Carnivores and humans

Can they peacefully coexist in Romania?

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MILVUS group

Royal Netherlands Embassy

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Foreword

The present publication is the result of the project "Carnivores and humans – can they peacefully coexist in Romania?". It deals with a topic which in Romania until now hasn't received the attention it deserves. We recommend it to everyone who may – willingly or unwillingly – have to deal with carnivores: stockmen, farmers, conservationists and hikers. We hope that foresters and hunters will also find it useful to read.

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Carnivores and humans

The word 'carnivore' is generally used to denote animals feeding on meat. In order to survive, these animals need to prey on other animals and the moments of catching pray arouse strong – very often negative – emotions in the eyes of the human beholder. People rarely view the capacities and characteristics resulting from the adaptation to a predatory way of life with indifference. The features of big mammals: intelligence, skillfulness, power, speed and endurance – together with the capacity for cooperation – elicit mixed feelings towards them: fear, repugnance, respect or even awe. These feelings define the attitude of people towards carnivores even today, having long been estranged from nature. Since today it is humans who decide the fate of carnivores, their decisions also determine the future of these animals.

Carnivores and people look back to a long history of living together. Carnivores have always been present in the environment of humans. The ancestors of people and the carnivores of today very often populated the same areas. Most likely, there were minor or major clashes between them, but never so great as to threaten the survival of either men or carnivore. They mutually 'respected' and avoided each other, in the same way that people living in nature did not so long ago, and do to this day where they still survive.

Carnivores have always had an important place in the consciousness, culture and religious beliefs of different human groups. Several Northern ethnic groups of Europe, Asia and America thought of themselves as the descendants of an animal of some kind –very often bears or wolves – or they worshipped these animals as gods or sacred beings. Indigenous groups, perfectly adapting themselves to nature, have found a way of living together with carnivores in harmony. This harmony had lasted for several million years and has started to decline only after humans switched from a hunting and gathering way of life to farming and livestock breeding. Shepherding alone did not necessarily lead to a large-scale deterioration of the human-carnivore relationship, because shepherds, from early times on, had to face many unfavorable natural phenomena – like the existence of carnivores. The very fact that shepherding could develop as a way of life proves that the degree of losses was bearable. Shepherds had perceived losses as natural,

Photo: Kerekes István

they had lived with it, they had accepted and reckoned with it. As a consequence of a sedentary farming lifestyle the possibility to own land and gather wealth arose, which – in the long-term – led to the growth of the human population and, in the same time, to the destruction of the natural habitats of some animals. As a consequence of the growth of activities damaging nature (agriculture, water pollution, deforestation, overgrazing) and the growth of the human population, carnivores and their animals of prey were squeezed out of more and more of their natural habitats. At the same time, humans, valuing material goods, found it harder and harder to resign to livestock losses. In the dark period of the Middle Ages, carnivores (especially wolves) became more and more the symbols of evil, due to misconceptions, false beliefs and superstition. The "civilized" world had declared war on large carnivores.

As a consequence, during the XVIIIth – XXth centuries, these animals (bears, wolves, otters, lynxes) had practically disappeared in most states of Western Europe (the same has happened in North America), and their number has seriously declined in Central and Eastern Europe. During the last decades, due to growing consciousness about the importance of protecting nature and environment, there have been several attempts to study and protect large carnivores. These attempts have two aims: strengthening and protecting the existing populations, and, in some cases, the reintroduction of these animals to their former habitats. However, these initiatives are time-consuming and expensive, in many cases facing a strong opposition even today. In this sense, Romania is a relatively 'fortunate' case. Compared to other European states there still exists a considerable population of large carnivores (see the chapters on individual species for more information). Conserving the Romanian populations may be of key importance in the survival of these species, not only locally, but also as stock for potential later reintroduction in the rest of Europe.

A positive public opinion is essential for the effective conservation of large carnivores. In order to form a positive public opinion, misconceptions and superstitions about large carnivores should be eliminated and proper public information about these animals needs to be provided. The public at large should know about the real extent and causes of the damage and about effective and locally applicable prevention methods. The latter is especially important in those regions in which people and these animals live together.

As a first step, we aimed to obtain a picture about carnivore-human conflicts that took place in Transylvania during the last three years. That has been the goal of this project: 'Carnivores and people – Can We Peacefully Live Together in Romania?' The studied species are: the brown bear (Ursus arctos), the wolf (Canis lupus) and the otter (Lutra lutra). We use the term 'conflict' to describe any damage caused in livestock, farms, fields, orchards, fishponds and – in the case of brown bears – attacks on humans as well.

In the second part of 2004, during the period of our project, there was particularly much damage done. Due to the size of the study area and the larger number of conflicts than we had anticipated, the cases studied and analyzed by us represent only a small fraction of all the damage done. Despite this fact, we gathered much valuable information about the extent, reasons and circumstances of this type of damage, about animal behavior, about the way people who suffered losses relate to these animals, about the possible protection and prevention methods, and their applicability. The project has been the organic part of two greater concepts: one aims to aid the long-term survival of large carnivores (brown bears, lynxes, wolves), while the other focuses on otter conservation, with both also acknowledging human needs. We will make use of the data collected during the last few months in several ways: we will introduce locally appropriate and feasible damage prevention methods; we will use our knowledge in education and instruction, and in order to elaborate suggestions that will improve the damage compensation system.

The Wolf (Canis lupus)

Legend
- wolf damsges

The Wolf (Canis lupus)

Range: at one time, the wolf was present in the entire Northern hemisphere; it used to be the most widespread mainland mammal species. Due to their extraordinary adaptation ability, they have conquered all types of habitat. Due to human persecution, to the destruction of their habitats and the decrease of their animals of prey, they have been forced back to a small fraction of their former range: in the United States of America to 5%, in Canada and Mexico to 15%, in Europe and Asia to 25%. Currently the largest European populations can be found in Romania, Belarus, Ukraine, Spain, Macedonia and Bulgaria. West of Russia, 35% of the European wolf population lives in Romania.

Biological features: The wolf is the largest representative of the dog family (Canidae).

The wolf is the exclusive ancestor of the domestic dog that has devotedly served humans from ancient times. Wolves' color and size varies considerably, this great genetic diversity giving the base to dog breeding

In Europe, wolves are the third largest mainland predatory mammals after the polar bear and the brown bear. Their appearance is close to that of a German shepherd dog, but they have longer legs, a smaller body, and a shorter, bushier tail. Their chest is not as deep as is that of most dogs of a similar size.

Their fur is thick and varies from white through gray and reddish-brown to black. The color of European wolves gives the impression of gray – this is due to the mixing of hairs of different colors: white, black, yellowish brown and reddish. This is why the same animal may appear to us to have different shades of color, depending on the environment and on light conditions. The weight of an adult individual varies between 20 to 80 kilograms (45 to 175 pounds) for males and 15 to 55 kilograms (35 to 120 pounds) for females. In Romania, the average weight varies between 35 and 60 kilograms (75 to 130 pounds). The length of the body varies between 110 and 150 centimeters (44 to 60 inches), the length of the tail between 30 and 35 centimeters (12 to 14 inches). Their height is 50-70 centimeters (20 to 28 inches). The size of wolves relates to the size of their prey: the largest individuals live on the tundra of Asia and North America, feeding mostly on buffalo, musk ox, and moose.

Photo: Kerekes István

Wolves walk on their toes; their tracks

resembling to that of large bodied dogs (but due to the long fingers they are slightly oval in shape), with four toes and with claws. The characteristic of wolves is that on their hind legs the fifth toe, which can be found on several dog breeds, is missing.
Their dentition consists of 42 teeth. Their canines and fangs are well developed. A curiosity is that the volume of their brains can be 30% greater than those of the dogs of the same size.
Wolves living in the wild can live for up to 10 years, those in captivity for up to 16.
Way of life: Wolves are animals adapted to a predatory way of life. Since they usually bring down prey larger than themselves – something they couldn't do alone – they live in social units called packs. Cooperation between the members of the pack improves the chances of successful hunting, rising of the young, and defense of their territory. Within the pack the members communicate through different postures and howls. A strict hierarchy reigns in the pack, separately for males and females. A dominant (alpha) couple forms the centre of the pack, the others are their subordinates. The rest of the pack consists of the offspring of the dominant couple and, in some cases, of newcomers that have joined the family. Serious fights very rarely occur within the pack. Violence usually ends with the adoption of a subservient posture by the fight's loser. The offering of the unprotected neck inhibits the fellow pack members' aggression.
Normally, packs consist of 2-15 members. In Europe, pack formation is influenced by human interference, therefore larger packs are extremely rare. In Romania an average pack consists of 3-6 wolves. The size of the territory used by the pack depends on several factors: the size of the pack, the density and size of prey, geographic conditions, and human factors. While in arctic regions the area of a pack can consist of 2500 km^2, the smallest territory in Portugal is 16 km^2. The average territory in Europe is 100 to 500 km^2. Wolves constantly monitor their territory; they mark it and defend it from neighboring packs. They trot with an average of 8 km/h, and can run more than 50 km in a single night. They often kill other wolves straying into their territory. The latter are usually young wolves that have left their packs or ones that have been pushed out of their packs.
Their prey usually consists of large herbivores (ungulates). In Romania, their natural prey is red deer, roe deer, chamois, fallow deer, wild boar and small-bodied mammals (from hares to common voles). In some cases they feed on birds and even carrion, in the autumn they may eat ripe fruit. They often capture sheep because it is easy prey and is often accessible.
The pack chases its pray for many kilometers until its complete exhaustion. The way of life of wolves implies the ability to go long distances and feed whenever food is available. Their stomach has a great capacity to widen, so they can consume up to 10 kilograms (22 pounds) of meat at one time. Their digestion is very fast, four hours after they have eaten, they can eat anew. In order to survive, an adult wolf

needs 1 kg (2.2 pounds) of meat a day and 2-2,5 kg (4.5 – 5.5 pounds) in order to stay in good condition and to be able to breed.

During the hunt, wolves usually bring down superannuated, feeble, sick or young animals. Healthy deer, chamois, or fallow deer can usually escape, while wild boars and stags can often defend themselves.

Photo: Deák Attila

Reproduction: Normally, only the alpha pair reproduces in the pack. This happens in February – March. Their gestation is of 62-64 days, the same as that of dogs. The alpha female chooses the place for the litter – in the following period this area will be the centre of the pack's activity. The number of pups can reach 12 but it rarely exceeds 3-6. The whole pack takes part in the raising of the young. After the age of 3-4 weeks, the pups start consuming meat regurgitated by their mother and from this time on their growth accelerates. At the age of 7-8 months they are full members of the pack, but they only reach sexual maturity at the age of two years. Grown-up, dominant wolves will try to win the alpha (chief) position by the age of three years, or they leave their pack. In the life of wolves the first three years are the most critical. Only a small percentage of them will reach adulthood. From the above mentioned follows that wolves, in contrast to popular belief, are not prolific animals. Moreover, wolf populations regulate themselves anyway through needing a large territory, competition between packs, their breeding characteristics and territorial aggression.

Wolves and humans

The view that men are the descendants of wolves exists in the myths and religions of several primitive cultures. Every Turk's mother was a female wolf. The mother of Dsinghis Khan, the great leader of the Mongols was Boert-a-Tschao, a mythological wolf. There are several versions of the legend that describes Rome's establishment.

Both Kyros, the founder of the Persian Empire, and Dietrich, the old German hero, have lived among wolves. Within several North American Indian ethnic groups, like the Iroquois of the Great Lakes region, there have been 'wolf-tribes', Indians who had called themselves wolves and had made sacrifices to totems representing wolves. These Indians were convinced that their direct ancestors were wolves. In the same way, several ethnic groups had considered that wolves were superior beings, this is why they had asked for their protection, health and fertility. The Kantschal, a primitive people of Asia, being convinced that women cannot give life to two babies at one time, had believed that giving birth to twins could only be the work of wolves. Because women had to be, by necessity, faithful, and not even emotionally could they have been implicated with men other than their husbands, not even a god, the birth of twins was considered an accident and a wolf was considered as father. They made a wolf-figure out of grass that the mother had to keep along herself as 'husband'. The Indians along the Columbia River esteemed wolves as saviors: long ago, when humans still had had animal forms (deer-men, beaver-men and other hybrid beings), monsters had hunted them down and had tormented them. This was the time when the wolf had appeared on earth: it had killed the monsters, had defeated evil in all its forms and had taught many useful things to people. Then, out of the monsters' corpse-pieces, the wolf had created the Indian. In the same way, wolves escort and protect the gods of the German and Greek mythology: Wotan and Aphrodite. The image of the protective wolf exists in our time as well: the Sicilian peasants of the XIXth century had kept wolf-paws in their stables in order to hunt the bad spirits away. These beliefs have a base in reality: at the birth of man, wolves had already existed. Their presence has put its mark on the entire development of humanity. ' The first humans' learning processes were based on the observation of the wolves' behavior ' – claims the Russian biologist and wolf-specialist Dimitrij Ivanowitch Bibikow.

Physiologically, humans were not suited for hunting: they did not have claws or strong jaws, they weren't fast nor very strong. Prehistoric humans had to face the same problems as wolves, which, after all, have become specialized in the hunting of animals larger than themselves. Humans, just like wolves, had to learn hunting in groups. Humans' main help in hunting is still the dog, which is a descendant of the wolves.

' We have all the reasons to believe that the positive – or at least not negative – attitude towards wolves was typical in the case of most primitive societies, based on hunting, gathering or farming.' – states Eric Zimen.

As we have already mentioned in the previous chapter, the relationship between man and wolf had begun to deteriorate only after humans have switched from the

[1] - After: Wolfgang Schroeder (1994) – Le mythe du loup, Le loup: Entre le mythe et la réalité, Revue Panda no.1/94

hunting-gathering way of life to farming and livestock breeding. The first human-wolf conflicts that we know about have happened in 5000 B.C., in the early farming communities of South-Western Asia.

The oldest marked evidence about humans' negative attitude towards wolves is in the Old Testimony, in which the princes of Jerusalem, who must have been immoral thieves and despots, are compared to thieving wolves. Jesus had also used the example of wolves clad in lambs' furs when talking about false prophets. The systematic and organized extermination of wolves starts in the Middle Ages, when Charlemagne (742-814) orders his knights to fight wolves and pagans. By this time, the former wolf-brother and humans' hunting-partner had become the nobles' hunting competitor and the thief of the peasants' livestock. In tales and legends, the wolf is the incarnated evil. Bruno Bettelheim, psychoanalyst and writer of the book ' Children need tales', states that in the tale of 'Red Riding Hood', the wolf is not just the symbol of male seduction but also the incarnation of all our antisocial and animal instincts. For others, wolves represent the animal form of the devil: Francis Bodin, inquisitor and witch-trial judge suggests that wolves are not even animals but magi and wizards that took wolf-shapes.

Nevertheless, the war for the extermination of wolves had reached its culmination well after the dark period of the Middle Ages, when the Enlightenment and Renaissance have had already become universal dogma. The wolf is not the incarnation of the devil anymore but a plain pest. Even so, this is enough to withdraw the right of existence from wolves. The first modern naturalists have backed the legitimacy of the extermination of 'the enemy of humanity and its development' with arguments –claims Friedrich von Tschudi in 'The fauna of the Alps', This work reflects the scientific knowledge of the time. According to this book, the wolves often descended to Bâle, Soleure, l'Argovie, Fribourg, Zurich and Schaffhouse during cold winters, tearing the inhabitants apart and killing the dogs on their chains. The writer was an enlightened intellectual.

Photo: Kerekes István

Eventually, the result of all this was that the wolf had disappeared from most of its former range. At the end of the XVIIIth century, wolves had died out in Britain, 100 hundred years after the last wolves were killed in Germany, Holland, Belgium and Denmark. In

the beginning of the XXth century, they have disappeared from France, Switzerland and from 48 states of the USA. Following World-War II, they were exterminated in many countries of Central Europe as well. Today, wolf population is slowly growing in several European states, and in some places there are attempts to reintroduce them. If they find suitable life conditions, wolves can even repopulate certain areas on their own.

It is obvious that wolves have indeed caused damage to humans. It is also understandable that the fear of shepherds and farmers is well-founded; the loss of even a few animals could easily mean falling into poverty and misery for them.

There are innumerable stories about wolves that eat humans; in Russian literature for example, about wolves chasing sledges through cold nights. There are also American stories about lone trappers and gold-diggers that have to fight with wolves.

Wolves are too scared to attack humans. There is not one wolf homicide story from the past centuries that has been proven to be true. It is possible that in the faraway past, accidents of this kind could have happened in special circumstances. We can observe that these stories always date from times of war and famine like the 30 years war (1616-1648) or times of political crises or epidemics. During times like these, there were so many dead that often there was no place left to bury them and wolves often ventured into localities, eating the unburied corpses. Very likely, the bodies of people frozen to death in the wild came to the same end. Naturally, wolves were blamed for the death of people of whom only clothes or remains were left.

Photo: Koros László

As a curiosity, we can mention that, during our researches, we have also found similar stories: for example, in the Valley of the Küküllő River, the inhabitants believe to know about a woman who was killed by wolves during a cold winter while she walked from one village to another. The same story is told in the villages of the Niraj Valley: people of different regions all believe that these cases have happened in their villages.

