a group who utilizes this practice. Hunters on the other hand, are not as readily named as a group practicing wildlife poisoning – one third of respondents recognize that this is a practice that is used by hunters in order to protect game animals from predators. It is interesting to note that only around one in ten respondents consider that pigeon breeders could be responsible for wildlife poisoning, whereas studies show that cases of deliberate poisoning of birds of prey by pigeon breeders are not rare (Ružić, Grubač, in Pantović, Andevski, 2018).

Conversely, even though farmers are acknowledged as a responsible group by the greatest number of respondents, the corresponding motivation of this group –

protection of farmland and pastures as well as livestock from wild predators is recognized by slightly more than a third of respondents. Protection from pests is at the forefront as a motive that is identified by $\frac{3}{4}$ of respondents. As this is in fact a widespread practice in Serbia we can conclude that the respondents are well informed in this respect. The same goes for the motive of protection from feral dogs and cats – which is recognized by half of the respondents. The practice of laying out poison baits to deal with the populations of feral animals is quite common in communities where these animals can inflict damage to livestock populations and residents of hot spots with the most poisoning cases in Serbia are evidently aware of this. In line with hunters being acknowledged as a responsible group by one third of respondents – slightly less, a quarter name this motive of protection of hunting activities as a driver for wildlife poisoning.

When it comes to regions that represent poisoning hot spots in Serbia, it is significant to point out that close to 40% of respondents are not aware which regions are critical in this respect. Vojvodina is acknowledged by close to a third of the respondents as a region where poisoning occurs frequently. On the other hand, Šumadija and Western Serbia are recognized as a hot spot by less than 10% of respondents.

Regarding the seasons when wildlife poisoning most commonly occurs – close to a third of respondents are uninformed and winter, a season when wildlife poisoning occurs frequently is recognized by less than 10% of respondents.

Institutions officials knowledge – baseline level

When it comes to knowledge of the species of vultures that nest in Serbia, officials employed in relevant Serbian institutions unanimously recognize that Griffon vulture breeds in Serbia. The situation is a bit different concerning the other types of Balkan vultures - the conservation status of the Egyptian and Cinereous Vulture is not known to all of them, as one third of them believe that the Egyptian Vulture still nests in Serbia and close to one in five of respondents think that the Cinereous Vulture breeds on the territory of the Republic of Serbia.

Employees of institutions in Serbia are relatively well informed on the diet of vultures. The vast majority of them acknowledge that the carcasses of wild and domestic animals are consumed by vultures. Close to one third believe that vultures eat hunted rodents as well, and a small number of them believe that they eat other hunted animals. Nevertheless, most of the employees have a clear picture of the basic species characteristics of vultures as obligate scavengers.

Wildlife poisoning is singled out by institutions officials as the most important threat to vultures. However, half of the respondents do not name poisoning as the threat that endangers vultures the most, therefore, awareness needs to be raised about the extent of this threat in the context of other endangering factors.

Institutions officials are aware that vultures are the unintentional victims of poisoning, who accidentally ingest poisoning either by eating poison baits or animals that have died as the primary targets of poisoning. One fifth of them consider that the key cause of poisoning for vultures is pesticide poisoning.

When it comes to the groups that are most responsible for wildlife poisoning, the majority of institutions officials in Serbia are able to identify groups that still use these practices. Farmers are recognized as a group that are accountable for incidents of wildlife poisoning. They are less unanimous in the case of hunters and pigeon breeders; however, the majority recognize them as well, as groups that are responsible for using this practice. They are somewhat divided when it comes to the responsibility of livestock breeders.

Employees from institutions in Serbia are familiar with the motivation that drives this type of behavior. They recognize the most prominent motives that drive wildlife poisoning - protection from pests and agricultural land from wild animals, protection of pastures and livestock from wild animals, and protection from stray dogs and cats. However, only a third single out protection of hunting activities as important motivation for wildlife poisoning, and a similar number points out protection of birds of prey.

