

LIFE CONNECT CARPATHIANS



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

Action A5

**An initial assessment of damage prevention
measures**

**Amended Deliverable: A report on the
assessment and recommendation on the
efficiency and effectiveness of implementing
new damage-prevention methods**

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

**An assessment of Human-Wildlife Conflict in
2016, in the LIFE Connect Carpathians Project
area**

April 2017

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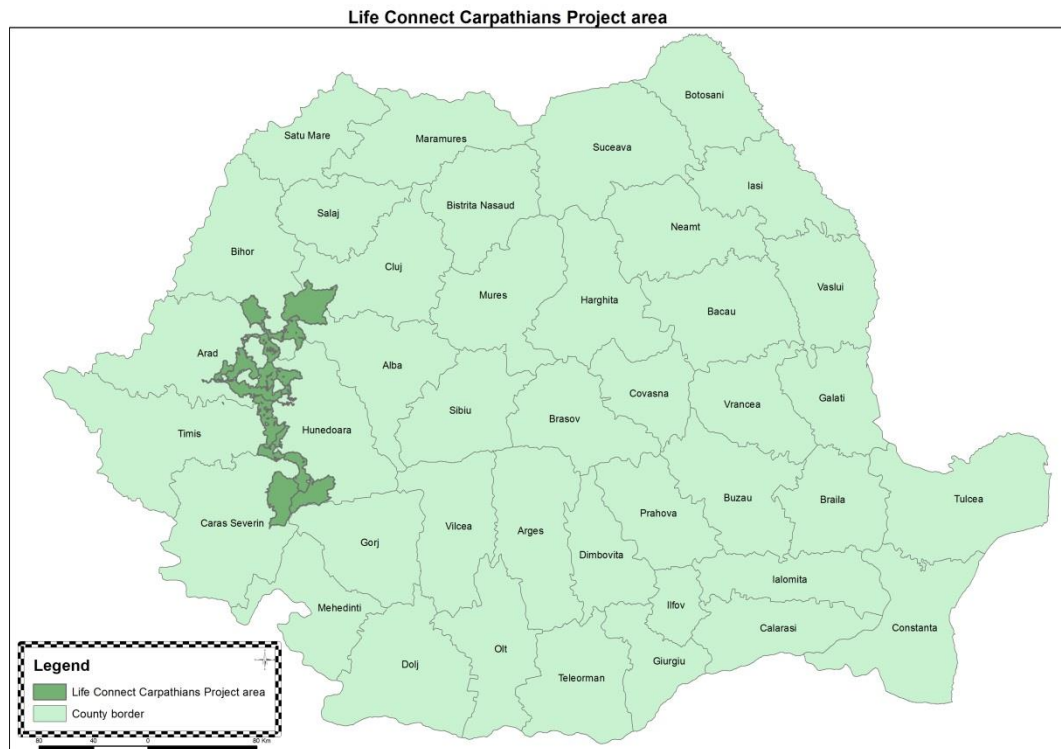
Gareth Goldthorpe & Radu Popa, April 2017-04-19

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Background

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.

Objectives

The work presented in this report focuses on HWC data collected from the project site as a follow-up to the baseline survey carried out in 2015¹. As such, the key objectives of the study were to:

- Add to data gathered during the baseline survey
- Continue developing positive relations with farmers

Method

Between 25th October 2016 and the 8th of February 2017, households interviewed during the 2015 human-wildlife conflict (HWC) survey were revisited for follow-up interviews. In addition to the original interviewees, households visited during a separate survey, centred on the Natura 2000 Zarandul De Est Site (see [Appendix I](#)) were also interviewed. A total of 98 households took part in this second survey, of which 78 had also been interviewed during the first survey (table 1).

