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LIFE Connect Carpathians
LIFE 12 NAT/UK/001068

Enhancing landscape connectivity for brown bear and wolf through a regional network of NATURA 2000 sites in Romania

Action D1

**Final report detailing changes in the
attitudes of local communities**

**Final report detailing trends in Human-
Wildlife Conflict incidents (severity and
frequency)**

An Assessment of Human-Wildlife Conflict within the Apuseni-Southern
Carpathian Corridor, carried out as part of the EU LIFE+ project,
“Enhancing Landscape Connectivity for Brown Bear and Wolf through a
Regional Network of NATURA 2000 Sites in Romania, LIFE Connect
Carpathians LIFE12 NAT/UK/001068”

Final Report

D1: Final report detailing changes in the attitudes of local communities

D1: Final report detailing trends in HWC incidents (severity and frequency)



Gareth Goldthorpe, Radu Popa & Mihaela Faur

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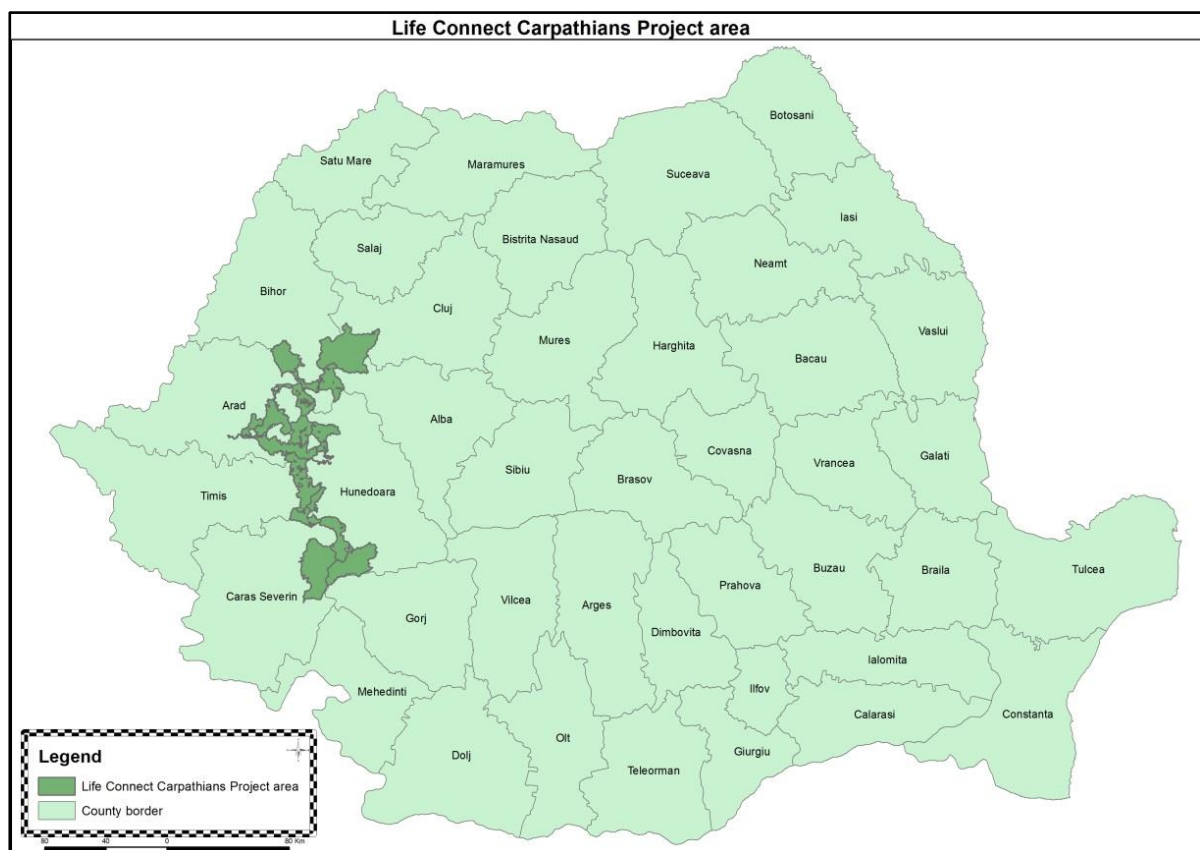
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Introduction

THE LIFE PROJECT

The EU LIFE+ NATURE project, “Enhancing landscape connectivity for bear and wolf through a regional network of NATURA 2000 sites in Romania, LIFE Connect Carpathians LIFE12 NAT/UK/001068”, addresses threats to connectivity within a landscape corridor that is critically important for the conservation of priority species, the European bear and wolf. Passing through a network of twenty Natura 2000 sites, the Zarand landscape corridor (Map 1) is increasingly fragmented and there remains only one key route through which bears, wolves and other wildlife can move between the Western and Southern Carpathians.



Map 1: EU LIFE+ NATURE project site within Romania

The Romanian Carpathian Mountains are an important biodiversity reservoir providing habitat for bears, wolves and Eurasian lynx and supports their dispersal across Central and Western Europe and, in project terms, can be divided into three key areas. These are Core zones, where populations of large carnivores persist; Recolonization zones, where conditions favour the return of large carnivores; and Corridor zones, where the movement of large carnivores can be facilitated. However, the region is undergoing rapid economic transition; land-use change towards more intensive agricultural and forestry practices and infrastructure developments are fragmenting the landscape, reducing ecosystem connectivity and biodiversity values. There is only one narrow habitat corridor suitable for ensuring connectivity, the Zarand Landscape Corridor, and efforts need to focus on: ensuring the functionality of the corridor and effectiveness of the Natura 2000 network; securing habitats critical to the maintenance of connectivity; addressing human-wildlife conflict and negative attitudes towards large carnivores and Natura 2000 sites, and; ensuring that the planning and management of forestry, hunting and other land/resource uses are sympathetic to the conservation management of priority species. Ensuring this process is the main goal of the project

and is being addressed in several key ways, including the securing and restoration of critical habitat and landscape features, addressing direct threats such as human-wildlife conflict and poaching, the development of species action plans and building the awareness and advocacy of the local population and other stakeholders for the conservation of the bear and wolf and Natura 2000 sites in the corridor.

The work presented in this report focuses on one specific area, human-wildlife conflict and contributes directly to the key project action: developing and implementing practical strategies to reduce human-wildlife-conflict and to ensure a rapid and effective response should conflicts occur, thus building tolerance for the presence of carnivores. Specifically, this report addresses the project's need to "assess the level of human-wildlife conflict in the project area".

HUMAN-WILDLIFE CONFLICT

To that end, a survey of agriculture and related human-wildlife conflict in the project area, was carried out in 2015. Focusing on three key areas (below) this initial work acts as a baseline from which subsequent monitoring could be measured. The key objectives of the study were to gain an overall understanding of HWC, gather baseline data from which project/mitigation impact could be measured and begin forming positive relations with farmers.

This was achieved through the implementation of a survey, using semi-structured interviews of relevant interest groups in the area, including: Livestock owners/managers, shepherds/herders, crop farmers, bee-keepers and orchard owners. A full account of that survey, it's findings and recommendations, can be found in the survey report¹ but a brief summary of the key points is included here (see Text Box).

Text Box: HWC Baseline Survey

According to the baseline, the primary source of income in the project area is agriculture and almost everyone raises livestock (mostly sheep) and grows crops (primarily hay, potatoes and corn). Sheep are managed through transhumance, moving between summer and winter pastures each year. Pastures tend to be fairly small, around 55ha, and crops more so, usually around 3ha. Most households sell the produce from their farms, but prices and demand are low. The main problems experienced are with wild animals, and this seems to be getting more common.

On average, a farm will experience around 15 HWC events in a year and these will typically involve a pair of wolves attacking sheep in the summer pastures (causing an average annual loss of around 1.8%), or wild boar, in sounders of around 14 animals, feeding from crops of hay, potato and corn and exclusively at night. Livestock depredation happens either at night, while the sheep sleep in the corral or during the day, whilst grazing on the pastures and less than 500m from the forest.

Nearly all households have dogs and most use at least four methods for protecting their stock/crop; usually dogs, guarding the flock at night, avoiding risky areas at pastures and fencing. Most farmers do not report HWC, primarily because they do not know who to report it to or because damage was not serious enough.

Since that initial survey, engagement with the households has continued with a smaller version of the survey repeated each year, allowing the project team to offer support and advice on conflict-related issues as well as continuing to build an understanding of human-wildlife conflict in the area.

¹ Goldthorpe, G., 2015. An Assessment of Human-Wildlife Conflict within the Zarand Landscape, carried out as part of the EU LIFE+ project, Enhancing Landscape Connectivity for Brown Bear and Wolf through a Regional Network of NATURA 2000 Sites in Romania, LIFE Connect Carpathians LIFE12 NAT/UK/001068. Fauna & Flora International, Cambridge, UK.

In some cases, this engagement has involved the direct intervention of the project in the form of HWC mitigation support and training. This level of engagement has occurred both with the interviewees involved in the baseline survey and within the broader community. A full account of these interventions, which include the provision of fencing, livestock guarding dogs and chemical deterrents, can be found in the project report².

At the end of the 2018 summer season, the full survey was repeated in order to allow for a comparison with the baseline and to discuss the potential impacts of HWC mitigations provided to households by the project.

In addition, recipients of mitigation support external to the survey group were approached, either in person or by phone, and asked to provide basic information on their experiences with human-wildlife conflict, both historically and since the mitigation intervention. For this, they were asked three questions:

- 1: How severe was the HWC you experienced before the project provided support?
- 2: Since the project intervened, has this changed?
- 3: If HWC has continued, please provide on as many post-mitigation HWC events as possible.

For questions 1 & 2, households were asked to gauge their responses as either *Mild*, *Serious* or *Severe*.

This report presents the findings of these surveys.

² Goldthorpe, G., Popa R., & Faur M., 2018. The Deployment of Human-Wildlife Conflict Mitigation Measures: LIFE Connect Carpathians. Fauna & Flora International, Cambridge, UK.

2018 HWC Survey Methodology

STUDY SITES

The methodology used follows that of the original baseline with some adaptations. The survey was carried out in the three zones (Map 2) identified by the project team for the 2015 baseline survey:

Site 1: Rusca Montană-Țarcu-Retezat Corridor, a core area with an Important corridor between north and south populations, high densities of large carnivores, intact local knowledge on living with large animals, seasonal movement of livestock with conflict likely to be high in summer pastures, beehives at higher altitudes and orchards in the lowlands.

Site 2: Drocea-Codru Moma Corridor, where an important and clearly defined corridor connects a re-colonisation area, there are high densities of livestock, abandoned orchards and some crops and beehives.

Site 3: Apuseni-Bihor where relatively high densities of large carnivores are present and local knowledge is still intact, there is seasonal movement of livestock with conflict likely to occur in both winter and summer pastures, bee hives & orchards also present.

The survey itself was carried out over a six-week period spanning September and October 2018, by members of the project team and involved respondents of the baseline survey (94%) or of subsequent monitoring surveys.

DATASHEETS

The survey was administered during visits to folds/farms, by a team of surveyors consisting of one interviewer and one assistant. The role of the assistant was to record data onto the relevant datasheets adapted from the baseline survey (see appendices). In the case of livestock, data for each fold/farm were entered on separate datasheets, assuming each fold had one flock or herd.

The bulk of the interview (covering details of the fold/farm, pastures/fields, livestock numbers/crop details, losses to wild animals, details of attacks and preventive measures) was recorded onto an “HCC” datasheet (Appendix 1). This differed from the original baseline datasheet in that questions relating to goods produced and sold by the households were omitted as these were originally included only understand the economic context within which HWC was occurring. It is assumed that these remain the same. For the same reasons, some questions relating to demography and farm infrastructure were not repeated in the current survey.

As with the original, at the end of the interview, the interviewee was asked to give details of the most recent conflict event and this was recorded on the separate “attack” datasheets (Appendix 2). Once recorded, the interviewee was then asked to give the details of the conflict event before that and so on, until the interviewee could not recall anymore; a different “attack” sheet was used for each attack event. Each interview was given a unique identifier, marked on the relevant datasheets, and consisting of a unique number and the date of the interview.

Knowledge, Attitudes & Perspectives

In addition, though only in some cases, interviewees were also asked to work with the interviewer to fill-in a Knowledge, Attitudes and Perceptions (KAP) questionnaire. Previously, this had been implemented, by the project, as a separate, though related survey, to a much broader population³. The KAP survey allowed the project team to understand how households perceive the natural world around them and, in particular, their attitudes towards large carnivores (though, in the original survey, this was never explicitly stated). The intention was to repeat the survey, at the broader level,

³ Williams, H., 2017. Large Carnivore Conservation Conflict in the Carpathian Mountains, Western Romania. Thesis submitted at Imperial College London, UK

for comparative analysis. Unfortunately, this was not possible and so was only included here, as a smaller version of the original, to further supplement our understanding of HWC in the project area and to provide further indications of how intervention by the project has impacted the project stakeholders.

The finalised questionnaire (Appendix 3) consisted of six sheets of A4 paper and was delivered verbally by the interviewee. At the top of the first page was a brief text explaining who was conducting the survey and why, plus stressing its anonymity. The research instrument itself consisted of 37 items: individual survey questions or statements for which we wanted to document the respondents' opinions. These items were organised into six sections, with a brief guide to answering the questions at the beginning of each section. The six sections focused on the following aspects:-

1. Relation with and use of the landscape (3 questions)
2. attitude, value and belief of people about wildlife (13 questions)
3. previous personal experience with large carnivores in the area (2 questions)
4. knowledge about bears and wolves and their management (9 questions)
5. attitude toward bear and wolf management (1 question)
6. sources of information and how important this issue is to people (3 questions)
7. socio-demographic aspects (6 questions)