Institutions officials are somewhat more informed about which regions are sites of frequent wildlife poisoning, compared to the other target group. More than half (3/5) acknowledge that frequent wildlife poisoning occurs in Vojvodina and less than half (2/5) do so for Šumadija and Western Serbia. It is important to note that one third of the respondents are uninformed.

When it comes to knowledge of the existence of the database for poisoning incidents of birds in Serbia, as well as a National action plan for combating wildlife poisoning and protocol defining procedures and jurisdictions for investigating wildlife poisoning, the respondents from institutions are mostly uniformly uninformed. This implies the need for informing and educating employees from relevant institutions about the existing resources, strategies and protocols.

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Annex XXII. Questionnaire about recorded wildlife poisoning and presumable poisoning events.

QUESTIONNAIRE

CONTRIBUTOR INFORMATION	
Country:	
Organisation:	
Address:	
Telephone:	
E- mail:	
Webpage:	
Name and position of person providing the information:	
E-mail of the person providing the information:	

Q1. Please specify to the best of your knowledge how many wildlife poisoning incidents (WPI) are you aware of that have occurred in your country, their location, species affected, and other relevant information presented in the table below.

WPI	Date/Period	Location (GPS coordinates if available)	Species affected	No. of poisoned individuals	Type of poisoning (intentional, incidental, unknown)	Main driver (conflict with predators, stray dogs, other wildlife, etc.)	Substance used
1							
2							
3							
4							
5							

** please add new rows for more WPIs if needed;*

Q2. Please specify to the best of your knowledge for how many wildlife poisoning incidents in your country have official necropsies been conducted on wild animals which were suspected to have died from poisoning or ingesting poison baits. (please use the same numbering for the incidents as in the table above)

WPI	Species	Cause of death/ necropsy results	Name of referent institution

** please add new rows for more WPIs if needed;*

Q3. Please specify to the best of your knowledge for how many wildlife poisoning incidents in your country have toxicological analysis been conducted, either on dead animals or on poison baits. (please use the same numbering for the incidents as in the table under Q2.)

WPI	Sample (animal species or poison bait)	Tested substances	Confirmed substances	Name of referent laboratory

** please add new rows for more WPIs if needed;*

Q4. Please specify to the best of your knowledge how many wildlife poisoning incidents in your country have officially been prosecuted by the public prosecutor's office and have reached court trials. (please use the same numbering for the incidents as in the table under Q2.)

Q5. Please specify to the best of your knowledge for how many wildlife poisoning incidents in your country have court rulings been delivered. (please use the same numbering for the incidents as in the table under Q2.)

Contributor information for relevant governmental institutions	
Country:	
Institution:	
Address:	
Telephone:	
E- mail:	
Webpage:	
Name and position of person providing the information:	
E-mail of the person providing the information:	

Annex XXIII. Questionnaire for target audiences in local communities.

QUESTIONNAIRE

P1. Based on your knowledge, do the following vulture species breed in ...country...? Please answer with yes, no or I don't know.	1. Yes	2. No	3. I do not know, I am not informed
1. Griffon Vulture			
2. Turkey Vulture			
3. Cinereous Vulture			
4. King Vulture			
5. Egyptian Vulture			

P2. Do you know which types of food do vultures in ...country... use from the types listed below? Please answer with yes, no or I don't know.	1. Yes	2. No	3. I do not know, I am not informed
1. Carcasses of wild animals			
2. Carcasses of domestic animals			
3. Hunted large mammals			
4. Hunted rodents			
5. Hunted domestic animals			
6. Hunted insects			

P3. What is endangering the vulture populations in ...country.. the most?

Read the answers from 1-6. Rotate the answers from 1-6. When you read the list say: or some other cause which we haven't stated?

1. Lack of food
2. Disturbance

3. Wildlife poisoning
4. Poaching
5. Accidental electrocution of collision with power cables
6. Extensive use of legal toxic compounds (pesticides, insecticides, rodenticides)
7. Other, what?_____
98. Doesn't know (don't read)
99. Refuses to answer (don't read)

P4. How would you evaluate your own knowledge about the issue of wildlife poisoning on a scale from 1 to 5, 5 being excellent knowledge.

