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2018

Guide

Learning to live with wolves

Questions from the domains of agriculture,
forestry, hunting, tourism and politics

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Publication information

Published by WWF Germany

Date 09/2018 (5th edition; revised German version of the Leitfaden/Guide published in 2011)

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Production Maro Ballach/WWF Germany

Printing Aumüller Druck GmbH & Co. KG.

Printed on Circleoffset Premium White (100% recycled paper)



Photo credits: © Ralph Frank / WWF (cover, 20, 21, 33); Sergey Gorshkov / WWF (4, 62, 80); Jupiterimages (6); WWF (8, 10, 19, 28, 29, 31, 35, 43, 44, 69, 73, 83, 88, 9899); Axel Gomille; (9) Gettyimages (10, 11, 15); DaddyBit (15); Ireneusz Wojtowicz (17); G. Kopp (23); G.Delpho / WILDLIFE (23); Frank Parker (24); Armin Hofmann (30, 43, 84); Jan Noack (39); Kathrin Merkel (42); Peter Sürth (43); Rolf Fischer (48); Game Camera (55); Krummheuer (56); Peter Jelinek / WWF (59); Konjushenko Vladimir (60); Keith Webber Jr. (75); Boarding1Now (76);

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Foreword

The wolf is back! And it is not alone. For many years, things didn't look good for large mammals here in Europe. Deprived of their natural habitats and eradicated by humans, many species had completely disappeared from large areas of Europe. But thanks to stricter nature conservation legislation and successful species protection projects, the prospects are now good for wolves, lynxes, moose and other species.

For more than a century, wolves had vanished from large parts of Europe. However, they are now re-establishing themselves in many European states. But what conservationists celebrate as a great success poses challenges for people living in wolf inhabited areas. Frequently raised questions include: Are wolves dangerous? How will hunting change? What is the best way to protect livestock from wolf attacks? And how can wolves and humans coexist in a way that is mutually beneficial?

This brochure aims to illuminate answers to the most pressing questions posed by people who now live in close vicinity to wolves. At the same time, the wolf deserves a factual debate without being romanticised, demonised or polemicized.

In the end, the wolf can only successfully survive in Europe if we find solutions for low-conflict coexistence in a constructive dialogue with stakeholders, including livestock farmers, hunters and conservationists. New forms of conflict resolution are needed that combine old traditions with modern technology.

WWF strongly believes that human beings and wolves can live alongside one another, and is working at many levels to secure a permanent home for the wolf all over Europe.

Eberhard Brandes | CEO, WWF Germany

Introduction

This brochure provides information insights first and foremost concerning wolves in Europe. Yet, wolves don't just live in Europe, but also in Asia, North America and in the northern regions of Africa. With this in mind, the first question we need to ask is: What do we mean when we use the term "wolf"?



Wolf habitats are just as varied as their behaviour towards their individual environments and especially towards people.

Characteristics of wolves in the far north of Canada and Scandinavia do not necessarily hold true for wolves in southern Europe. Conclusions drawn from observations conducted in large expanses of open country – for example, in Germany’s eastern regions – must be applied with caution to more spatially restricted wolf habitats in the Alps and other mountainous areas. And finally, we should avoid excessive generalisations about wolf behaviour, for in comparison to other species, wolves display a particularly pronounced ability to learn and adapt to changing situations.

Wolves are the “individualists” of the animal world: their character and behaviour, that is, their temperament, is the result of the “traditions” inherited from their parents and family members, hereditary factors and individual life experiences. Yet despite the differences that may emerge between individual wolves, two behavioural patterns are typical: they are careful and very curious.

In regions now viewed by the wolf as home, farmers, foresters and tourist operators feel a sense of unease. Some are even deeply upset. Animal owners are faced with the challenge of having to protect their livestock, which means extra work and new financial burdens. It is thus important for WWF to provide those directly affected with specific answers to questions that come up repeatedly. As part of this process, we would first like to introduce the wolf, including its behaviour and its characteristics. For more detailed information, please refer to the annex, which contains specific reference material on this subject.

This brochure is intended to serve as a source of information for everyone to help understand our (new) neighbour: the wolf.



Arctic wolf (*Canis lupus arctos*)



Tundra wolf (*Canis lupus albus*)



Arab wolf (*Canis lupus arabs*)



Mexican wolf (*Canis lupus baileyi*)



Mackenzie River wolf (*Canis lupus mackenzii*)



Iranian wolf (*Canis lupus pallipes*)