	1st Survey Total	1st Survey Only	2nd Survey Total	2nd Survey Only	Both Surveys
Rusca Montană-Țarcu-Retezat	30	2	30	2	28
Drocea Codru Moma	13	0	15	2	13
Apuseni-Bihor	42	5	39	2	37
Zarandul De Est	0	0	14	14	0
Total	85	7	98	20	78

Table 1: Number of households interviewed, per site, for each survey and for both

Of the 98 households interviewed, 42 had been supplied with electric fences by the project and all of these reported that they had had no further wildlife-caused damage since (this is not to say their crop/livestock were not attacked, merely that any attack was unsuccessful) and, therefore, no HWC data to provide. This left a total of 45 HWC records for analysis, all of which reported only one incidence of conflict with no households reporting multiple conflict events. Whether this reflects reality or an outcome of the survey methodology needs to be determined.

¹ 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

Results

Of the 46 that reported on HWC in 2016, 36 (78%) of them reported only attacks on livestock only, seven (15%) on attacks only on arable crops and one (2%) on both. No households reported any wildlife-caused damage on fruit/nut trees or bee-hives.

Attacks on Livestock

Characteristics of attacks

Most attacks (74%) occurred in August, September or October (12, 12 & 9 attacks respectively), particularly between the hours of 17:00 & 18:00 (Figure 1).

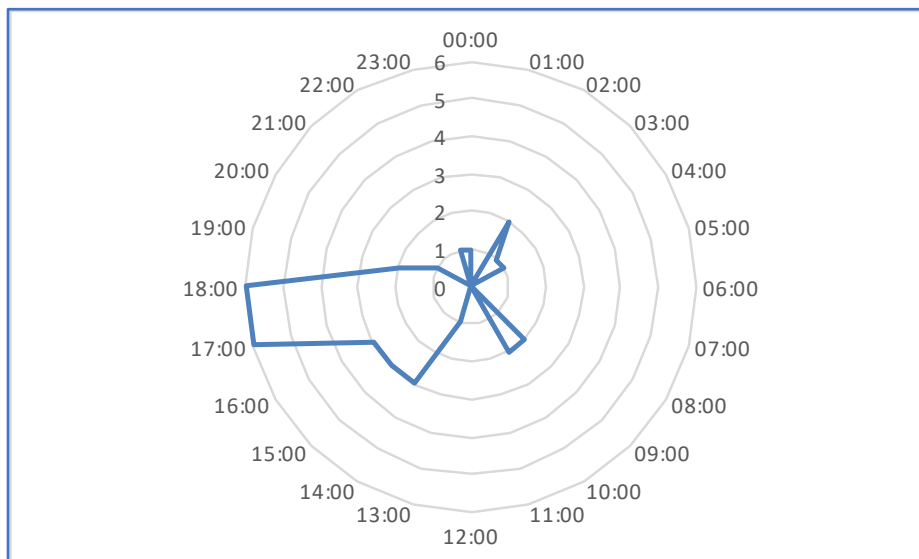


Figure 1: Distribution of attacks on livestock over the day (24 hours)

Almost all attacks were within one kilometre of the forest and the largest proportion of these were within 500m (Fig. 2). The average distance was 434m (300m median; range is 20-2,000m).