1 2 3 4 5 6 (Don't know / can not evaluate)

P5. What do you think, from which of the causes listed below do vultures get poisoned the most?

1. from poison baits intended for vultures
2. from poison baits intended for other animals
3. because they consume poisoned animals
4. because they get poisoned by pesticide
5. Some other cause, which?
98. Doesn't know
99. Refuses to answer

P6. Do you agree with the following statements? Express your personal attitude towards each statement using the following scale: (1) I disagree completely, (2) I mostly disagree, (3) I neither agree nor disagree, (4) I mostly agree, (5) I completely agree	1. I disagree completely	2. I mostly disagree	3. I neither agree nor disagree	4. I mostly agree	5. I completely agree	98. I don't know (do not read)
1. Vultures have important roles for human activities	1	2	3	4	5	98
2. The greatest value of vultures such as the Griffon Vulture is the fact that it is a tourist attraction	1	2	3	4	5	98

3. Vulture numbers would increase if we would simply leave them alone.	1	2	3	4	5	98
4. Vultures have an important role in the ecosystem	1	2	3	4	5	98
5. Wild animals have/play an important role for human activities	1	2	3	4	5	98
6. Poisoning wild animals is sometimes justified	1	2	3	4	5	98
7. Governments/Countries should conduct controlled poisoning of wild animals on their own	1	2	3	4	5	98
8. Wildlife poisoning is only a problem when it poses a threat for people/humans	1	2	3	4	5	98

P7. Wildlife poisoning/Poisoning of wild animals in ...country... can occur intentionally or unintentionally, with legal or illegal poisoning substances. According to your opinion, how does wildlife poisoning most commonly occur?

1. Intentionally, with illegal poisons from the black market
2. Intentionally, by misuse of legal poisoning substances (pesticides, insecticides...)
3. Accidentally, by misuse of legal poisoning substances out of negligence/ignorance

P8. What do you think, how often are people from the following groups responsible for wildlife poisoning in ..country..? Please evaluate using a scale of 1-4, where 1 means „often“, 2 „occasionally“, 3 „rarely“, and 4 „never“.	1. often	2. occasionally	3. rarely	4. never	98. I don't know (do not read)
1. Livestock breeders	1	2	3	4	98
2. Hunters	1	2	3	4	98
3. Farmers	1	2	3	4	98
4. Beekeepers	1	2	3	4	98

5. Pigeon fanciers/breeders	1	2	3	4	98
6. Individuals who deliberately poison animals simply because they like killing things	1	2	3	4	98

P9. According to your assessment, how often is each of the below listed motives behind the poisoning of wild animals in...country..? Please evaluate using a scale of 1-4, where 1 means „often“, 2 „occasionally“, 3 „rarely“, and 4 „never“.	1. often	2.occasionally	3. rarely	4. never	98. I don't know (do not read)
1. Protection of pastures and livestock from wild animals (wolves, bears, etc.)	1	2	3	4	98
2. Protection of agricultural land from wild animals	1	2	3	4	98
3. Protection of agricultural land from birds of prey	1	2	3	4	98
4. Protection of pigeons from birds of prey	1	2	3	4	98
5. Protection of apiaries from bears	1	2	3	4	98
6. Conflicts among people about land use (pastures, hunting areas)	1	2	3	4	98
7. Protection of hunting activities	1	2	3	4	98
8. Protection from stray dogs and cats	1	2	3	4	98
9. Protection from pests (rats, insects et at.)	1	2	3	4	98

P10. According to your assessment, in which regions of „country,,, are wild animals most frequently poisoned?

(Please choose one of the answers below)

1. Vojvodina
2. East and South Serbia
3. West Serbia and Šumadija
4. Belgrade
98. Doesn't know (do not read)

99. Refuses to answer (don't read)

P11. According to your assessment, in what period of the year does wildlife poisoning mostly occur in ...country...? Please choose one or more seasons.