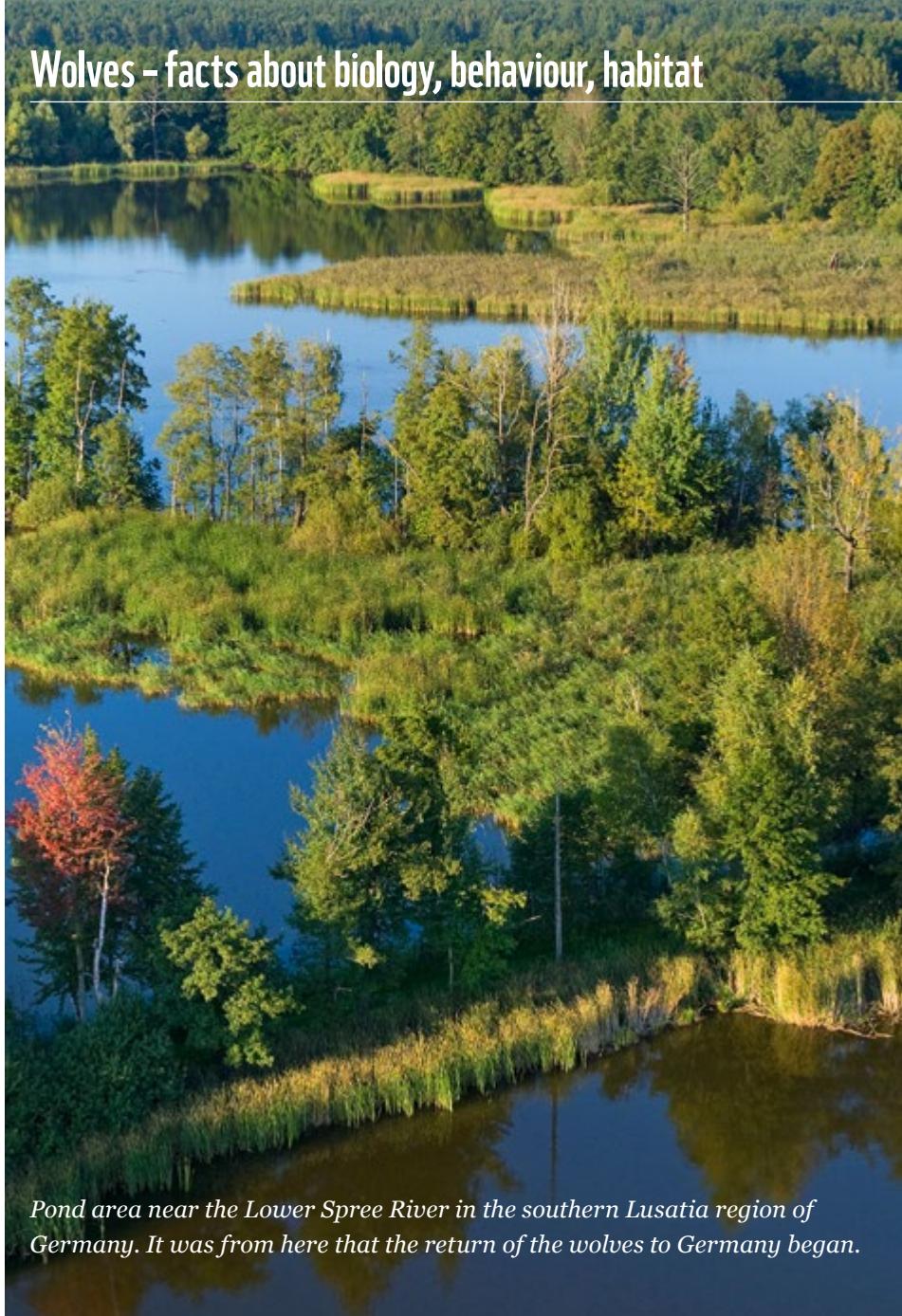


European grey wolf (*Canis lupus lupus*)



Tibetan wolf (*Canis lupus chanco*)

Wolves - facts about biology, behaviour, habitat



Pond area near the Lower Spree River in the southern Lusatia region of Germany. It was from here that the return of the wolves to Germany began.

How do you recognise a wolf?

A wolf is about the size of a German shepherd. Its colouring and weight can vary greatly by location. The colouring of European wolves is not as varied as that of Canadian wolves. Nuances of light brown and ochre are typical for the fur on the belly. Wolves' backs are usually dark brown, interspersed with black. Seen from a distance, their hair blends to create an overall grey impression.

The wolf is long-legged, its head is wider than that of a dog, its eyes are slightly slanted and its tail hangs down loosely. In the wild, a 12-year old wolf is already considered to be quite old. According to our research, the oldest wolf in the wild reached the age of around 14, but most die much earlier. In captivity, an age of 17 years is considered rare.