Wolves in Romania

According to estimates after World War II, there were 4000 to 5000 wolves in the forests of Romania. This number has later considerably decreased due to poaching. The post-war famine has lead to the growth of poaching for meat – the large number of guns remaining from the war also helped. In the absence of their natural prey, wolves had begun to seize more and more domestic animals. This way wolves received the attention of the government and, in the 50's, their organized extermination had begun. The state paid a premium for every specimen shot or pup killed. They were killed by all means: traps, poison, until –at the end of the 60's– wolf population fell to 1500 specimens. Another result of the poisoning campaign was that vultures had completely died out in Romania and the number of ravens has critically decreased. In the end, the communist regime has introduced the ban on arms, thus radically reducing the number of hunters. This way the population of animals of prey grew which has been beneficial for the rebounding of the wolf-population.
In 1991, the use of poison was banned by a ministerial order. In 1993, Romania has joined the Bern Agreement. This latter, along with Law no. 103/1996 regarding hunting (complemented by Law no. 654/2001) define the protection of wolves in Romania. According to these documents, wolves are a strictly protected species. Wolf hunting season is defined yearly by special decree (for example, in the 2003-2004 shooting season, wolves could only be hunted between September 12 and March 31, as stated in decree no. 668/2003). According to official data, there were 4144 wolves in Romania in 2004. In accordance with the governmental decree no. 87/2004, 555 wolves can be killed on the territory of Romania in the 2004-2005 hunting season.

Wolf damages in Transylvania
- cases studied by us -

Between August 2004 and January 2005, we gathered data about wolf-inflicted damage. We have used all means for this goal; the media as well as reports of the local population, shepherds, hunters and hikers. We wanted to obtain a realistic picture about all the factors and circumstances that made these damages possible. The persons we have interviewed had not remembered all details, and often did not even know the number of animals entrusted to them – this is particularly valid in the case of young lambs aged only several weeks. This is why, in many cases we did not write the precise date to the event, only a month or year – in these cases there are several events comprised. In the following pages, we will briefly present the cases studied by us.

The Cerghizel sheep-fold (Ungheni commune, Mureș County)

Date	Livestock	Dogs	Shepherds	Losses	Location
Aug.- Sept. 2004	842 sheep, 4 goats, 3 kids, 1 donkey	6 big, 4 small	2-3	1 sheep	150 meters from the sheep-fold, on the pasture
Aug. - Sept. 2004	842 sheep, 4 goats, 3 kids, 1 donkey	6 big, 4 small	2-3	1 sheep	In the forest

Possible cause:

1. immediacy of the woods
2. The sheep were not closed in the sheep-fold because its sides were weak – the shepherds were afraid that the animals might break out

The sheep-fold of Tirimia (Gheorghe Doja commune, Mureș County)

Date	Livestock	Dogs	Shepherds	Losses	Location
2004	320 sheep, 48-50 goats, 2 horses, 7 pigs and 2 cows	4 big, 2 small	2	1 goat	The wolves have pulled the goat out of the sheep-fold?
Oct. 2004	320 sheep, 48-50 goats, 2 horses, 7 pigs and 2 cows	4 big, 2 small	2	1 sheep	The wolves have pulled the animal out of the sheep-fold? – the carcass was found 150 m away, near the stream

Possible cause:

1. The sheep dogs were tied up (according to the shepherd, this was the cause).

Drojdii sheep-fold (Bereni commune, Mureș County)

Date	Livestock	Dogs	Shepherds	Losses	Location
June 21. 2003	?	6	4	1 foal	100 m above the sheep-fold, on the edge of the wood covering the hill's ridge

Possible cause:

1. The shepherd tied the mare to a tree on the edge of the forest, quite far from the

sheep-fold. In addition, it was known that there were two wolves regularly visiting the area – even their trail was known; and was quite close to the tree to which the horse was tied to.

* The family of the shepherd mentioned two other events. Some of these could not be verified, while the rest happened earlier than the past three years, thus they were irrelevant for our study (in November 2000 two wolves killed two sheep on the pasture that was on the side of the village).

Bahnea sheep-fold (Bahnea commune, Mureș County)

Date	Livestock	Dogs	Shepherds	Losses	Location
2003	400 sheep, 30 goats, 120 lambs, 1 horse, 1 donkey and 1 cow	10 big, 2 small	2-3	2 or 3 sheep	?
May – June 2004	400 sheep, 30 goats, 120 lambs, 1 horse, 1 donkey and 1 cow	10 big, 2 small	2-3	6 lambs	The lambs were in the sheep-fold (the frightened sheep coud have broken its sides).

Possible cause:
1. The sheep-fold is on a bushy area that is hard to supervise.
2. The shepherd believes that a dog once bitten by wolves will not try to confront them.

Lepindea sheep-fold (Bahnea commune, Mureș County)

Date	Livestock	Dogs	Shepherds	Losses	Location
Aug. 2004	400 sheep, 27 goats, 6 pigs	4 big, 2 small	2	2 sheep	The wolves have snatched the sheep away from the side of the sheep-fold. These were spending the night outside. Their carcasses were later found by the dogs 50 m further away, in the reeds of the river.

Possible cause:

1. The sheep have spent the night outside.
2. The dogs were tied up on the side of the flock that was opposite to the forest – the wolves came out from the woods and reached the flock from its unguarded side.

Idrifaia sheep-fold (Suplac commune, Mureș County)

Date	Livestock	Dogs	Shepherds	Losses	Location
Oct. 6. 2004, 2 am	400 sheep, 2 horses, 1 veal	4 big, 1 small	2	1 sheep	Outside, on the pasture, in the back of the sheep-fold

Possible cause:

1. According to the shepherd, the damage could have been prevented with more vigilence and preparation

Suplac sheep-fold (Suplac commune, Mureș County)

Date	Livestock	Dogs	Shepherds	Losses	Location
May 2004	750 sheep and goats, 2 horses, 11 pigs, 60 poultry	12 big	4-5	1 sheep 4 lambs	Near the sheep-fold, on the pasture
Sept. 2004	750 sheep and goats, 2 horses, 11 pigs, 60 poultry	12 big	4-5	1 sheep 4 lambs	Near the sheep-fold, on the pasture

Possible cause:

1. The dogs were not brave enough (they were scared to go close to the wolves).
2. The sheep were not locked in the sheep-fold for the night.
3. The dogs were tied up during the last attack.

Laslău Mare sheep-fold (Suplac commune, Mureș County)

Date	Livestock	Dogs	Shepherds	Losses	Location
Aug. 2-3 2004	350 sheep and some goats	4 big	2	1 sheep 1 kid goat	On the pasture

2004	350 sheep and some goats	4 big	2	1 sheep	On the pasture
2003	350 sheep and some goats?	4 big	2	1 donkey and its young	On the pasture, 1 km away from the sheep-fold

Possible cause:
1. The sheep were outside and spread wide during the night.
2. The shepherds and the dogs have all noticed the attack too late.

Laslău Mare sheep-fold (La Stejar pasture) (Suplac commune, Mureș County)

Date	Livestock	Dogs	Shepherds	Losses	Location
Oct.. 11. 2004	558 sheep and goats, 5 pigs, 1 horse, 1 foal	4 big 1 small	2	1 sheep	In the sheep-fold
July 2004	350 sheep and some goats	4 big	2	1 capră	In the sheep-fold
2003	?	4 big	4	2 sheep 1 lamb	?

Possible cause:
1. The dogs got lured away by the wolves

Vaidacuta sheep-fold (Suplac commune, Mureș County)

Date	Livestock	Dogs	Shepherds	Losses	Location
2004	200 sheep some pigs, cows and horses	4 big 2 small	2	15 sheep, lambs and ram	The animals were either by the side of the sheep-fold or they were pulled out of it

Possible cause:
1. The wolves had lured the dogs away.

Odrihei sheep-fold (Coroisânmartin commune, Mureș County)

Date	Livestock	Dogs	Shepherds	Losses	Location
2004 during winter	300 sheep, 30 goats, 3 cows, 1 horse, 3 donkeys, 1 mule	6 big 2 small	1 shepherd-help	10 sheep	On the pasture and in the sheep-fold

2004 spring	300 sheep, 30 goats, 3 cows, 1 horse, 3 donkeys, 1 mule	6 big 2 small	2	0 (3) sheep– all 3 were saved	On the pasture and in the sheep-fold
Oct. 2004	300 sheep, 30 goats, 3 cows, 1 horse, 3 donkeys, 1 mule	6 big 2 small	2	1(3) sheep- 2 sheep were saved	On the pasture and in the sheep-fold
Nov. 7 2004	300 sheep, 30 goats, 3 cows, 1 horse, 3 donkeys, 1 mule	6 big 2 small	2	1 (2) sheep- one sheep was saved	On the pasture and in the sheep-fold

Possible cause:

1. During winter the sheep were guarded by a partially deaf old man.
2. The attack was noticed too late.
3. The shepherd believes that the success of wolf-attacks depends only on the vigilence of the watcher.

Șoimuș sheep-fold (Coroisânmartin commune, Mureș County)

Date	Livestock	Dogs	Shepherds	Losses	Location
Easter-time, May, Oct. 2004	250 sheep, 25 goats, 1 horse	5 big (2 young)	2	0 (the sheep were eventually saved)	On the pasture and in the sheep-fold

Periș sheep-fold (Periș commune, Mureș County)

Date	Livestock	Dogs	Shepherds	Losses	Location
2004 April - May	287 sheep and goats, 4 cows, 1 mare, 1 horse, 1 pig, 8 piglets	2 big, 2 pups	5	1 goat 1 lamb	In the sheep-fold

2004 April - May	287 sheep and goats, 4 cows, 1 mare, 1 horse, 1 pig, 8 piglets	2 big, 2 pups	5	1 lamb	Beside the sheep-fold, when the sheep were sleeping outside
2004 April - May	287 sheep and goats, 4 cows, 1 mare, 1 horse, 1 pig, 8 piglets	2 big, 2 pups	5	1 lamb	Near the sheep-fold (in the evening, when the flock went drinking)

Possible cause:
1. The sheep-dogs were not adequate.

Gornești sheep-fold (Gornești commune, Mureș County)

Date	Livestock	Dogs	Shepherds	Losses	Location
Nov. 2003	?	?	?	2 goats 1 sheep	?
Sept. 2004	480 sheep and 70 goats, 2 horses 1 donkey	8 big, 4 small	4	1 sheep	On the pasture, near the riverside

Possible cause:
1. The sheep did not spend the night inside the sheepfold.
2. The first attack of the year always surprises the shepherds and the dogs.

Mura Mare sheep-fold (Gornești commune, Mureș County)

Date	Livestock	Dogs	Shepherds	Losses	Location
Oct. 2004	Around 400 sheep, 8 piglets	5 big (out of these 2-3 young ones)	2	34 sheep	Outside, on the pasture near the sheep-fold

Possible cause:
1. The sheep were not locked in for the night.
2. Due to the rain, the dogs were not attentive enough.

Fițcău sheep-fold (Aluniș commune, Mureș County)

Date	Livestock	Dogs	Shepherds	Losses	Location
2004 spring	400 sheep and goats	6 big, 2 small	7	2 veal? 1 kid?	On the pasture

2004 summer	400 sheep and goats, 40 cattle, 4 horses and 8 pigs	6 big, 2 small	7	2 sheep?	On the pasture, while drinking
Sept. 2004	400 sheep and goats	6 big, 2 small	3	1 sheep	On the pasture

Possible cause:
1. The sheep were not locked in for the night (before September).
2. The terrain is not easy to watch (hills, groves, bushes).
3. Late-night pasturing
4. Immediacy of the woods
5. The animals drink in a small forest next to the stream.

Sălard (Lunca Bradului commune, Mureș County)

Date	Livestock	Dogs	Shepherds	Losses	Location
Dec. 2001	0	2 big	2 persons, family	1 dog (malamut)	In the yard of the house

Possible cause:
1. The owner believes that the dog shouldn't have been tied up – it couldn't defend itself or run away.

Deda-Bistra sheep-fold (Deda commune, Mureș County)

Date	Livestock	Dogs	Shepherds	Losses	Location
2004 summer	400?	8 big	6	8 sheep	On the pasture called Păşunea Pleşei (the night attacks have happened in the sheep-fold)
Sept. 2004	400?	8 big?	?	4 sheep	The valley of the Bistra stream

Possible cause:
The dogs do not always notice wolves hiding in bushy and hilly pastures.

Poiana Țesnii – Piatra Galbenă (12 km from Băile Herculane, Caraș-Severin County)

Date	Livestock	Dogs	Shepherds	Losses	Location
2004	25 goats	2 big, 4 small	1	0 (the wolves were chased away)	On the pasture with trees

The sheep-fold of Podeni Vale (Podeni county, Caraș-Severin County)

Date	Livestock	Dogs	Shepherds	Losses	Location
Sept. 16 2004	70 sheep and 18 goats, 3 cows, 2 veals, 1 horse	2 big 2 small	1 woman	1 sheep	On the pasture, close to the sheep-fold

Possible cause:
1. The dogs are too afraid of wolves – one can hear this in their bark when the predators are around.

Sarafinești (Podeni, Caraș-Severin County)

Date	Livestock	Dogs	Shepherds	Losses	Location
March 2004	?	?	?	3 goats	?
May 2004	?	?	?	1 sheep 1 lamb	?
July 20. 2004	?	?	?	4 goats	On the pasture
Oct. 14. 2004	80 sheep, 10 goats, 1 cow, 4 oxen, 1veal, 1 horse	2 big(one aged 20)	Family, 6 people	16 sheep 1 ram	In a high-sided sheepfold (1,80 m)
2004	?	?	?	2 pigs	In the village

Possible cause:
1. The dogs were not adequate – they didn't even bark when the wolves were approaching.
2. The village is made up of houses that are far from each-other.
3. The sheep-fold was 1,80 m high, no one supposed that the wolves could get in.

Podeni sheep-fold (the pasture of Valea Camenii, Podeni commune, Caraș-Severin County)
1.

Date	Livestock	Dogs	Shepherds	Losses	Location
May 2004	15 sheep, 8 goats, 1 cow, 1 pig	5 big	2	1 sheep	On the pasture

Aug. 2004	15 sheep, 8 goats, 1 cow, 1 pig	5 big	2	2 sheep	On the pasture

* During June and July, the wolves had made several attempts on the flock – without success

Possible cause:
1. The wolves had lured the dogs away.
2. The shepherds were not vigilant enough, they were unprepared.
2.

Date	Livestock	Dogs	Shepherds	Losses	Location
End of May 2004	80 sheep, 2 oxen, 2 pigs and poultry	5 big	3	1 sheep	On the pasture, at the edge of the forest (10 m away from the shepherdl)
summer-autumn 2004	80 sheep, 2 oxen, 2 pigs and poultry	5 big	3	6-7 sheep	?

Possible cause:
1. Most probably, the shepherds were not attentive enough (a wolf snatched a sheep 10 m away from the shepherd).

The sheep-fold of Ip (Ip commune, Sălaj County)

Date	Livestock	Dogs	Shepherds	Losses	Location
Jan. 24 2004	1000 sheep and several goats, 10 cows, 20 horses	6 big, 3 small	2	2 sheep	On the pasture, 100 m away from the sheep-fold
April. 7 2004	1000 sheep and several goats, 10 cows, 20 horses	6 big, 3 small	2	1 goat 1 sheep 1 lamb	Outside on the pasture, not far from the sheep-fold
Aug. 15 2004	1000 sheep and several goats, 10 cows, 20 horses	6 big, 3 small	2	2 sheep	Outside on th pasture, not far from the sheep-fold
Oct. 26 2004	1000 sheep and several goats, 10 cows, 20 horses	6 big, 3 small	2	36 sheep	In the 4 km perimeter of the sheep-fold

Possible cause:
1.The sheep did not spend the night in the sheep-fold.
2. During the last attack the sheep were unattended.
3. The shepherd was not prepared for a wolf-attack (there were no wolves in the area before).

Săcel sheep-fold (Săcel commune, Maramureș County)

Date	Livestock	Dogs	Shepherds	Losses	Location
May 2004	250 sheep, 25 cows 2 horses	5 big	2 persons	2 sheep 4 lambs	On the pasture, close to the village
July 2004	250 sheep, 25 cows 2 horses	5 big	2 persons	2 sheep	On the mountain pasture
Autumn 2004	250 sheep, 25 cows 2 horses	5 big	2 persons	2 sheep 1 dog	On the pasture, close to the village

Possible cause:
1. The wolves had lured the dogs away.
2. The dogs noticed the wolves only after that these had already killed the sheep.

A farm 1 km away from Coșbuc commune (Coșbuc commune, Bistrița Năsăud County)

Date	Livestock	Dogs	Shepherds	Losses	Location
Nov. 8. 2004	24 sheep, 16 goats	3 adults 2 pups	1 owner (partially deaf)	18 sheep	In the sheep-fold, on the pasture, several kilometers away from the house

Possible cause:
1. The sheep were guarded by a partially deaf, old man.
2. The sheep-fold is 20 m away from the house, it cannot be easily looked after.
3. There were no problems with wolves before – people were unprepared.

După Deal (Ponor commune, Alba County)

Date	Livestock	Dogs	Shepherds	Losses	Location
Spring 2001	?	?	1	1 sheep	On the hillside pasture
Autumn 2003	-	1	1 person	1 dog	In the yard of Silviu Ciulea

Possible cause:

1. The details of the attack were incredible – we question the authenticity of the case.
2. The typical villages of Romania's Apuseni Mountains consist of houses that are quite far from each other; practically there is not a big difference between the pasture and the village's territory.