1. Spring
2. Summer
3. Autumn
4. Winter
98. Doesn't know (do not read)
99. Refuses to answer (don't read)

P12. To what extent do you agree with the following statements related to reporting poisoning incidents to the relevant authorities? Please express your personal attitude towards each statement using the following scale: (1) I disagree completely, (2) I mostly disagree, (3) I neither agree nor disagree, (4) I mostly agree, (5) I completely agree	1. I disagree completely	2. I mostly disagree	3. I neither agree nor disagree	4. I mostly agree	5. I completely agree	98. I don't know (do not read)
1. People/citizens do not know who to report animal poisoning incidents to	1	2	3	4	5	98
2. It is known which individuals poison animals in this area, it is a „public secret“	1	2	3	4	5	98
3. Every person should report to the police any information/knowledge about wildlife poisoning	1	2	3	4	5	98
4. Hunters should report to the police information/knowledge about wildlife poisoning more often	1	2	3	4	5	98
5. Veterinarians should report to the police	1	2	3	4	5	98

information/knowledge about wildlife poisoning more often						
6. People who report someone from their community for poisoning wild animals risk altercations and conflicts in their community	1	2	3	4	5	98
7. Poisoning mostly takes place in remote locations and therefore the perpetrators are rarely identified	1	2	3	4	5	98

**P13. What of the following would you do if you had information about poisoning?
Read the answers 1-3. Rotate the answers 1-3.**

1. I wouldn't report it to the police
 2. I would report it to the police but only if it would not have any negative consequences for me
 3. I would report it to the police even if I knew that i might have negative consequences for me
98. Doesn't know (do not read)
99. Refuses to answer (don't read)

Question only asked if P13 is answered 1 or 2

P13a. If you would not report it, which of the following would be the main reason?

Read the answers 1- 3. Rotate the answers 1- 3. When you read the list say: or some other reason which we haven't stated.

1. Because there are enough other people worrying about that
 2. Not to come into conflict with people from my environment/community
 3. Because there is nothing in it for me
 4. From some other reason, which_____
99. Refuses to answer (don't read)

P14. Do you know for at least one poisoning incidents with animals in your environment/community for the past 10 years, apart from deration:

1. Yes
2. No

Question asked only of P14 answered „Yes“

P14a. What was it about? /instruction: don't read the answers, let the respondent say it on his own and mark /	Mark
1. Mass poisoning of birds from pesticides	
2. Using explosives for fishing	
3. Someone intentionally poisoned wild animals outside of settlements because they bothered them in some way	
4. Someone intentionally poisoned any type of animal (wild animals, stray dogs or cats, birds of prey) in settlements/ inhabited areas because they bothered them in some way	
5. Any protected species accidentally poisoned	
6. One or more vultures accidentally poisoned	
7. Other. What?_____	

Question asked only of P14 answered „Yes“

P14b. Have you personally or anyone from your community had an animal poisoned? If so, which? / instruction: don't read the answers, let the respondent say it on his own and mark /	Mark
8. Pet	
9. Guard dog or shepherd dog	
10. Hunting dog	
11. Domestic animal (pigs, poultry et al.)	
12. Bees	
13. Pigeons	
14. Some other animals. Which?	
15. No, I never had such an experience.	

P15. In which group of people is it most important to raise awareness about wildlife poisoning?

Please, choose one answer. *Read the answers 1-5. Rotate the answers 1-5. When you read the list say: or some other group which we haven't stated.*

1. Citizens in general
2. Hunters
3. Game wardens
4. Livestock breeders
5. Farmers
6. Other groups. Which? _____

98. Doesn't know (do not read)

99. Refuses to answer (don't read)

P16. How important would you rate wildlife poisoning investigations, compared to other police work? Express your personal attitude using the following scale: (1) completely irrelevant, (2) mostly irrelevant, (3) neither irrelevant nor important, (4) mostly important, (5) extremely important.

1. Completely irrelevant
2. Mostly irrelevant
3. Neither irrelevant nor important
4. Mostly important
5. Extremely important
6. Doesn't know (do not read)

99. Refuses to answer (don't read)

P17. Do you know of a specific case of a police investigation for a wildlife poisoning incident in ...country..., for example a case that was in the media?