Czechoslovakian wolfdog



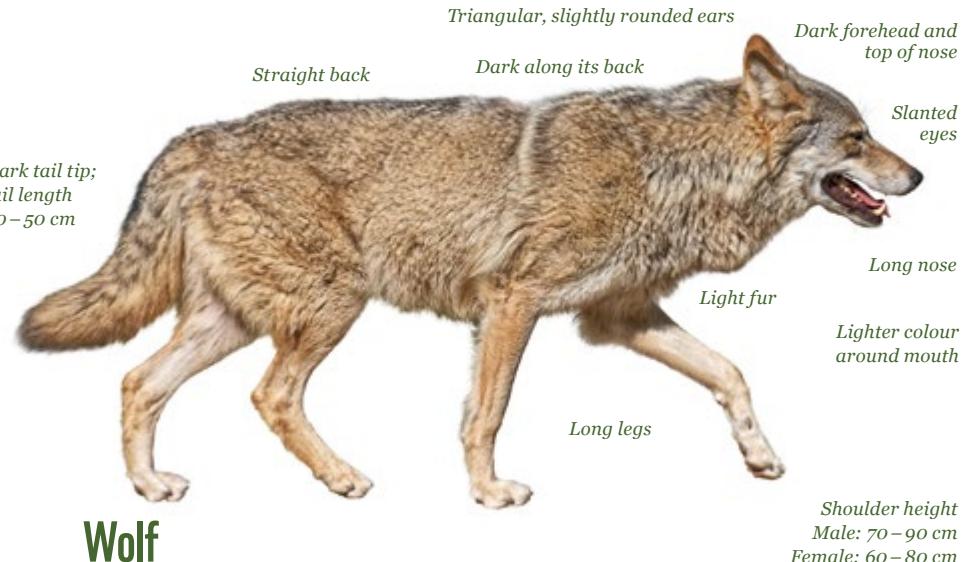
Saarlooos wolfhound



German shepherd

Head/body length

Male 110–150 cm; female 100–125 cm



Wolf

Siberian husky



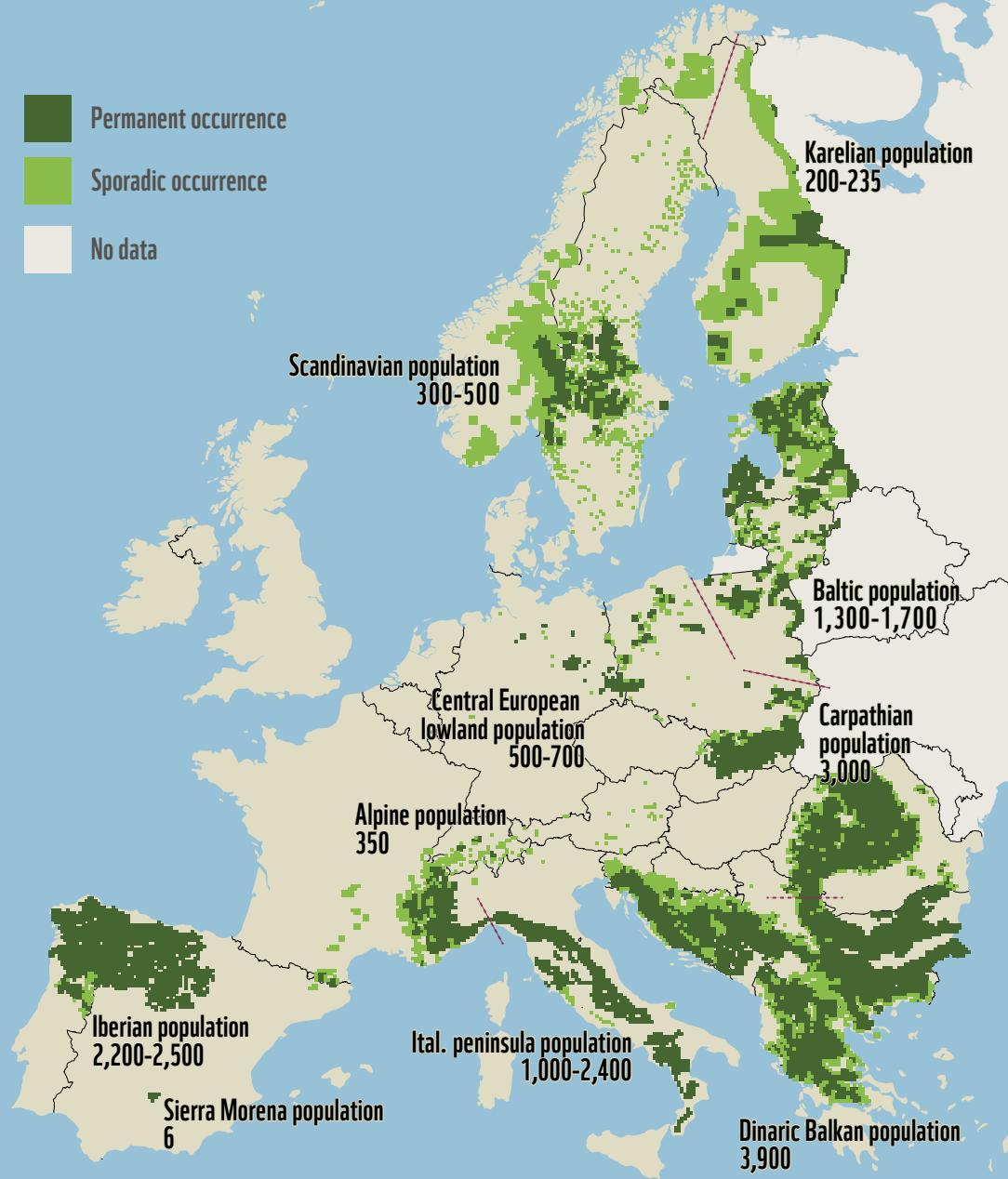
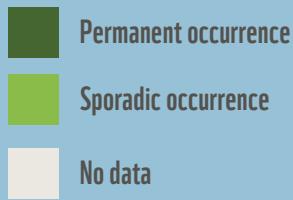
Where do wolves come from?

The day comes in a young wolf's life when it sets out on his own and leaves its family in search of a suitable place to live and a partner to start his own family. It is not uncommon for wolves to migrate over 300 to 500 kilometres, and some even establish their territories over 1,000 kilometres away from the parents. Older adult wolves also migrate under certain circumstances, for example, the death of a partner or displacement by humans.

Wolves can reach all of Europe's mainland from the following areas:

- » Northern Italy, Switzerland, French Alps
- » Balkan
- » Western Carpathians
- » Eastern Poland, Baltic Region, Northeast Finland, Karelia, Northwest Iberia

Right: Many of Europe's wolf populations have grown over the past 10 to 30 years. Wolves can theoretically be found anywhere in mainland Europe (WWF map based on: Chapron et al. 2014, Science 346(6216):11517–1519). The approximate individual numbers of the 10 European wolf populations are shown. The figures are based on estimates and the results of national monitoring.



Why do wolves suddenly (re)populate new areas?

Originally, wolves inhabited at least the entire northern hemisphere of the Earth. Indeed, only humans have settled in a more diverse range of habitats. All of Europe used to be populated with wolves; the current areas of non-habitation can be attributed to eradication by humans. For about 30 years now, however, the distribution range of wolves has been expanding again on our continent. Conditions have become more beneficial for wolves for a number of different reasons:

- » Mainstream attitudes towards other living beings have changed.
- » As a result, we treat nature differently today. We protect flora and fauna and try to preserve biodiversity.
- » Corresponding laws at national and international levels support these efforts.
- » The wolf – once systematically hunted – is now protected under strict international laws.
- » The large wolf populations in Eastern Europe are growing, which has been spurring the animals to migrate west again.
- » The old wolf populations in the Balkans and Italy have recovered. Wolves have spread northwards from Italy into the Italian and French Alps.
- » Many animal populations that can serve as wolf prey, for example, roe deer and red deer, have increased in Europe.

A highly adaptable animal, the wolf is gradually returning to its former habitats. Yet it doesn't necessarily need the wild to survive. It also feels at home in man-made landscapes.



What do genetic tests reveal about the origin of wolves?

Traces left by the wolf – for example, saliva left on killed prey, scat or hair – can be used to identify its genetic substance, or DNA. Provided that the sample is fresh, one can perform a DNA analysis to determine various factors, including gender, and whether the saliva is actually from a wolf (or rather from a dog). By comparing the genetic characteristics of the animal to that of other wolf populations and looking for genetic correspondence, the animal's region of origin can be determined. This makes it possible to differentiate between the various “genetic lines”.

For example, all wolves from Italy, Switzerland and France have common characteristics that identify them as members of the Italian line. We count wolves from Slovenia and Croatia as belonging to the southeast European line because of the similarity in their common genetic characteristics. In the same way, the wolves in the Carpathians also have common genetic traits that distinguish them from wolves in north-eastern Europe. The north-eastern European line includes those wolves that inhabit eastern Poland, Russia and Finland, from which the first wolves in Germany also descend. To perform the complex work of DNA analysis, researchers need samples of hair, scat, urine or blood. However, these samples have to be fresh, which is why it is not possible to use every sample found.