Tău Cornii (Roșia Montana commune, Alba County)

Date	Livestock	Dogs	Shepherds	Losses	Location
Summer 2003	300 sheeps	?	?	1-2 sheep/ damaged family	In the village, on the pastures found between the houses
Oct. 2003	?	?	?	1-2 sheep/ damaged family?	In the village, on the pastures found between the houses
Jan. 2004	?	?	?	? - since then, the villagers stopped keeping sheep	In the village, on the pastures found between the houses

Possible cause:

1. The sheep were unattended on the pasture, in the absence of shepherds or dogs.
2. The houses are far from each other. There are free, unclosed spaces between them. In addition, one part of the village has moved out because of the RMGC, so there is not much movement and activity around. Wolves had no problem at all in capturing the sheep.

Fișer sheep-fold (Gherghilău pasture, Rupea, Brașov County)

Date	Livestock	Dogs	Shepherds	Losses	Location
July 2004	More than 1000 sheep, 1 bull, several horses	9 big	3	5 sheep	In the sheep-fold and around it
Oct. 2004	More than 1000 sheep, 1 bull, several horses	9 big	3	10 sheep	In the sheep-fold and around it (one sheep was taken, further at the drinking - place)

Possible cause:

1. Although the sheep are closed in the sheep-fold every night, it can shelter at most ¼ of the flock.
2. There are many groves and bushes near the pasture – these give predators the possibility to hide

Bunești sheep-fold (Bunești commune, Brașov County)

Date	Livestock	Dogs	Shepherds	Losses	Location
spring - autumn 2004	1000 sheep, 15 goats, 10 cattle, 1 horse	9 big, 1 small	4-6	2 sheep, 2 lambs	Out of the 4 attacks, 2 have happened in the sheep-fold, 2 on the pasture

Possible cause:

1. During the attacks that took place at the sheep-fold, the shepherds were sleeping.
2. The wolves usually approach the flock from the bushes, the dogs cannot see them.
3. As we know from our experience, the flock often passes through forested territories. At these times several sheep gets left behind from shepherds and dogs. In addition, several of the sheep were limping – presenting an easy prey for carnivores.

Meșendorf sheep-fold (Bunești commune, Brașov County)

Date	Livestock	Dogs	Shepherds	Losses	Location
spring - autumn 2004	700 sheep, 12 cows, 10 horses, 20 pigs	4-5	3-5	4 sheep, 3 lambs	?

Possible cause:

1. Most attacks happened in rainy weather when the dogs seek shelter, leaving the sheep unattended.

Roadeș sheep-fold (Bunești commune, Brașov County)

Date	Livestock	Dogs	Shepherds	Losses	Location
February 20. 2004	800 sheep, 5 donkeys, 6 pigs	5 medium-sized	3	4 sheep 10 lambs	On the pasture, around the sheep-fold

Summer 2004	?	?	?	2 lambs	?

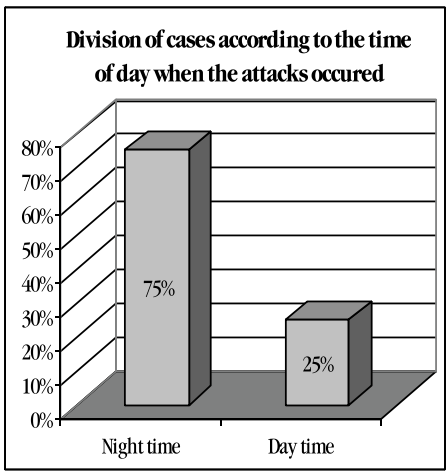
Possible cause:

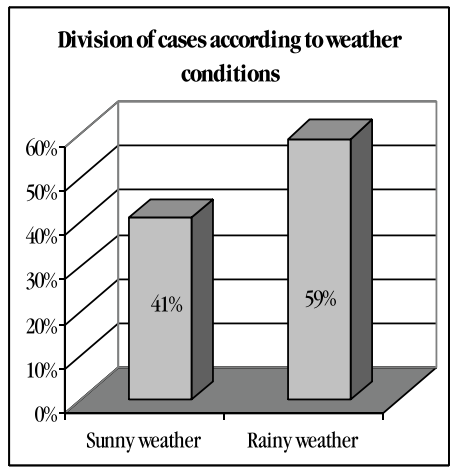
1. The shepherds did not heed the barking of the dogs.
2. The swelled river had separated the shepherds from the sheep and the dogs (the sheep were on the other side).

Some remarks on the studied cases

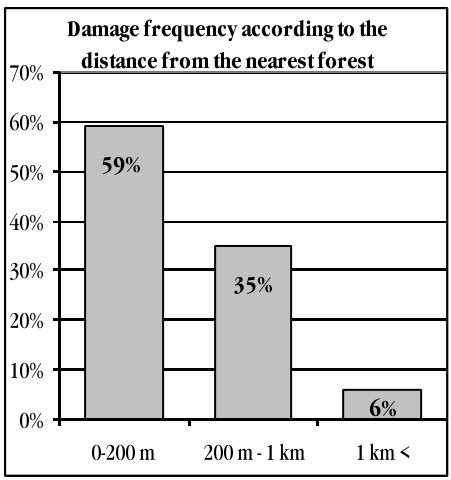
1. Attack circumstances:

In 71% of the cases we know the time of day when the attacks occured, and in 34% we know what the weather was like. Presented graphically:

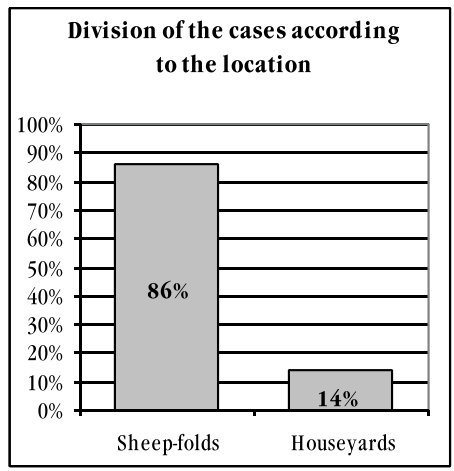




In 73% of the cases we know the distances from the nearest forest:



Division of the cases according to the location:



2. Attacks that had happened in villages: During our investigation we learned about 10 cases in which wolves caused damage inside villages. We have been able to examine 9 out of these cases – some of these have also been presented in the media. In one case, the wolves caused damage at a farm actually situated 1 km away from the village. This way, the circumstances are the same as in the case of sheepfolds. The rest of the cases have happened in three isolated villages with few inhabitants in which the houses are quite far from each other, with bushes, groves and smaller pastures in-between. The houses – apart from the ones in the centre – very often are at 100 m distance, or even farther from each other (for example, the villages of Romania's Apuseni Mountains). The neighboring houses are very often separated only with weak, symbolic fences. Thus, it is not surprising that even timid animals like wolves, dare to enter these villages. We do not know of any situation in which wolves would have entered 'villages' in the conventional meaning of the term.

3. The characteristics of wolf-attacks:

The shepherds whom we talked to told us some curiosities about the way wolves attack flocks. Some of these are:

- Very often (but not always) wolves approach the sheep-fold from the downwind side

- Often more wolves attack from different directions, chasing the flock downhill in order to separate the chosen prey from the flock, after which they kill it near the riverbank. It's much easier to carry the captured animal downhill to a safe distance.

- For a long while, it was a mystery, how wolves could take a mature, developed sheep several hundred meters away from the sheepfold without being noticed. Among certain shepherds there's a view saying that wolves seize their prey by the neck and drive them with their tails. This view rests upon the fact that wolves do seize their prey by the neck. They try to drag the animal as far as possible from the sheepfold. This is why they do not kill it right away but they drive it seizing by its 'collar'. While driving the animal they're balancing with their tails, this is what gives the impression of driving it with their tails. Some shepherds have mentioned that wolves 'charm sheep with their eyes' so that the sheep follow them. This belief has a base in reality: frightened sheep, cut off the herd, instinctively run after their kin. It is possible that instead of their kin, they follow the wolf running in front.

- We have often thought about how it was possible for wolves to capture

sheep from flocks that are guarded by several big dogs (often 10). Almost every shepherd has mentioned that the wolves lure the dogs away from the flock: the pack approaches the flock from different directions. The first dog that notices a wolf draws the attention of the other dogs on the wolf by barking – and soon all the dogs will try to chase away the same intruder. Meanwhile, the flock is left unprotected. Often the shepherd himself follows his dogs to encourage them.

- In some cases wolves can jump inside the sheepfold. Nevertheless, they cannot take away animals bigger than lambs from the inside. In some cases they can pull out their prey through the fences of dilapidated sheepfolds.

- It's very rare for wolves to kill more animals than what they can consume (in nature such things do not occur). Out of all the wolf attacks that we have studied, in five cases have we learned that more than 10 animals were killed on one occasion. In all five cases, the farmers admitted that they did not take the necessary precautions to protect the flock. For example, in two cases the sheep spent the night out of the sheepfold and in the other three they were left without any protection. Sometimes, the wolf that jumps in the narrow sheepfold is much too excited. There is a great number of potential prey, human smell, barking and various noises, so it does not wait for the death of its prey and attacks yet another sheep. In the case of attacks upon flocks left outside there are also disturbing factors that lead to the fact that wolves kill more animals without eating out of them. They keep following the smaller sheep-groups that got cut off from the flock.

- According to our observations, there are innumerous possibilities for wolves to prey upon livestock, especially near flocks that spend the night spread out on the pasture, that graze during the night or that wander through forests and bushy grounds. Not often, but we have seen sheep with toe disease,

Photo: Kecskés Attila

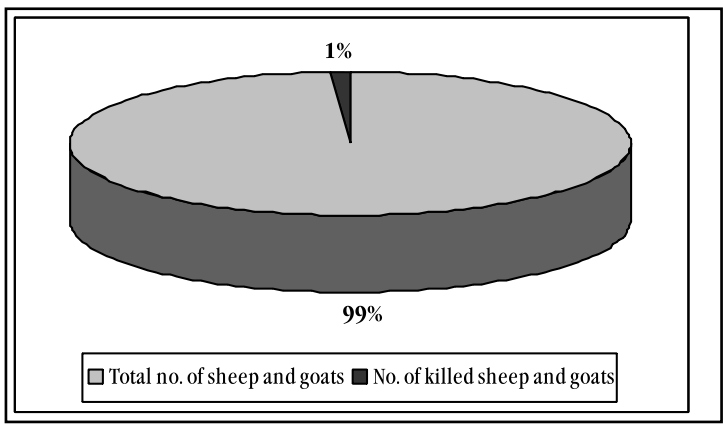
limping, getting left behind from the rest of the flock, representing easy prey for predators.

4. The significance of wolf-inflicted damage: In areas where domestic animals are kept in wolf habitats, there is a great chance that sooner or later wolves would try to capture some of them, as predators always pick the easiest prey to capture. Domestic animals, unlike wild ones, have lost their capacity to defend themselves or to escape – they entirely depend on the protection of humans. Domestic animals, except in regions untouched by humans, occur in great numbers in a relatively small area (e.g. sheep flocks). And in today's Europe there are no more untouched regions.

Consequently, wolf damage occur everywhere where wolves live. It cannot be denied that wolf damage can occasionally be considerable, especially in the case of farmers whose only source of income is represented by the domestic animals they own. It is understandable that if somebody has only two sheep and both of them get killed, that person will bear a grudge against carnivores. At the same time, we should also bear in mind that the number of domestic animals killed by predators in a certain area is quite small, compared to the total domestic animal population.

For example, the total of all sheep and goats of Mureș County was 339.843 in 2004. In the same year, in all the cases studied by us, wolves had killed only 79 goats and sheep. According to our estimates, we have succeeded to size up 50% of the damages. This means that the wolves in 2004 had killed only 0,04% out of the total goat and sheep population of Mureș County.

6996 sheep and goats were kept on the farms of Mureș County that we have visited and where damages have been done. Out of these, 79 had fallen prey to wolves (see chart):



* We would like to mention the fact that there is no proof that all ‘wolf-damage’ was actually committed by wolves. It is likely that dogs have caused a small part of the damages to livestock. An alleged wolf skin that comes from an animal killed by sheep dogs backs up this assumption. Although the shepherds believe that this skin belongs to a wolf, after thorough examinations we have drawn the absolutely sure conclusion that the skin had actually belonged to a dog that looked very much like a wolf. In some regions people talk about wolves with strange coloration (red wolf, wolf with white-spotted chest). One can ask the question: are we really talking about wolves in these cases?

The Brown Bear (Ursus arctos)

Legend
- attacks on humans
- damage in livestock
- damage in crops

The Brown Bear (Ursus arctos)

According to latest research, the bear family presently consists of 7 species.
1. Sloth bear (Melursus ursinus), dwelling in the jungles of India, Nepal and Sri Lanka
2. Spectacled bear (Tremarctos ornatus), found in South America in the Andes
3. Sun Bear (Helarctos malayanus) of South-East Asia
4. Asiatic Black Bear (Ursus thibetanus), a dweller in Central and Eastern Asia
5. Black bear (Ursus americanus) in North America
6. Polar bear (Ursus maritimus), an inhabitant of the Northern Polar region
7. Brown bear (Ursus arctos), discussed below

Range: the brown bear is the most widespread member of the bear family (Ursidae). At one time it inhabited most of the Northern Hemisphere, all the way from the polar regions to the subtropical zone. It dwelled in Europe, Northern and Central Asia, Japan and North America, even on the fringes of the tropical regions of South-Eastern Asia.
Today bear populations – excepting Russia, Canada and Alaska – are everywhere in decline. Due to human persecution, destruction of habitat, loss of feeding grounds and food, bears have been restricted to a fraction of their former habitat. Their numbers are being further reduced by trade with certain body parts of the species (such as the gall bladder used in traditional Eastern medicine - the active ingredient of the gall bladder can be found in 54 different herbs). The present world population numbers from 125 000 to 150 000 individuals. European brown bears now number about 50 000 and, excepting the North-Eastern populations, are found mostly in isolated pockets with relatively few individuals. A significant population other than that in North-Eastern Europe (37 000 individuals) is found in the Carpathian Mountains (8 100) and the Dinaric Alps-Pindos Range (2 100). Noteworthy is the Scandinavian population, which 70 years ago was on the brink of extinction with 130 individuals, and has now grown to 1000 bears. This 10% to 15% yearly increase in population is the greatest that has been recorded in the species anywhere.
Biological features: the physiology of brown bears varies according to habitat and availability of food. Males are usually larger than females. The largest subspecies lives on the Kodiak islands off the shores of Southern Alaska (Kodiak Bear), and can weigh up to 500 kilograms (1 100 pounds) and be more than 3 meters (10 feet) long. Brown bears living near the shores of Alaska, also called Alaskan Grizzlies, and the bears of North-Eastern Asia (Kamchatka Bear) are not much smaller. These

Photo: Nicolae Șerban - Pârâu

bears rely on protein rich salmon meat as a large part of their late summer and autumn diet. (Pacific salmon species are similar to trout, although significantly larger. They enter rivers and lakes from the ocean, spawn, and die.) In territories with less animal protein, bears are much smaller, such as the Canadian Brown Bear (Grizzly Bear) and the even smaller European Brown Bear.

European brown bears have a body length of 150 to 200 cm (5-6.5 feet), weighing between 100 and 300 kilograms (220 to 660 pounds). Height at withers is 90 to 150 cm (3-5 feet), but standing on their two hind legs they can reach up to a height of 2,5 m (8 feet 4 inches). Their color varies greatly from light brown to almost black, but it is most often dark brown.

Their most remarkable feature is a robust body build and the shoulder hump made up of huge muscles, used for digging roots, insect larvae and nests of small mammals out of the ground. Although bears may seem clumsy, appearences can be deceiving. Bears can be surprisingly fast!

Their feet have 5 fingers, ending in huge, 5-10 cm (2-4 inches) long, sickle-shaped claws. Using these claws, bears can easily dig and climb trees; they also like to take apart decomposing tree trunks and turn over large boulders. Bear tracks are easily recognisable with 5 clearly marked clawed fingers. Footprints of the hind legs are longer.

Bear teeth indicate the diet of their owners : canines are well-developed, while – contrary to most other predators – the surfaces of molars (used for grinding food) are large, allowing the breakup of foodstuffs made out of plants. Thus, their teeth indicate an omnivorous lifestyle.

Life span is 20 to 25 years, the longest recorded in captivity was 47 years.

Way of life: bears usually lead a solitary life, avoiding each other, if possible. Exceptions from this rule are the breeding period, when males spend some time with the female, and the time when the female is raising her cubs. 2 or 3-year old siblings may also stay together for an extended period of time.

Brown bears prefer oak and beech forest of the hills, as well as conifer forests of the mountain ranges. Their territorial needs vary according to the availability of food in the area: from 50 square kilometres (20 square miles) in Croatia all the way up to 1600 square kilometres (640 square miles) in the forests of Scandinavia. Other factors beside food are human disturbance and the availability of hiding places.

Bears generally are active during both the day and the night, although tend to be more so at night. Where they are persecuted by humans, they have become almost exclusively nocturnal. Bears may walk tens of kilometres during one single night, usually using the same routes.