1. Yes
2. No

<p>P18. According to your opinion, how important would it be to undertake some of the following measures? Please express your personal attitude by using the following scale:(1)</p>	<p>1. Entirely irrelevant</p>	<p>2. Mostly unimportant</p>	<p>3. Neither important nor important</p>	<p>4. Mostly important</p>	<p>5. Extremely important</p>	<p>98. I don't know (do not read)</p>
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completely irrelevant, (2) mostly irrelevant, (3) neither irrelevant nor important, (4) mostly important, (5) extremely important						
1. That the state/government financially compensates the damage to livestock breeders and farmers, caused by wild animals	1	2	3	4	5	98
2. Create more supplementary feeding sites for vultures	1	2	3	4	5	98
3. Ensure free electric fences	1	2	3	4	5	98
4. Resolve issues of the ownership of pastures and rights to use them	1	2	3	4	5	98
5. Work more on informing the general public about the problem of wildlife poisoning	1	2	3	4	5	98
6. Increase administrative fines for wildlife poisoning	1	2	3	4	5	98
7. Enforce a stronger control of import and trade of legal poisoning substances (pesticides, insecticides, rodenticides)	1	2	3	4	5	98

P19. To what extent do you agree with the following statements? Please express your personal attitude towards each statement using the following scale: (1) I disagree completely, (2) I mostly disagree, (3) I neither agree nor disagree, (4) I mostly agree, (5)	1. I disagree completely	2. I mostly disagree	3. I neither agree nor disagree	4. I mostly agree	5. I completely agree	98. I don't know (do not read)
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I completely agree						
1. The natural balance is very delicate and easy to disturb	1	2	3	4	5	98
2. Earth is like a spaceship, with very limited space and resources	1	2	3	4	5	98
3. Plants and animals have an equal right to exist just like humans	1	2	3	4	5	98
4. Humans are destined to rule over the rest of nature	1	2	3	4	5	98

P20. Mark the respondent's sex without asking the question:

1. Female
2. Male

P21. What is your age? (Age of the person at last birthday, expressed in complete solar years. Enter the number)

P22. What is your highest level of education?

1. Uncompleted elementary school
 2. Completed elementary school
 3. Completed secondary school with 3-years programme (e.g. 3-years vocational school)
 4. Completed secondary school with 4-years or longer programme (e.g. grammar school/gymnasium)
 5. Completed higher education (professional or university degree, master of science degree, doctorate)
99. Declines to answer (don't read)

P23. Is something from the list relevant to you:

1. I am livestock/cattle farmer
2. I am agricultural production farmer
3. I am a hunter
4. I work as a ranger
5. I work in the Police Department
6. I work as a veterinarian
7. None of the above

99. Declines to answer (don't read)

/if the respondents is a hunter; P23=3/

P23a. Are you a member of hunter membership?

1. Yes
2. No

P24. What is your employment status?

1. Employed
2. Unemployed
3. Employed on maternity leave or other types of leave
4. Retired
5. A student in full-time education (school, university)
6. A full time homemaker (housewife/-men)
7. Unfit for work due to a long-term illness or disability

99. Declines to answer (don't read)

/IF P24 = 1/

24a. Are you employed:

1. Self-employed or assisting family member at family farm
2. Self-employed in own business (firm, craft, enterprise, etc.)
3. Assisting family member at family business (firm, craft, enterprise, etc.)
4. Employee who work for an employer
5. Something else. Please specify:_____

99. Declines to answer (don't read)

P25. What was the total income of your household in the previous month, regardless of the sources?

1. No income
 2. Up to 400 EUR
 3. 401-600 EUR
 4. 601-800 EUR
 4. 801-1.200 EUR
 5. 1.201-1.600 EUR
 6. 1.601-1.800 EUR
 8. 1.801-2.400 EUR
 9. Over 2.400 EUR
99. Declines to answer

Annex XXIV. Questionnaire for target audiences within relevant governmental institutions.

P1. Based on your knowledge, which species of vultures currently breed in ...country...?