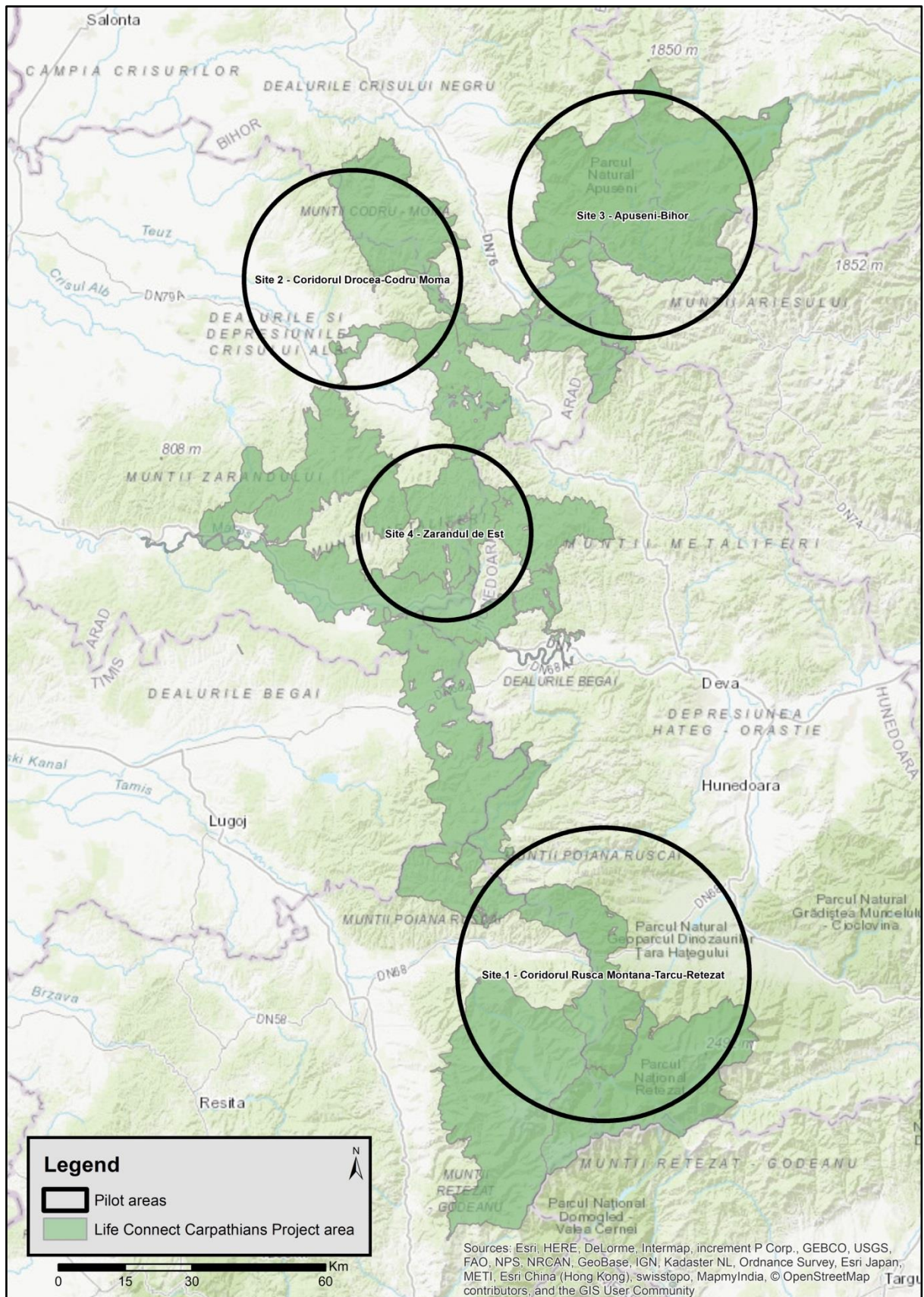
All attitudinal questions were measured on a 5-point Likert scale ranging from "very negative" to "very positive", "very bad" to "very good", or "strongly disagree" to "strongly agree". An "I do not know" option was also usually included. In addition to these multiple-choice questions, the attitudinal sections also contained one open question (#19) requesting a short essay-type response. All knowledge items were of closed structure, offering multiple choice responses, but all of these items also offered an "I do not know" option.

It is important to note that in this situation the KAP survey has been applied to a very specific group; i.e. livestock owners, and so the findings are biased towards that group. In normal circumstances, the survey would be implemented on a much larger group and would involve stratified random sampling to ensure a representative selection of community groups.

Throughout the implementation of this work, best practices, to reduce observer bias, have been followed; in particular, the interviewers avoided sharing his or her experiences and views or voicing their opinions.

DATA ANALYSIS

All data analysis was done in Microsoft excel directly from the database and was restricted to descriptive and summary statistics to map the nature of farming and livestock/crop protection approaches. Not all questions were answered by all respondents and so the sample size for specific questions varies; where relevant, this is indicated in the text in the Results section here-in.



Map 2: The main project sites for HWC survey work, including the Zarand du Est site

Results & Discussion

HWC SURVEY

Demographics

The survey took place in three main study areas comprising a total of 45 villages in 19 communes. There was a total of 87 respondents from the three sites surveyed, distributed as follows: 34 from Coridorul Rusca Montană-Țarcu-Retezat (Site 1), 15 from Coridorul Drocea-Codru Moma (Site 2) and 38 from Apuseni-Bihor (Site 3) (Map 2).

Table 1. Distribution of respondents across the survey area

| Study area | Commune | Village | Number of Respondents |
|--|---------------------|---------------------|-----------------------|
| Site 1: Coridorul Rusca Montană - Țarcu - Retezat | Băuțar | Băuțari de Jos | 1 |
| | | Bucova | 6 |
| | Densus | Peștenița | 2 |
| | | Hățăgel | 1 |
| | | Densus | 1 |
| | | Pestenita | 2 |
| | | Stei | 3 |
| | | Poieni | 2 |
| | Lunca Cernii de Jos | Lunca Cernii de Jos | 1 |
| | | Negoi | 3 |
| | | Valea Babii | 1 |
| | | Lunca Cernii de Jos | 3 |
| | Sarmizegetusa | Hobița Grădiște | 2 |
| | | Brezova | 2 |
| | | Sarmizegetusa | 3 |
| | | Păucinești | 1 |
| Totals | 4 | 16 | 34 |
| Site 2: Coridorul Drocea Codru Moma | Buteni | Păulian | 2 |
| | Dezna | Laz | 1 |
| | | Slatina de Criș | 1 |
| | Dieci | Dieci | 3 |
| | | Rosia | 3 |
| | Sebiș | Prunișor | 2 |
| | | Sălăjeni | 2 |
| | Secas | Secas | 1 |
| Totals | 5 | 8 | 15 |
| Site 3: Apuseni-Bihor | Arieșeni | Fata Cristesei | 1 |
| | | Cobleș | 6 |
| | | Galbena | 1 |
| | Baita | Baita | 1 |
| | Bunțești | Brădet | 3 |
| | | Ferice | 1 |
| | | Dumbravani | 1 |
| | Câmpani | Fânațe | 1 |
| | | Câmpani | 6 |
| | | Valea de Sus | 1 |
| | | Campani | 1 |
| | Cristioru de Jos | Cristioru de Jos | 1 |
| | Gârda de Sus | Gârda de Sus | 2 |
| | Lazuri de Beiuș | Hinchiriș | 3 |
| | | Lazuri de Beiuș | 1 |
| | Nucet | Baita | 1 |
| | Pietroasa | Pietroasa | 1 |
| | | Magura | 2 |
| | | Chișcău | 1 |
| | | Pietroasa | 2 |
| | Scarisoara | Scarisoara | 1 |
| Totals | 10 | 21 | 38 |

The majority (94%) of respondents were male and, based on baseline data, the average age was 52. As with the baseline survey, the low number of female respondents negated the need for any gender-based disaggregation of the data.

Of the 87 surveyed here, 82 (94%) had been surveyed in the 2015 baseline survey. Of the remaining five, three were surveyed in the 2016 HWC survey and two appear for the first time, having received mitigation interventions from the project (see below).

Dominant forms of agriculture, farm descriptions and land details

Forms of agriculture

There may have been a slight shift in economic drivers within the study areas (Figure 1) since the baseline was carried out in 2015. Whilst the majority of respondents (84%, N=79) still cite livestock ownership as their main source of income, there has been a drop in the number of livestock managers, with no-one claiming this as their primary profession and only 5% as their secondary income source; in the baseline, these numbers had been 10% and 8% respectively. Conversely, whilst the overall numbers remain relatively low, the proportion of people citing crop farming as their primary income source has more than doubled, from 7% during the baseline to 16% today. Despite this, according to the current survey, the level of crop damage caused by wild boar has dropped dramatically (see below).

There also seems to have been a shift from multiple to single income sources. In the baseline survey most respondents (84%) were involved in two (32%) or even three (52%) forms of agriculture (commonly, livestock, crops and fruit). In the current survey, however, the vast majority of respondents (90%) claim only to be involved in one type of agriculture (most commonly, livestock). In addition, nine of the original households have, since the baseline, sold-off their livestock and no longer practice any kind of agriculture.

Numbers of fruit-growers remained low with only two people (3%, N=79) citing it as a tertiary source of income. As a result, coupled with the lack of wildlife-related problems involving fruit orchards in the baseline (or any subsequent) survey, details on wildlife attacks on fruit crops were not sought in the current survey. No one cited bee-keeping as an occupation in the current survey (one household cited beekeeping as a secondary source of income in the baseline survey).

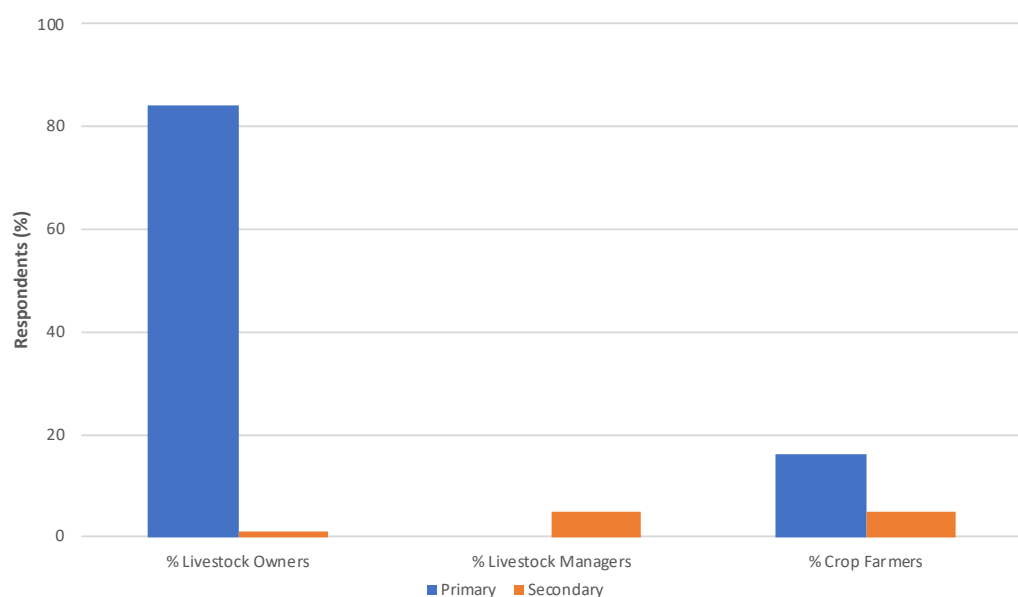


Figure 1. Forms of agriculture practiced within the project area in 2018

Farm descriptions

Of those that described their winter farm (N=77), all had a permanent house and a stable. Most (96%) also had a large barn, used for general storage of farm equipment and animal fodder, whilst only 8% also had a smaller barn; all of which is similar to the descriptions gleaned from the baseline survey.

Of those that described their summer farm, or sheep fold (n=46), all mentioned a house, most describing it as a two- or three-room wooden structure; 91% described a corral, for night-time protection of livestock, and 13% detailed a small shelter for animals. A smaller proportion of the current survey respondents gave details on their summer farm than did so in 2015 (53% & 79% respectively) and this may be why all here talk of a permanent structure at their summer farm; in 2015, 13% spoke of a house at the summer pastures. It maybe that most of those answering this question moved daily between their summer and winter pastures.

Across all three sites, 61 respondents (70%) commented on the number of people working at their farm/fold; an average livestock farm had only one person working there (Range = 1–4).

Of the 60 respondents that gave details of where they spend the winter, all are at their home village; of these, 23 (38%) said they were at their village throughout the year. Of those that used summer pastures, (n=36), most (72%) arrived in May and planned to leave in either September (26%) or October (43%).

Land size & tenure

On average, the size of pastures appears to have increased, from 55ha in 2015 to today's average (mean) of 92ha, despite a decrease in the number of people reporting on their pastures; 83 in 2015, but only 63 in 2018. Conversely, there has been a large drop in the number of people reporting on crop hectareage (69 in the baseline; only 15 in the current survey) as well as a drop in the average area of cultivation (3ha in 2015; 1.3ha currently).

Table 2. Productive land across all sites and each individual site

| | Total | Size of Pastures (ha) | | | Total | Size of Crop Fields (ha) | | |
|-------------------------|-------|-----------------------|---------|--------|-------|--------------------------|-----------|--------|
| | | Mean | Min-Max | Median | | Mean | Min-Max | Median |
| All Sites (N=63) | 5,788 | 91.87 | 5-260 | 80 | 19.68 | 1.31 | 0.1-12 | 0.3 |
| Site 1 (n=25) | 2,201 | 88.04 | 7-200 | 100 | 16.93 | 2.82 | 0.25-12 | 0.44 |
| Site 2 (n=14) | 1,037 | 74.07 | 6-200 | 58 | - | - | - | - |
| Site 3 (n=24) | 2,550 | 106.25 | 5-260 | 110 | 2.75 | 0.31 | 0.10-0.50 | 0.3 |

More livestock owners (N=76) are now opting to both own and lease pastures than in the baseline (57% and 28%, respectively; Table 3) whilst the number that either fully own or fully lease their pastures have dropped from around one-third in 2015 to less than one-quarter (Figure 2).

Table 3. Proportions of owned and leased pastures

| | Owned | % | Leased | % | Both | % |
|-------------------------|-------|-------|--------|-------|------|-------|
| All Sites (N=76) | 16 | 21.05 | 17 | 22.37 | 43 | 56.58 |
| Site 1 (n=29) | 5 | 17.24 | 5 | 17.24 | 19 | 65.52 |
| Site 2 (n=14) | 1 | 7.14 | 0 | 0.00 | 13 | 92.86 |
| Site 3 (n=33) | 10 | 30.30 | 12 | 36.36 | 11 | 33.33 |

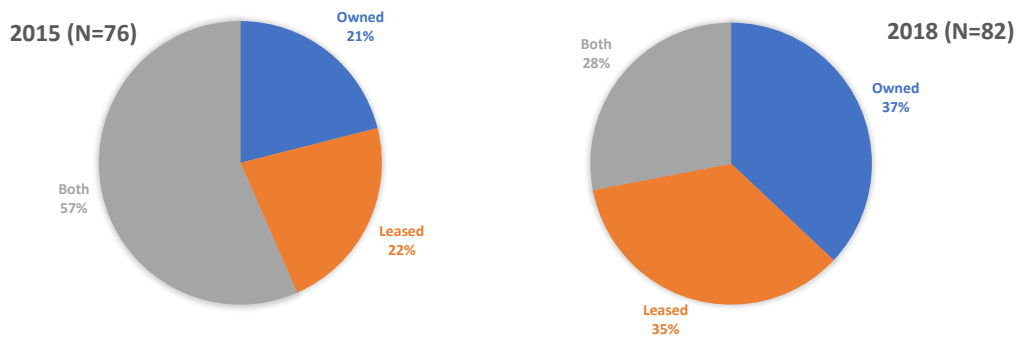


Figure 2. Land ownership across surveys

The baseline survey suggested that the proximity of active pastures to forested areas may play a role in the vulnerability of livestock to wolf depredation as the majority of daytime attacks occurred within 500m of the forest edge. In order to understand whether this may be a widespread problem, the current survey included this as a question within the main questionnaire. From this, it was found that, across the project area, pastures tend to be more than 500m from the forest edge (though, amongst those that provided details, never more than 1,000m) (Figure 3).