“Dog genes” are frequently found in the genetic material of wolves. This is nothing unusual because dogs and wolves are closely related. Over the past 15,000 years, their genes have been exchanged time and again, which is why some wolf populations carry genes that are otherwise associated with dogs.

Such genetic markers are found in virtually all domestic animals and their wild ancestors, from domestic and wild boar to house cats and wild cats. Accordingly, “dog genes” found in the genetic material of wolves does not call the “authenticity” of wolves as a discrete species into question. There is also comparable intermixing between other closely related species, including snow hares and field hares, Arctic foxes and red foxes, and brown bears and polar bears. But make no mistake: red foxes, snow hares

and wild cats are still their own separate species. On the other hand, there are known cases of wolves and dogs mating – for example, in Italy. This occurs when a small number of wolves from certain regions encounter larger packs of feral dogs. The resulting cross-breeds are most different from real wolves in their appearance and behaviour. These animals are usually caught and killed.



Regions like the Carpathians are an important refuge for Europe's wolves.



When wolves migrate and disperse, they may encounter wolves with other genetic origins in the areas they enter. Traces from their region of origin can be detected in the offspring produced through intermating. The figure shows various “gene flows” in Europe. Wolves live permanently in the areas marked in dark green. In the light green regions, wolves occur sporadically (figure based on: Hindrikson, M. et al. 2016).

How quickly can wolves spread?

Wolves show excellent persistence at long distance migration. They can roam for over a week, undetected and without significant food intake. Within its own territory, a wolf easily travels 20 to 50 kilometres in one night. In search of their own territory and a partner, young wolves can double this distance within 24 hours. The German wolf "Alan" travelled from east Germany to Belarus in 2009 in 46 migratory days (+79 rest days), covering a distance of >1,550 km. This wolf is a good example of a young wolf's urge to disperse. One wolf named "Slavc", who originated from a pack of wolves on the Slovenian-Croatian border, migrated almost 1,000 kilometres through Slovenia, Austria, South Tyrol and northern Italy until he met a young wolf and settled down with her to "start a family". Migrating lone wolves are typically looking for a partner to start a new pack. The new packs can be found in the direct vicinity of other packs or several hundred kilometres away. In this way, wolves are able to colonise new regions over long distances. Once wolves have begun to inhabit a new territory, they multiply and give rise to new packs. Within just 10 to 20 years, entire regions can be repopulated by wolves.



How closely do wolves live together?

Wolves are not concentrated in small areas. In an area populated by wolves, the number of adult wolves always remains relatively constant. A “family” (pack) uses and defends its family’s territory. A foreign wolf pack is not tolerated within this territory, and outsiders are driven away. Indeed, in some cases in North America, an attacking pack will completely wipe out another pack. However, neighbouring packs of wolves can also be “friends” and come together for a short time.

» A wolf family consists of four to six wolves on average, with the two parents, the yearlings and the current wolf pups, which are usually included in the count from age five to six months at the earliest. Over the course of a year, the family size fluctuates considerably: not all pups survive and the one- to two-year-olds usually leave. The mortality rate of the young wolves depends on various factors. In addition to disease, it is mainly the availability of prey that determines how many pups survive. The pack has the smallest number of members in early spring before the pups are born and the highest number after the pups are born. In autumn and early winter, the young wolves are almost as big as the adult animals.



- » Young wolves usually leave their families when they are one or two years old, often before they have reached sexual maturity. They go in search of an “available” place to live and a partner to start a family.
- » Under the conditions that prevail in Central Europe, the territory inhabited by a family ranges between 150 and 300 km². The size of the territory essentially depends on two factors: the available food supply per pack member and the local terrain. With a large food supply, the territories are smaller, e.g. 150 km². However, if food is difficult to find, the territory is extended to 300 km² or even further. In this context, it is not only the total quantity of food available that plays a role, but also accessibility and topography. Wolves prefer areas in high mountain regions, with their many steep and rugged slopes, as they can be inhabited in a different manner than wooded lowland regions. Man-made landscapes and structures also affect the habitat. A pack of wolves will usually integrate medium-sized towns and villages into their territory.



Are wolves loners?

Wolves typically live in a family. The young wolves that have left their family live on their own until they can start their own family or find a new one. Adult wolves may also be loners – for example, if they have been roaming for several years and have not yet found a partner, or if one of the partners in a pair dies unexpectedly. In some cases, a wolf may travel alone without other pack members, e.g. if one parent stays with the pups and the other parent tries to find food. In such cases, the wolf is only temporarily alone, and not truly a “lone wolf”.

How is a pack or family formed?

There are various ways:

- » A female and a male wolf meet, are attracted to each other and decide to stay together and produce offspring.
- » If one of the parents in an existing pack dies, e.g. due to old age, illness or an accident, a new wolf might fill the vacant position. Otherwise, the pack may break apart.
- » When wolves come across a family, either individually or in pairs, there can be aggressive fights between these animals and the pack. This can result in the dissolution of existing packs and the creation of new ones. In some cases there can even be fierce conflicts between parents and their own young – with deadly consequences, even for the parents. But this rarely happens in the wild. Among wolves in enclosures, on the other hand, conflicts of this kind can often be observed.

How many pups does a female wolf produce?

Similar to dogs, wolves give birth to three to eight pups (on average five). Theoretically, a single litter can contain up to twelve pups, the mating season is in February and the pups are usually born by the end of April or beginning of May. The female wolf typically prepares several dens for her litter. She digs them herself, using a natural cave or taking one over from another animal. If humans disturb the wolves in their dens, they move with their pups. Pup mortality can be very high. All members of the family help to raise the offspring.

Where do wolves with offspring live?

Wolves give birth to their pups in a den. The den can take many forms: a cave in the side of a cliff; a burrow in the ground; or even a crevice in a hollow tree. As a rule, the parents move at least once during the first two months; they can, however, move several times. As soon as the pups are old enough, they are moved to what is called a rendezvous place. It is here that the wolves keep their pups safe when they are too old to stay in a cave for several hours but too young to accompany their parents at all times. The pups wait and play at these rendezvous spots, while other members of the wolf family bring food. As the pups grow in size and become more mobile in late summer and autumn, the wolves change their location with increasing frequency.