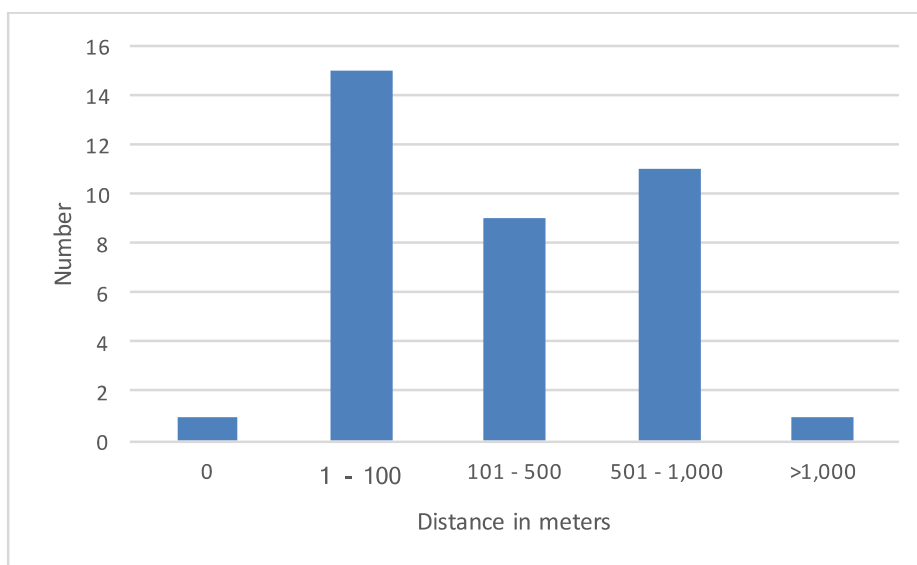


Figure 2: Distance to nearest forest edge from HWC event

In most cases 21 (61%) livestock were grazing immediately prior to the attack. However, just before seven (21%) of the attacks, the sheep were sleeping at the fold and in three (9%) cases, they were moving between the pastures and the fold (Fig. 3).

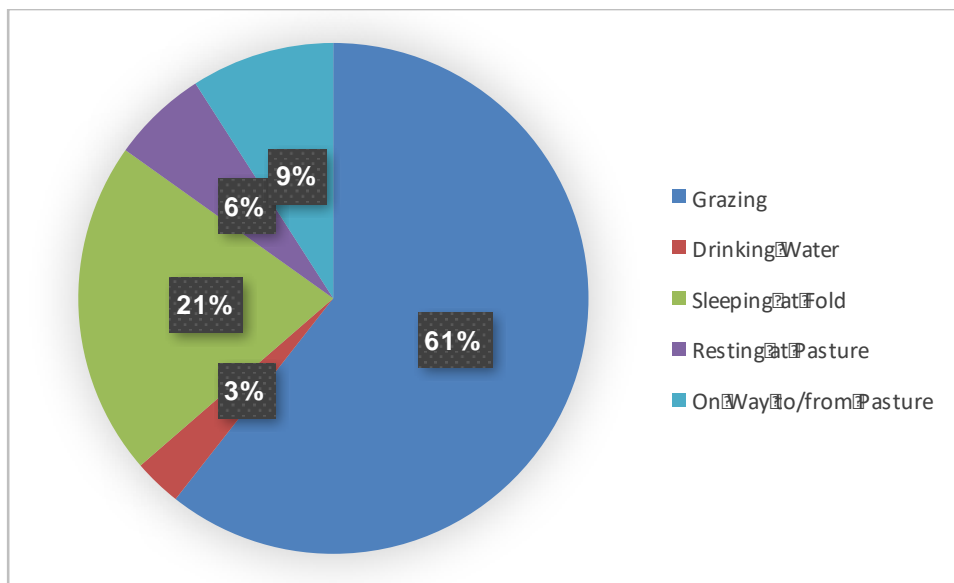


Figure 3: Activity of livestock immediately prior to HWC event

Wildlife species involved in attacks

In terms of which wild species were involved in attacks on livestock, 30 (85%) events were blamed on wolves whilst only 5 (13%) were attributed to bears, one (3%) on jackals and none on dogs. Similarly, in 33 (89%) cases, the livestock attacked was sheep with only four (11%) reports of goats attacked and none of cows. There was one report of a donkey being attacked (Figure 4 a & b).