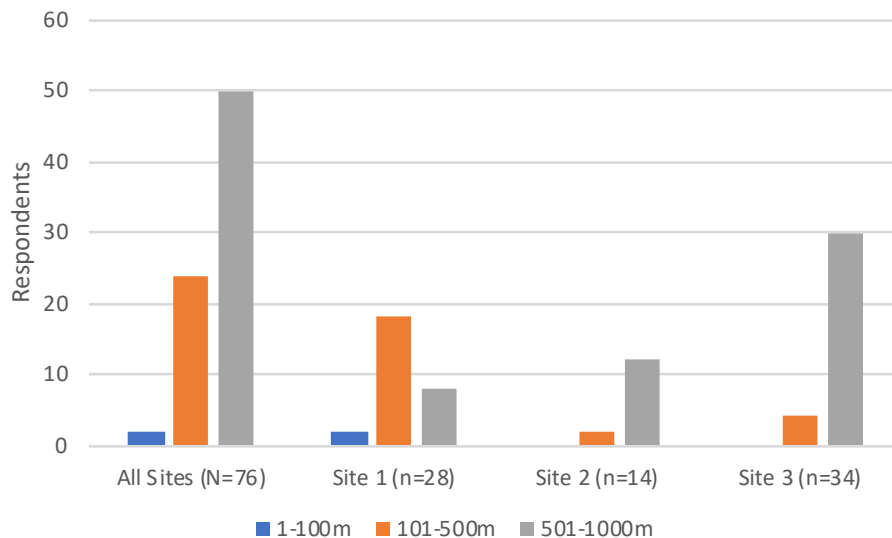


Figure 3. Distances of pastures from the nearest forest edge

Livestock & crops

Livestock

Sheep remain the most abundant livestock kept across all sites, though the overall numbers have slightly reduced; 60 farms (92%) kept 14,062 with an average of 234 per farm (median=190) (Table 4). In addition, 10 people (16%) owned goats for a total of 710 and an average of 71 (median = 37). As with the baseline, the tendency was for mixed flocks and so records for these stock species, sheep and goats, were combined for analysis.

Table 4. Numbers of livestock across all sites

| | n farms | Per Farm | | Total |
|--------|---------|----------|--------|--------|
| | | Mean | Range | |
| Sheep | 60 | 234 | 22-800 | 14,062 |
| Goats | 10 | 71 | 3-350 | 710 |
| Cattle | 6 | 14 | 5-25 | 85 |

Comparing the figures for cattle with those collected for the 2015 baseline (Table 5), it appears that, whilst there are overall declines in both the overall numbers of animals and the numbers of people owning them, the average number of animals per household has increased. However, numbers and proportions of sheep have remained relatively stable and these are the most important livestock animal in the project area in terms of both economics (Figure 4) and human-wildlife conflict (see below).

Table 5. Livestock ownership between surveys

| | Sheep & Goats | | | | | | | Cattle | | | | | | |
|--------------------|---------------|----|--------|------|-----|-------|--------|--------|----|-------|------|-----|-----|--------|
| | N | % | Total | Mean | Min | Max | Median | N | % | Total | Mean | Min | Max | Median |
| 2018 (N=65) | 61 | 94 | 14,772 | 242 | 30 | 800 | 215 | 6 | 9 | 85 | 14 | 5 | 25 | 12.5 |
| 2015 (N=84) | 65 | 77 | 18,872 | 290 | 19 | 1,000 | 230 | 57 | 68 | 593 | 10 | 1 | 100 | 5 |

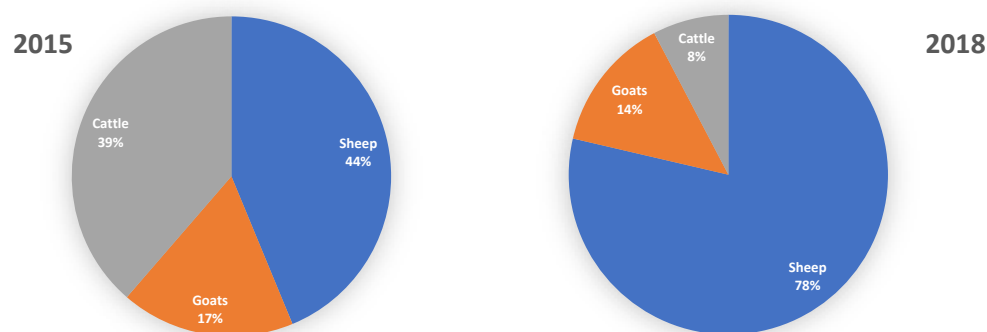


Figure 4. The relative importance of sheep in the project area between surveys

Numbers for horse and donkey ownership were minimal in the baseline, and in the current survey these livestock types had disappeared completely. More interesting is the almost complete loss of pigs from the sample population; whilst in 2015 just over half of the respondents owned pigs, in the current survey there was only one respondent claiming pig-ownership.

Further evidence of a streamlining in livestock farming comes from a comparison, between surveys, of the numbers of livestock-types typically owned. Whilst the baseline survey showed that only 22% of households owned only one species, with a third owning multiple stock-types (usually sheep, cattle and pigs), the current survey has single-species ownership (primarily sheep) as the major trend (65%).

Crops

Despite the reported increase in the proportion of households citing crop farming as their primary source of income, the number of households providing details of their crops has decreased here. In 2015, almost all households were growing some kind of crop; mostly hay (97%), potatoes (92%) and/or corn (65%). In the current survey, the number of households providing details of their crops has dropped to a mere 8% and this is dominated by those that grow potatoes (100%) followed by corn (29%). This is in-line with the decrease in the average size of crop fields reported above. No households in Site 2 reported crops.

Losses to Wild Animals

The majority of households still consider wild animals to be the primary source of problems faced across all survey sites. However, the proportions (%) of those giving this response is far higher in the current survey than compared to the baseline (Figure 5). This may be a reflection of a relative lack of response to this question (54% of those interviewed in the current survey compared to almost 100% in the baseline) or it could represent a hardening of attitudes towards wild animals. Certainly, the

findings of the KAP survey suggest that negative attitudes towards certain species (i.e. wild boar and, to a lesser degree, wolves) is closely allied to perceptions of damage caused by them (see below).

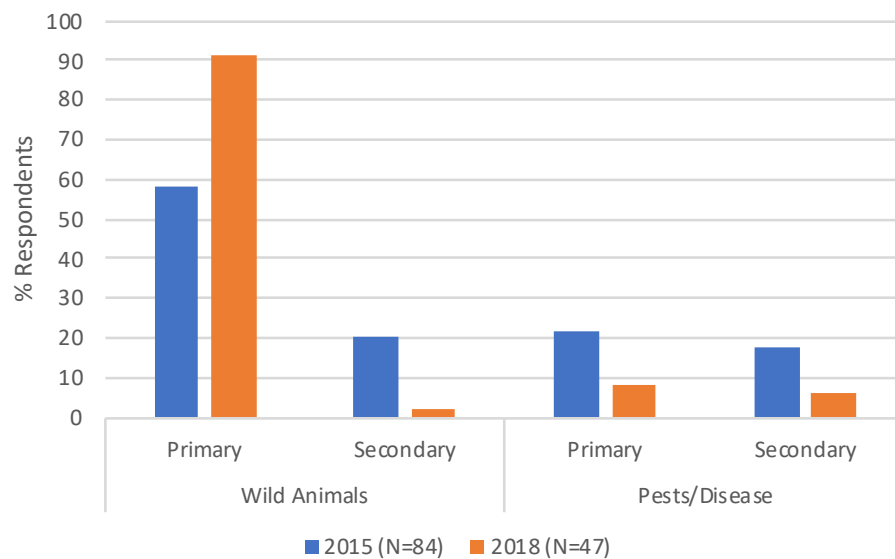


Figure 5. Prioritisation of problems faced by households across the surveys

The highlighting of summer pastures as the place where wild animals are particularly problematic is also continued from the baseline with, again, an increase in the proportion of people agreeing with the statement (71% in 2015; 100% in 2018).

Respondents were asked to identify which wild animal they saw as being the most problematic for them. Across all sites (n=44) the wolf was seen as the most problematic by most (84%) respondents whilst the boar only made the top slot for 16%. Compared to the baseline survey, this represents an increase in the proportion of households viewing the wolf as the most important conflict species and a decrease for the boar; the 2015 survey had the two sharing the position and with only around half of the sample population (Figure 6).

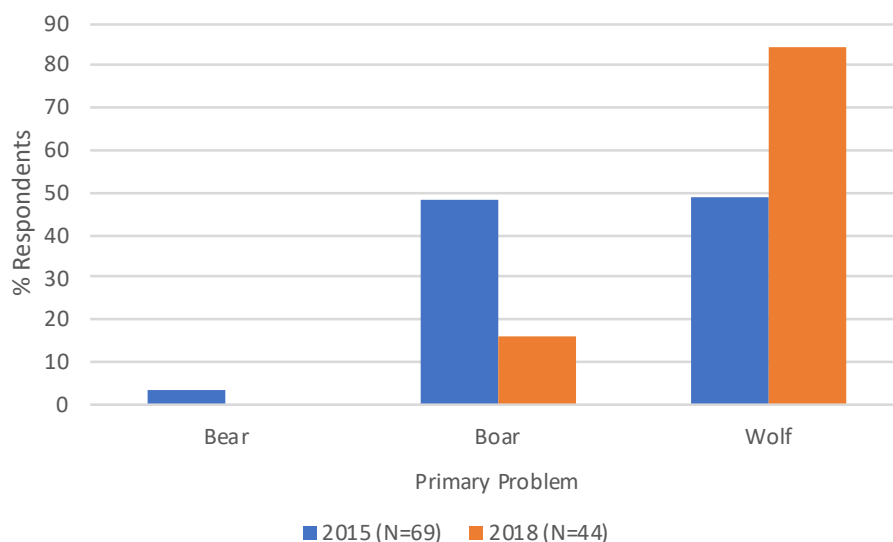


Figure 6. Shifts in people's perceptions of the most important HWC species

The decrease for the boar may be more a reflection of the drop-in households citing crops as their primary agriculture whilst the increase for the wolf may reflect the apparent elevation in the importance of sheep in the project area. However, this finding is somewhat out of kilter with those

of the KAP which found, overwhelmingly, that wild boar most often associated with extremely negative attitudes (see below).

The range of months cited as the most problematic was much narrower in the current survey than in the baseline. Whilst, in 2015, all months were represented, to varying degrees, in the current survey only the summer months (April to October) were identified. This may be a symptom of apparent data gaps in this years' survey and an apparent bias towards livestock owners concerned with human-wolf conflict in the summer pastures. That said, August was identified as the most problematic month which, as with the baseline findings, coincides with the busiest months in the summer pastures. Despite this narrower range, the general pattern for problem animals remains the same, with the majority of respondents identifying the height of summer as the most problematic (Figure 7).

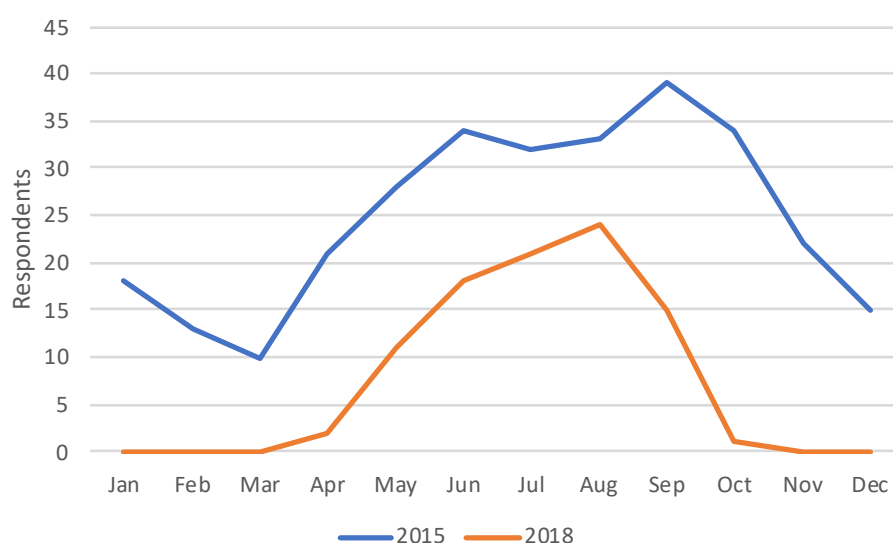


Figure 7. Comparison of the importance of months for problems with wild animals

Trends in HWC

When asked to comment on any trends in the occurrence of attacks on stock and/or crops by wild animals over the past five years, the majority of respondents (60%) across all sites claimed that problems with wild animals had been getting more common. In Site 3 specifically, 100% of respondents reported that problems with wild animals was worse now than five years ago. This is comparable with the findings from the baseline survey where, proportionally, most people perceived problems to be getting worse (Figure 8). More interestingly, whilst in 2015 11% perceived the problems to be less, in the current survey no-one believes this to be the case with a swing to those reporting that the occurrence of HWC has remained at the same level.

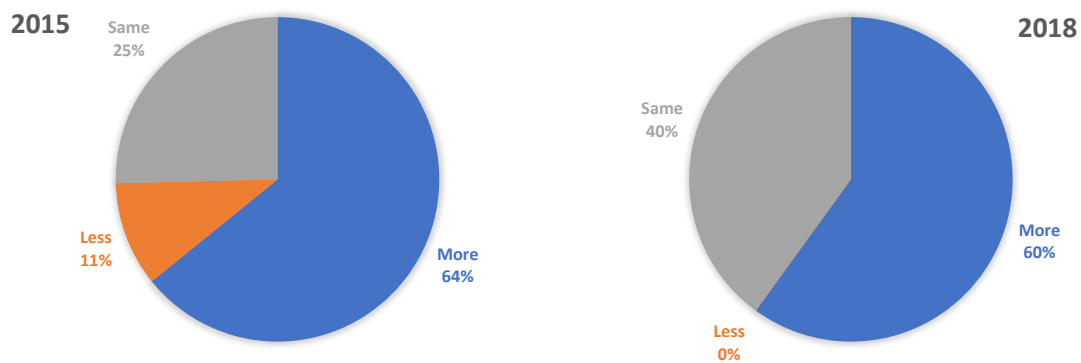


Figure 8. Comparison of perceptions of trends between the two surveys

Preventative Measures

The details given on methods used by households to protect their livestock and/or crops, from wild animals, are very similar to those taken in 2015 (Figure 9). With responses from 74 households (85%), the majority still used dogs (82%) and standard (non-electric) fencing (84%) followed by shepherds guarding the flocks at night (72%). The most noticeable differences between the current and baseline data are the increase in the use of electric fencing and the decrease (from 20% to 0) in crop farmers guarding their crops at night. Both of these may be directly attributable to the project as the distribution of electric fencing represents a key effort in addressing the HWC issue and has been used extensively by crop farmers against night-time attacks by wild boar (see below).