Although bears, by their physiology, are primarily predators, they have, to some extent, adapted to digesting plants. Contrary to real herbivores, they can utilize only a small part of herbal food, therefore prefer feeding on energy rich plant parts with a high sugar content. They prefer meat, which is easily digestible and has a high energy content, but they rarely get it. 80 % of the brown bears' diet is of vegetal origin. Bears, unlike other predators, have small eyes with weak eyesight. They locate their food mainly by smell and hearing.

Brown bears are omnivores with a widely varied diet. In springtime they feed on young, tender grasses, shoots, insects, larvae, rodents and seeds found in their nests, as well as wild fruits left from the autumn. After the snow melts they will also seek and eat carcasses of animals that died in the winter. In the summer they eat mostly early ripening wild fruits, such as strawberries, blueberries, blackberries and raspberries; insects, such as ants and bees; insect larvae; the young of small mammals found in their nests. If they can, they will also catch newborn ungulates. According to American data, 50 % of all moose calves are killed by bears, while in Scandinavia this figure is 25 %. Older calves and adult, healthy ungulates (red and roe deer, wild boar) capable of fleeing or even fighting back, are not a target for bears (there has been no research done on this subject in Romania). Domesticated animals, being unable to flee or defend themselves, and usually being crowded into a small area, however, do attract bears. Prey that cannot all be eaten at once will be covered by branches, leaves and soil, and the bear will continue to feed on the meat until it lasts. In the autumn bears consume fruits and seeds of various plants, with high nutritional value. In Romania these are oak and beech acorns, wild pear, wild apple, rowan, cornelian cherry, bloodtwig dogwood, blackberries, blueberries, hazelnuts, occasionally walnuts. The quantity of food eaten by bears also depends on the season: in the spring they have a small appetite, in the summer a normal appetite, and in the

Photo: Bereczky Leonardo , Vier Pfoten International


Photo: Bereczky Leonardo , Vier Pfoten International

fall they become extremely voracious, practically consuming everything edible that comes across their path. The explanation for this is simple: in order to survive the winter, bears must store sufficient fat. This is especially true for pregnant females that must give birth and suckle their young through the winter without feeding.
Bears, contrary to popular belief, do not hibernate in the real sense, although they do spend the winter dozing. Their body temperature decreases a few degrees, and their body functions slow somewhat in order to save energy. Sometimes bears wake up during the winter and leave their den. Disturbing a bear during its winter sleep is dangerous!
Reproduction: pregnant females go to their winter dens earlier than other bears. Bears are not highly reproductive mammals: they first breed at the age of four to six years, from which time on females give birth at every 2 or 3 years in the most optimal case. Breeding occurs in June or July. The development of the fertilized ovum stops after some time. It will only be embedded in the uterus around November when development starts again. Births occur in January or February, after an actual pregnancy of only 2 months. One or two cubs are born at a time, rarely 3, and exceptionally rarely more. Cubs are born extremely underdeveloped, with a weight of at most 1 kg (2 pounds), being totally dependent on their mothers. Succesful raising of the cubs depends on several factors, such as sufficient food and the absence of other predators. Young bears stay with their mothers until the age of 2 years when they may reach a body weight of 80 to 100 kilograms (175 to 220 pounds). Cubs exhibit a lighter coloured „collar" around their necks, which will disappear during maturation.
„Blood bear" is a term in Hungarian used to denote bears that have succesfully preyed on domesticated animals and have formed a habit of it. If bears realize how easy and reliable a source of food livestock is, they will continue to try to catch domestic animals. Contrary to popular belief, the much feared „blood bears" do like to consume plants.

Bears and humans

Like wolves, bears play an important role in the beliefs and consciousness of man.

For Celts, bears were a symbol of warriors. The Celtic word for bear is „artos" which is found in the name of the legendary king Arthur. Siberian and Alaskan people believe that bears are like the Moon, because they disappear in the fall and reappear in the spring. Many people have the belief that bears are the ancestors of humans. Algonquin Indians in Canada, for example, viewed bears as their forefathers.

A large number of cave paintings give proof of an ancient bear cult in Europe. In the beginning of the 20eth century further remarkable signs of such rituals were found in the caves of Switzerland and Austria. Among bones and utensils found around the fireplaces of ancient man were bear skulls buried in grave chambers made of stones.

In Greek mythology bears are companions of Artemis, the goddess of hunting and the Moon. The goddess itself often assumed the shape of a bear.

The Yakuts of Siberia believe that bears are all-knowing, remembering everything and forgetting nothing. Some Tatar tribes in the Altai mountains say that Earth transmits all information to bears. Most Siberian hunting tribes had a taboo against saying the word „bear", preferring to use terms such as Lord of the Forest, Grandfather, Grandmother, Uncle, as if bears were a part of the family. Ancient Hungarians also had a taboo against saying the name of the animal, which actually became forgotten. The current word: 'medve' is of Slavic origin. Certain parts of bears had magical qualities in some cultures: the soles of the feet of bears nailed near the entrance kept evil spirits away. Yakuts used to put the soles of the feet in the cradle of babies for protection. Claws were believed to have healing powers; according to Tatars of the Altai they healed headaches.

Some North American Indian tribes believe they are the descendants of bears. One example is the Bear Clan of the Iroquis.

One of the most remarkable forms of the bear cult was practiced by the Ainu people of Eastern Asia, on Sakhalin and Hokkaido islands. The origins of this people were much debated among scientists, with the conclusion that they are the descendants of an ancient stone-age group. Ainus practiced complex rituals for their Main Goddess, the Bear Mother even in the 1920es. These are the only stone-age practices relating to bears that survived to the 20eth century. The Ainus had caught a bear cub which they raised in a cage for 2 or 3 years. The sacrifice was always a male animal, as it would have been stupid to sacrifice the Ancient Mother, the source of life. They believed bears to be the most important of the mountain

gods that assumed the shape of the bear upon descending to Earth. Upon being sacrificed, the god could escape and return to the rest of the gods, taking the gifts of the ritual with him. These were the gifts of humans to the gods while gods gave the meat and skin of the bear to the people.

Tribes of the Altai mountains called upon bears as witnesses to their oaths. Yakuts sat on a bear skull while saying an oath, while the Tunguz people chew bear skin when taking an oath of truth. They believed that telling a lie under such circumstances will make the bear eat them.

The North American and Siberian hunting tribes, as well as the Lapps, had severe restrictions on women during a bear hunt. Women were forbidden to look at the head of the bear or to step in the tracks of the bear. The bear's body was never carried in through the entrance which women also used because this would have brought upon the people the bear's wrath.

Later on hunting lost its importance to survival just as bear hunting lost its mythological significance. Bears, however, continued to be symbols of power, wisdom and courage. Coats of arms of nations, cities, knighthoods and nobles contain bears (those of Berlin, Bern, Madrid, Bruges, for example). Numerous Greek, Roman, Gallic, French, Dutch, Belgian, Swiss, Italian, German, Spanish and Russian coins and stamps are endowed with the figure of bears.

The regress of brown bears in North America commenced with the arrival and proliferation of European settlers. In certain areas of Europe this has long been going on. Bears had disappeared from Danemark as early as 3500 years ago, from Great Britain in the 11th century, from France in the 19th century, from Hungary in the beginning of the 20th century, and from Germany around the year 1600. During the 19th and 20th centuries the population in Scandinavia, Poland and that in the Alps had drifted near extinction. Dying off of the populations continues in our days, in spite of the huge efforts made for the remaining small populations. Protection of isolated pockets, however, cannot insure the survival of the species. An example is the only population native in the Pirenees: this large area is the home of only 15 bears, most of which had been introduced from Slovenia. The last native female,

Photo: Nicolae Șerban - Pârâu

Canelle was shot during a wild boar hunt on November 1, 2004. The last chance for the survival of this native population would be if the last cub of this animal would be a female. The sex of the cub is currently not known, and if it is a male, the native Pirenean population is doomed.

Bears in Romania

40 to 50 % of the present Europen brown bear population east of Russia lives in the Carpathians of Romania. In the beginning of the 20th century the following areas had the largest concentration of bears: Gurghiului mountains, Maramureș, the mountains of Bistrița-Năsăud, Sebeș Harghita and Covasna counties, the area around Gorj, Vâlcea, Arges, Muscel and Putna.
The species was also found around Hunedoara, in the Banat region, around Dâmbovița, Prahova, Râmnicu-Sărat, and in the counties of Bacău and Neamț, although in smaller numbers. During and after World War II, bears were ruthlessly slaughtered in Romania. By the beginning of the fifties the population fell drastically to an estimated all-time low of 860 individuals. At this time a significant change occured: the communist system declared bears a protected species. Hunting was practically prohibited, with only a few special exempted persons. Bears were fed in the spring and in the fall and she-bears with cubs enjoyed special protection. Even the area around bear dens recorded in forestry registers was protected. Another positive factor was the significant decrease in poaching.
Shooting permits were increased in the first half of the seventies which resulted in a 20 % decrease of the population in 5 years. By the end of the eighties there were about 8 000 bears in Romania, exceeding the sustaining capacity of the natural habitats, which resulted in an increase of bear-caused damages. Specially noteworthy is the fact that in certain areas (such as Brașov, Tușnad, Predeal, Sinaia, Bușteni) bears became used to food sources provided by accessible garbage bins and being fed by tourists. Problems have not stopped after the later decrease in the bear population. Bears fed by tourists continue to visit the locations even after the tourist season is over, endangering local farms, in some cases even the life of local people.
In the beginning of the nineties poaching has increased, partly as a response to bear-inflicted damages. Locals often used poison to kill off damage-causing bears. As a result of this practice and the liberalization of hunting quotas, bears dropped to an estimated 5 or 6 thousand individuals at present. The exact number is not known. The population is most dense in the southern part of the Easter Carpathians and the eastern third of the Transylvanian Alps (Harghita, Covasna, Vrancea, Brașov

counties).
The use of poisons was prohibited by a ministry decree in 1991, and in 1993 Romania signed the Bern Convention. The latter, together with Hunting Law 103/1996, (amended by 654/2001) establish protection of bears in Romania. According to the mentioned laws, bears are a strictly protected species.
The government decree of 87/2004 allowed 342 bears to be shot in the hunting season of 2004-2005.

Bear damages in Transylvania
- cases studied by us -

Fițcău shepherd camp (Aluniș commune, Mureș county)

Date	Livestock	Dogs	Shepherds	Losses	Location
Spring of 2004	400 sheep + goats	6 big, 2 smaller	7	2 calves? 1 young goat?	pasture
Summer of 2004	400 sheep + goats, 40 cattle, 4 horses and 8 pigs	6 big, 2 smaller	7	2 sheep?	pasture (while the animals were drinking)
2004 September	400 sheep + goats	6 big, 2 smaller	3	2 sheep	pasture

Cerghid (Ungheni commune, Mureș county)

Date	Livestock	Dogs	Persons	Losses	Location
Autumn of 2004	Bees (50-70 beehives)	0	2 persons	The bear tear apart a beehive and ate the contents	In the courtyard of a house located at the edge of the village

Săcel shepherd camp (Săcel commune, Maramureș county)

Date	Livestock	Dogs	Shepherds	Losses	Location
2004	250 sheep, 25 cattle, 2 horses	5 big	2	1 sheep	At the edge of the village, on a pasture

Roadeș shepherd camp (Bunești commune, Brașov county)

Date	Livestock	Dogs	Shepherds	Losses	Location
2003 autumn	800 sheep, 5 donkies, 6 pigs	5 medium-sized	3	1 pig	400-500 meters away from the shepherd's camp, at the edge of the forest

Fișer shepherd camp (Gherghilău pasture) (Rupea, Brașov county)

Date	Livestock	Dogs	Shepherds	Losses	Location
September 2004	More than 1000 sheep, 1 bull, more horses	9 big	3	1 bull (300 kg) 1 colt	150 and 200 m away from the shepherd camp (the same night)
Autumn 2004	?	?	?	1 piglet	The piglet was taken from the pigsty located next to the pen (nother sheepflock)

Bunești shepherd camp – towards Fișer (Bunești commune, Brașov county)

Date	Livestock	Dogs	Shepherds	Losses	Location
2004 (3 cases)	1000 sheep, 15 goats, 10 cattle, 1 horse	9 big, 1 smaller	4-6	5 sheep	1 km from the shepherd camp, while grazing
October 24, 2004	1000 sheep, 15 goats, 10 cattle, 1 horse	9 big, 1 smaller	4-6	1 sheep	50 m away from the pen

Meșendorf shepherd camp (Bunești commune, Brașov county)

Date	Livestock	Dogs	Shepherds	Losses	Location
September 2004 (more cases)	700 sheep, 12 cattle, 10 horses, 20 pigs	4-5	3-5	1 colt 4-5 sheep	On the pasture
October 2004 (more cases)	700 sheep, 12 cattle, 10 horses, 20 pigs	4-5	3-5	1 cow, 1 calf and 1 pig	On the pasture

Bunești shepherd camp – towards Viscri (Bunești commune, Brașov county)

Date	Livestock	Dogs	Shepherds	Losses	Location
July 2004	approx. 300 sheep, cattle	3 big, 7 puppies	2-4	1 cow	Further away from the pen, on the pasture

Stâna Micloșoara (Baraolt, județul Covasna)

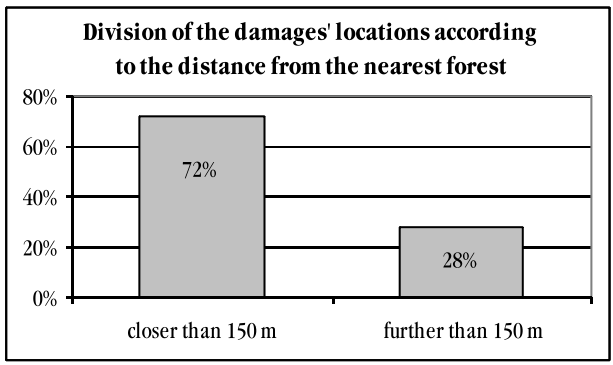
Date	Livestock	Dogs	Shepherds	Losses	Location
May 2004	420 sheep, 2 horses, 6 goats, cattle	4 big 2 small	6	4 sheep 1 pig	Next to the pen, on the pasture
June 2004	420 sheep, 2 horses, 6 goats, cattle	4 big 2 small	6	1 sheep	Next to the pen, on the pasture
July 2004	420 sheep, 2 horses, 6 goats, cattle	4 big 2 small	6	2 sheep	Next to the pen, on the pasture
August 2004	420 sheep, 2 horses, 6 goats, cattle	4 big 2 small	6	1 viței	Next to the pen, on the pasture
September 2004	420 sheep, 2 horses, 6 goats, cattle	4 big 2 small	6	2 capre	Next to the pen, on the pasture

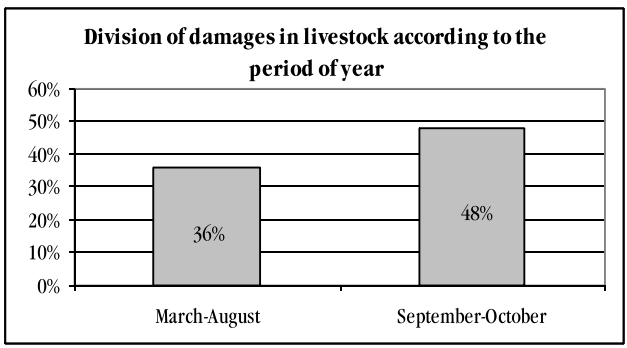
Comments on bear damage in livestock:

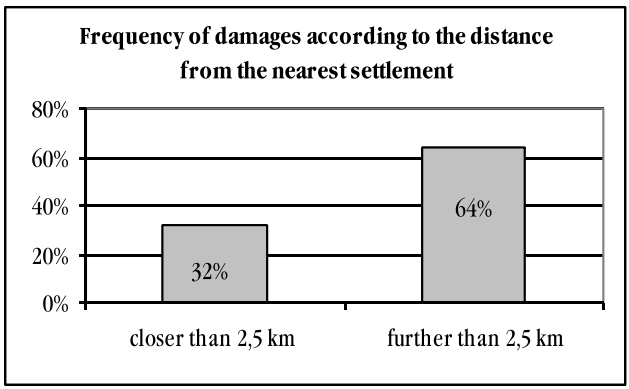
In all the cases that we studied, bear attacks occured during the evening or night. Contrary to wolves, bears often disregard guarding dogs. Smaller livestock, such as sheep, goats, or pigs are grabbed with the fangs, and are carried to a safe area with dense vegetation, where bears may eat as much as 40 kilograms (88 pounds) of the meat at one time. As bears leave with the prey in their mouths, the body of the prey will hang to the right or to the left between the first legs of the bear. This looks as if the bear would have taken the prey under the arm.

It is difficult to chase bears away from prey they already killed – bears protecting their prey may be dangerous to the extreme. This is most evident in areas where bears have gotten used to the presence of man and have lost their natural fear of humans. As we have already mentioned, bears are creatures of habit; if they have experienced that the presence of man means food, they will continue to try to prey on domestic animals. Such bears are more difficult to keep away and are more dangerous to the herders.