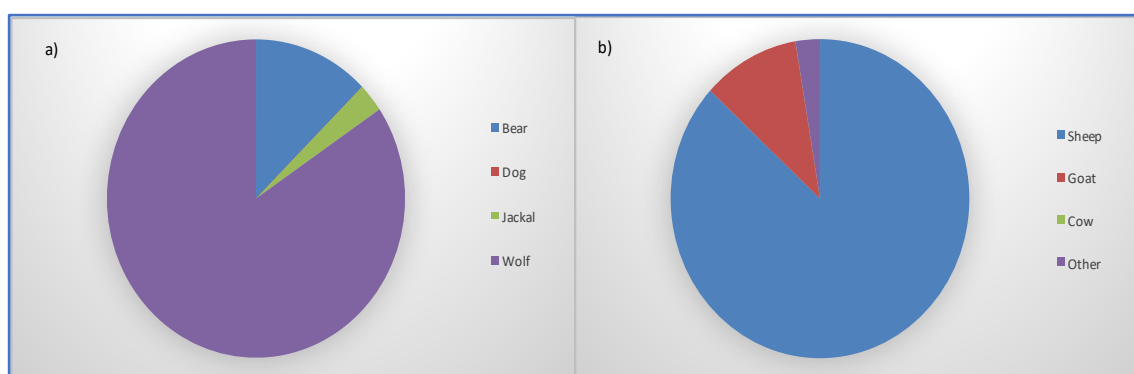


Figure 4: a) Species involved in HWC events; b) Livestock-type attacked

The average (mean) number of wolves recorded was two (min = 1; max = 5) whilst all bear records were of a solitary animal. The single record of jackal was of a pack of six animals.

Severity of attacks

Of the attacks on sheep, 16 (46%) resulted in the death of livestock and seven (20%) in their injury (in two cases, the interviewee reported that some sheep were killed and others injured during an attack). In 12 (34%) of attacks, the livestock escaped unharmed. Whilst, then, most attacks (66%) resulted in the death or injury of stock, 36% of reported attacks were unsuccessful with no sheep being killed or injured (Figure 3).

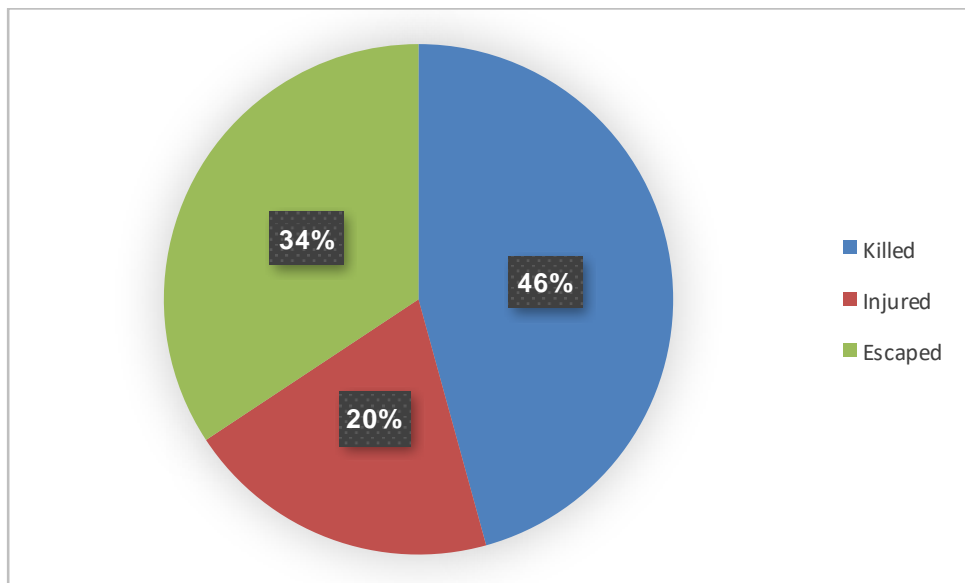


Figure 5: Distribution of outcomes resulting from wolf attacks on sheep (n=33)

Livestock Protection

Dogs were present for 28 (87.5%) of the attacks and in 16 of these, their response to the predator was to *bark and chase* (50%), only slightly more often than the 12 (38%) attacks to which they responded with barking only.

Looking more closely at the records pertaining to attacks on sheep, where dogs were present and there had been no death or injury to the stock (n=15), the response of the dogs in 13 cases (81%) had been to chase the predator(s) away from the flock. Where the dogs had only barked at the predators, the most likely outcome (83%) was the death or injury of one or more members of the flock (Figure 6).