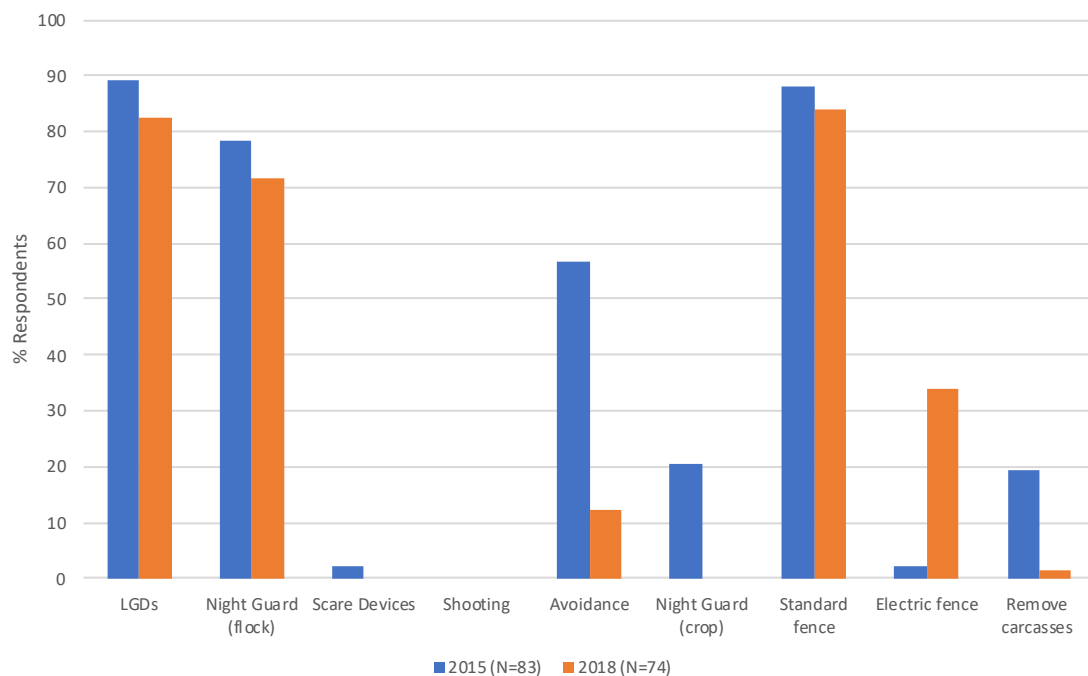


Figure 9. Methods currently used to protect livestock and/or crops from wild animals across surveys

Most people in 2018 (47%) used at least three methods for protecting their stock/crop (in 2015, 41%, used at least four methods) and of those, 92% combined dogs, sleeping with the flock and using standard (non-electrified) fencing. Of the 18 respondents (24%) that used four methods, most used this combination, with the additional precaution of electric fencing.

Eleven respondents in the current survey used only one protection method and in all but one case these were crop farmers using electric fencing (the one exception was a cattle and pig farmer that only used dogs). Eight of these crop farmers were interviewed during the baseline survey and all had reported severe crop damage, caused by wild boar. At that time, their primary protection from crop loss was through the use of standard fencing, which they acknowledged was only partly effective. Since that time the project has provided them all with electric fencing and this seems to have been very effective (see below).

Livestock Guarding Dogs

All those with dogs, in the current survey, had adults but only seven (12%) also had juveniles. In total, there were 287 dogs (273 adult & 14 juvenile) in the sample, with an average of five adult dogs and two juvenile dogs per farm. The pattern was the same between sites and, with the exception of less dog-owners having juvenile dogs (in 2015, just over half of the dog owners also had juveniles) which is, presumably due to the 2015 juveniles now being adult.

The preponderance of mixed-breed dogs found in the baseline has intensified, with 95% of the current sample being of mixed-origin (in 2015 it was 63%), but the Mioritic breed (which in 2015 was the second most common breed) is now absent, with second place taken by “other” breeds (either Caucasian, Kangal or Central Asian) followed by Carpathian (8%) and Bucovina (2%) breeds (Figure 10). Only six respondents, all in Site 3, had Caucasian dogs whilst 10 (six in Site 1 and four in Site 3) had Carpathian breeds.

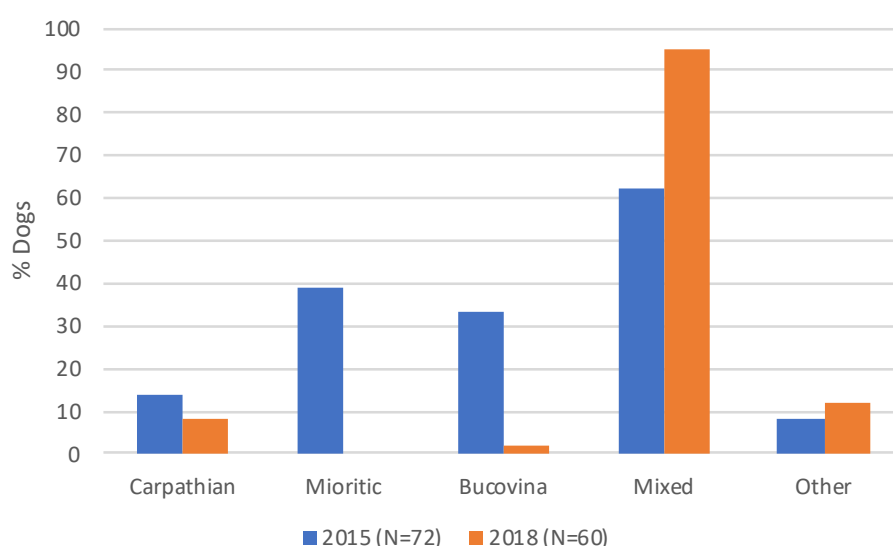


Figure 10. Different breeds of dogs kept at livestock and/or crop farms

An updated description of human-wildlife conflict in the project area

As part of the 2015 baseline survey we collected data on as many recent HWC events as each respondent could recall. This was to act as the baseline for subsequent monitoring and so the same exercise was repeated during the current survey. This data is summarised below and compared with the findings taken from the 2015 survey.

A total of 72 HWC events were recorded from 36 households. Of these, 19 households reported multiple attacks with the maximum number being four and the average being two. Only four households in Site 2 reported any attacks and all, bar one, were single events; the multiple-event household reported three attacks which gave an average number of 1.5 in Site 2.

The peak month for HWC was August, with numbers building steadily from April and then dropping rapidly in September. The most important period of the day seemed to be the afternoon, with a

peak in activity at around 18:00; evening and night time together were also important. Relatively few attacks occurred in the morning.

Attacks on livestock were exclusively on sheep and almost exclusively carried out by wolves, with an average of two wolves involved (the maximum was 14 but this may be an exaggeration, as often happens when livestock owners recall attacks by wolves; G. Goldthorpe, *personal observation*). The attacks tended to occur at the pastures, whilst the animals were grazing (68%) or resting (6%), and within 500m of the forest edge (the average distance was 233m). A smaller proportion of attacks happened at night while the sheep were sleeping (21%).

Dogs were present at almost all of the events and all had the dogs barking (100%) or barking and chasing the wolves (78%). Similarly, people (shepherds) were present at almost all the events and they all shouted while some also chased the wolves (78%). Attacks usually resulted in sheep being killed (57%) or injured (23%); however, 30% of attacks were unsuccessful. Almost no-one reported the attacks (94%) with the most common reasons being that there was either no, or very small damage suffered (68%; this included those that reported that the sheep recovered), or that the process was too complicated (11%).

Monitoring HWC

Also, as part of the original baseline survey, respondents were asked to recall as many actual HWC events that occurred over the previous year. For the purposes of comparison with data collected in the current survey, HWC data reported for the summer months of 2014 (April to October) were extracted from the database and run through comparative analysis. The number of households involved in the baseline survey is similar to that interviewed for the current survey (Table 6) and both the percentage of households that reported HWC (45% & 49%, respectively) and the percentage of those reports that involved livestock (84% & 81%) were also similar between the surveys. However, the number of HWC events, involving livestock and large carnivores seems to increase dramatically in 2018; from 34 in 2014 to 86 in the current survey.

Table 6: Breakdown of HWC frequency (specifically large carnivore attacks on livestock) between surveys

| | HWC reports | Reporting livestock attacks | Number of attacks | Average (mean) | Number of multiple events |
|-------------|-------------|-----------------------------|-------------------|----------------|---------------------------|
| 2014 (N=85) | 38 | 32 | 34 | 1.06 | 2 |
| 2018 (N=87) | 43 | 35 | 86 | 2.00 | 20 |

The spread of HWC events, across the summer period, followed a similar trend in the current survey as to that represented in the baseline, with a peak in mid-summer, and differed only in the sharpness of the increase over time. Similarly, the time of day that HWC events tend to occur has not changed significantly over time, with the majority of the attacks on livestock occurring in the afternoon; the peak shifting slightly from 16:00 to 18:00, and the spread narrowed considerably.

KNOWLEDGE, ATTITUDES & PERSPECTIVES

As part of the HWC survey, respondents were also asked to answer questions for a Knowledge, Attitudes and Perceptions (KAP) survey; of the 87 interviewed, 32 agreed. Most (94%) were male and the average (mean) number of years living at the location was 40 (range = 10-60; median = 42). Nearly all (97%) households regularly visited areas with wild animals, and most (85%) of these did so in order to look after livestock (shepherding/herding).

When asked what wild animals were present in the area, almost all listed wolf, roe deer, fox and wild boar (all 97%, except fox which was cited by 94%). Also popular were bear (56%), red deer (56%) and lynx (38%). Otter and jackal were hardly mentioned (3% & 6%, respectively) and beaver not mentioned at all (Figure 11).

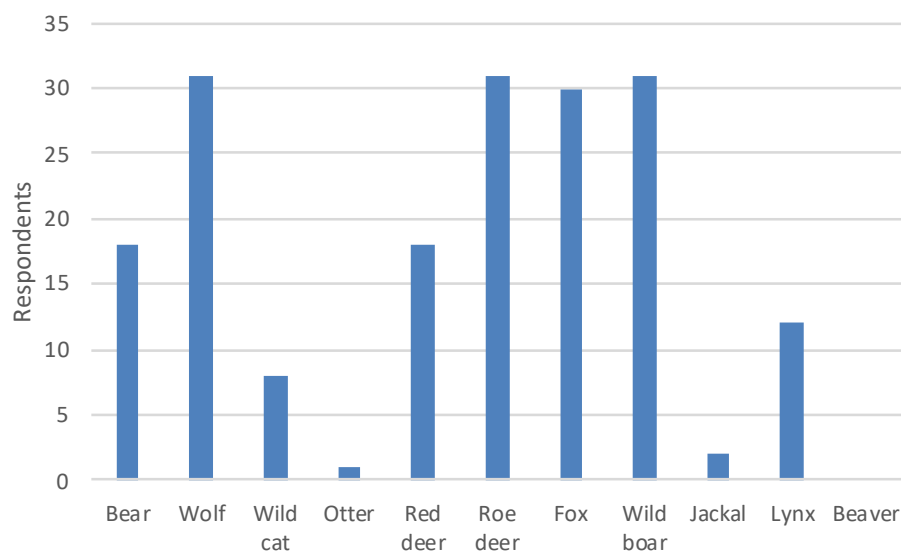


Figure 11. Responses to the question; What wild animals are found in this area?

Respondents were also asked how often, if at all, they saw any of the large carnivores (bear, lynx, jackal and wolf) and/or wild boar (or any of their tracks) when in the forest. The responses provided seem in accordance with what one might expect, given the ecology of these species, with bear, lynx and jackal almost never seen, wolf occasionally spotted, and boar frequently encountered (Figure 12).

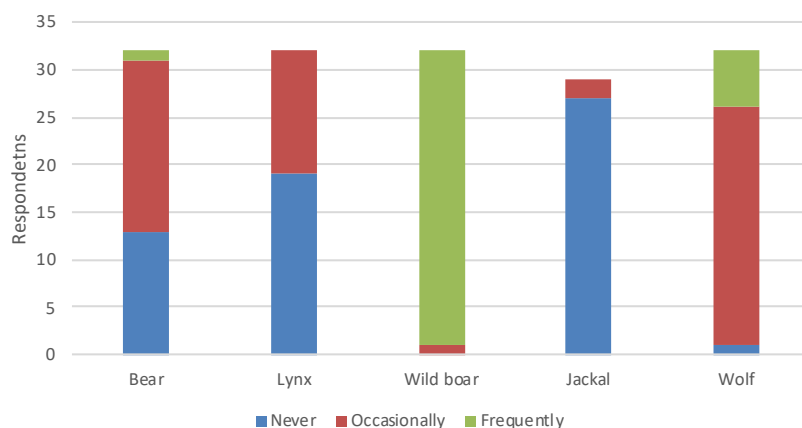


Figure 12. Responses to the question; In this area have you ever seen [these] animals, or their tracks/signs...?

Attitudes

When asked about their attitudes towards having certain wild animals in their region, most households felt neutral about bears and lynx (57% and 66%, respectively) and bad about wolves being present (72%). The strongest feelings, however, were evoked by wild boar, with 84% considering the presence of boar to be a very bad thing (Figure 13).

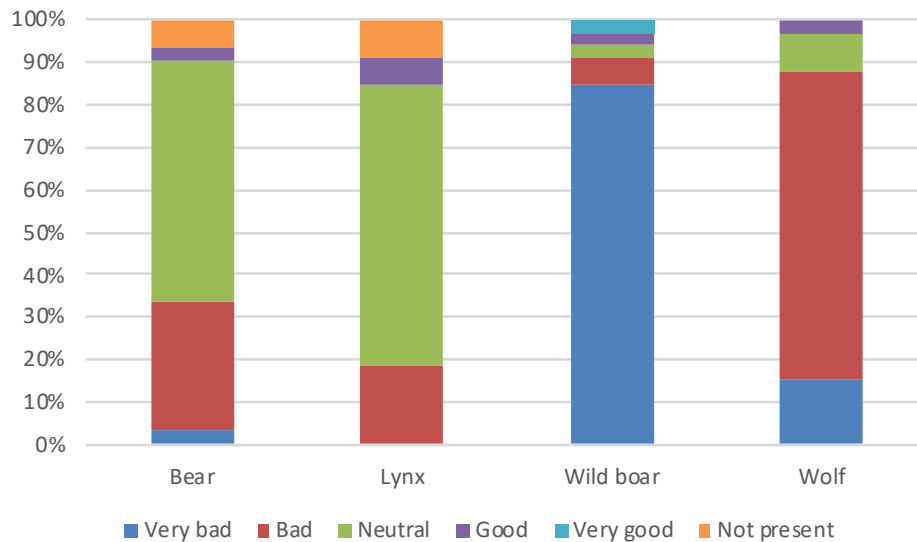


Figure 13. Responses to the question; how do you feel about these animals being present?

This general response is seen again when asked to describe their attitudes towards these species; the most strongly negative attitudes are reserved, once again, almost exclusively for wild boar; 84% had a “very bad” opinion of them. The wolf, also again, did not fare much better with 26% describing their attitude as “very bad” but 68% as “bad” (Figure 14).

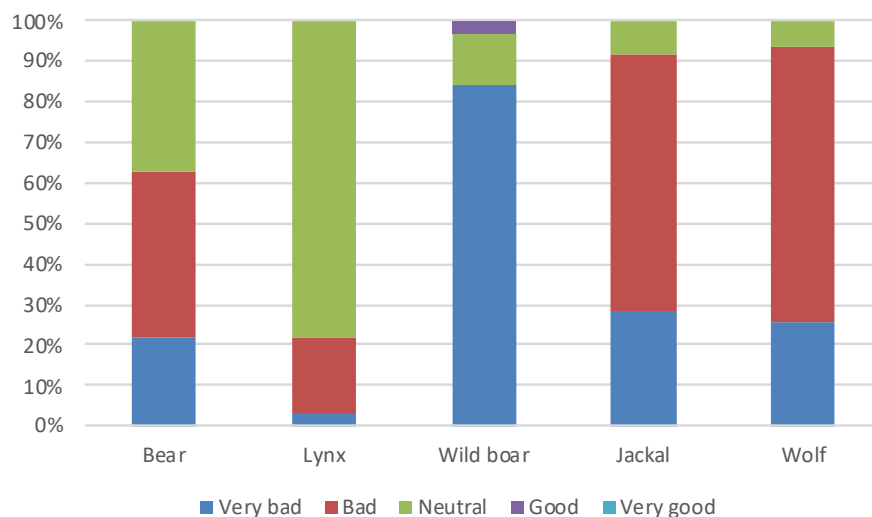


Figure 14. Responses to the question; how would you describe your attitude towards these species?