Please mark all answers you believe to be correct
(Format: multiple choice)

1. Griffon Vulture

2. Turkey Vulture

3. Cinereous Vulture

4. King Vulture

5. Egyptian Vulture

P2. Do you know with what from the listed below do vultures feed in ...country..?

Please mark all answers you believe to be correct
(Format: multiple choice)

1. Carcasses of wild animals

2. Carcasses of domestic animals

3. Hunted large mammals

4. Hunted rodents

5. Hunted domestic animals

6. Hunted insects

P3. What is endangering the vulture populations in ...country.. the most?

Please choose one of the listed answers.

(Format: single choice)

1. Lack of food
 2. Disturbance
 3. Wildlife poisoning
 4. Poaching
 5. Accidental electrocution of collision with power cables
 6. Extensive use of legal toxic compounds (pesticides, insecticides, rodenticides)
 7. Other, what?
98. I don't know

P4. What do you think, with what do vultures get mostly poisoned of?

Please choose one of the listed answers.

(Format: single choice)

1. From poison baits intended for vultures
 2. From poison baits intended for other animals
 3. Because they eat poisoned animals/animals that died of poisoning
 4. Because they get poisoned from pesticides
 5. Other, what?
98. I don't know

P5. Poisoning of wild animals in ...country.. can occur intentionally or unintentionally, with illegal or legal poisoning substances. According to your opinion, how does wildlife poisoning most commonly occur?

Please choose one of the listed answers.

(Format: single choice)

1. Intentionally, with illegal poisons from the black market
 2. Intentionally, by misuse of legal poisoning substances (pesticides, insecticides...)
 3. Accidentally, by misuse of legal poisoning substances out of negligence/ignorance
98. I don't know

P6. What do you think, how often are people from the following groups responsible for wildlife poisoning in ..country..?	1. Often	2. Occasionally	3. Rarely	4. Never
1. Livestock breeders				
2. Hunters				
3. Farmers				
4. Beekeepers				
5. Pigeon fanciers/breeders				
6. Individuals who deliberately poison animals simply because they like killing things				

P7. According to your assessment, how often is each of the below listed motives behind the poisoning of wild animals in ..country..?	1. Often	2. Occasionally	3. Rarely	4. Never
1. Protection of pastures and livestock from wild animals (wolves, bears, etc.)				
2. Protection of agricultural land from wild animals				
3. Protection of agricultural land from birds of prey				
4. Protection of pigeons from birds of prey				
5. Protection of apiaries from bears				
6. Conflicts among people about land use (pastures, hunting areas)				
7. Protection of hunting activities				
8. Protection from stray dogs and cats				
9. Protection from pests (rats, insects et at.)				

P8. According to your assessment, in which regions of „country,,, are wild animals most frequently poisoned?

(Please choose up to 3)

(Format: multiple choice)

5. Krajina
6. Hercegovina
7. Posavina
8. Srednja Bosna
9. Tropolje
10. Podrinje

98. I don't know

P9. According to your assessment, in what period of the year does wildlife poisoning mostly occur in ...country...?

(Please choose one or more seasons)

(Format: multiple choice)

1. Spring
 2. Summer
 3. Autumn
 4. Winter
98. I don't know

P10. Individuals who intend to poison wild animals in ...country,, can be prevented and sanctioned by various means by the governmental institutions. According to your opinion, how important are some of the aggravating circumstances and obstacles?	1. Entirely irrelevant	2. Mostly unimportant	3. Neither important nor important	4. Mostly important	5. Extremely important
1. Bad law enforcement					
2. Complexity of the investigation					
3. Difficulties with evidence procedures in court					
4. Expensive toxicological analysis					
5. Black market for banned poisons on					

Internet					
6. Lack of control over the prescribed use of legal poisons, such as pesticides, rodenticides et al.					
7. Low penalties for wildlife poisoning					
8. Inadequate and unclear protocols for police action					
9. Poor reporting of information from witnesses					

P11. To what extent do you agree with the following statements related to reporting poisoning incidents to the relevant authorities?	1. I completely disagree	2. I mostly disagree	3. I neither agree nor disagree	4. I mostly agree	5. I completely agree
1. People/citizens do not know who to report animal poisoning incidents to					
2. It is known which individuals poison animals in this area, it is a „public secret“					
3. Every person should report to the police any information/knowledge about wildlife poisoning					
4. Hunters should report to the police information/knowledge about wildlife poisoning more often					
5. Veterinarians should report to the police information/knowledge about wildlife poisoning more often					
6. People who report someone from their community for poisoning wild animals risk altercations and conflicts in their community					

7. Poisoning mostly takes place in remote locations and therefore the perpetrators are rarely identified					
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P12. In which group of people is it most important to raise awareness about wildlife poisoning?