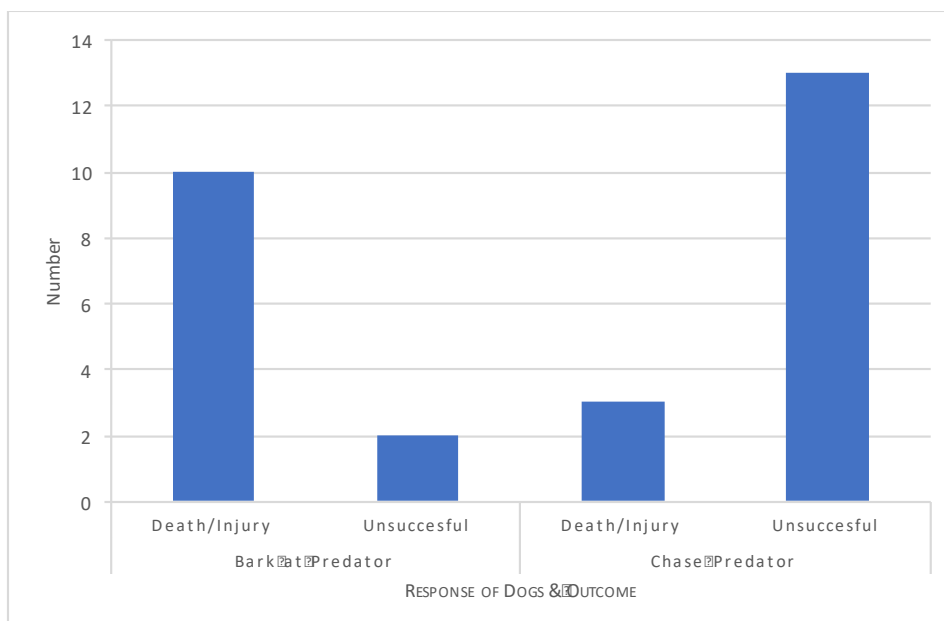


Figure 6: Results of wolf attacks on sheep depending on whether the response of guarding dogs was to bark or to chase predators

Although there are comparatively few cases (four, or 12.5%) where dogs were not present at the time of the HWC event, all resulted in the death or injury of sheep.

Of those that responded to the question of whether, or not, there was a person present during an attack (n = 37), 36 (97%) responded positively; the typical response to the predator was almost equally divided between shouting (17, or 49%) or chasing and shouting (18, or 51%) at the predator.

The affect that these responses had on the outcome of the attack is less clear than that found with dogs. Thirty-one households provided data both on the presence/absence of people during an attack as well as on the outcome of that attack. Of these, 10 (32%) reported an unsuccessful attack (i.e. no death or injury inflicted on livestock), seven (70%) of which had responded to the predator by shouting and chasing the predator Fig. 7). However, either response was more likely to still result in the death or injury of livestock (74%).