However, the responses were far more evenly distributed when asked if they would be afraid to go to an area known to have these species present. In all cases, most households disagreed with the statement that they would be afraid (Figure 15) with a relatively high portion of respondents only

agreeing to the statement with regards to the main predators, bear, lynx and wolf (31%, 31% & 25%, respectively).

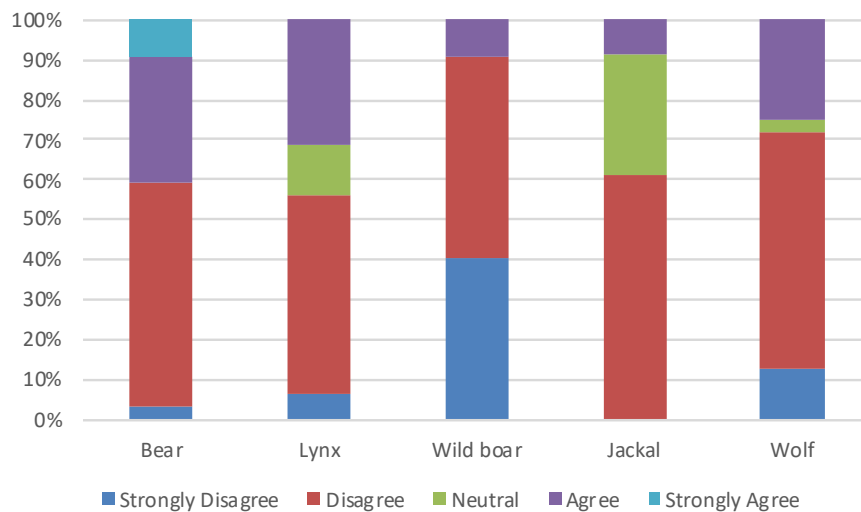


Figure 15. "I would be afraid to go to places with..."

Households were asked whether they felt that, over the past 10 years, the numbers of these species had increased, decreased or remained stable. In terms of the more elusive animals, the bear and the lynx, the general impression seemed to be that the numbers had stayed the same (50% & 56%, respectively) whilst the wolf had an even split between those that thought it was at the same numbers and those that thought their numbers had increased somewhat (31%, each). Perhaps most surprising is that a small number of households felt that wolf numbers have decreased.

Again, it is the wild boar that elicited the most consistent response with 94% saying that their numbers had increased greatly (Figure 16). Respondents were also asked to suggest a reason for their answers and, with most people citing an increase of some degree, the most popular response seemed to be that it was because there was no longer any hunting. Interestingly, the HWC survey revealed a perception amongst households that the frequency of problems caused by wild animals (primarily wild boar and wolves) has also been increasing and it is not difficult to imagine a correlation between these two findings.

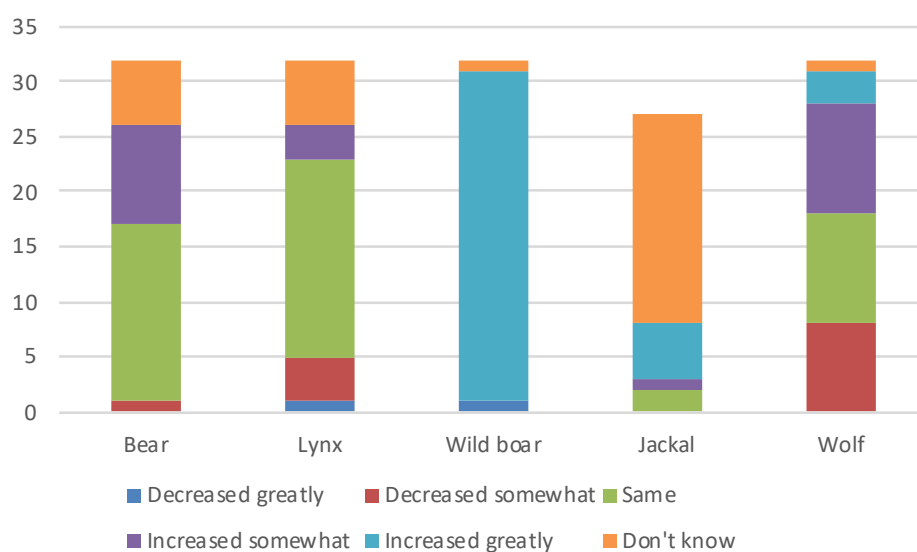


Figure 16. Trends in numbers of key species over the previous 10 years

When asked how they would like to see the numbers of these species change over the next 10 years, the boar again elicits the strongest response with 81% saying that their numbers should be greatly reduced (Figure 17). Also, again, most would also like to see numbers of wolves decrease but not by such a large degree; 34% called for a decrease and only 28% for a big decrease. And again, a surprise with the wolf, with a third of households stating that they would be happy to see wolf numbers stay as they are. When asked why they felt this way, almost all (97%) associated a decrease in numbers with a concomitant decrease in damage to their property. In the case of the bear and lynx, most people were happy to see their numbers remain as they are (62% & 84%, respectively). Two surprise results were shown for wild boar and wolf. A third of households said that they would be happy for wolf numbers to remain as they are whilst 6% called for an increase, and 12% for a “great increase” in wild boar numbers.

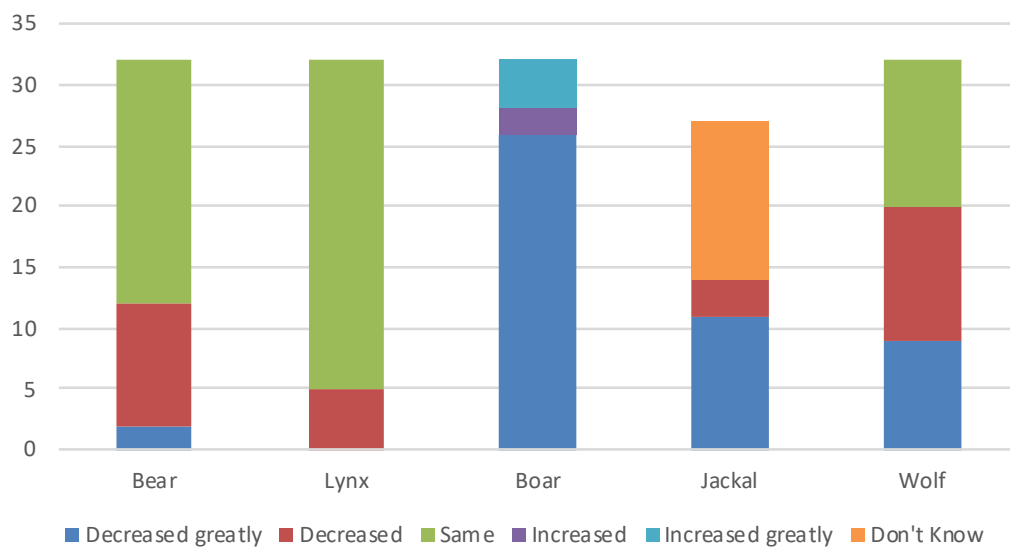


Figure 17. How would you like the numbers of these species change?

Interviewees were asked to gauge how strongly they agreed or disagreed with the following statements:

1. There are benefits to living in an area with large carnivores
2. Damages are an accepted fact of life when coexisting with large carnivores
3. Compensation paid for large carnivore damage is adequate and makes up for losses
4. The procedure for obtaining compensation is clear and easy

1: Nearly half of the respondents were neutral on the benefits of these wild animals, neither agreeing nor disagreeing that there are benefits to living with large carnivores. However, a quarter agreed with the statement whilst only 15% disagreed and 7% strongly disagreed.

2: Even more surprisingly, given the responses thus far, an overwhelming majority of respondents either agree (16%) or strongly agree (78%) that damages caused by large carnivores are an acceptable consequence of coexisting with large carnivores.

3: However, when it comes to considering the available compensation for suffering that damage, more than two-thirds either disagree (53%) or strongly disagree (16%) with the statement that it is adequate.

4: And the same proportions are shown when considering that the procedure for applying for that compensation is clear and easy; 53% disagree and 16% strongly disagree.

Whilst significant in its connotations for improving the relations between farmer and wild animals, it's important to note that these sets of questions explicitly refer only to large carnivores and so this conclusion cannot be applied to what appears to be the real villain of the survey; the wild boar.

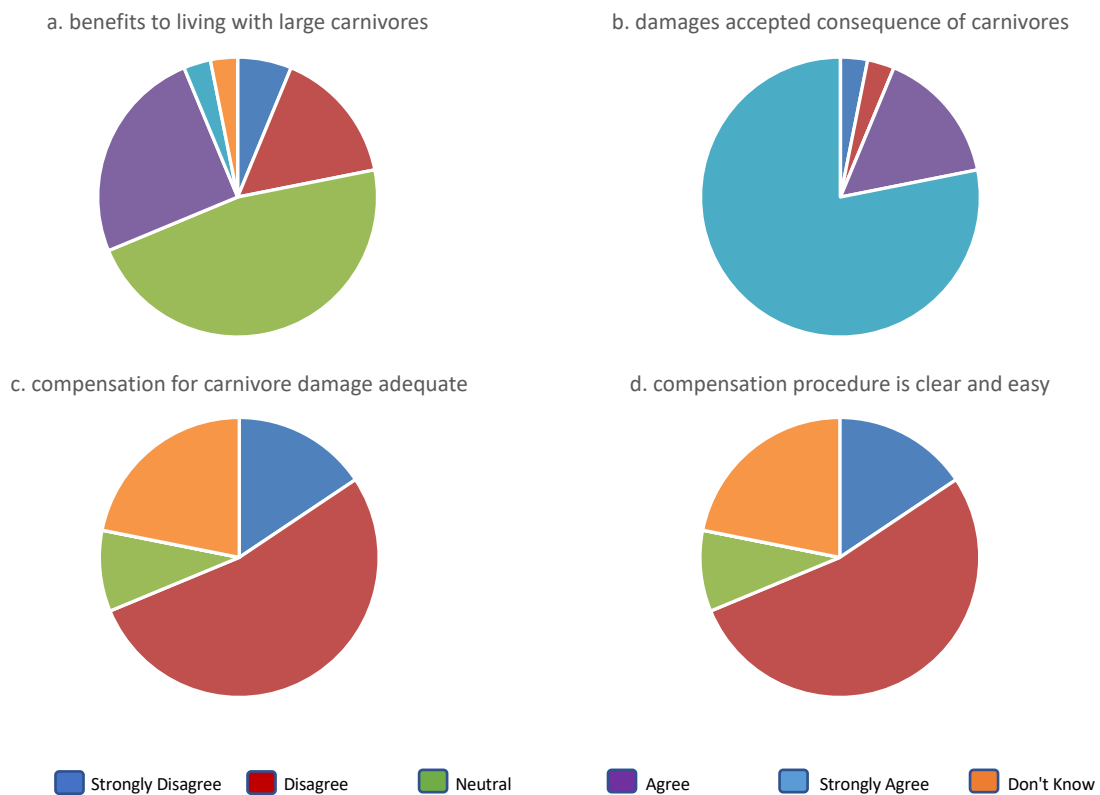


Fig 18 a-d: Responses to four statements dealing with coexistence with large carnivores and the availability of compensation

Respondents were then asked which species of wild animal they thought had the greatest potential for causing them problems and, in line with previous questions, all saw the wild boar as being highly likely to cause them problems. The wolf faired only a little better with respondents thinking it either likely (41%) or highly likely (59%) to be a problem.

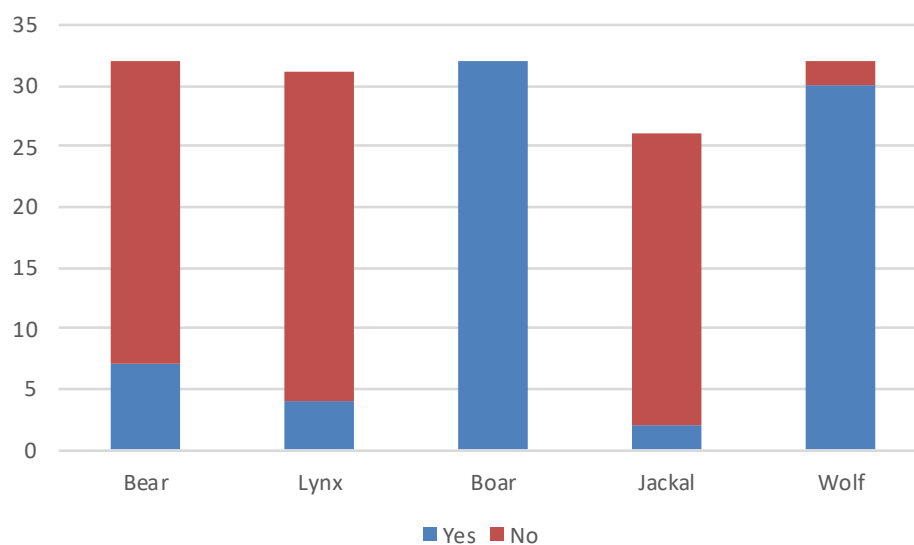


Figure 19. Respondents that have experienced damage caused by the key species.

Conversely, bears and lynx were both considered to be unlikely (12% & 9%) or highly unlikely (44% & 81%, respectively) to cause problems. This pattern was borne-out when considering the experiences of respondents with damage caused by these species; all had experienced damage caused by wild boar and nearly all (94%) by wolves whilst only 22% and 12% had property damaged by bear or lynx, respectively (Figure 19).

Most households appeared to know who to report wildlife damage too, with most (91%) naming either the Town Hall or Game Management Units as recipients of compensation claims when responding to an open question on the subject.

Respondents were asked what measures should be taken with problem animals (individuals, not species) and were given the choice of five options: leave them alone; frighten them away; relocate them; shoot them (lethal control); or show people how to prevent further damage. Almost all declared shooting, to kill, to be the best option for wild boar (94%) and wolf (75%) whilst the favoured option for bear was to frighten them away and, for lynx, to leave them alone. Perhaps the most surprising result, considering the general neutrality towards the jackal up to this point, is that 93% of households favoured shooting jackals (Figure 20).

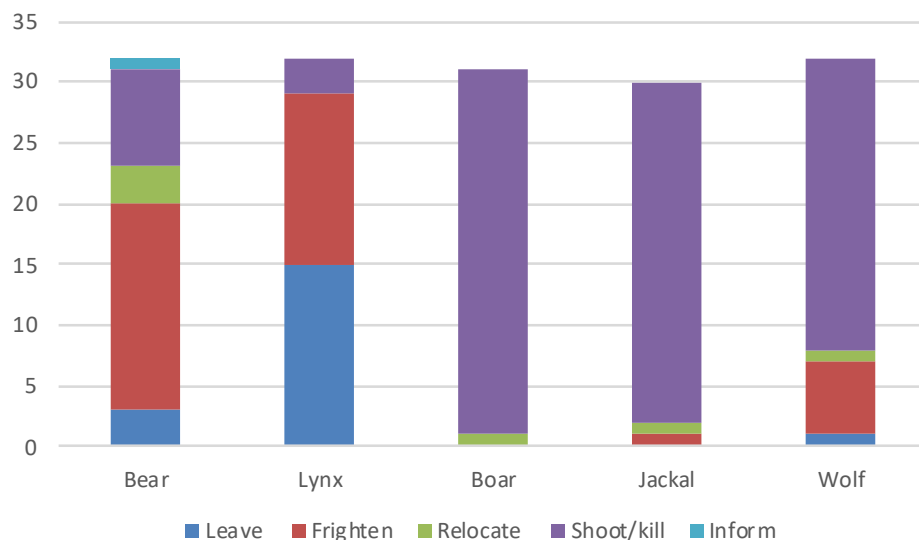


Figure 20. How would households prefer to deal with problem animals.