Shepherds often have to rely on the alertness or even courage of their dogs. It is a rare dog that dares to oppose a bear. The surest way to protect a herd from a bear is to locate the approaching predator in time. Normally a bear that has been sighted in time can be kept away with noise and the help of the dogs. The success of this depends significantly on the number of the shepherds and the daring of the dogs. In some areas where bears feed near humans and there is a lack of natural food, trying to chase a bear away may achieve the opposite result. In the case of too frequent noise-making (the firing of petards or explosions with carbide) bears will eventually







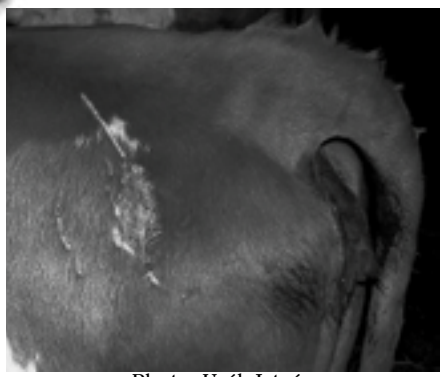


Photo: Urák István

become used to the method which will lose effectiveness. Bears have been known to react aggressively to flashlights and noise.

In spite of what has been said, bears do fear humans, which is proven by the fact that shepherds or farmers usually succeed in getting their animals back, if they realize in time what is going on.

Most of the attacks on livestock occur in the autumn when bears' appetites grow immensely in order to prepare for winter sleep. In this period, when bears seek the most nutritious food, the severity of bear damage always increases. This is especially true in areas where there is little natural food rich in nutrients, such as oak or beech acorns, or wild fruits with a high sugar content. In such cases bears may even be forced to try their luck at pigsties. If bears do not succeed to build up their store of fat in the fall, they might try to steal pigs even in winter. Being wary animals, they will try to take pigs from stalls farthest from the house.

Bear damage in crops

Bear damage to crops was attempted to be measured in Mureș, Harghita, and Covasna counties. Damage was concentrated in orchards and in cereals (mainly maize and oats). In some cases most of the damage was not done by eating the crops, but by trodding on the plantation. Farmers usually report the damage to the authorities verbally, and hardly ever submit a written claim for compensation. Damage estimation is also complicated by the fact that wild boar damage almost everywhere surpasses bear damage by a wide margin. Red deer and roe deer also contribute to the damage, although to a lesser extent. All the above mentioned animals may take their share from the same cereal field. In addition, bear damage is usually a responsibility of the forestry department, while damages

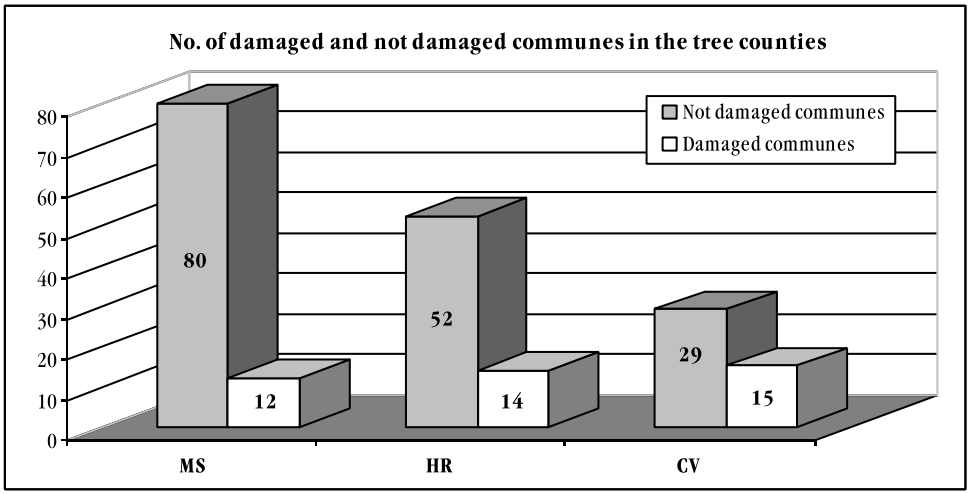
Photo: Domokos Csaba

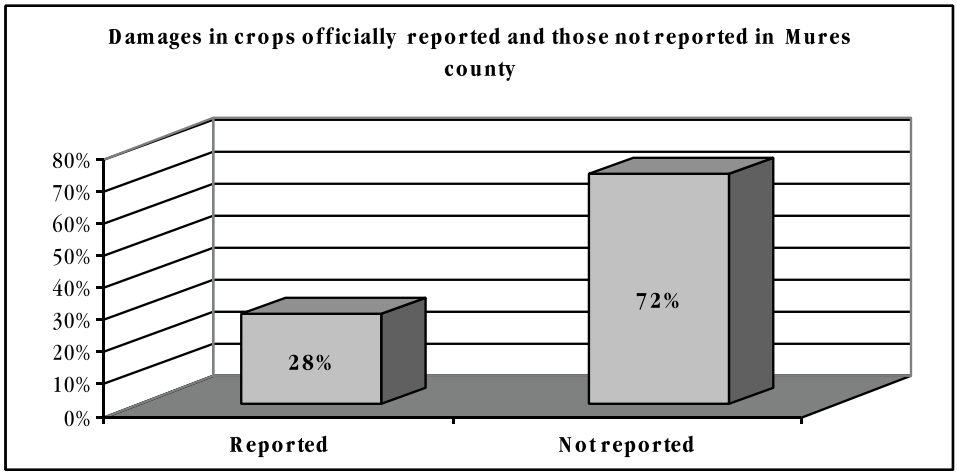
caused by wild boar, red and roe deer are a responsibility of hunting associations. As damage is almost never compensated, farmers often do not even try to apply. As a consequence, damage estimation is rarely done. On top of that, bear and wild boar damage are often put in the same category. Therefore we could not even try to arrive at an approximative value of total bear damage. Bears did the most damage to maize, but have also damaged oats, potatoes, carrots, grapes, apples, walnuts and the fruit trees themselves. Breaking off branches of fruit-bearing trees can often cause more damage than eating the fruit or cereals. The table below lists only communities where crop damage was officially reported.

Country	Commune	
Mureş	Brâncoveneşti	Saschiz
	Deda	Sărățeni
	Chibed	Gurghiu
	Ruşii-Munți	Vânători
	Aluniş	
Harghita	Căpâlnița	Dealu
	Corund	Zetea
	Ulieş	Mereşti
	Băile Tuşnad	Feliceni
Covasna	Brăduț	Poian
	Baraolt	Ozun
	Bodoc	Arcuş
	Boroşneu Mare	Zagon
	Micfalău	Dobârlău

In order to get a more complete picture, we also took in consideration bear damage that did not appear in the records. More extensive damage is usually done to several neighbouring communes or villages. Few of the communes suffering damage lies in the immediate vincinity of the zones with several hundred square kilometres of unbroken conifer or mixed forest. Most are in the area of decidious (oak or beech) forest. Problem areas with several communes each were defined where bear damage occurs every year.

Some areas had more bear damage in 2004, while others had less than in previous years. Increased damage can certainly be correlated with lack of food, but not necessarily with overpopulation. A cyclic lack of acorns typical of beech and oak plays also an important role, together with large-scale picking of forest fruit by humans. We cannot disregard the role of tree harvesting. Normally the yield of a hectare of forest greatly surpasses that of a hectare of cereals. In addition the seeds of trees (acorns of beeches and oaks) are much higher in nutrients than the seeds of cereals.





Bear attacks

Bears usually try to avoid contact with humans. Still, accidents happen, and some of those are tragic. We will present a few details of the bear attacks we investigated.

Biborțeni

Sz. J. 54 years old, of Biborțeni, had been feeding his dog tied up near his maize field on August 29, 2004, at 6: 30 P. M., when he heard noise from the maize.


Photo: Antal István

Upon investigating he found a wide path leading into the plants. He reported that he had not thought of a bear, rather of a wild pig or a thief, so he proceeded to walk the path. He might have gone about 15 metres (50 feet), when he noticed a bear cub eating maize 3 meters (10 feet) in front of him. He also spotted another cub a little farther away. When he shouted to chase the animals away, a she-bear appeared, snarled, and launched an attack. The farmer reported that the bear had tried to bite his head. He attempted to protect himself by using a maize stalk to hit the eyes of the bear. The animal backed off, then stopped and showed his teeth. This time, Sz. J. backed off, and the bear responded by attacking. She hit the pelvis of the man, ripping off his belt. It was probably the belt that protected him from being deeply wounded by the claws of the bear. After an attack lasting only a few seconds, the bear retreated. The man reported that farm workers busy a few hundred meters (yards) away had not noticed anything. Fortunately he was able to go home and was taken to the hospital. Upon returning after treatment he saw the mother bear and her two cubs playing near the scene of the attack.

Silea Nirajului

Sz. M, the victim, was attacked and killed by a bear on the autumn of 2001. According to the report of his brother, Sz. B, there were no eye witnesses of the event. The unfortunate man was a shepherd, and the accident happened while walking from the village to the place where the sheep were kept. He happened to walk by his own maize field, hearing noises of an animal inside. He thought it must be a wild boar and approached the animal in order to drive it away. The bear wounded him on several places, of which the most grave was ripping open the area of his loins. A nearby man came to his aid, but by the time they arrived to a village where he could have been given first aid, the victim bled to death.

Solocma

The accident happened on August 26, 2004, only 80 meters (240 feet) from the village limit and nearest public light. Sz. O. reports that he had been noticing damage in his maize field. He suspected wild boars and decided to try to chase


Photo: Kerekes István

them away. Several nights in a row he walked to the field after dark. The first time he was accompanied by his dog. As he arrived to the maize field, he heard a noise made by some wild animal. His dog kept barking and after a while the noise ceased; the animal or animals moved away. The next evening he was without his dog. He heard a noise just like the first time, which stopped as he arrived. The third night he again went to the maize field with his dog. There again was a noise, but his dog did not bark this time. He waited a while but the noise did not stop. The farmer had a pitch-fork, so he decided to find out what is going on. He walked into the dense field, noticing the bear only when it was directly on him. The animal had already stood on his hind legs and, towering over him, attacked. The attack was first directed to his head, with the bear practically scalping him (pulling the skin off his head on several places using the claws). The farmer fell to the ground, and turned onto his stomach. The bear tried to turn him back with his paws, administering several blows to the left side of the rib cage. His hands, pulled up to protect the head, were also bitten several times. The man was conscious the whole time, but did not move. His dog was also present, but did not try to oppose the bear or bark. Finally the bear left.

The wounded man tried to get up, but it took a while for him to gather his wits to some extent. First he was unable to see, as his eyes were covered by the skin pulled off his head. Eventually he managed to get back to the village and he was taken to the city hospital to be operated.

The cause of all 3 cases presented above was disturbing the bear while feeding in the maize. Bears will consider the maize they eat their own and will protect it! It is hard and very dangerous to chase away a bear protecting its food. Before trying to drive away an animal damaging the crops, you must ascertain that it is not a bear!

Braşov

M. D. of Molidului street suffered a bear attack on July 14, 2004, around 4 o'clock in the morning. The man had been walking his friends to the street from his apartment. None of the persons entering the dark street from the lighted staircase had seen the animal which was also hidden by a hedge. On the top of the stairs

leading up to the apartment building, the men suddenly faced a bear. (Two other, smaller bears were later reported to be nearby). The surprised animal first attacked M. D. who was heading the group. He did not even have time to warn his friends. His kneecap was hit, causing multiple fractures of the leg. The man reported that he had „flown" approximately 3 meters (10 feet) as a result of the blow, hurting himself further on the stairs (pelvis dislocation and back injuries). Next the bear turned on I. S, a Turk, who was given a blow to the head. Neither of the victims lost their consciousness, and the Turkish man succeeded to drag M. D. back to the staircase. The third person was unhurt.

This event was not a consequence ot the victim's behavior, but was caused by the special situation in the Răcădău district. The bears have been visiting the Răcădău garbage dumps in Braşov for 20 years and have gotten used to the presence of man. This type of bear that has lost its fear of man has been causing a lot of problems. The case discussed above was not the first in the city, and, unfortunately, also not the last. Even though numerous solutions had been suggested to solve the situation, these were not taken seriously until October 2004, when a bear killed 2 people and wounded 11 more. Appearently, sanctions imposed by the authorities (feeding bears in the forest, driving bears away from the area, prohibiting feeding and photographing bears by residents and tourists, patrolling the area) have achieved their result.

Sovata

Between 3 and 4 P. M. on August 13, 2003, a 45 year-old farm worker, K. K. was killed by a bear. There are several eye witnesses to the event, all of them field workers, amongst them the father of the victim. One of the witnesses, the person who found the corpse, gave the following report: The area in question is a steep meadow with a thicket on the upper half. Six farmers working on the field noticed two cubs about the size of shepherd dogs (around 18 months old) running startled from the thickets and heading

Photo: Domokos Csaba


Photo: Nicolae Șerban - Pârâu

directly to the summer hut built on the base of the hill. Upon seeing the farmers working a few meters in their path, they stopped fearfully, turned back to the thickets, rounded it, and left the area. Approximately at the same time, the father of the victim saw the she-bear tearing something apart in the thickets. He thought it was a young cattle. The mother bear, like her cubs, ran out of the thickets fearfully, stopped in front of the workers, and, after a few seconds of tension, turned and run after her cubs.

The father told a worker that he should go and look for the calf the bear killed. The man found a dead and maimed body that could only be identified by some clothes and tools lying on the ground. The victim probably met the bears rushing down the slope and got between the mother bear and her cubs.

The sudden appearence of a mother bear with cubs in the proximity of people on a hot August day suggests that the bears have been disturbed, and the mother was trying to protect her young. This assumption is corroborated by a Sovata man, who reported people trying to separate the cubs from the mother with the aid of dogs, previous to the accident.

How to avoid bear attacks

Bears, by their physical strength and size, can kill a man. Even smaller ones are capable of this. In spite of the power of bears, the majority of attacks do not end in human death. The attacking bear leaves in a very short time, leaving the fallen, defenseless man alone. Bears do not consider people to be prey; bear attacks are usually in defense. Bears that feel that their safety, their cubs' safety, or their food is in peril, will do what many beings – including humans – would do in a similar situation: they will try to defend themselves. Sometimes an attack has the goal of showing superiority to an intruder in the bear's own territory. This is a common phenomenon in the animal kingdom. The aim of such behavior is not killing the intruder, but chasing him away.

The most important factors leading to aggressive behavior:

- presence of cubs
- presence of a carcass the bear feeds on
- a surprise encounter
- presence of a dog (a snarling dog often causes a retreating bear to return)

Knowing this, the following is advisable:

1. Do everything to avoid meeting a bear

- avoid places that attract bears and those with bad seeing conditions (thickets, steep slopes, forest clearings, feeding grounds (raspberry, blackberry, blueberry patches, animal feeders, etc.)

- make sure bears will notice you in time: talk, sing, call attention to yourself. Always travel in a group in a bear-inhibited area – the more people in a group, the smaller the chance of a bear attack.

- do everything to avoid attracting a bear's interest: when on an excursion, pack away all food, garbage, cosmetics and other substances that can have an attractive odour to bears, and pull this package up a branch of a tree far away from your camping place. The package should be at least 3 meters (10 feet) from the ground, and as far away from the trunk of the tree as possible. We know of a case when chocolate wrappings forgotten in the tent made the bear approach the tent! Cooking, barbecuing and eating should be done far away from your tent. Do not leave leftover food, garbage or crumbs after you, so bears cannot associate the presence of tents and humans with food. Never feed bears and convince others to do the same. Bears used to feeding lose their natural fear of man and may attack to provoke food.

- watch for bear signs: tracks, droppings containing seeds or hair, trees with the bark missing or with claw marks, dead animals (which may be food for bears). If you see the above signs, leave the area or be very careful. Give up camping especially if you discover packaging material in bear droppings.

If you sight or hear bear cubs, leave quietly and immediately. Remember that cubs are curious and playful and if their mother is nearby they might not fear you. They could approach you.

2. If you do meet a bear:

2.1 If the bear is farther from you than 100 metres (300-350 feet) and has not spotted you, try to remain inconspicuous and leave quietly. If you still want to continue on your path, wait until the bear leaves the area, or, if possible, make a big detour on the downwind side.

2.2 If the bear has spotted you, but is farther than 100 metres (300-350 feet): You must give the animal a chance to ascertain that you mean no danger. Talk quietly (bears have relatively poor eyesight) so the bear will realize you are a human. This is

usually sufficient for bears to retreat. If the situation allows, back off slowly, always keeping your eye on the bear. If you do decide to continue on, make a big detour, but this time on the upwind side, so the bear can track you by smell.

2.3 If the bear has spotted you and shows signs of aggression: If you followed the above instructions, you hopefully are still a distance away from the bear. In no circumstances should you run for it; even downhill, bears are easily capable of catching up with you. Try to retreat slowly and calmly, without turning your back toward the animal. Do not establish eye contact, but look at what the bear is doing. If time permits, you can try to climb a tall tree. Aggressive-looking bears often only try to look threatening. Some of the attacks are only bluffs, with the animal stopping or changing direction just before contact. The purpose of these bluff charges is to give you time to back off. Use this and continue your slow retreat.

There are no 'surefire' methods for the worst case when the bear is actually attacking. Some say that you have to defend yourself in every way possible. Use whatever objects are handy, or even your fists and aim at the head, the nose, the eyes. (In some countries you can buy bear spray containing substances unpleasant for the bear. This is a last resort, as you can only use it from less than 5 meters (15 feet). At present this seems to be the best protection.) Others claim that you have to drop to the ground and remain in a fetal position, protecting your most sensitive body parts (your loin, stomach and throat area), at the same time clasping your hands over the nape of your neck for protection. After the attack is over, remain motionless for a while. Make sure the bear has left and get first aid immediately.