How is the social structure of a wolf family organized?

A wolf lives in a family group that is not as strictly hierarchical as it is often described. A strict hierarchy develops first and foremost when wolves live in captivity.

A wolf family living in a natural environment consists of the following members:

- » the two parents, male and female
- » the subadult wolves between 12 and 24 months
- » the pups, i.e. the wolves in the first year of life
- » occasionally – but rather rarely in Central Europe – one or more sexually mature wolves. These can be young wolves that have not migrated by the second year or other adult wolves (who may be integrated into the family to varying degrees). Two factors play a primary role in the size and composition of the family: the size of the prey animals and the environmental conditions. When the main prey animals are large and can mount a strong defence, (e.g. moose), the packs may be larger on average than in regions where the main food on the menu is prey that is easily overpowered. Since strong individual wolves are also able to hunt animals as large as a red deer alone, another factor probably plays a role: studies from North America indicate that large packs can more efficiently exploit their prey. In the Yukon, for example, a pair of wolves lose up to 50% of their prey to scavengers like ravens. A large pack, on the other hand, is better able to consume all of the prey caught, with fewer losses.

Left: Social rituals between wolves are a daily must and encourage family cohesion.

How do wolves mark their territory?

Primarily by scent, i.e. markings with urine, scat and glandular secretions. Territory is also marked acoustically by howling.

How do wolves communicate?

It has not yet been fully researched how wolves communicate with each other. They use body language and facial expressions, using their eyes, ears and lips. Communication is further supported by the distinctive coat colouration around the head. Both the body language and the number of known facial expressions are more diverse in wolves than in dogs. Wolves also communicate with a wide range of vocalisations, including howls, barks, growls, yelps and whines. Odour also plays an important role.

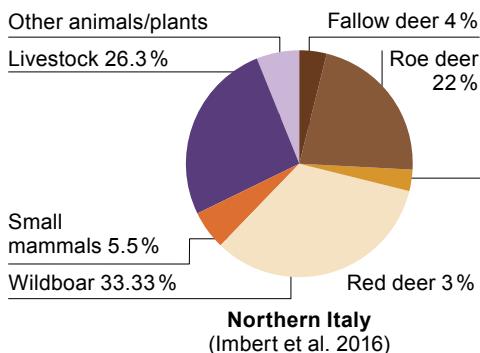
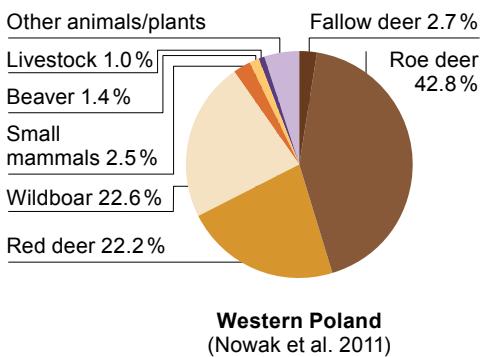
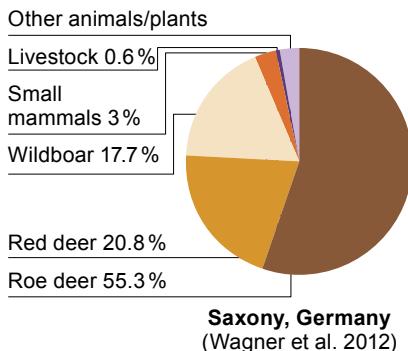
What do wolves eat?

Wolves are mainly carnivores, and they also eat carrion. In summer, they will also forage for fruit.

Basically, wolves eat what they can easily prey on. An old, very young or sick animal is less alert and easier to kill than a healthy, agile and strong animal. Since the wolf not only surprises its prey, but also chases it, the less energetic, slower animals are automatically “selected”. Wolves can also smell sick animals before the disease becomes visible to humans. In contrast, attacking a healthy and strong animal always poses an increased risk for the wolf, but this does not mean that healthy animals are not preyed on. The wolf does not necessarily prefer to hunt young or sick animals when, for example, roe deer, which are widespread and easy to catch, are available.

The main prey animals for the wolves of Central Europe are:

- » Red deer, roe deer, wild boars
- » Chamois (if available)
- » Smaller wildlife, such as beavers, badgers, hares, raccoons and mice, and smaller predators such as foxes and raccoon dogs.
- » Lifestock, if they are not adequately protected. Sheep and goats are particularly affected, while full-grown cattle and horses are usually left alone. However, calves and foals can be at risk, as well as animals that are tied up.
- » Dogs that roam free and follow a wolf's tracks may be killed and eaten. Dogs are considered competitors but also fall into the range of prey. Nevertheless, wolves react to dogs individually and very differently.



Why is the carcass of a wild animal not completely eaten?

There can be several reasons for this:

- » A single wolf is not able to eat more than ten kilos at once. Most prey animals are heavier.
- » The wolf was disturbed while eating the prey.
- » Some wolves prefer fresh prey that they have killed themselves.
- » There is sufficient food and easily accessible prey present in the wolf's territory.
- » The wolf does not return to the remains of its kill because it is afraid it will be ambushed by a human being.
- » Often the wolves that eat only half of their prey are particularly active individual animals with no food shortage in their territory. When wolf families catch prey, there is often not much left of the carcass.



How do wolves hunt?

The hunting strategies used by wolves vary based on the type and character of the prey, the size of the pack, the local terrain and other environmental factors. When searching for possible prey, wolves tend to split up and move in parallel to one other. A stalked prey animal is sometimes chased over a long distance. Confident of their success, a chase of up to three kilometres is not unusual. In terrain with particularly good cover, wolves also rely on the element of surprise. When necessary, the wolves mobilise their considerable talent for planning and strategic action. This includes their ability to bring prey into situations where there is no escape – for example, by making them fall down in steep terrain or driving them onto icy surfaces. A wolf can also hunt on its own. When this is the case, it selects its prey depending on its individual capabilities.