Knowledge

The next set of questions dealt with households' knowledge of the two key species; the wolf and bear. This composed of nine closed-questions with six species-specific questions (three for bears and three for wolves) plus three questions that were relevant to both species. Unfortunately, one of these questions (relating to the diet of wolves and bears) was not answered in the right manner (with most households choosing multiple responses) and has thus been removed from the data-set. This left eight questions; three about bears, three about wolves and two concerning both. Subjects covered ranged from animal ecology, legal status and population ecology.

Overall, respondents showed a good level of knowledge of both key species with most questions answered correctly by most respondents (Figure 21). Some questions, however, seemed to cause problems, with two wolf-based questions in particular, one on sociality (only 22% knew the average wolf-pack size) and the other on feeding ecology (with only 16% able to estimate the daily intake of meat by an adult wolf), receiving low scores across the sample population. Conversely, knowledge about bears seems consistently high, with the only questions receiving less than a 90% success-rate

focusing on the hibernating habits of bears (only 56% got this right) and another relating to breeding, where 22% simply did not know when cubs appear (the remaining 78% were correct).

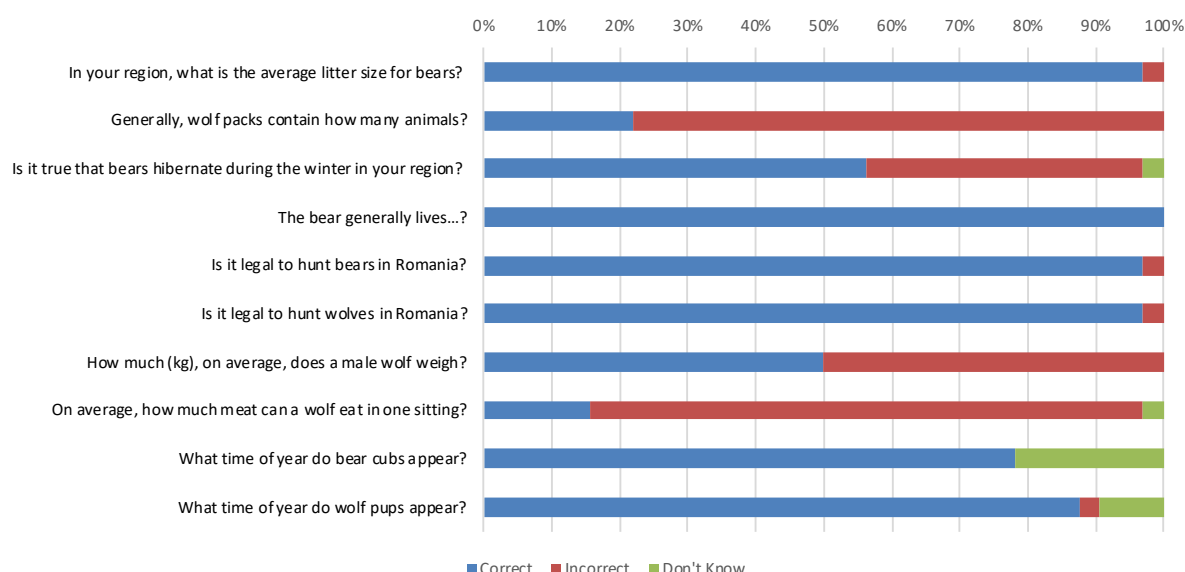


Figure 21. Success rate for households answering questions of animal biology, ecology and status

Interestingly, when looking more closely at the two wolf questions that received low pass-rates, there was a tendency for respondents to over-estimate both pack size (78% circled 6-9 individuals) and the amount of meat eaten by an adult wolf (59% thought it to be between 9 & 14kg, and 22% put it at 15-20kg).

Households were asked about their sources of knowledge on wild animals (Figure 22) and given a choice of possible answers. Most gave multiple sources, with 44% providing two sources and 53% citing three, four or even five sources. Amongst those that chose two sources, the most popular combination was *family & own experience* (57%), followed closely by *school & own experience* (43%). Of those that chose three sources (28%), the most popular combination was *school, family and their own experience* (67%).

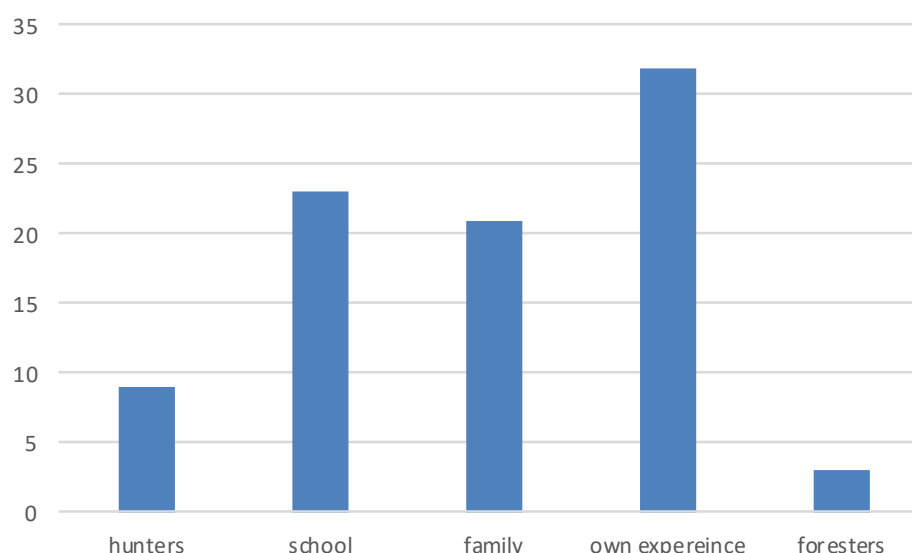


Figure 22. Sources of peoples' knowledge on wild animals

There was an equal division (47% each) between those that would, and those that would not be interested in learning more about wild animals with the latter half dominated by households that had scored relatively low on the knowledge questions. Of those that showed an interest in learning

more, most (65%) identified either television (18%), the internet (18%) or both (29%) as their favoured medium for receiving information (Figure 23).

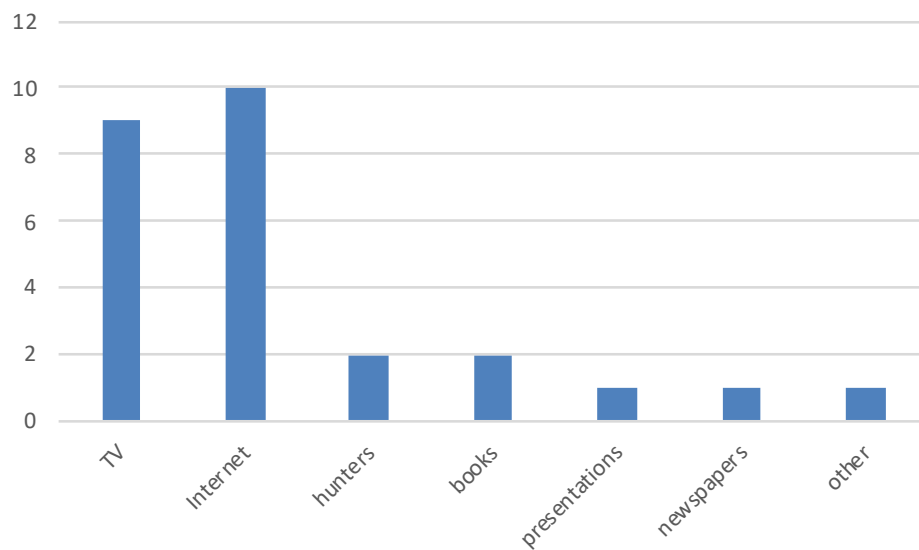


Figure 23. Potential sources of information for further learning

The mean age of respondents was 49 (Median = 47) and most were, primarily, herders (50%), Livestock owners (13%) or foresters (13%). Other occupations (Figure 24) included retirees (9%), police (3%) and housewife (3%).

Livestock owner
herder
Foresters
police
housewife
retired
cereal farmer
other

Figure 24. Primary occupations of responding households

Not surprising, then, that most households (42%) depend entirely on agriculture for their income whilst 32% receive at least half of their annual income from agriculture. Only 13% receive less than half of their income from agricultural production.

THE IMPACT OF HWC MITIGATION SUPPORT PROVIDED BY THE PROJECT

Mitigation support provided to HWC survey respondents

Throughout the life of the project, and based on several types of engagement, the project team has provided active support to households in mitigating the impacts of human-wildlife conflict (see report for full details on mitigation support deployed⁴). In this way, 36⁵ of the survey respondents have received support from the project in the form of: electric fencing for protecting sheep at the fold (n=18); electric fencing to protect crops from damage caused by wild boar (n=16); LGD pups for protecting sheep at the pastures (n=4); and chemical treatment for crop protection (n=2).

Of these, 18 (50%) suffered no further HWC at the point of mitigation intervention; this includes four households that had received fencing for their sheepfolds, 13 that had received fencing for their crops and two that used Hukinol to protect their crops. In most cases (72%) the mitigation interventions had been installed between 2 and 2.5 years prior to the current survey. The remaining 28% had their mitigation in place for at least a year. Whether these cessations in HWC can be attributed solely, or at all, to the mitigation support provided by the project is difficult to say, but anecdotal evidence collected by the authors suggest that in most cases there is a strong correlation^{6&7}. It should be pointed out, however, that of the 51 households involved in the survey that did not receive any mitigation support from the project, 26 experienced no HWC in 2018. These were all livestock owners and eight of these have, in the last year, sold-off their livestock.

Of the remaining 18 (50%) HWC survey respondents that received mitigation support from the project, all reported (to the project) subsequent HWC events. A total of 32 attacks were reported with the number per household ranging from one to three (mean=1.78) and all but one involved livestock owners. However, 25 (78%) of these attacks, reported by 16 households, occurred at sites other than those where the mitigation support had been installed. Most (72%) of these 16 respondents had been provided with livestock fences and 18 (67%) involved wolves attacking sheep flocks at, or on the way to/from the pastures.

That means, of course, that seven of the HWC events did occur at the sites where mitigation measures had been installed by the project and are, therefore, of particular interest here. These seven events involve five households; all but one of which had received electric fencing to protect their flock at night (one of these had also received LGD pups from the project). The exception had received an electric fence to protect his crops from wild boar. All of the fences had been in place for around two years, whilst the pups had been with the owner for around 1.5 years.

One of the households, Alboni Alin from Site 1, had reported on three post mitigation HWC events, all involving wolves (individuals or a pair) attacking his flock at the pastures. Fortunately, none of these events resulted in the loss or injury of Mr. Alin's sheep but whether this can be attributed directly to the project pups is unknown as Mr. Alin owns four other dogs, and it may be worth following up with these LGD pups with some monitoring. Interestingly, at least two of the three events occurred within 200m of a forest edge; a behaviour that is consistently highlighted as resulting in an increased likelihood of depredation by wolves (see above).

⁴ The Deployment of Human-Wildlife Conflict Mitigation Measures: LIFE Connect Carpathians. October 2018

⁵ NB: three households received both livestock fencing and dogs and one household received fencing for both livestock and crops

⁶ Goldthorpe, G. & Popa, R. 2017. An Assessment of Human-Wildlife Conflict Mitigation Measures. LIFE Connect Carpathians. Fauna & Flora International, Cambridge, UK

⁷ Goldthorpe, G., Popa, R. & Faur, M. 2018. An Assessment of Human-Wildlife Conflict Mitigation Measures – 2017 Update. LIFE Connect Carpathians. Fauna & Flora International, Cambridge, UK

Of the remaining three HWC events involving wolves, all occurred at the sheepfolds where electric fencing had been installed and none were successful (i.e., no losses were incurred by the households). These cases, then, can be considered as demonstrations of the efficacy of electric fencing as protection from wolves.

The last household of interest here received an electric fence for their crops back in July 2016. In the current survey, they report an unsuccessful attempt by wild boar to access his potato crop.

In conclusion, whilst the number of households that have received mitigation support from the project and have, subsequently, provided evidence for the efficacy of that support are few, the general trend seems to be for positive outcomes.

Mitigation support provided to non-survey stakeholders

In addition to those included, each year, in the HWC survey, there were several project stakeholders that received HWC support from the project either under other project activities⁸, including engagement with Game Management Units (n=11), responses to specific and extreme HWC events made-known to the project team (n=20) or as the outcome of a similar survey carried out in the Zarund du Est part of the project area⁹ (n=22).

In this way, 53 households received support in the form of fencing for livestock (n=10), crops (n=30) or apiaries (n=13). Geographically, this included households from Zarundul (n=35), Muntii Metaliferi (n=6), Retezat (n=3), Apuseni (n=3) and other areas (n=6). This latter category includes one sheep-farmer responding to repeated attacks on his flock by a bear, and five Game Management Units (GMUs).

Installation dates for these fences vary with the earliest being provided in June 2016 and the most recent in October 2018. However, generally most (25; 48%) were deployed in 2017 (between May and November), followed by 16 (31%) in 2016 and 11 (21%) in 2018. Of these 53 households, 32 gave details of HWC events that occurred prior to receiving mitigation support from the project with a total of 44 attacks were reported; seven on livestock, 18 on crops and seven on apiaries.

Of the 53 households involved in mitigation support, 32 gave details of HWC events experienced before the project's intervention. Usually, this was a matter of weeks, or even days (in the case of emergency responses) before the intervention and so these data span several years (early 2016-late 2018). More than half of these reports (54%) were of wild boar damage to crops, followed by bears (33%) attacking sheep and apiaries (all of the latter cases refer to one particular event⁹ and, finally, wolves (13%) attacking sheep flocks.

A total of 11 sheep attacks were recorded (just over half, 55%, were carried out by bears whilst the rest involved wolves) resulting in 23 sheep killed (mean=2.09) and 1 injured. Three of the attacks (two by bears), were unsuccessful. Other livestock affected included one attack on goats, resulting in two killed, and one attack on cattle, also resulting in two dead, both by wolves. A shepherd was also injured by a bear attacking his flock.

The other seven HWC events involving bears were on apiaries; these all occurred over a one-week period in early November 2017 and resulted in the loss of 18 hives from the seven sites¹⁰.

All crop damage was caused by wild boar and this affected 18 households or GMUs. A total of nearly 30ha was damaged, with the most affected crop being corn (26.4ha; 89%). This was followed by pastures (1.5ha), wheat (1.1ha) and potato (0.83ha).

⁸ The Deployment of Human-Wildlife Conflict Mitigation Measures: LIFE Connect Carpathians. October 2018

⁹ Goldthorpe, G. & Popa, R. 2017. An assessment of Human-Wildlife Conflict in 2016, in the LIFE Connect Carpathians Project area. Fauna & Flora International, Cambridge, UK

¹⁰ Goldthorpe, G., Popa, R. & Faur, M. 2018. An Assessment of Human-Wildlife Conflict Mitigation Measures – 2017 Update. LIFE Connect Carpathians. Fauna & Flora International, Cambridge, UK

When asked to assign a rank of *Mild*, *Serious* or *Severe* to the level of HWC usually experienced, most (63%) households chose *Serious*. However, almost a third (31%) described their usual HWC experiences as *Severe* whilst only 6% assigned a rank of *Mild*.