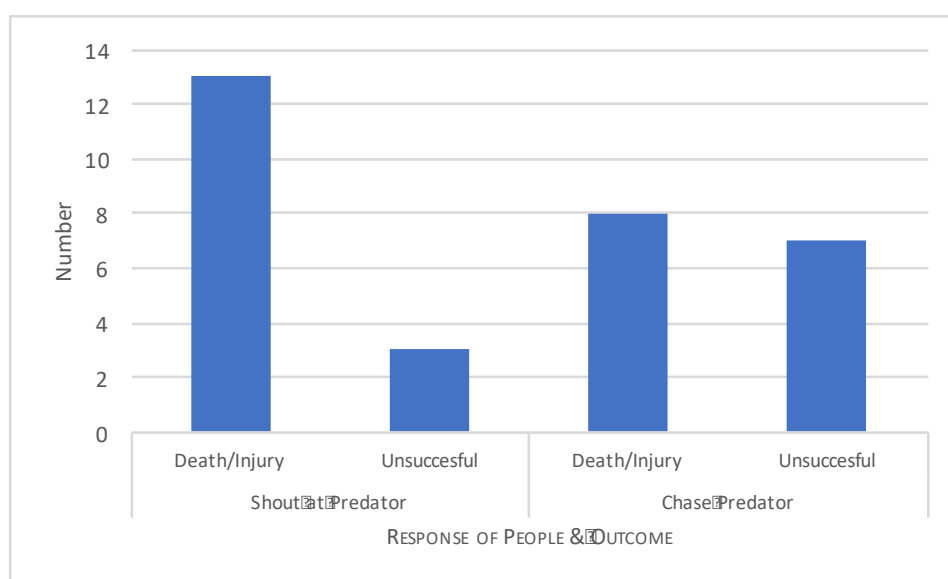


Figure 7: Results of wolf attacks on sheep depending on whether the response of people had been to shout at or to chase predators

Only two (6%) livestock-owners reported the conflict event to local authorities and neither had received compensation for their damages. Of those that didn't report, the most cited reason was that there was either little or no damage (75%), or that there was a lack of information about either who to report to (8%) or that there was any compensation available at all (6%).

Attacks on crops

There were only eight reports of attacks on crops, all carried out by wild boar and all occurring at night, mostly in August or September. In most cases, the crop attacked was more than 500m from the nearest forest edge and the average distance was 823m (median = 850m). Although both maize and potato crops were attacked, damage was limited to potato crops, with an average of 0.05ha lost, and only two households reporting a loss. The other six (75%) respondents had all been provided with electric fences and reported no damages.

Discussion

Frequency of attacks

When considering the results of the 2016 HWC survey, the most notable finding is that there were apparently no households that experienced multiple attacks. During the baseline survey carried out in 2015, when households were asked how many attacks by wild animals they experienced in 2014, the average number of attacks per household was 15. There seems, then, to be a huge disparity between these results which is unlikely to be explained by either a decline in the numbers of wild animals nor a significant increase in the protection afforded to livestock or crops. The most likely explanation, then, lies in the way in which data was collected whereby visits occurred only between October 2016 and February 2017 (five months) and each household was surveyed only once. If annual monitoring data is to be collected, a more systematic approach should be applied or, if resources for this are not available, the period of monitoring can be reduced to every two or three years.

Responses of dogs relating to outcomes on sheep

It was clear from the baseline survey that livestock guarding dogs are widely used by households in the Carpathians and the response of these dogs to predators (primarily wolves) does seem to impact the outcome of an attack. Whilst sample sizes are small, there is some initial suggestion that an attack, by wolves on sheep, is less likely to result in the death or injury of the sheep if the dogs actively chase the predators from the flock. However, this does assume that an attack that results in dead and/or injured sheep means a failed attempt by the dogs to protect the flock whereas it could be argued that, with no dogs at all, the level of death and injury may have been higher. Although there are comparatively few cases (four, or 12.5%) where dogs were not present at the time of the HWC event, all resulted in the death or injury of sheep. Interestingly, one of the goat farmers, who reported an attack that resulted in one death and 15 injured animals, left his stock to graze freely with neither dogs or shepherds.

Timing of attacks

Like the 2015 HWC survey, most attacks involved wolves attacking sheep and wild boar damaging crops and, in the former, most attacks occurred during the summer months (April-September), when, typically, households that practice transhumance livestock farming move their livestock to higher-altitude pastures.

Whilst there seems to have been a slight shift in the time of day where wolves are likely to attack (data collected during the 2015 baseline survey indicated that most wolf attacks occurred between 14:00 & 17:00, compared to the current survey which shows most wolf attacks occurring between 17:00 & 18:00) the attacks are still occurring within 500m of the forest edge with the sheep being more vulnerable whilst at the pasture. The advice here would be to keep sheep away from forest patches and to be extra vigilant towards the end of the day.