How to keep bears away from your farm

Wild animals must remain wild. Do not attract them near your home or mountain cabin. Many, seemingly harmless things may contribute to bears coming to your back yard. Do the following to ensure safety from bears: Remove bird feeders after winter is over. Keep garbage in places unaccessible to bears. Do not leave food or leftovers in the open. Protect your livestock, plants, fruit trees and beehives with fences.

Photo: Bereczky Leonardo , Vier Pfoten International

The Otter (Lutra lutra)

Legend
- otter damages

The Otter (Lutra lutra)

Range: there are 13 otter species worldwide. The best known are the Eurasian otter, the sea otter and the giant otter of the Amazon. The Eurasian otter, which also lives in Romania, once was widespread on three continents: Europe, Asia and Africa, from the British Islands to Japan and from the North Pole all the way to Northern Africa. They are not present on the islands of the Mediterranean except Corfu, Lesbos, Chios and Euboea. They can be found from sub sea level regions (Holland) to heights of 4000 m (Tibet). Today, due to human persecution and to the diminishing of suitable habitats, the number of the European otter has decreased considerably. In the 1970s and 80s they were on the verge of extinction in France, Belgium and Germany. They are likely to have died out in Liechtenstein and Switzerland. In Holland they became extinct in 1988, but they have been reintroduced later. The most diminished populations live in Central Europe, in great part as a result of improper water management policies. There still are strong populations in Portugal, Ireland, Scotland, the Balkans and in the tundra of Northern Russia. The otter populations of Finland and Britain have grown in the last years.

Biological features: the otter is a member of the mustelids (Mustelidae). In Romania, it is the largest representative of this family, after the badger. Its body constitution is a compromise of adaptation to life in water and on land. The otter is the most adapted predatory mammal to life in water and it is the top predator of water habitats.

Otter fur is thick and consists of two layers: a short and soft layer that serves heat insulation and a long, strong cover fur. The fur is greasy, waterproof and so thick that the air gets trapped between the hairs – this is especially visible when the animals submerge in water. Their colour ranges from light to dark brown, being lighter on the under parts.

Similar to other weasels, the otters' body is elongated, and has a spindle-like shape with short limbs. Body length is 70-80 cm (28-32 inches) with the tail being 30-40 cm (12-16 inches). As in the case of all other weasels, males are bigger than females: the weight of males varies around 10 kg (22 pounds) and females are 1/3 lighter. Occasionally there are individuals weighing more than 20 kg (45 pounds).

Photo: Bagosi Zoltán


Photo: Bagosi Zoltán

The head of otters is flat and wide. Their ears are small and rounded. While submerged, they can close their nostrils and ears. Around the mouth and nose they have long whiskers which help them find their pray even in muddy waters. Their eyes are placed on the top part of the head. When swimming, only the eyes, ears and nose can be seen. Their teeth indicate a predatory lifestyle. They have sharp canines and molars with which they can seize slithery prey and can crack the lids of cockleshells.

They have 5 webbed toes. They can skillfully hold their prey with the forelegs while eating, while the longer, stronger hind legs are very useful in swimming. When swimming calmly, they row with all four legs like dogs. When needed (during hunting for example), they press their forelegs close to the body, the hind legs to the tail and drive themselves with an undulating movement of the body. For short distances they can even reach the speed of 12 km/h (7.5 mph). On occasion, they can stay submerged for 4 minutes, although the average duration of a dive is 20-50 seconds. During one dive they can swim 400 meters underwater. On the ground they may seem clumsy, but they are capable of running fast and covering long distances. Their tail is bulky, cylindrical on the top, thin in the end and plays a role in steering.

They can sometimes live for up to 10-12 years, but their average age is shorter. In captivity they have reached 22 years.

Way of life: Otters are solitary animals. Despite this, it is not uncommon to see 2 adult individuals stay together for a short period of time. Otters have a very playful nature; they can often be seen playing in groups or sliding in the mud of the riverside or in the snow.

Their habitats are rivers, lakes, swampy or boggy areas and seasides. Every otter has a territory along a water course or shoreline. They need the rich vegetation of the riverbanks as well as abandoned fox or badger holes that they can use for dens. Their hunting territories can overlap with each other to a certain degree: the area of a male can often contain the areas of several females. Otters mark their territories with their spraints on prominent places (stones that rise out of the water, tree stumps, bridges and points where rivers meet). They often use the same

places for marking. Otters straying inside already occupied territories know from these spraints what the 'master of the place' had previously eaten and wether it is worthwhile to try looking for prey there. Although otters are territorial animals, conflict is rare – they prefer avoiding each other. The size of their hunting grounds along a river is 7 km (4.5 miles) for females and can reach 15 km (9 miles) for males. The hunting grounds are much smaller on lakesides and larger on seasides. The size of the hunting ground is determined by the availability of prey. Otters are not built in a very energy-efficient way; and their active lifestyle also requires much energy. This energy can only be provided by the consumption of a sufficient amount of food. An adult otter has to consume an amount of food that represents 15% of its weight; that means 1-1,5 kg (2-3 pounds) of fish per day.

Otters are most active during the evening and early morning when they hunt. They can move up to 10 km (6 miles) during one night. Most of their food consist of fish. Although they are able to catch large fish, they prefer those that are 20-30 cm (8-12 inches) and most often they consume even smaller ones that are easier to catch. From time to time, a large part of their nutrients consist of amphibians (frogs in the first place). According to a survey of otters living along the Mureș River, amphibians made up a larger part of their diet than fish. Occasionally, they consume birds, smaller mammals, crabs, snails, and shellfish. They eat the captured prey on the stones that emerge from the rivers or on the banks.

Reproduction: otters can reproduce in every season. Mating takes place in the water or on the ground. The time of pregnancy is 61-65 days, but it may be delayed for up to 9 months. They usually give birth to 2-3 young – sometimes up to 5 – in dens under the ground. Otters have a rather small number of offspring compared to mammals of the same size mostly due to the fact that they do not have natural enemies. Females raise their young alone. The mother teaches her young for a long period. They become independent at the age of 1 year. During this time, they learn fishing methods and get to know the places that are rich in fish. They also have to learn the technique of drying themselves: the main reason for death among the young is catching cold because of wet fur. They reach sexual maturity by the age of two. Most otters – according to Western European data – do not live for more than 3 years, becoming victims of traffic accidents, water pollution or starvation.

Photo: Bagosi Zoltán

Otters and humans

Otters do not occupy such a prominent place in people's beliefs as bears and wolves. Nevertheless, they appear in many people's legends and tales like in the case of the Celts, North American Indians, Indonesian peoples, native Australians and in Northern peoples' (Norwegians, Swedish, Danish) pagan religions that preceded Christianity. In Alaska, a bone statuette was found dating back to 800 A. D., portraying a half human - half otter creature – most probably a shaman.

Otters usually symbolize intelligence, skillfulness, playfulness and joviality.

From the dawn of time, humans have always appreciated the fur of otters; this is why they have systematically hunted them. Diverse artifacts and records talk about their importance. The first known otter representation that appears on a relief dates from 1500 B.C.. According to some records, beginning in 1500 B.C., the hunting of sea otters had a very important role in the life of the North American Indian tribes that lived on the shores of the Atlantic Ocean. The fur of otters, their skin, meat, bones and even their teeth were essential for these people. This eventually led to the fact that, around 200 A. D., whole settlements have been depopulated as a consequence of the extermination of sea otters.

There also are records from 600-900 A. D. – the period of the Tang dynasty - telling us that Chinese fishermen used trained otters to catch fish. Early European encyclopedias (1480) also mention fishing with otters. This method is still used, especially in the East.

The dark Middle Ages – just like in the case of wolves and bears – did not provide much that was good for otters. In 1556 there was a decree in England promising rewards for killing otters and 'other harmful pests'. In yet another paper from England, the author mentions that otters had become so daring that "they attack the farmers sheep and the housewives' poultry".

In 1751, in the description of the Europeans' first expedition to Alaska, Steller mentions that sea otters had lived there in great numbers. Beside the fact that it was very easy to capture them, their fur was marvelous and the meat of the young was very tasty. Mass extermination of otters for their fur started in 1792. The hunting of sea otters came to an end in 1911, with the convention for the protection of seals. Seals are also hunted for their fur, and sea otters were included in the convention by accident. In any case, this happened just in time, because, according to the estimates, world sea otter population at the time consisted of only 500-1000 individuals.

In the 1800s several articles were published in England about the fact that, in those rivers from which otters were exterminated, the number of fish worthless

for fishing increased. According to an article that appeared in an English hunting review in 1946, otters do not cause serious damage in trout populations of creeks and rivers.

These days, the factors that threaten otters are river regulations (ruining their habitats and reducing the number of their prey), water pollution (detergents damage the impermeability of their fur), illegal hunting and traffic accidents.


Photo: Lanszki József

Otters, as we have already mentioned, are on the top of the water habitats' food chain, therefore all poisonous materials (like heavy metals) eventually pile up in their organisms. Therefore, otters are a sort of 'indicator': their presence or their health reflects the state of the habitat as well.

Otters in Romania

Previously, otters were hunted in Romania as well, mostly on the territory of the Danube Delta. In 1993, Romania joined the Bern Agreement. In accordance with this agreement and with law no. 103/1996 regarding hunting (completed by law no. 654/2001) the otter is a protected species. Its hunting is forbidden by law; nevertheless one can hunt them if in possession of a permit. Since otters can no longer be hunted, the interest towards them has ceased.
Practically, for more than ten years there are no data on the number of Romanian otters, nor on their distribution or the composition of their diet.

Otter-damage in Transylvania - cases studied by us -

Câmpul Cetății – Mureș County:
Cîmpul Cetății is situated at a distance of 18 km from Sovata, in the Niraj Valley (at the bottom of the Gurghiu Mountains). Here, a trout farm was set up in 1936 at the junction of the Smaller Niraj and the Greater Niraj rivers. Although it had been

established as a private enterprise, it was nationalized under communism. Most of it is still the property of the forestry, but a small percentage has been returned to the descendants of the former owner (the L. family). The farm covers a territory of 4 hectares and consists of about 50 lakes. The majority of these (the lakes belonging to the forestry) contain rainbow trout (Oncorhyncus mykiss), with the rest (the lakes on private property) having mostly carp (Cyprinus carpio), and its different subspecies (e.g. mirror-carp). The carp are exclusively bred for sale but a part of the trout is used for the repopulation of the rivers. The lakes are fed with water and oxygen from the Niraj River through a complicated sewer and sluice system.

According to the person interviewed, (L.G., ranger, descendant of the former founder of the fish farm), otters were always present in the area, but only rarely did they appear near the lakes. The people who work here already know the paths used by otters – these do not change over the years. Most likely there is one otter family that occasionally (mostly during winter) visits the fish farm. Otters have been seen on several occasions; but it is the tracks that are usually found. The visits of these animals – according to the ranger – usually happen during cold winters and the main reason for this is the scanty fish stock of the Niraj River which, during times like that, cannot fulfill the otters' increased need for food. The sparseness of the fish is mostly the result of poaching, which cannot be balanced by the systematic repopulation of these rivers with fish by the forestry service. Furthermore, it is obvious that an intensive fish farm represents a plentiful and easy source of food (the lakes swarm with trout – circumstances like these never occur in the natural habitats of otters).

Photo: Deák Attila

According to the people questioned, otters can feed on fish of any size. Nevertheless, the employees of the farm believe that the most appropriate prey are the individuals of 25-30 cm (10-12 inches), which is also the size of commercialized fish. It has never been possible to size up the damage precisely, but it is very likely that every visit of an otter means several kilograms lost trout. According to the ranger, they cannot stop otters from visiting the lakes from time to time; still, the most efficient prevention

method would be a suitable protective fence.


Photo: Bagosi Zoltán

Lăpușna - Mureș County:
Lăpușna can best be approached fom Reghin, through Libanfalva. It is located along the Gurghiu River (in the Gurghiu mountains) at a distance of 40 km from Reghin and 18 km from Ibănești (there are no other settlements between Lăpușna and Ibănești). Lăpușna was once a renowned tourist spot where school camps were organized. Today, there are only 3 families in the 'settlement', one of these, the T. family, lives at the trout farm. They run the farm that belongs to the state-owned forestry.
The farm gets its water supply from a small branch of the Gurghiu River, the water flows from the water basin system to the river. In Lăpușna, they breed brook trout (Salvelinus fontinalis) – for the most part for commercial purposes, the rest for repopulating the rivers. Besides the farm, there are several smaller basins along the river with indigineous trout (Salmo trutta morpha fario) offspring kept in nature-identical conditions. These are bred exclusively for repopulating the rivers.
In the spring of 2002, there was an accident at the trout-farm of Lăpușna that neither we nor the farmers were prepared for. An otter penetrated the farm and, in order to reach a basin, tried to pass through a canal. It was carried away by the current and sucked into the tube leading into the basin. The animal got stuck in the narrow end of the tube, entirely blocking it. In addition, the end of the tube was positioned in a way that people could not reach it. The employees noticed the accident only after one hour and a half and it took yet more hours until they could get the squashed body of the otter out of the tube. In the meantime, 1700 kg of trout has perished from the absence of oxygen in the overpopulated basin. The farm succeeded to sell 1 500 kilograms out of the 1 700. Following the accident, the canal and the tube system joining the lakes was radically redesigned. The tubes were closed on each end in order to prevent similar accidents. Besides this, the whole farm is guarded by dogs and in many places (known otter-paths leading in from the river) the dogs are on running chains. Practically, otters can only reach the lakes if they climb over the fences, thus their presence and consequently the damage have diminished considerably.
There had been damage on the farm before but on a much smaller scale. According to the director of the farm, otters usually hunt for fish of 20-40 cm (8-16 inches),

but they sometimes try their luck with much larger fish used for breeding. The bite-marks on the bodies of these fish are the signs of the unsuccessful attempts of otters.
Despite all this, T.D., the director of the farm, has a very positive attitude towards otters. He told us that the fish from the farm's lakes and from the rivers are more endangered by the pollution from wood cutting than by otters. The sawdust, motor oil etc. cause conditions favorable for the appearance and propagation of parasites which then can produce immense damage in the fish stock of the farm and of the rivers. Otters try to hunt on fish farms because of the diminished natural fish stock and the easy plunder. As for otters, the director said that the most effective protection measures are the electric fence and the dogs.

Stânceni – Mureș County:
Gudea is situated on the road between Reghin and Toplița, in the Mureș Gorge. The trout-farm is at a 1,5 – 2 km distance from the village, on the side of the forest road that leads to the Gudea Mare peak, along the Gudea creek. T.D., a former forestry employee is the leader of the farm. The Mureș Gorge (the river and its tributary streams) offers ideal conditions for a smaller otter community – we have found many signs that indicate the presence of otters (spraints, leftover prey, tracks). In the farm's lakes there is mostly brook trout (Salvelinus fontinalis) – 14 tons - but there is also rainbow trout (Oncorhyncus mykiss). The fish stock is used mostly for commercial purposes but a small part goes for the repopulation of rivers. The establishment is surrounded by a high fence and is guarded by several dogs. According to B.S., there was no noticed damage that could have been done by otters, although they have found otter tracks on two occassions. He had a positive attitude towards otters that he likes, even though he knew about the damages done in the Lăpușna farm. In his opinion, the pollution of the rivers led to the diminishing fish stock, which also threatens the survival of otters. This, and the easy prey offered in the farms can be the reason for the otters' visits to fish farms. Although he knows from his former ranger experiences that

Photo: Deák Attila

there are otters along the Gudea creek (his colleagues have also confirmed this), he believes that the fence surrounding the farm and the presence of dogs suffice to keep these animals away. According to his knowledge, otters feed on fish of 20-40 cm (4 to 8 inches).


Photo: Bagosi Zoltán

Mărtinești – Cluj County:
Mărtinești is situated between Cluj and Turda, on the side of the E 60 road. The fish ponds are also on the side of the road. The fish farm belongs to a central institution responsible for the administration of fish farms that functions under the supervision of the Ministry of the Environment. The surface of the lakes is 90 hectares and around 30 tons of fish are bred here. The main species are carp, pike-perch, crucian and silver carp and in addition there are pike and perch.
The lakes theoretically represent a suitable habitat for otters: high reeds surround them, they can provide enough nourishment for several animals and, with the exception of some lakes used for sport fishing, they are relatively undisturbed. At the same time, we should also note that these lakes are part of an intensive fish farm and that there is no river or stream in the area that could represent an alternative habitat for otters.
According to the keeper (T.I.), otters had been seen several times around the lakes, even while eating. Considering these things, we can presume that there are otters living here and that they have dens, too. The reason for this is that the lakes provide a plentiful source of nourishment for otters. Nevertheless, the damages are insignificant – according to their experience, otters feed on fish smaller than 20 cm. At the same time, he also mentioned that, when they dig holes in the ground they are also weakening the embankments and dams. Considering that the keeper has confused otters with muskrats (Ondathra zibethica) several times, it is very likely that this damage was done by the latter. Of prevention methods, he found that startling sounds (shots, petards) were most effective, although he said that, for the time being, there is no need for that.