(Please choose one answer)

1. Citizens in general
2. Hunters
3. Game wardens
4. Livestock breeders
5. Farmers
6. Other groups. Which?

P13. Do you agree with the following statements, related to investigation of wildlife poisoning incidents?	1. I disagree completely	2. I mostly disagree	3. I neither agree nor disagree	4. I mostly agree	5. I completely agree
1. Specialized police units for environmental crime, including wildlife poisoning, are needed					
2. More people are needed on the field (police, environmental inspectors, rangers etc.) for timely detection of poisoning incidents					
3. Game wardens to often tolerate unlawful practices in hunting areas					
4. Police should have specialized canine units for detecting poisonous substances used for wildlife poisoning					

5. Lack of coordination among relevant institutions is a bigger problem than lack of resources					
6. In ...country.. there are sufficient laboratories with enough capacities to conduct needed toxicological analyses					

P14. Do you agree with the following statements, related to legislation and legal processing of poisoning incidents?	1. I disagree completely	2. I mostly disagree	3. I neither agree nor disagree	4. I mostly agree	5. I completely agree
1. Public prosecutors are sufficiently educated for managing incidents related to poisoning of wild animals					
2. The legal framework for punishing the practice of poisoning animals is good, but the main problem is law enforcement					
3. Rarely are fines imposed under the Hunting Act					
4. Existing legislation regulates biodiversity protection well enough					

P15. How would you evaluate the cooperation between governmental institutions and civil society organizations regarding data collection about poisoning incidents on a scale from 1 to 5, where 1 is "very bad", and 5 "excellent cooperation":

1 2 3 4 5 (I do not know / I cannot evaluate)

P16. The following next statements relate procedures and documentation related to wildlife poisoning. According to the best of your knowledge:	1. Yes	2. No	3. I do not know, I am not informed
1. Is there a database for poisoning incidents of birds in ...country..			
2. Is there a National action plan for combating wildlife poisoning in place			
3. Is there a protocol defining procedures and jurisdictions for investigating wildlife poisoning			

/IF P17.1. = yes, P18 question opens/

P17. Related to database for poisoning incidents:	1. Yes	2. No	3. I do not know, I am not informed
1. Is there a clear protocol for documenting poisoning incidents in the database			
2. Do you ever use data from the existing database for carrying out work within your jurisdiction			
3. Do you consider that the existing database is adequately used for informing the public and raising their awareness about the problem of wildlife poisoning			

IF P17.3. = yes, P19 question opens/

P18. Related to the protocol that defines procedures and protocols for investigating wildlife poisoning:	1. Yes	2. No	3. I do not

			know, I am not informed
1. Is the existing protocol clear enough?			
2. According to the protocol, must the reports about poisoning incidents include an impact analysis of a single poisoning incident to the environment and biodiversity?			
3. Should the existing protocol be improved? If yes, how?_____			

P19. To what extent do you agree with the following statements, related to punishment of various unlawful actions damaging to animals and the environment?	1. I disagree completely	2. I mostly disagree	3. I neither agree nor disagree	4. I mostly agree	5. I completely agree
1. All forms of mass and non-discriminative killing of animals (trapping, poisoning, explosives et al.) should be punished as severely as possible					
2. Higher fines are needed for every type of poaching/illegal shooting					
3. Prison sentences should not be administered placing poison baits unless people are not put in danger, but only animals					
4. Rangers of protected areas should have the authority to arrest persons who poison animals, if they are caught in the act					
5. Sentences for poisoning of animals should be only administrative (financial), but not imprisonment					
6. Having poison baits should be a separate					

offense, regardless of whether it has been proven that an animal was killed					
7. Poisoning of animals should be a criminal offense only if it occurred in a protected area (nature park, national park)					
8. If poisoning of wild animals occurs in a commercial hunting area, the concessionaire should be deprived of the concession					