Households were visited, or contacted by phone, towards the end of the project (mostly in October 2018) and asked if they had experienced any further attacks on their stock or crop since the project provided them with mitigation support. For clarity, they were asked only to give details of attacks experienced at the point of intervention, whether that be their night-time sheep corral, fenced crop or fenced apiary (six households provided information on attacks that had happened elsewhere, these data have been excluded).

A total of 51 households provided information on post-mitigation HWC; most (59%) had received fencing for their crops whilst 25% had fences installed at their apiaries and 6% at their sheep corral. Of these, most (71%) had not experienced HWC at the point of intervention since the fence had been installed. When asked why they thought this was, all felt that it was directly a result of the mitigation support provided by the project. Of the 29% that reported continuation of HWC at the point of intervention, all reported that they had suffered no damage to their crops or stock as a result of the event.

When asked to categorise (*Mild*, *Serious*, *Severe*) their experiences with HWC before the mitigation support was provided, most (49%) used *Severe*, closely followed by 47% describing HWC as *Serious*. When asked to apply the same categories to their HWC experiences since mitigation was provided, all said it was *Mild*.

Key Findings & Conclusions

HWC SURVEY

The nature of farming in the project area has not changed, though there has been an increase in the number of people that consider crop farming to be their primary form of agriculture as well as, conversely, an increase in the proportion of farmers reporting attacks on their livestock by large carnivores. Wild animals remain the main problem faced by farmers and this is still most seriously felt in the summer pastures. Indeed, the basic description of HWC in the region has not changed in any marked way.

According to the HWC survey, the wolf is still perceived by the respondents as the most problematic and yet, for those that also took part in the KAP survey, the wild boar consistently received the most negative responses to questions regarding its presence, numbers and interactions with humans.

Related to this is the possible impact that the apparent emphasis on livestock owners in this survey seems to have had - with the majority of respondents being sheep-farmers the weight of the responses seems to have shifted almost completely to wolf-haters. Why this hasn't translated into the KAP survey is unknown but may simply be a matter of numbers – less than half of the HWC survey respondents took part in the KAP survey and so the HWC findings should be considered more representative and reliable.

The methods used to address HWC have changed somewhat with the use of electric fencing appearing to have replaced night-time guarding as one of the main methods for protecting crops from wild boar. The use of electric fencing is something that the project has actively supported, providing both materials and technical support to a number of households (particularly those that had reported unusually high levels of damage caused by boar) all of which have reported dramatically less (and even no) damage since. The apparent success of electric fencing for crop protection is further shown by the observation that it is now also being taken up by other households, independently of the project.

One worrying finding of the current HWC survey is that the number of attacks on livestock, mostly by wolves, seems to increase dramatically, more than doubling over the numbers reported in the baseline. This seems entirely down to the number of households reporting multiple HWC events in the summer pastures and, while it could represent an actual increase in the frequency of wolf attacks on sheep, it is more likely the result of several methodological issues related to the design and implementation of the survey.

The project team have had several years, since the baseline survey, to perfect their implementation and relations with the households will also have improved markedly, and together, it is likely that interviews with the participants have become more relaxed and open. There is also some disparity in the timing of the surveys, and this has had some impact on the nature of the data used in the comparisons within this report. The HWC data in the current survey was collected at the tail-end of the normal summer season and so relates to HWC events that occurred that year. The baseline survey, however, was carried out in the middle-of the summer season and so, the attack data recorded for that year were considered to be incomplete; i.e. they did not include the latter half of the season (which, incidentally, has been shown to be the busiest time for HWC). For this reason, the data extracted for comparative purposes, whilst collected during the survey, recollected HWC events from the previous years' summer season, and so is likely to be less rigorous. That said, it is important to note that the number of multiple HWC events reported for the 2015 summer season (i.e. the summer in which the data was collected) was also relatively low.

KAP SURVEY

The first thing that needs to be said about these data is that the sample population is taken almost entirely from households involved in livestock farming (i.e., the HWC survey population) and therefore likely to view wild animals as, at best, a professional consideration and, at worst, a livelihoods problem. That said, it is not surprising that they spend a lot of time outdoors and seem to be familiar with the fauna of the region.

Perhaps the biggest surprise result was the consistency with which the wild boar received negative responses. They are the most frequently encountered animal in the forest and most respondents had a very negative attitude towards them generally, feeling “very bad” that they were present at all and thinking that their numbers should be “greatly decreased”. Much of this seems to be because of the association of these animals with damage to property but it may also be linked to their apparent abundance, as supported by the frequency with which they are seen.

That the wolf was perceived in a comparatively less negative way (though, still generally negative) is at odds with the HWC survey findings, which reported elevated levels of HWC with wolves and greatly reduced, almost non-existent HWC with wild boar.

Of less surprise was the fact that the jackal consistently received the least number of responses (usually only 27 people) and of those that did respond, most did so with “don’t know”. This is most likely due to the fact that it is a non-native species, about which most people would know very little and which they see relatively little of.

In terms of population trends, the general feeling seems to be that numbers of the species of key interest to the project, wolves and bears, are increasing and that this is because they are not hunted enough. The way this question (Q11) is structured is a little problematic as it requires respondents to speculate on trends for each species but does not require that they suggest reasons for each trend. There are, then, several situations where a respondent gave a decreasing trend for one species and an increasing trend for another but only gave a potential reason for change in general. Whether hunting, for example, is being blamed for numbers decreasing or increasing is, therefore, sometimes obscured. This question should be adapted for any future use of the survey.

Another surprise result came from the question of how respondents would like numbers of these species to change over the next 10 years. A third of households said that they would be happy for wolf numbers to remain as they are, considering that the sample population for this survey is taken entirely from livestock owners. Even stranger, considering the general feelings towards wild boar as identified within the same survey, is that 18% wanted numbers of wild boar to increase. Whether this is to increase the hunting quotas for GMUs is unclear but, as only 12% of the sample population claim to hunt, this seems unlikely.

Attitudes towards these animals aside, perhaps the most significant finding here is that, on the whole, people see the benefits of large carnivores and would be willing to tolerate the problems associated with living alongside them. However, without relatively easy access to a representative compensation system, this tolerance is likely to be superseded by negative attitudes and, ultimately, the desire to see problem animals eradicated. Better access to a more representative compensation system would go a long way to improving relations between rural households and large carnivores.

Lethal control was identified by most people as the best way to deal with wild boar and wolves that cause problems, whilst it was indicated that the bear and the lynx were more likely to be merely *frightened away*. Surprisingly, considering its fairly neutral status in other questions, the jackal was also highlighted for lethal control. Whilst, in the case of the wild boar, this can be seen as a follow-on to the desire to see less of them generally, it should be remembered that lethal control as a response to a specific issue is quite different from the same approach to general population management. The fact that fewer people wanted to see significantly fewer wolves in the region than called for lethal control of problem animals further supports the apparent tendency in the project

area for people not to hate the wolf *per se*, but only to dislike it when it impacts their livelihoods. This is not necessarily the trend seen elsewhere, where there is a tendency amongst the general population to hate the wolf for purely irrational, often superstitious, reasons.

Knowledge of large carnivores was generally good, although most respondents faltered on questions of wolf feeding ecology and pack size. The tendency for people to overestimate pack size and daily meat consumption is important as it is these two aspects of wolf ecology that relate most directly to the issue of human-wildlife conflict. The logical outcome of overemphasising these aspects of wildlife ecology is the subsequent belief that there are more wolves in the country that need more meat to survive and it is, therefore, no wonder that the livelihoods of sheep farmers are suffering.

The 50% of households that apparently also perceive wolves to be physically bigger than they actually are also feed into this hypothesis. Refining their understanding of wolf ecology may, therefore, help reduce the perceived menace of these animals. Whether the same could be said for the extreme negative attitudes towards boar is difficult to say and, in retrospect, a series of questions on boar knowledge may have been useful in answering this.

There is some interest in learning more about large carnivores with the favoured medium being either television or the internet and this could prove useful for anyone wishing to engage in a public awareness campaign. Interestingly, the households who incorrectly answered the wolf-focused questions were less likely to be interested in learning more.

MITIGATION IMPACTS

Survey respondents

Nearly half of the HWC survey respondents received support from the project in the form of electric fencing for corralling sheep at night, LGD pups for protecting grazing sheep during the day or electric fencing or chemical treatment for crop protection. Of these, half suffered no further HWC at the point of mitigation intervention, including four households that had received fencing for their sheepfolds, 13 that had received fencing for their crops and two that used Hukinol to protect their crops.

Whether these cessations in HWC can be attributed solely, or at all, to the mitigation support provided by the project is difficult to say, but anecdotal evidence collected by the authors suggest that in most cases there is a strong correlation^{11,12}. A caveat to this, however, is that, of the 51 households that did not receive any mitigation support, 26 livestock owners also did not experience any HWC in 2018; eight of which had, in the last year, sold-off their livestock.

Of the remaining respondents that did receive mitigation support, all subsequently experienced HWC events, but only a handful (seven) of these occurred at the mitigation sites; all but one had received electric fencing to protect their flock at night (and one of these had also received LGD pups from the project). The exception to this had received electric fencing to protect his crops from wild boar and he reported an unsuccessful attempt by wild boar to access his potato crop.

One of the households had also received LGD pups from the project and they gave details of three attacks, by wolves, on his flock at the pastures. None resulted in the loss or injury of sheep but, whether this can be attributed directly to the project pups is unknown as the farm already had four adult dogs, all of which were present at the attacks and all of which were involved with protecting the flock. It may be worth following up with these LGD pups with some monitoring.

¹¹ Goldthorpe, G. & Popa R. (2017) An Assessment of Human-Wildlife Conflict Mitigation Measures. LIFE Connect Carpathians. Fauna & Flora International, Cambridge, UK

¹² Goldthorpe, G., Popa, R. & Faur, M. (2018) Mitigation Measures – 2017 Update. LIFE Connect Carpathians. Fauna & Flora International, Cambridge, UK

The other three attacks occurred at the sheepfolds that had electric fencing in-place and, in all cases, no sheep were lost. Together, then, these cases go a long way to demonstrating the efficacy of electric fencing in protecting corralled sheep from wolf attacks, at least in the short term. Monitoring of these households should be continued.

Non-survey stakeholders

Of the 53 non-survey households that received mitigation support, in the form of livestock, apiary or crop fencing, 32 gave an account of their historical experiences with HWC. More than half gave accounts of wild boar damaging crops, followed by bears attacking sheep and apiaries then wolves attacking sheep. Most households ranked HWC as, historically, *Serious* or *Severe*.

Almost all of the households provided information on post-mitigation HWC and most had not experienced further HWC at the point of intervention and all felt that this was directly a result of the mitigation support provided by the project. Of those that did report a continuation of HWC, none suffered any damage as the mitigation proved effective at actual protection. All those that had received mitigation support from the project claimed that their experiences with HWC were now *Mild*.

In conclusion then, whilst the number of households that received mitigation support from the project, and who subsequently provided evidence for the efficacy of that support is low, the general trend seems to be for positive outcomes.

RECOMMENDATIONS

This early indication of success in the mitigation interventions provided to stakeholders, particularly with regards to electric fencing, is promising and it is important to keep this momentum going. The project team has established demonstrably strong relations within the rural communities, throughout the project area, and it is important to maintain this presence. The continuation of the HWC monitoring team should, then be considered a priority.

It is also important to maximise on the success stories, anecdotal or otherwise, by disseminating the findings of this report, and communicating the generally positive experiences of project stakeholders to the wider communities within the project area, and beyond. The efficacy of the LGD pup programme initiated by the project is harder to demonstrate, primarily because more time, for the pups to fully mature, is needed but also as the pool of pedigree Carpathian LGDs is still diluted by the presence of existing dogs at the recipient farms, mostly of mixed breeds. The extension, and continued monitoring, of this particular programme is, then, especially important.

The assessment of all the mitigation methods implemented by the project would greatly benefit from a more formalised approach to distribution and monitoring. This could be achieved through the establishment of more well-designed trials, using model farms as well as control sites. Model farms, where certain aspects of management (in this case, animal husbandry) are designed and implemented using specific practices can provide an excellent pool of evidence for the uptake of methodologies within the wider community. However, as has been discussed in previous reports, this is an involved process and can be fairly demanding on resources, particularly manpower. As such, this should be envisaged as a long-term project established, for example, in collaboration with regional or national institutions that can provide their own resources.

Some of the lessons learned within the HWC component of this project, along with some of the other broader project components, should be drawn upon, and built upon, in order to develop and implement a regional or even national, awareness raising programme. This should include continued engagement with government agencies, local and national, in order to ensure that future, and on-going, economic and infrastructure development projects take into account the needs of wildlife populations.

Appendices

Appendix I

Data Sheet for interviews with farmers

[Articles marked with * can be recorded directly by the interviewer]

1. Interview #: _____ 2. Date: _____
 3. Name of person interviewed: _____
 4. Pilot Zone: _____
 5. What do you do in agriculture (marked with 1,2,3 depending on their value to the farmer, 1 most important):

☐ livestock owner

☐ livestock manager

☐ fruit grower

☐ shepherd/herder

☐ bee keeper

☐ crop farmer
 6. Contact details (telephone, e-mail, address): _____

 7. Native village, commune / county _____
- Description of fold/farm & pastures/fields**
8. Description of winter farm infrastructure (*Check all applicable variants*):

☐ house

☐ barn/stable

☐ smaller barn for lambs

☐ other (*specify*) _____
 9. Description of fold/farm infrastructure (*circle all applicable*):

☐ sheepfold (**details - no. rooms, building material**) _____

☐ *night-time corral (give details)* _____

☐ shelter for young animals ☐ other (*specify*) _____
 10. If you have animals, how many hectares does the pasture you use _____ ha
 11. If you have crops, each hectare has _____ ha
 12. Pastures/fields are: ☐ owned ☐ leased

13. The pasture distance to the forest (tick the applicable version):

☐ 0 m ☐ 1-100m ☐ 101-500m ☐ 501-1000m ☐ > 1 km

14. Number of shepherds/herders/farm hands at the fold/farm (specify): _____

15. Where are livestock kept in winter? _____

16. If seasonal, when did you arrive here? _____ 17. When will you leave? _____

Number of animals / crop details

18. Livestock type and number:

a. sheep: #: _____ b. Goats: #: _____ c. Cattle: #: _____

d. Horse: #: _____ e. Donkey: #: _____ f. Pigs: #: _____

19. Crop types in ha

a. corn: _____ ha b. potatoes: _____ ha c. hay _____ ha

d. alfalfa _____ ha e. wheat: _____ ha f. other: _____ ha

Losses in livestock or crops

20. What problems do you face? (1, 2, 3 depending on the severity of the problems, 1 worst case):

☐ disease / pest ☐ wild animals ☐ theft ☐ bad weather

other (*specify*) _____

21. Are the problems worse in winter pastures, in summer pastures or during the migration?

Circle the applicable version: winter summer during migration

22. Which is the most troublesome wild animal?

(marked with 1,2,3 depending on the farmer's impact, 1 greatest impact):