Gilău - Cluj County:
The trout breeding complex of the forestry service is situated in the direct neighborhood of the village of Gilău (there is another farm, next to it, allegedly no

damage had happened there). From one side, it is bordered by the reservoir of Gilău. The 45-50 basins are surrounded by a wire netting that is dug in the ground and an iron-fence. During the night, two rottweilers and a guard patrol it, walking between lakes. According to the employee of the trout farm, the visits of otters began three years ago and since then they have been visiting the lakes every 2-3 days. They come during the night from the direction of the neighboring reservoir, where they have dug a hole under the fence. Usually, a pair comes, rarely only one, and they usually stay for 2-3 hours at the lakes. The keeper has seen them several times playing among the basins. In his opinion, dogs do not represent an effective protection against animals that can flee into the water. Due to the pollution of waters and poaching, otters cannot find enough food in their natural habitat; consequently, they prefer fish ponds because these represent an easier and more reliable source of nourishment. In the opinion of P.V., the otters that cause damage in the fishponds live somewhere in the area. The damage is considerable, but bearable.

Remeți – Bihor County:
The fish farm of B.T. is situated on the Valley of the Iad stream, 2 km from the village of Remeți, in the neighbourhood of several houses. It consists of 4-5 smaller concrete basins and is surrounded by wire netting. The basin used for propagation is at a 1-1,5 km distance from the other, in a side-valley, and consists of basins without concrete built on the course of the river. There are houses in the direct proximity of both fish farms.
The bigger farm has an area of 3000 squaremeters. In its enclosed territory there are 4 medium size dogs. The smaller farm has only one dog (this farm is closer to the house and is not surrounded by any fence). Otters usually visit the farm during spring and summer and more rarely during autumn and winter. The smaller establishment, which is used for propagation, is not surrounded because there are mainly offspring, which, according to the owner, are not liked by otters.

Photo: Lanszki József

On both places, otters come from the direction of the rivers. A visit usually takes 15 minutes. Often, the farmers only know about these visits the day after (from tracks, fish-leftovers or spraints). Otters often take the fish away and consume it elsewhere. Since the bigger farm has been surrounded and guarded by dogs, there has been

much less damage (200 kg of trout/year – 25 million lei) – the owner thinks that this is the most appropriate prevention method.

The lakes of the Transylvanian Plateau (Zau de Câmpie, Șăulia, Fărăgău, Cipău, Iernut)

The Transylvanian Plateau zone is the unforested hilly region of central Transylvania that is situated between the Smaller and Larger Someș, the Șieu, the Mureș and Arieș rivers. In the last decades, the area has been mostly known for its fishponds. Today's lakes, for the most part, are man-made. These lakes cover a large area (some are larger than 30 hectares) and form an interconnected system.

During our visits in the region, we observed the following generalities: in several places, we found tracks or spraints showing the presence of otters. From our conversations with the employees working at fishponds, we found out that they often confuse otters with muskrats. Although there were people who knew about the presence of otters – some have even seen them – they could not give us much information about the extent of the damages. This is quite natural: we are talking about very large lakes and fish stocks; the occasional losses caused by otters do not strike the eye. All the persons that we have questioned had a positive attitude towards otters.

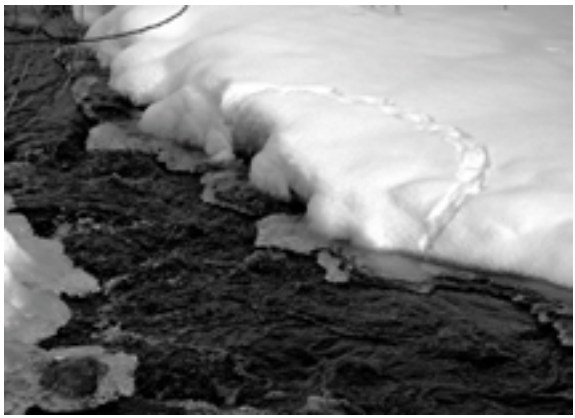
Remarks on the damage done by otters

The damage caused by otters is not as spectacular as that caused by wolves or bears. Often, the media is not notified about them.

Most times, otters are not even seen – it's mostly their tracks and the remains of fish that reveal to us that a predator has been there. In cases where they make attempts at a fishpond, they only stay for a couple of days in the vicinity.

The damage done by otters is usually observed at smaller fish farms. Here, opposed to bigger farms, the directors know precisely the amount of fish in the lakes, so they notice losses more easily.

Photo: Deák Attila

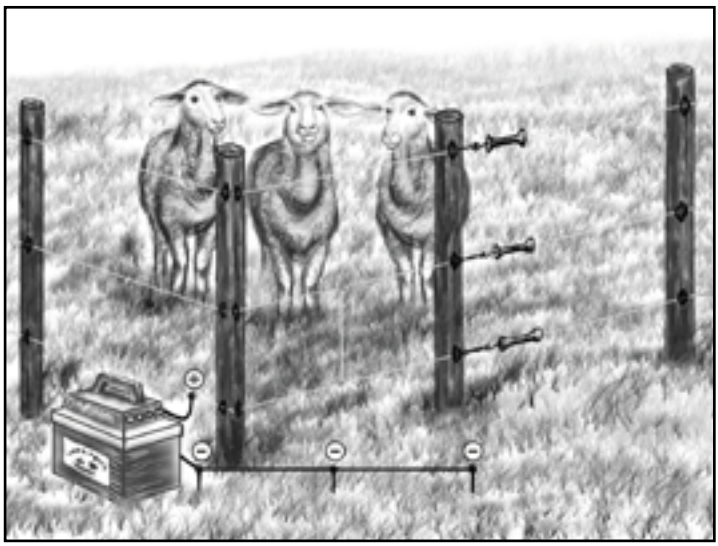


Many people know otters as bloodthirsty predators that kill vantonly and kill more than they can consume. Such behavior is very rare among adult animals. This is more characteristic of young animals, when they are learning to hunt. By the age of six months, they give up this habit.

Damage prevention methods

In the following, we will present several methods, successfully used abroad (and in certain places in Romania too) to prevent damages caused by bears, wolves and otters. We won't detail every damage prevention method that figures in the relevant literature, instead we will concentrate on those that can be realistically applied in Romania. Apart from these, there are numerous other methods that are still in the experimental phase.
The essence of these methods is that they are non-lethal, even for the carnivores. This is why they can be used even against threatened or legally protected species.
The development of damage prevention methods started only a few decades ago and nowadays the interest showed towards them is ever increasing. This arises from the fact that more and more humans realize the importance of living in harmony with nature.

1. Electric fence:
The electric fence can be successfully used as well for preventing damages caused by bears and wolves, as for preventing damages caused by otters.
It consists of several wires stretched in line with each other, powered with 5 000 – 10 000 V electricity. The electricity comes from a dry cell, a battery or from a network and is converted into a high voltage pulse by an energizer. The wires are used to simply surround the desired area (pasture, shepherd camp, agricultural field, fishpond). The advantage of the electric fence lies in the fact that it can be easily and quickly mounted, later it can be moved (relocated) and it is suitable also for large areas. In the same time, it implies a lower cost than a traditional fence of good quality, used for the same area.



Composition and functioning of electric fences:
1. The fence itself: it consists of wires stretched in line with each other, which conduct the electric pulses. These are mounted on wood, plastic, metal or

fiberglass posts using plastic insulators.
2. Energizer: at regular intervals (1-3 seconds), the energizer releases high voltage electric pulses (5 000-10 000 V) into the fence. Current intensity is so low, that the system is totally harmless for the animal (or human) touching the electric wires. Nevertheless, it delivers a very unpleasant and hard-to-forget electric shock.
3. Power source: the system can have various power sources, depending on local conditions: dry cell, battery, network source (plug) or a solar panel, which is best to be combined with a battery.

Mounting and maintenance: depending on local terrain conditions, the posts must be mounted at a distance from each other in a way that the height of the lowest wire will not exceed the recommended height. On even ground, the posts can be at a distance of 8 meters (8.7 yards) from each other. The posts can be home-made, of wood, or you can purchase plastic, fiberglass or metal posts, which have a sharp lower end (usually metallic). These can be easily inserted into the ground.
The negative pole of the energizer must be grounded. A good grounding is essential, and for this you need to insert into the ground at least 3, at least 1 meter long rustproof metal bars, which will be interconnected and also connected to the negative pole of the energizer.
If you have a correct grounding, the bars won't shock even when touched. In frozen ground or in dry, sandy soil it is difficult to achieve a good grounding. In these cases you need to use more bars, as deep as possible. The energizer's performance determines the possible length of the wires.
The energizer can be connected in two ways:
1) The positive pole is connected to each wire. To deliver an electric shock, it is enough if the animal touches only one wire. The wires can also be interconnected, you don't need to be afraid of short-circuiting the fence. It can only be used if you have a good grounding.
2) The positive pole is connected to the first, third and fifth wire, whereas the negative pole to the second and fourth wire. It is recommended to separately ground the negatively charged wires at certain distances.
It can also be used with weaker grounding, the disadvantage is that two neighboring wires cannot touch. If you tie strings, flags to the wires, you have to make sure that these don't touch the neighboring wire and that they are dielectric. You can reach maximum effect if the animal's body touches two neighboring wires at once.
The number of wires is optional; it is recommended to use 5 wires against bears and wolves and 2-3 against otters. You can choose the length of the wires taking in consideration the performance of the energizer; the total length can be of several kilometers (as much as 10 kilometers). The lowest wire should be at a height of 20 centimeters from the ground, and the wires should be at a distance of 20-30

centimeters from each other.
If the biggest threat comes from wolves, the lower wires should be closer to each other and the upper ones further from each other, whereas in the case of bears the wires should be at equal distances from each other.
The fenced domestic animals learn quickly to avoid touching the wires. Most animals avoid them even if at that time the wires are not charged with electric impulses. This is especially true in the case of the docile horses, pigs and dogs. Carnivores also learn their lesson in a short time, but they will attempt again from time to time.
It is important to remember that an electric fence is a psychological barrier rather than a physical one. Scarred animals (or fleeing animals) – wild boar herds, bears – cannot stop in front of it unless they can observe the fence in time. This is why you have to make the fence easily noticeable. You can achieve this by stretching out in line with the wires strips that are wider and noticeable even in the dark (white or shiny), and by hanging on the wires fluttering strings at certain distances. These simple methods allow the approaching animal to notice the fence in time.
It is also important that the area around the electric fence is clean and easily observable by wild animals.
If you use the electric fence to protect sheep, you have to keep in mind that scared sheep, if they are kept in a small enclosure, can break through the fence. You can prevent this by also keeping the traditional sheep enclosure or by using the electric fence to surround a larger area.
Under high voltage lines, it is recommended that you place the wires perpendicular on the high voltage lines (and not in line with them). The electric fence needs a minimum maintenance – this means mainly cutting down from time to time the grass and other vegetation growing under the wires – otherwise the vegetation, by coming in contact with the wires, can short-circuit the system, decreasing the voltage and shortening the lifespan of the battery.
Depending on the size of the carnivore you want to keep away, you have to adjust the height of the wires in the following way (of course, you can use less wires – especially if you also use warning strips – but there is a better chance that the predator will jump over the fence):

Height from the ground / Species	1st wire	2nd wire	3rd wire	4th wire	5th wire
Wolf	20 cm	40 cm	70 cm	90 cm	120 cm
Bear	20 cm	50 cm	80 cm	110 cm	120 cm
Otter	15 cm	25 cm	35 cm	-	-

The electric fence must always function, even if at the moment there are no domestic

animals inside of it. Otherwise carnivores can learn how to bypass it.
Electric fences can be purchased in Romania too. One dealer is the AGROM-COM in Sângeorgiu de Mureș (at a distance of 5 kilometers from the city of Tîrgu Mureș). In 2004, the costs of an electric fence at this company were the following (the prices are for an electric fence that would surround a 600X600 meter area with 3 wires, with the posts at a distance of 8 meters from each other):

Wire (3 X 2400 m)	12.852.000 lei
Insulators (in total 300 pieces)	2.263.200 lei
Reel (to gather the wires)	800.000 lei
Gate handle (3 pieces)	234.000 lei
Energizer (for powering it, a 12V battery is enough)	7.371.800 lei
Total	23.521.000 lei (the price of approx. 12 sheep)

2. Traditional (conventional) fencing:
A proper fence is the surest damage prevention method in the case of all three carnivore species. It's expensive if we are talking about fencing large territories. It's seldom used in the case of sheep flocks, because it is difficult to move.
The pales surrounding the sheepfolds also provide a certain protection. In the case of sheep flocks, fences can be made of wire netting or wood – what must be kept in mind is that fences surrounding sheep must be strong enough so that the animals won't knock it over. Another important aspect is that fences must be as high as possible (wolves can jump over fences 1.80 m high!). Of course, this can rarely be achieved, but the effectiveness of the fence can be raised with an outward bent upper part, a fladry, or by hanging on the fence itself blazing, rustling objects. Yet another important aspect is the distance between the boards or pieces of wood that make up the fence – this shouldn't exceed 20 centimeters. If it's possible, raise a double fence – in this case, the distance between the two fences shouldn't exceed 70 centimeters.
If the sheep are frequently left without human supervision – in an area known to be visited by bears or wolves – it's recommended to make a 1.80 m high fence from wire netting. Of course, the posts should be sturdy and well fixed. At the top of the fence there should be a 70 cm outward bent part and at the bottom, a further 1 m outward bent part dug into the ground.
When it comes to otters, you should not forget that the animal is a good climber and a skillful digger. Fences surrounding fishponds should be of at least 3 m high, with 2 m raising above the ground. The rest (1 m) should be dug into the ground

in the following way: 0.5 m should be in a normal (vertical) position, whereas the other 0.5 m should be horizontal, bent outwards from the fishpond. This way, you can prevent that otters dig under your fence and reach the ponds.

3. Fladry:
It consists of bright colored (red or orange) strips – made of some kind of textile – that are attached to a string, with which we surround the designated area. The strips are 10 cm (4 inches) wide and 50 cm (20 inches) long and they are set 50-70 cm apart, with their lower ends just touching the ground. This method is used against wolves. Originally, it was used in wolf hunts in Eastern Europe and Russia. It is effective only against wolves, which are afraid of it and don't cross the line (it's totally ineffective against ungulates, for example). If wolves get used to it, the method loses its effectiveness, so it's not recommended to constantly use it for a longer period of time. After using it, it's recommended to collect it during daytime.
Nevertheless, it's very effective when using it for a shorter period of time: when the traditional fence in not yet set around the shepherd camp, when the sheep cover greater distances while grazing, during occasional night time grazing, and so on. It can be applied when wolves often enter the sheepfold – it must be placed outside the traditional (conventional) fence. When placed on top of a traditional fence, it reduces the chances of wolves jumping over the fence. A fladry mounted around a shepherd camp preserves its effectiveness for a longer time if wolves do not have the opportunity to closely inspect it. Of course, this is true only if there is a permanent presence of shepherds and dogs.
The effectiveness of the fladry: experiments conducted in Idaho (United States of America) showed that wolves have entered for the first time a 400 ha area (permanently surrounded with fladry) only after 61 days. In Alberta (Canada) a 25 ha area was surrounded using fladry. In 60 days, wolves have approached the fladry for 23 times before crossing it for the first time.

4. Using sheep dogs:
It is the oldest method used to guard livestock. The fact that it persisted until our days speaks for itself about the effectiveness of the method, used against bears, wolves and otters alike.
Nevertheless, the method has its deficiencies: few shepherds have well trained dogs (they have confirmed this by themselves on numerous occasions). For example, during wolf attacks, dogs often try to chase the wolves, leaving the livestock unprotected, whereas in the case of bears, in many cases dogs warn about the approaching predator only when it's too late.
What must be achieved is that dogs always stay beside the sheep flock, even in rainy,

misty or cold weather. More, in these cases shepherds must also be alert, since dogs instinctively try to seek shelter. Experience shows that the best sheep dogs are those which are raised from their birth along the sheep, but even their training must be emphasized. Usually, it's not the pure races that become the best sheep dogs.
In the case of otters, if there is no possibility to let the dogs run loose around the fishponds, it's recommended that they are tied to running chains, which confer them as much movement space as possible. This is especially true if we know the trails regularly used by otters to approach the lakes, ponds.

5. Frightening methods:
As a completion to the above said, there are several frightening methods that can also be used against carnivores: fire, petards (fired in the evening, during the night and at dawn). These methods can rather be used for prevention purposes. Used in excess, they can loose their effectiveness (for instance, in the case of bears).
Also, you can mount different types of electric or mechanic devices, that warn about the approaching predator. One of the simplest and cheapest solutions is to use a string which has bells attached to it – it can be used to warn especially about approaching bears (wolves jump over the string, if they notice it in time). In the case of otters, you can hang pieces of used clothing on known otter trails – it should keep them away for a while.
Another frequently used method is to tie bells (cowbells) to the sheep's neck, which warn the shepherds and the dogs if the sheep are scarred. Often, it's too late.
It's relatively cheap to construct (even by yourself) systems that turn on a siren or a lamp when a wire is touched or torn.

6. There are also methods that can only be used by competent authorities. One example is to use rubber or plastic bullets to gradually deter carnivores. Another method is taste aversion, when chemicals (for example, lithium-chloride) are used treat a carcass. The predator that feeds from that carcass will associate his illness with that kind of meat and not eat it again.
At last, a non-lethal method is the trapping and relocating of the carnivore. In the United States, bears trapped for this reason –before their release – were conditioned to fear humans.