Some wolves choose prey that they can overpower on their own. These are often inexperienced young, weak, or older animals. Some wolves even turn obstacles like fences into elements of their hunting strategy, whether hunting alone or together.

“Preferences” and “specialisations” can be observed in both individual animals and entire family groups. If hunting strategies have proven successful with certain prey animals, they are likely to be repeated. This leads to the development of different prey preferences.



How do wolves eat in winter?

While large herbivores have to starve at high altitudes in winter – food is scarce, and moving through the snow is exhausting – large carnivores do rather well during this time. Wolves move quickly in the snow with their big paws. They are faster and use less energy than roe deer, red deer, wild boar and rabbits. These species share their habitat with wolves even in winter, while many animals of prey spend more time in the valleys in winter. Wolves react to every seasonal change of their prey. If their prey is drawn close to towns because they are attracted by food, the wolves go with them. Here, too, they kill their usual prey, but they also prey on unprotected farm animals, whether in winter or summer.



Are wolves only active at night?

No. Wolves are also active during the day. However, wolves shift much more of their activity to dusk and night time if there are a lot of people moving through their area. In this way, they act just like other wild animals. In places where no people cross their paths wolves are active during the day and at night.

Why do wolves kill more than one animal?

If, for example, a flock of sheep is startled by wolves but is unable to flee, the sheep will go into shock or become panicked. Wolves then act on instinct, which is a behaviour familiar to other predators (e.g. dogs, martens). The unnaturally trapped prey animals and their panicky behaviour “stimulate” the wolf’s senses and drive it to kill the prey. Even if sheep flee to mountain pastures to seek safety in numbers, this can lead wolves to kill or injure more than one animal. Also, different breeds of sheep exhibit different escape patterns.



How much does a wolf eat per day?

The data in literature varies greatly. Estimates range from 1.7 to 10 kg of meat per day. A ten-year investigation conducted in the Polish Bialowieza Natural Forest Reserve found that wolves ate an average of 5.3 kg of meat per day. Other studies estimate a daily meat ration of about 2 to 3 kg to survive. However, prey animals do not just consist of meat, but also fur, bones and innards. The total weight represents the biomass of the animal. The Polish study calculated an average of 7.7 kg of biomass per day and wolf. With an average prey animal mass of 55 kg per animal – which is equivalent to about one red deer calf – a wolf eats about 40 prey animals weighing about 55 kg in a year. This corresponds to a total of 2,200 kg per wolf and per year. This number varies, of course, depending on the weight of the prey, the weight of the wolf, how often the wolf was disturbed while eating, how much energy the wolf needs and other potential food sources. The wolf finds this 2,200 kg “prey biomass” in an area about 200 to 300 km² in size. This corresponds to a wolf kill rate of around 11 kg of biomass per 100 hectares (250 acres) per year and wolf. However, wolves are distributed very differently in their territories; hunting takes place more extensively in some areas. These zones shift over the course of the year, depending on the amount of prey. In this way, certain areas of a wolf’s territory are “stressed” more than others over the course of the year.

Do wolves find enough food in Europe?

Yes, wolves find enough food because in many regions of Central Europe there are large numbers of roe deer and wild boar. Other prey species such as red deer and chamois, a species of goat-antelope native to mountains in Europe, are also present in many mountainous areas throughout the year within a wolf territory, but in very different local densities. From the beginning of the 19th century to well into the 20th century, most prey came under pressure from humans and even disappeared completely in various regions. Now, with the increase in wildlife populations, wolves are finding natural prey again. In any event, wolves enlarge their territory until the food base is sufficient, which naturally regulates the density of wolves, as a pack defends the resources of its territory against invading wolves.

Questions regarding winter feeding and winter fences for deer are addressed later on (see p. 54).



What effects does the occurrence of wolves have on other wild animals?

Wolves detect sick wild animals earlier and prey on them far more efficiently than human hunters, thus helping to reduce the spread of diseases. In this way, they can reduce the risk of epidemics and may even prevent them altogether.

On the other hand, wolves can also become infected by diseases carried by farm animals or other wild animals. Mange, salmonellosis, babesia, distemper and other infections and parasitic diseases can be transmitted directly, through ticks and insects or through the environment. A sick predator will either die quickly or recover quickly. Visibly ill wolves are therefore a rare occurrence. Rabies can lead to behavioural changes.

The ongoing large-scale fight against rabies throughout Europe has met with success. For many years the number of reported cases in northern, western and central Europe has remained low and has been limited to bats and imported pets. While rabies is not fully contained in eastern and south-eastern Europe, the main vectors are red foxes and raccoon dogs, which live in areas where wolves are present.

Prey that the wolf does not eat entirely right away is eaten by other carnivores and scavengers. Vultures, which are increasingly suffering from an insufficient food supply in many parts of their current distribution, can benefit in particular from the wolf's presence. However, further research on this subject is still needed.

Some smaller predator species such as the golden jackal, and probably also the fox, are impacted by the presence of wolves, who are a competitor for prey. In Slovenia, golden jackals have disappeared from areas where the wolf has settled.

Right: Studies of faecal samples have shown that roe deer are at the top of the menu for wolves living in Germany.



Are wolves dangerous to humans?

Experience gathered around the world indicates that wolves who are raised and live in the wild are not fundamentally dangerous to humans. However, not everyone has the same understanding of the word “dangerous”, which is why it’s worth taking a look at the statistics.

Around 18,000 wolves live in the EU – both in very sparsely and densely populated regions. Every day there are encounters between humans and wolves. Most of them go unnoticed by humans. Statistically speaking, there is less than one fatal wolf accident in Europe every ten years. Wolf attacks on humans around the world over the past 400 years were summarised in a very comprehensive scientific research study conducted by the NINA Institute (2001). Between 1950 and 2000, 59 incidents were verified in Europe. In 38 of these cases, the wolves were infected with rabies. Five of these attacks ended in death. Of the remaining 21 cases, four ended fatally, all of them in Spain. Attacks not caused by rabies can be attributed almost exclusively to wolves or wolf cross-breeds that have been fed by humans or provoked or, as in Latvia and Lithuania, by escaped or semi-domesticated wolves.