☐ bear ☐ boar ☐ deer ☐ dog

☐ jackal ☐ wolf ☐ other (*specify*) _____

23. In what month(s) do you tend to have the greatest animal/crop losses due to wild animals? _____

24. If you consider the last 5 years, have problems with wild animals been:

Less same more

Preventative Measures

25. What measures do you use to protect your livestock and/or crops from wild animals?

Circle all those used and rank in order of importance:

___ dogs ___ Sleeping with the flock ___ shooting ___ guard crops
___ scare devices (*specify*) _____
___ avoiding risky areas (*specify*) _____
___ fencing (*details*) _____
___ removing dead animals other (*specify*) _____

26. Guard dogs #: _____ of which, adults (>1 yr) #: _____ juveniles (<1 yr) #: _____

27. Are they: *Carpathian* *Mioritic* *Bucovina* *mixed breeds*
 other (*specify* _____)

28. Do you think you have good dogs? yes no partly

Remarks

29. Do you have anything else you would like to add about what we have talked about?

Details of recent attacks

1. Date of the attack: _____

2. Time of Day: ☐ Dawn ☐ Morning ☐ Afternoon ☐ Evening ☐ Night

(*Approximate time if known* _____)

3. Animal(s) involved and their number if seen: bear _____ boar _____
 deer _____ dog _____ jackal _____ wolf _____ other _____
 (*specify*) _____

4. Distance to the edge of the forest _____ m

5. Coordinates of the place (show the person interviewed a map and ask her to indicate the exact location): N _____ E _____

6. What were the animals doing at the time of the attack: (tick the applicable version):

☐ grazing at pasture ☐ drinking at water source ☐ sleeping at the fold

☐ resting on the pasture ☐ walking to/from the pastures

☐ other (specify) _____

7. Number and type of animals killed/injured:

sheep: killed _____ injured _____

cow: killed _____ injured _____

Other (specify): _____ killed _____ injured _____

8. How many hectares of crops have been spoiled / lost?

a. corn: ____ ha b. potatoes: ____ ha c. hay ____ ha

d. alfalfa ha e. wheat: ha f. other: ha

9. How many hives damaged? _____

10. Dogs present? ☐ yes ☐ no

11. Behavior of the dog to the prey: (tick the applicable variants):

☐ no reaction ☐ bark ☐ chase ☐ bite/contact

☐ run away ☐ other (*specify*) _____

12. There was someone present? ☐ yes (*specify*) _____ ☐ no

13. Behavior of the person to the wild animal: Circle the applicable variant:

☐ no reaction ☐ shout ☐ chase ☐ shoot

☐ other (specify) _____

14. You reported the incident? ☐ yes ☐ no (if not, why not? _____)

15. You have received compensation? ☐ yes ☐ no ☐ Waiting

Why? _____

16. You want to add something?

[Now ask questions about the attack before the one discussed, and repeat questions 1-16, then for the attack before that, until the attacks have been recorded or the person interviewed is losing interest]

Appendix II

Details of recent attacks/conflict events for interview #:

1. Date of attack: _____
2. Time of attack: *dawn am pm dusk night-time*
(*approx. time if known* _____)
3. Animal(s) involved and number if seen:
bear (____) boar (____) deer (____) dog (____)
jackal (____) wolf (____) other (specify _____)
4. Distance of attack site to nearest forest _____ m
5. Location coordinates (from *map or GPS*): _____
6. Weather (*circle applicable*): *clear cloudy mist/fog rain snow*
other (specify _____)
7. Activity of flock/herd immediately before the attack: (*circle applicable*):
grazing on pasture drinking at water source sleeping at fold
resting on pasture walking to/from pasture (details _____)
other (specify _____)
8. # and type of livestock killed or injured:

Sheep; killed _____ injured _____

Cattle; killed _____ injured _____

Other (specify); _____ killed _____ injured _____
9. Area (hectares) of crops damaged/lost

Corn _____ ha potatoes _____ ha hay _____ ha alfalfa _____ ha
10. Number of fruit trees were damaged/lost

plums _____ apples _____ apricot _____ pears _____

11. Number of hives were damaged/lost _____

12. Dogs present: yes (1) no (0)

13. Dog behaviour toward predator: *Circle applicable:*

no reaction (0) bark (1) chase (2) bite/contact (3) run away (4)

other (specify _____)

14. People present yes (1)(specify _____) no (0)

15. Person's behaviour toward wild animal: *Circle applicable:*

no reaction (0) shout (1) chase (2) shoot (3)

other (specify _____)

16. Was the attack reported? Yes (1) no (0) (If not, why? _____)

17. Did you receive compensation? Yes (1) no (0) still waiting (2)

18. Is there anything else you would like to add about what we have talked about?

[Now ask for the next previous attack and repeat data questions, and then for the attack before that, until all attacks have been registered and/or interviewee loses interest. If no more, note here the total number recorded _____]

Appendix III

Written questionnaire to quantify public opinion and knowledge

(Please fill out this information when starting an interview)

Name of interviewer: _____

Date: _____ Time: _____

Community: _____ Gender (circle): Male Female

[#: _____]

Hello,

I'm _____, student at the University I work with a British association for a study on the life of people in the area and their interactions with and attitudes towards wildlife. Your participation is voluntary and you do not need to tell us your name.

1. For how long have you lived in this community? (specify years and/or months) _____

2. How often do you go to places with wild animals? _____

(if no direct answer, use the following to prompt the respondent; circle the appropriate answer)

Almost daily At least once a week Once a month Seldom Never

3. What do you usually do there?

Sheep/cattle herding hunting forestry fishing berry/mushroom picking
tending crops making hay excursions other (specify) _____

4. What wild animals are found in this area? (do not read out options to the respondent; as they answer circle as appropriate)

bear wolf wild cat otter red deer roe deer
fox wild boar jackal lynx beaver other (specify) _____

5. In this area have you ever seen any of the following animals, or their tracks/signs:

| | Never | Occasionally | Frequently |
|-----------|-------|--------------|------------|
| bear | 1 | 2 | 3 |
| lynx | 1 | 2 | 3 |
| wild boar | 1 | 2 | 3 |
| jackal | 1 | 2 | 3 |
| wolf | 1 | 2 | 3 |

| 6. The fact that the following animals exist in this area is, for you... | very bad | bad | neither bad nor good | good | very good | There aren't any in this area |
|--|----------|-----|----------------------|------|-----------|-------------------------------|
| bear | -2 | -1 | 0 | 1 | 2 | 9 |
| lynx | -2 | -1 | 0 | 1 | 2 | 9 |
| wild boar | -2 | -1 | 0 | 1 | 2 | 9 |
| jackal | -2 | -1 | 0 | 1 | 2 | 9 |
| wolf | -2 | -1 | 0 | 1 | 2 | 9 |

(if all wild animals are present in their area proceed to question 8; if they state that any of the wild animals are not currently present, ask question 7)

| 7. If any of the animals not currently found in this area were to appear, this would be... | very bad | bad | neither bad nor good | good | very good |
|--|----------|-----|----------------------|------|-----------|
| bear | -2 | -1 | 0 | 1 | 2 |
| lynx | -2 | -1 | 0 | 1 | 2 |
| wild boar | -2 | -1 | 0 | 1 | 2 |
| jackal | -2 | -1 | 0 | 1 | 2 |
| wolf | -2 | -1 | 0 | 1 | 2 |

| 8. Which answer best describes your attitude/opinion towards these animals? | very bad | bad | neither bad nor good | good | very good |
|---|----------|-----|----------------------|------|-----------|
| bears | -2 | -1 | 0 | 1 | 2 |
| lynx | -2 | -1 | 0 | 1 | 2 |
| wild boars | -2 | -1 | 0 | 1 | 2 |
| jackal | -2 | -1 | 0 | 1 | 2 |
| wolves | -2 | -1 | 0 | 1 | 2 |

9. To what extent do you agree or disagree with the following statement:

| I would be afraid to go to places with... | strongly disagree | disagree | neither disagree nor agree | agree | strongly agree |
|---|-------------------|----------|----------------------------|-------|----------------|
| bears | -2 | -1 | 0 | 1 | 2 |
| lynx | -2 | -1 | 0 | 1 | 2 |
| wild boars | -2 | -1 | 0 | 1 | 2 |
| jackal | -2 | -1 | 0 | 1 | 2 |
| wolves | -2 | -1 | 0 | 1 | 2 |

10. To what extent do you agree or disagree with the following statement:

| A lot of animals are killed and eaten by... | strongly disagree | disagree | neither disagree nor agree | agree | strongly agree |
|---|-------------------|----------|----------------------------|-------|----------------|
| bears | -2 | -1 | 0 | 1 | 2 |
| lynx | -2 | -1 | 0 | 1 | 2 |
| jackal | -2 | -1 | 0 | 1 | 2 |
| wolves | -2 | -1 | 0 | 1 | 2 |

11. a) Over the past ten years have the numbers of these animals changed in this area?

| | Decreased greatly | Decreased somewhat | Remained the same | Increased somewhat | Increased greatly | Don't know |
|-------------------|-------------------|--------------------|-------------------|--------------------|-------------------|------------|
| bear | -2 | -1 | 0 | 1 | 2 | 98 |
| lynx | -2 | -1 | 0 | 1 | 2 | 98 |
| wild boars | -2 | -1 | 0 | 1 | 2 | 98 |
| jackal | -2 | -1 | 0 | 1 | 2 | 98 |
| wolves | -2 | -1 | 0 | 1 | 2 | 98 |

b) Why do you think those changes happened? _____

12. a) How would you like the numbers of these animals to change in this area over the next ten years?

| | Decrease greatly | Decrease somewhat | Remain the same | Increase somewhat | Increase greatly | Don't know |
|-------------------|------------------|-------------------|-----------------|-------------------|------------------|------------|
| bear | -2 | -1 | 0 | 1 | 2 | 98 |
| lynx | -2 | -1 | 0 | 1 | 2 | 98 |
| wild boars | -2 | -1 | 0 | 1 | 2 | 98 |
| jackal | -2 | -1 | 0 | 1 | 2 | 98 |
| wolves | -2 | -1 | 0 | 1 | 2 | 98 |

b) Why do you want these changes to happen? _____

| To what extent do you agree or disagree with the following statements: | strongly disagree | disagree | neither disagree nor agree | agree | strongly agree | don't know |
|--|-------------------|---------------|----------------------------|------------|-----------------|--------------|
| 13. There are benefits to living in an area with large carnivores | -2 | -1 | 0 | 1 | 2 | 98 |
| 14. Damages are an accepted fact of life when coexisting with large carnivores | -2 | -1 | 0 | 1 | 2 | 98 |
| 15. Compensation paid for large carnivore damage is adequate and makes up for losses | -2 | -1 | 0 | 1 | 2 | 98 |
| 16. The procedure for obtaining compensation is clear and easy | -2 | -1 | 0 | 1 | 2 | 98 |
| 17. Which of the following animals do you think are most likely to cause you annoyance or damage? | | Highly Likely | Likely | Not likely | Highly unlikely | I don't know |
| bear | | 1 | 2 | 3 | 4 | 5 |
| lynx | | 1 | 2 | 3 | 4 | 5 |
| wild boar | | 1 | 2 | 3 | 4 | 5 |
| jackal | | 1 | 2 | 3 | 4 | 5 |
| wolf | | 1 | 2 | 3 | 4 | 5 |
| 18. Have you or anyone close to you ever experienced damage caused by.... | | | Yes | No | No answer | |
| bear | | | 1 | 2 | 99 | |
| lynx | | | 1 | 2 | 99 | |
| wild boar | | | 1 | 2 | 99 | |
| jackal | | | 1 | 2 | 99 | |
| wolf | | | 1 | 2 | 99 | |

19. Who do you first go to in case of an attack or damage caused by wild animals?

20. If a wild animal causes damage, what measures should be taken? (tick the preferred option for each species)

| | bear | lynx | wild boar | jackal | wolf |
|-------------------------------------|------|------|-----------|--------|------|
| Leave alone and hope it moves on | | | | | |
| Frighten away | | | | | |
| Capture and relocate | | | | | |
| Shoot/kill | | | | | |
| Inform people how to prevent damage | | | | | |

21. What is the main food of wolves/bears? (circle the correct answer)

| | | | | | |
|-------------|------------------------|---------------------------------------|-----------------|---------|------------|
| Wolf | Fruits, berries, grass | Deer, wild boars & other wild species | Livestock/crops | Carrion | Don't know |
| Bear | Fruits, berries, grass | Deer, wild boars & other wild species | Livestock/crops | Carrion | Don't know |

22. In your region, what is the average litter size for bears? (circle the correct answer)

1-3 4-6 7-9 Don't know

23. Generally, wolf packs contain how many animals? (circle the correct answer)

1-5 6-9 10 or more Don't know

24. Is it true that bears hibernate during the winter in your region? (circle the correct answer)

Yes, but not continuously Yes, all winter No Don't know

25. The bear generally lives...: (circle the correct answer)

alone in pairs in family groups Don't know

26. Is it legal to hunt bears/wolves in Romania?

| | | | |
|---------------|-----|----|------------|
| Bears | Yes | No | Don't know |
| Wolves | Yes | No | Don't know |

27. How much (kg), on average, does a male wolf weigh?

1-25 26-50 51-75 More than 75 Don't know

28. On average, how much meat can a wolf eat in one sitting?

4-8kg 9-14kg 15-20kg Don't know

29. What time of year do cubs/pups appear: (circle as appropriate)

| | | | | |
|-------------------|-----------|------------|----------|------------|
| Bear cubs: | Jan-March | April-Jun | Jul-Sep | Don't know |
| Wolf cubs: | March-May | Jun-August | Sept-Oct | Don't know |

30. Please tell us where your knowledge of wild animals has come from. (Circle all that apply)

| | | | | | | |
|---------------------------|--------------------|--------------------------|-------------------------|-------------------|------------|-----------|
| newspapers / magazines | books/ leaflets | fairy tales / legends | hunters | radio | television | internet |
| school | family | farmers / herders | protected area staff | own experience | | Foresters |

other (specify): _____

31. Are you interested in learning more about wild animals? (Circle the appropriate answer)

1. Yes 2. Partly 3. no 98. Don't know / no answer

32. In what form would you like to obtain information?

| | | | | |
|------------------|----------|------------|---------------|---------------------------|
| television/radio | internet | excursions | from hunters | from protected area staff |
| from foresters | books | leaflets | presentations | newspapers / magazines |

other (specify): _____

33. How old are you? _____

34. What is your occupation? (please circle all that apply: underline their primary occupation):

| | | | | | |
|-------------------------|---------|------------------------------|------------------------|-----------|---------|
| livestock owner | herder | protected area staff | forester | police | hunter |
| tourism industry | teacher | student | High school student | housewife | retired |
| currently unemployed | driver | fruit grower / wine maker | cereal farmer | | |

other (specify): _____

35. What is the approximate total monthly income for your household? (Tick the appropriate box)

☐ RON0-500 ☐ RON501-1000 ☐ RON1001-2000 ☐ RON2001-3000

☐ RON3001-4000 ☐ RON4001-5000 ☐ RON5000+

36. What proportion of your household income comes from agriculture (including crops, livestock and bee-keeping)? (Tick the appropriate box)

☐ Zero ☐ A quarter ☐ Half ☐ Three quarters ☐ 100%

37. What level of education have you completed?

1. Primary 2. Secondary 3. High school 4. University 5. Postgraduate

Thank you very much!