Laws on the protection of wolves, bears and otters, on the prevention of carnivore - inflicted damage, and on compensation

1. With the adoption of the Law no. 13 **(Legea nr.13/1993)** in 1993, Romania has joined the **Bern Agreement**. The signatories of this agreement bind themselves to ensure the survival of all wild plants and animals enumerated in the agreement. According to the Bern Agreement, wolves, bears and otters are strictly protected species, consequently all actions that aim to capture or kill them qualify as crime; it is forbidden to destroy their dens and lairs, or to deliberately disturb them. It is forbidden to possess or to trade these animals (dead or alive), including the products made out of their body-parts on the territory of Romania. According to the law (paragraph 9, alignment 1), in those cases in which there is no other option and the survival of the protected species (in our case of the wolf, the bear and the otter) is not in danger the state can dispense with the strict protection (more exactly with paragraphs 4, 5, 6, 7, and 8) if the aim is to prevent considerable damage to agricultural products, livestock or fish stock.
According to alignment c) of paragraph 23, grazing and agricultural activities are forbidden in state forests.
2. Romania joined the **Washington Convention** in 1994 with the adoption of Law no. 69 **(Legea nr. 69/1994)**, which forbides commerce of endangered or rare plant and animal species, as well as of products made out of their body-parts. In this sense, foreign trade of the species ennumerated in the convention (including wolves, bears and otters) dead or alive, trophies of these animals and products made out of them qualify as crime.
3. According to **Law no.103** regarding hunting **(Legea fondului cinegetic și a protecției vânatului nr.103/1996)** that appeared in 1996, and according to its modified and completed version, **Law no. 654 (Legea 654/2001)** that appeared in 2001, hunting of wolves, bears and otters is forbidden.
According to paragraph 8, the central office responsible for silviculture, has to take the appropriate steps, together with the appropriate ministries, in order to prevent damage caused by predators or by hunters.
According to paragraph 15, for damage caused by huntable species (wild-boars, deers, stags) the leaseholder of the hunting area is responsible (in most cases hunting association) meanwhile for damage done by strictly protected, not huntable animals (eg. wolves, bears, otters) the central office for silviculture is responsible. In the case of strictly protected species, **persons suffering damage should be compensated from the wildlife protection fund (fondul de protecție a vânatului).**
According to the law, the person suffering damage has to hand in a request to

the leaseholder of the hunting area and to the local council within 3 days after the observation of the damage. Following this, the damage will be evaluated by a committee that consists of a delegate of the leaseholder of the hunting area, a representative of the local council and of the damaged person. The committee has to make out an **acknowledgement record (act de constatare)**. In the case in which the leaseholder of the hunting area does not appear within 48 hours, the acknowledgement record should be made out by the representative of the local council and of the person suffering damage in the presence of two witnesses. Afterward, a court decides upon compensation of the damage.

4. The protection of the wolf, bear and otter is also controlled by **Law no. 462 (Legea nr. 462/2001)**, adopted in 2001. This law prescribes the designation of protected areas and protection of wild plant and animal habitats.
5. In 2001, **Government Decree no. 58 (Ordin nr. 58/2001)** about the origin and use of the **wildlife protection fund** was issued. The regulation attached to this decree states that, in the frame prescribed by the 103/1996 law, compensation for damage caused by strictly protected animals in agricultural products, livestock and forest plantations are all covered from this fund.
6. **Government Decision no. 748 (Hotărâre nr. 748 / 2002)**, published in 2002, prescribes the measures for protection of agricultural products, forest plantations and domestic animals against wild animals. According to the resolution, the owners of land, forest plantations and domestic animals are required to fulfill certain obligations.
Owners of land and forest plantations are obliged to take the following protection measures in order to prevent damage caused by wild animals:
- they have to take the appropriate guarding measures of lands and forest plantations;
- they have to set up scaring devices (still or moving) on their lands and plantations authorised by law that scare away wild animals or prevent their penetration.
When requested by landowners, leaseholders of the hunting area are obliged to provide them with devices that keep away wild animals from agricultural lands. Leaseholders of the hunting area are obliged to take actions in order to keep away wild animals.
In case of damage, the owners of agricultural land, forest plantations or domestic animals need the following documents to prove that they have fulfilled their obligations:
1. an **acknowledgement record (act de constatatare)** made out by a committee (using the method presented in Law no. 103/1996)
2. **the request to the leaseholder of the hunting area (adresă către gestionarii fondurilor de vânătoare)** in which the person suffering damage had requested

devices meant to scare away wild animals.The request can also be presented at the local authority's office on whose grounds the agricultural land is located. The local authority is obliged to forward the request to the leaseholder of the hunting area.
3. **a record (proces verbal)** that is made out by the leaseholder of the hunting area about the fulfillment of the duties of the person suffering damage after the handing over of the scaring devices.
Owners of livestock are obliged to take the following measures in order to prevent damage:
- they have to guard the grazing or working domestic animals and they have to make sure that they only graze on authorized areas;
- they have to enclose their animals for the night and use appropriate scaring devices to keep away wild animals;
- when driving their animals through public forests to the pasture or water, they can only use designated paths. These paths are designated by agreement of the hunting association that administrates the hunting area, the forestry office and the person who guards the domestic animals.
In case of damage caused by wild animals, the owners of domestic animals need the following documents to prove that they have fulfilled their obligations:
1. Proof that they kept *the maximum allowed number of guard-dogs* (according to Law no. 103/1996, the allowed number of dogs is 1 in lowlands, 2 in hilly regions, and 3 in mountains).
2. A contract concluded with the owner of the land in which all designated pasturing areas are marked, as well as the maximum allowed number of animals per hectare is noted.
3. The report of the above-mentioned comission (see Law no. 103/1996) examining the obligations presented above.
4. A permit specified by the law that refers to the driving of animals through forests.

Damages portrayed in the media

The media (television, radio, newspapers and internet) have a significant role in forming people's opinion. In most cases, the public at large hears about the damage done by carnivores from the media and draws its conclusions consequently. At the same time, this impression is decisive in the formation of public opinion about carnivores – an opinion that is hard to change or even to influence later. This is why it is very important that people get precise and detailed information about damages, without any exaggeration. From the summer of 2004, the Romanian media presented several reports about damages caused by carnivores (and other wild animals as well). These reports often are not based upon precise information; news and articles often (in some cases unfoundedly) have a negative tone. It is understandable that television reporters and journalists do not have much time to gather detailed information about all the sides of a problem; in addition news have to be interesting and shocking. In the same time, it is worthwhile to consider the possible 'side-effects' of the materials that reach the general public.

In the following, we will present a concrete example about a certain case: what has been in the news and what really happened – with no further comments added.

We have learned from 2 television channels (PRO TV and TVR2) that on Sunday, October 24th (at night, according to ROMPRES News Agency) a bear-cub has entered several farms in Ormeniș (Mureș County) and has caused damage.

ROMPRES, Tîrgu Mureș, October 25th:

'Bear cub killed with axes and sticks: Sunday night, the inhabitants of Ormeniș village, armed with axes and sticks, have killed a bear cub that has terrorized the village and has caused damage in several farms. The inhabitants of Ormeniș were wakened by noises made by the bear cub. The bear cub has bitten a pig and clawed a dog, after which it has returned to the forest. Armed with sticks and axes, the villagers, afraid that the animal might later return to the village, followed the tracks of the bear and have killed it. The locals state that, until the end of last year, bears had not entered their village, but during this autumn they have often plundered the bee hives. The cub was transported to the Veterinary Center of Tîrgu Mureș in order to examine whether it has represented a threat to the village and whether it was rabid. If the contrary is proven, the villagers will have to pay a fine, especially because the animal is protected by the law and its estimated value is of 100 million lei.' ROMPRES.

We visited the spot on the following weekend and contacted M.V., a villager on

whose farm most of the 'bear-damage' took place. Our conversation has highlighted many interesting details:

1. The event had not happened at night (as it was presented in the news) but during the day at 13.00 hours. This circumstance should not be neglected, considering that the house in question stands on the main (and most busy) street of the village. In addition, the back yard opens to a common garden, which is further separated from the pasture by two streets and rows of houses. Practically, the cub has made his way through the two rows of houses and the street, has entered the common garden, and then the courtyard, all this during daylight. No matter what our opinion is about bears, this fact is hardly usual. The strange behavior of the bear was also noticed by the neighbors of whose courtyards it had made its way through. There is an explanation for this behavior that later the villagers have found out and that the ranger has also confirmed: there was a wild-boar hunt in the nearby woods and the frightened bear had fled in the village. First, the hunters have confused it with a wounded wild boar and have followed it.

2. From the common backyard, the bear had entered the chicken-yard of M.V. and had run into the gate that separates it from the house's main yard. Although the gate opened, the bear did not go inside the main yard. The first person to notice the bear was the wife of the farmer; alerting her husband with screams. On one side of the chicken-yard there is a pigsty with its small fenced court. To reach the garden from the back, one can only pass by the pigsty. It is thus understandable that, seeing the bear, the first thing that came to the mind of the farmer was the pigs – later they found out that, while on the run, the bear had indeed wounded one pig close to its eyebrows. Snatching up a nearby stick used for stirring the swill, the farmer tried to chase the bear out of the chicken-yard. The bear had tried to flee in the direction of the backyard, but probably did not find the exit, so it ran in the direction of the corner of the courtyard, right into the dog chained there. According to the farmer, the bear grasped the dog with its paws for several seconds but left it unharmed, and finding the way out, it ran out to the garden from the back. By that time, reinforcement had also appeared in the person of the neighbor called by the wife. Armed with a stake, he joined the farmer to chase the bear in the cornfield. The bear tried to escape and, running through the legs of the neighbor, knocked him over. According to this person, the bear stopped 10 meters away, looked back and fled without harming the man on the ground. Eventually, it succeeded in getting into the neighboring garden and from there to the main road of the village. By this time, according to the farmer, at least 30 people had gathered and, armed with stakes, started to chase the animal. The bear has tried to climb a steep hill near

the village, but, according to M. V., failed and rolled down to the road (based on our observations, we can state that the hill would not have been an obstacle for a healthy animal).

3. According to the people asked, the bear had finally succeeded in escaping from the village on a side street. Those villagers who were willing to talk to us could not tell us exactly what had happened after this. Very soon two hunters appeared, bringing the body of the bear. One hunter asked about his dog. Later, the local ranger appeared as well and the carcass was put on a truck and transported to Tîrgu Mureș. In the meantime, the reporters of PRO TV Tîrgu Mureș had also appeared and interviewed the villagers.

This was what the people directly concerned in the event had told us. The facts presented in the media differ from the villagers's statements:

1. First, according to ROMPRES, the bear had 'terrorized the villagers during the night and had caused damage to several farms… had bitten a pig and clawed a dog'. Bears that visit the village at night obviously come to prey (so they terrorize) – this image is much closer to the general public's view on bears than that of a cub, miserably trying to escape first from the hunters and later from the villagers. Furthermore, a week later, at the time of our visit, the dog and the pig did not have any scars.

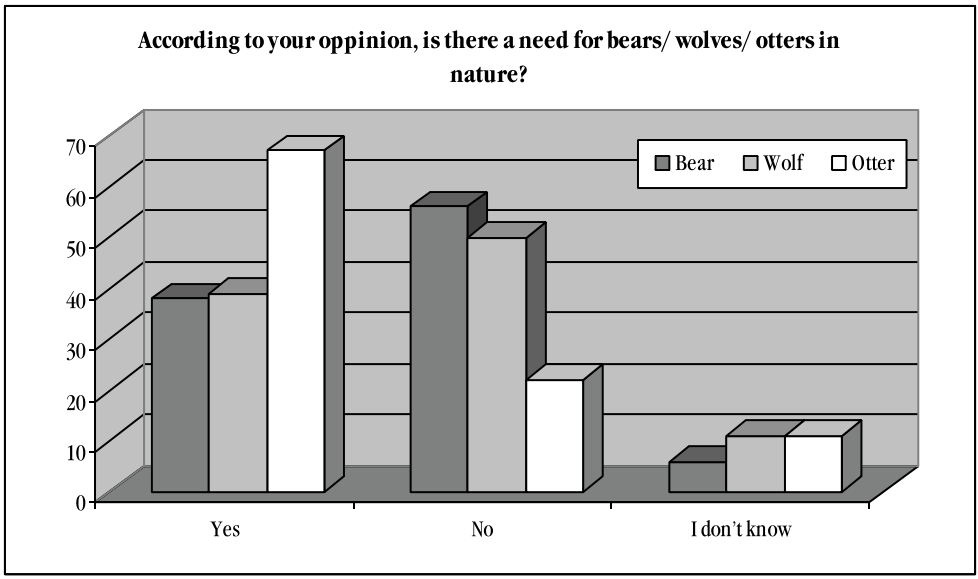
2. The part of the television news about the villagers having waited all night for the mother of the cub probably has its origin in the fact that, according to those interviewed, the reporter has raised the possibility of the mother-bear's visit to the village.

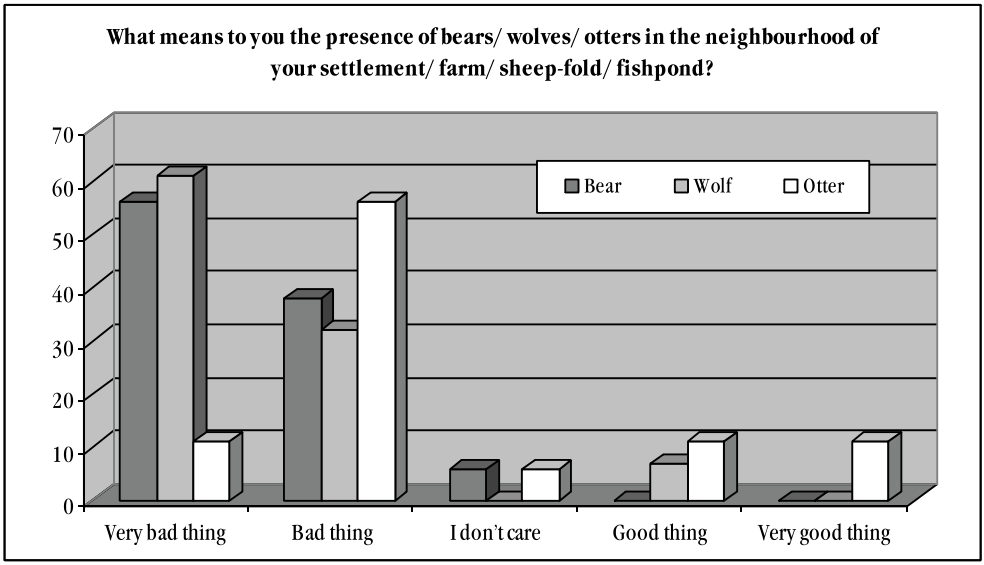
3. According to the villagers' statements bears did not cause any damage in the village (contrary to what has been said in the media) either in the beehives or in the cereals.

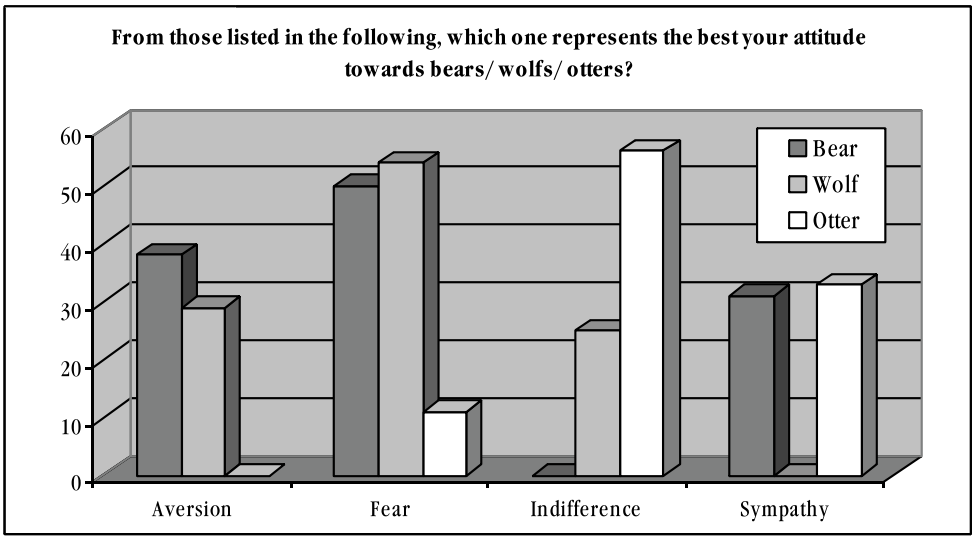
4. The possibility of the bear being rabid could have emerged through an actual case that was repeatedly presented in the media (the case of a bear-attack in the Răcădău district of Brașov). Anyhow, the examinations made in the Veterinary Center proved that the animal was not rabid. Besides, dr. C. has unofficially declared that the frontal lobe and neck lobe of the animal weighing 80-90 kg was shattered (there were no bullet-wounds on the animal) causing its death.

Damaged people's opinion about the three species

In parallel with studying the damages inflicted by bears, wolves and otters, we also conducted an opinion survey amongst those who suffered damages. We selected three questions from the questionnaire that we used - in the following we will present the answers that we received (from the charts are missing the opinions of people who suffered damages in their crops, caused by bears):






From those listed in the following, which one represents the best your attitude towards bears/ wolfs/ otters?
60
50
40
30
20
10
0
Aversion
Fear
Indifference
Sympathy
Bear
Wolf
Otter

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