In India, such problems are more conspicuous, but mainly due to living conditions associated with poverty. The wolves find few natural prey animals, but often gain access to human corpses.

Although the wolf population in Europe has increased over the past 30 years, the number of wolf accidents has decreased. In Romania, the European country with the largest wolf population (about 3,000), there are only few reports of people being bitten by wolves – and only in cases where shepherds tried to kill wolves. Indeed, wolves regularly roam through human habitations in Romania without incident. Wolves also regularly pass through towns in other wolf regions.

Wolves usually avoid contact with humans. Wolf-human encounters at only a few metres distance do, however, occur. It can become dangerous when wolves start to associate positive experiences with humans. The wolf “MT 6”, also known as “Kurti”, (a young wolf from the Munster wolf pack in Lower Saxony, Germany), was one of these wolves. When wolves are fed, they first learn to beg and then become trusting and intrusive. This can also happen when people try to play with or pet wolf pups. It is impossible to predict how the young wolf will develop in response to this experience. It is not advisable for wild animals to be close to humans under any circumstances, and this applies to all wildlife species. Wolves were hunted intensively for centuries, so that a certain caution and restraint towards humans has become intrinsic. Careless wolves previously had to fear for their lives. On the other hand, wolves are also very adaptable. It is difficult to say how wolves will respond in the medium term when almost all of their experiences dealing with and being near people have been positive rather than negative. For instance, wolf pups that learn early on that humans are a source of food may seek out proximity to them later on and beg for food. Wolves should also not be followed for observation purposes or to take photos. Particularly when wolves are sick, they can become dangerous. In Eastern Europe especially, rabies has not been successfully contained everywhere. But wolves are not the main vector of rabies.

What should I do if I encounter a wolf?

Very few people notice when wolves are nearby. Even if a wolf is right next to a hiking trail, it will usually hide and wait until the people have passed. If a wolf is surprised or unexpectedly discovered, it will retreat or increase its distance. This is not necessarily the distance the human is comfortable with, but rather the distance the wolf wants. In areas where wolves live permanently, there will always be opportunities to observe them. In these areas, dogs should stay close to humans and potentially be kept on a leash. Otherwise, loose dogs can be driven away, attacked or even killed by wolf packs. In general, the following advice applies in the event of a wolf encounter: stay calm. If you feel uncomfortable due to the short distance, you can shout loudly and make yourself bigger.

Sometimes humans arouse the interest of wolves. The wolves then keep a close eye on what's happening. In this way, they get to know human settlements and learn which behaviour is conducive to their own safety. If they sense that people have become aware of them, they usually disappear quickly and quietly. Under no circumstances should the animals be lured with food or followed. Nevertheless, individual wolves may watch their counterparts with interest. Similar to young dogs, young wolves in particular are driven by playful curiosity. If they repeatedly approach people, dogs or towns, they should always be scared off, for example, by shooting them with rubber bullets.

In areas with wolves, sooner or later people will come across one; it's perfectly natural. However, wolves that actively approach humans time and again or even behave aggressively towards people should be consistently frightened off or shot at by experts.

Right: Encounters with wolves, while rare, do occur.



Why do wolves come to towns?

When wolves enter areas where people live, local residents often ask why. In most cases the answer is simple: hunger. Pets without sufficient protection, animal waste, animal feed and wild animals on which wolves prey can all arouse the interest of wolves. In addition, several wild animals (hare, roe deer, wild boar) can often be found at the edge of or in towns. On the other hand, a human settlement can also act as a shortcut for wolves if the shortest route to their goal goes right through a village. The curiosity of wolves, especially young wolves, may also lead them to “explore” human settlements. In any case, care should be taken to ensure that wolves are not lured into residential areas by humans.

Wolves that approach humans deliberately and particularly conspicuously should be carefully observed. If wolves are specifically interested in humans, beg, become pushy, want people to play with them or behave aggressively, and attempts to scare them off are unsuccessful, then it is not only justified but also advisable to remove these animals from the population. In such cases, there is a danger that the wolves have been fed and are therefore deliberately looking for food in the human environment. The action that can and should be taken in individual cases is governed by national management plans and international legal frameworks. However, it is not generally uncommon for wolves to observe people from a safe distance from their hiding places – as long as they feel unobserved or unthreatened. It is also a known fact that pups are very curious and avoid humans less than older animals.

Do wolves need the wilderness?

No. If there are people around, forests serve as hiding places. But large, dense forests or real wilderness areas are not necessary for wolves to survive. They can live in almost any region and type of landscape, from Spain to Siberia, including environments strongly influenced by humans. The supply of prey is crucial. However, a dense road network poses a risk to wolves. Wolves often travel long distances and are therefore often at risk of being hit by cars or trains. Since 2000, more than 70% of all wolves found dead in Germany were killed by cars.

Can wolves live in the man-made landscape of Central Europe?

Yes, they can. Wolves are used to dealing with humans. They almost always share their habitat with people in Europe. In the usual territory sizes of 200 to 300 km², the wolf invariably comes across roads, paths, houses and towns. Like other wildlife, wolves will integrate any kind of human infrastructure into their territory. It is therefore not uncommon for wolves to be seen near or even in the middle of human settlements. They try to move in a way that minimises the energy they need and they prefer routes with no obstacles, such as wilderness paths or forest roads.

How do I know if there is a wolf in the region?

Interpreting tracks is an art about which a number of books have been written. Genetic evidence is considered to be the most correct verification of a wolf's presence. All other signs and tracks are only indications. We would therefore like to highlight some of the most important features here.



Single paw print,
ideal track

Tracks and signs:

Paw print (adult wolves): Adults walk on their toes and leave a print with 4 toe pads and claw marks, 9 to 13 cm long, that are slightly rounded. The toes are very symmetrical. These prints are easy mistaken for a dog's paw print and this possibility cannot be completely ruled out. It is therefore impossible to unequivocally identify a wolf from a single paw print.



Length of stride: This can vary greatly and depends on the gait, size, and speed of the wolf, as well as other factors, such as the gradient and subsurface. Stride length also does not provide unequivocal evidence of a wolf rather than a dog.