P20. To what extent do you agree with the following statements, related to the capacities of the police.	1. I disagree completely	2. I mostly disagree	3. I neither agree nor disagree	4. I mostly agree	5. I completely agree
1. Police investigations about wildlife poisoning need expensive and sophisticated technology					
2. The main problem is that incidents are not reported to the police					
3. The police is sufficiently equipped for investigating wildlife poisoning					
4. The police is sufficiently educated for investigating incidents with wild animals					
5. Police investigations about wildlife poisoning should include representatives of the civil society organizations					
6. The police has better things to do and should not waste resources on investigating wildlife poisoning incidents					
7. The police do not take seriously the need to launch investigations into wildlife poisoning					
8. Specialized police units should be introduced					

to deal with the crime of wildlife poisoning					
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P21. In police investigations of wildlife poisoning it is necessary to use:

Please mark all the answers you believe to be correct

(Format: multiple choice)

1. Forensic entomology
2. Toxicological analysis
3. Fingerprint analysis
4. Forensic ballistics
5. Forensic psychology
6. Canine units
7. Records of sale of legal poisoning substances (pesticides, insecticides, rodenticides...)
8. Confirming time of death of the animals

P22. Some of the means of preventing wildlife poisoning are listed below. According to your opinion, how important would it be to undertake some of the listed measures?	1. Entirely irrelevant	2. Mostly unimportant	3. Neither important nor important	4. Mostly important	5. Extremely important
1. That the state/government financially compensates the damage to livestock breeders and farmers, caused by wild animals					
2. Create more supplementary feeding sites for vultures					
3. Better protect wild ungulate populations					
4. Ensure livestock breeders and farmers are provided with free shepherd and guard dogs					
5. Ensure free electric fences					

6. Resolve issues of the ownership of pastures and rights to use them					
7. Completely ban logging in ...country.. for some time					
8. Work of reducing the populations of allochthone animals					
9. Work more on awareness raising of the general public					
10. Work more on awareness raising among key stakeholders (livestock breeders, farmers, hunters, institutions)					
11. Impose a stricter control of the trade of legal poisoning substances (pesticides, rodenticides et al.)					

P23. To what extent do you agree with the following statements?	1. I disagree completely	2. I mostly disagree	3. I neither agree nor disagree	4. I mostly agree	5. I completely agree
1. The natural balance is very delicate and easy to disturb					
2. Earth is like a space ship, with very limited space and resources					
3. Plants and animals have an equal right to exist just like humans					
4. Humans are destined to rule over the rest of nature					

P24. Do you work in

- List of the institutions to which the questionnaire is sent

P25. Do you directly deal with the issue of wildlife poisoning in your line of work?

1. No
2. Yes, but only of domestic animals
3. Yes, both of wild and domestic animals

/IF P26 = No/

P26. Have you in any way been involved in the issue of poisoning of animals in your line of work?

1. No
2. Yes, but only of domestic animals
3. Yes, both of wild and domestic animals

P27. How would you evaluate your own knowledge about the issue of wildlife poisoning on a scale from 1 to 5, where 1 is "very bad" and 5 "excellent knowledge".

1 2 3 4 5 (I do not know / I cannot estimate)

P28. Have you ever attended any educational programme related to detection and processing of wildlife poisoning incidents?

1. No
2. Yes

/Only for those who answered yes/

P29a. Who organized the educational programme? _____

P29. How many years of service do you have in the institution where you now work?

P30. How many years of service do you have in the department you are currently working in?

P31. Which of the following best describes your current job position?

1. Employee
2. Lower management level
3. Middle management level
4. Upper management level
5. Highest management level (director of the institution, member of the management board, general director)
6. External associate
7. Other. What?