Wolves still tend to attack in packs of two whereas the average number of boar recorded has dropped from 14 to four. How this related to general population demographics for wild boar in the area would be an interesting line of inquiry. Also, differing from the previous year's results is that most damage committed by boar was to potato crops, not maize, though this may be a direct result of the distribution of electric fences to some of the farms.

Improving monitoring

To improve the impact of HWC monitoring a more systematic approach can be adopted. In doing so, the first question to ask will be “what is the objective of the monitoring?” and, in most cases, three clear objectives can be identified:

1. To build on HWC baseline data for improved understanding
2. To monitor trends in HWC; frequencies and severity
3. To monitor economic impact on households

Ideally, households would report HWC events to the team so they can be followed-up on. Team contact details are provided to those involved in trials and are also included in the information distributed to households. However, experience elsewhere suggests that this may not be the most reliable approach with most people, for various reasons, consistently failing to report actual HWC events; even when active follow-up is evidenced. As such, relying solely on the method will likely not generate enough data for an effective monitoring programme. To this end, a pro-active approach can be taken, whereby households are visited regularly, regardless of actual attacks in something more akin to patrolling an area. Details of how this might be carried out are provided in a separate document.

Appendix I: A Summary of Human-Wildlife Conflict in Zarandul De Est Site

Background

The Zarandul De Est Natura 2000 site comprises almost entirely of settlements, farmland or land in the direct service of livestock breeding. It is also rich in wildlife and their habitats and, as such, may be particularly prone to human-wildlife conflicts. This is particularly relevant where large carnivores, such as wolf and bear, are concerned as they have not been resident in significant numbers in the area for several years. The need to assess the dynamics of human-wildlife conflict here is high and yet, because of the relative scarcity of large carnivores in the area, the approach taken has differed, with a focus on building relations within the community and avoiding direct reference to carnivores. Because of the sensitive nature of the work, the semi-structured interviews used elsewhere within the project area² were deemed too inflammatory for use here and, instead, an unstructured interview approach was adopted.

Nevertheless, the underlying motivation of the survey remained the same, with areas or inquiry being:

- Where are the key areas of human-wildlife conflict?
- What types of conflict are typical?
- How severe, both in terms of probability and number, are the conflict events?

In addition, the project sought to develop a risk assessment for the area based on several criteria, including; probability, economic impact, emotional impact and perceived impact on personal safety. By answering these questions, the project will be able to mitigate the conflicts, reducing its' impacts and reversing any negative attitudes of the local population towards wildlife, especially large carnivores.

Towards that end, the main objectives of the evaluation were to:

- Obtain a general level of understanding of the conflict between people and carnivores
- Build positive relationships with farmers/breeders so that their knowledge can improve
- Contribute to project aims such as supporting biodiversity conservation in the Carpathians and identifying management plan objectives.

Methodology

A two-stage approach was taken to data collection:

1. Collation of 2015/16 official wildlife damage reports from Town Mayors and Game Management Unit representatives within the Zarandul De Est Natura 2000 site
2. Unstructured interviews with farmers, shepherds and beekeepers in the area

² 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

Stage 1

To collect official damage reports, trips were made to all administrative units and hunting managers within the site, or in its immediate vicinity, and copies of HWC applications requested. From these, data on the complainant, their location, the number of livestock/area of crops damaged, were extracted.

Stage 2

The survey was conducted during visits to farmers and bee-keeper's municipalities (Obârșia, Roșia Noua, Almășel, Troaș, Buceavă - Șoimuș), by a team of two rangers; one to carry out the interview and another to fill in the data sheets. Since it was estimated that these groups largely overlap, it has developed a single scorecard for all forms of agriculture.

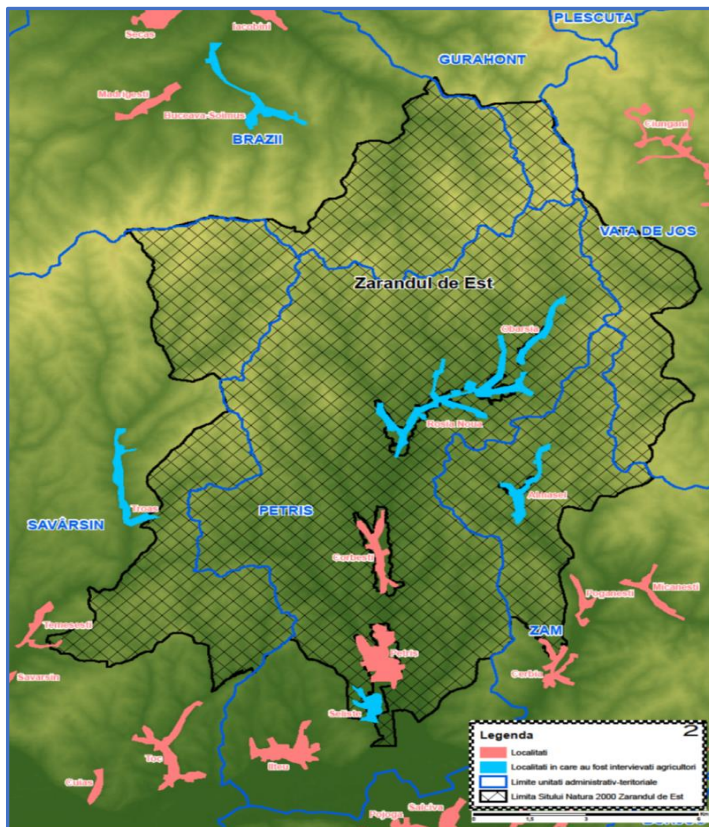


Figure 1: Areas where unstructured interviews were conducted

Through this survey, we sought to answer the following questions:

- What is the nature of agriculture within the site?
- What is the nature of HWC within the site?
- What are the impacts of HWC on the local population?
- What husbandry and protection methods are currently used to address HWC?

Findings

Agriculture

Almost all farmers in the study site use multiple forms of agriculture, having both livestock and crops. The main livestock is sheep and goats with around a quarter having bee hives. The majority (58%) practices subsistence farming whilst 39% produce enough to sell a small portion of their product.

Human-Wildlife Conflict

Official records suggest that wild boar was the main cause of crop damage in both 2015 and 2016 and that the villages of Corbești, Petriș and Ilteu received the largest proportion of the damage in 2015 and Roșia Noua & Petriș in 2016. The most affected crop, in both years, was maize (no damage reported to potato crops in 2016). However, the records show a threefold decrease in reported damage in 2016.

Again, according to official records, depredation on livestock by wolves (there were very few accounts of bears attacking sheep) was relatively rare in both years, with just two cases reported over the 2015-16 period. However, during the 2016 survey, interviews uncovered details of five wolf attacks during that year and it may reasonably be assumed that similar unreported attacks would have happened in the previous year. Reasons given to the survey for not reporting such conflict events included not knowing that compensation was available or how to correctly make a report and that the damage incurred was too small to report.

Three of the municipalities (Săvârșin, Brazii, Zam) approached by the survey did not provide any records, stating either that those affected had not met the legislative criteria for compensation or that they had only verbally communicated their complaints. However, there is some evidence, collected by the project, to suggest that this may not be the case in at least some instances. Generally, it appears that, of all those that correctly submitted their complaints, none were resolved and, therefore, compensation was not awarded.

Crop/livestock protection measures in Eastern Zarand site:

Generally, the level of protection from wild animals afforded to crops and livestock is poor; where there is fencing around crops and apiaries (many sites have none) it is typically a simple wooden fence. Livestock Guarding Dogs are used but are typically not well-suited, either in terms of their breed or their numbers, whilst cattle tend to be left unattended at the pastures during the day.

Solutions and measures to reduce human-wildlife conflict

Having established a firm basis for understanding the HWC issue in the Zarandul De Est area, steps to address and mitigate it have begun. Primarily, this involves Improving community awareness of husbandry/crop protection measures and informing farmers about the compensation process.