Tracking: Wolves often run in a "single register", placing their hind paws exactly in the imprint left by their forepaws. In winter they like to run in a row, precisely in the footsteps of their predecessors. This makes it difficult to determine how many animals there are. They run with single-minded resolve over long distances without continuously deviating to the left or right of their chosen route.

Typical straight track pattern



Remains of a roe deer carcass

Carcass: Based on the injuries to the prey's body, the tracks around it and the way the animal was eaten, the responsible predator can be identified relatively reliably. However, complete certainty can only be achieved by examining genetic material – the “genetic fingerprint” – for example, from traces of saliva left on the carcass. If the material is good enough, an animal can be identified individually.



Scat with lots of hair

Faeces (scat): Scat can usually be ascribed to a wolf with relative certainty as long as there are no golden jackals and feral dogs in the area or dogs that also feed on wild animals (or pets). Intestinal DNA can be obtained from fresh scat, which can be analyzed to determine the origin and sex of the animal.



Wolf



German shepherd

Appearance: Even experts who have frequently seen wolves may find it difficult to identify a wolf with absolute certainty. There are dogs that look a lot like wolves. The way a wolf moves and behaves provides the experienced wolf expert with clues. A wolf is usually more light-footed, linear and single-minded than a dog. Only dogs that have been feral for a long time have a body type similar to the wolf and move in a similar way.

Humans and wolves – potential conflicts and questions



Wolves and public safety

Wolves have a bad reputation when it comes to discussing the danger they pose to humans. Many negative stories originate from places beset by war and epidemics. In such circumstances, wolves may occasionally prey on humans. There is no evidence that public safety is endangered by wolves. Accidents, however, cannot be ruled out in very rare cases when several unfavourable factors are linked.

Are larger wolf packs, i.e. large family groups, more dangerous for people than smaller ones?

No, there's no evidence of this in any wolf inhabited area. All of the accidents investigated in recent years were individual cases and were not related to the size of the wolf group.

Is it still safe for children to play alone in the woods?

Yes, children from other regions of the world where wolves live also play in the woods. In order to minimise the risk of accidents, some behavioural tips should be kept in mind when coexisting with wild animals. Specifically, don't follow wolves, don't feed wolves and avoid the dens with their litters. However, such precautions also apply when dealing with other species of wildlife that may attack when threatened (such as wild boars) or that can transmit diseases (such as foxes). Generally speaking, smaller children should not play in the forest without supervision – whether in a wolf area or not.

Do day care centres in the forest need to be closed?

No (see above).

Are the paths to schools still safe, especially in remote parts of a town or city?

Yes. In EU countries with many wolves, children often walk long distances through forests and meadows without any incidents.

Should we expect road accidents with wild animals to increase?

There is a real danger that wolves themselves will end up being hit by cars. However, there is no evidence the danger is increasing for other wildlife species. When wolves are hunting, it is possible that game will be driven onto the road, which can lead to accidents. However, such incidents do not occur with statistically significant frequency.

Are campsites safe in areas with wolves?

Yes. But here, too, you should make sure to remove all leftover food and do not feed wolves.

Will events such as outdoor festivals attract wolves because there is a lot of rubbish lying around?

No, these are one-time events, and the rubbish is disposed of quickly. Rule number one for coexisting with wolves applies to this scenario as well: do not engage in the deliberate or unintentional feeding of wolves in a manner they can become accustomed to.

Do municipalities need to issue safety warnings or offer training?

“Safety warnings” for dog owners and farmers are useful, but not necessary for the general public. On the other hand, information and training at all levels are important.

Can wolves transmit diseases that can also be dangerous for humans?

The only relevant risk is rabies. Northern, central and western Europe are considered rabies free. Only in Eastern and south-eastern Europe (for example, in Croatia, Serbia, Greece) do rabies cases occasionally still occur, and they are kept in check by targeted vaccination campaigns. However, the statistics on rabies in Europe show that wolves are not among the main carriers of the disease in areas impacted by rabies. Foxes are the primary carriers, even in wolf areas. If rabies occurs in a previously rabies-free area, authorities typically implement emergency measures to prevent the establishment or further spread of the infection.

Do pets need to be protected from wolves?

Wolves may prey on dogs, cats and other pets. Accordingly, house pets should not wander around freely in areas where wolves live. A dog's ability to track wolves can become its downfall. Cats seek safety in trees if they are chased by wolves – just as they do when chased by a dog. Rabbits, guinea pigs, ducks, chickens or other domestic animals need supervision or sufficient protection not just from wolves, but also from martens, foxes and hawks, among other potential predators..



The wolf's return can pose a great challenge for livestock farmers.

Wolves and agriculture

In addition to their normal sources of food, wolves may also prey on livestock. Farmers are among the first to noticeably feel the presence of wolves. What are the consequences for livestock farming in general and in special conditions such as alpine pastures or along coastlines? What solutions are there?

Is pastured livestock safe from wolf attacks?

No, not without appropriate safety measures.

Do wolves kill adult cows or horses?

This can happen, but it is rare. The more cattle and fewer wild prey available, the greater the danger. The breed and how the animals are kept play an important role. In addition, there are wolves that specialise in certain prey animals and that will increasingly attack calves and cattle if they have the opportunity to do so.

Should I expect my animals to flee from wolves over long distances?

Yes. Individual sheep can be separated from the herd by several kilometres. Sheep usually try to rejoin other sheep. Groups and single animals, separated from the main herd, may wander around a wide area after an escape.

Does grazing livestock panic when wolves are nearby?

If a wolf attacks, sheep and goats will respond by panicking. How long this state lasts is, among other things, a question of the breed and the former experiences of the sheep/goats. Attacks on cattle are less common. Cattle will respond in part based on their past experiences, the composition of the herd (calves, young cattle or adult cattle) and, to a certain extent, their breed. Horses may also panic when attacked by wolves. The response

always depends on their past experience with wolves. Donkeys have less instinct to take flight than horses and are very alert and defensive. However, they are not able to fend off wolves effectively.

Can I expect more livestock injuries?

Yes, if the grazing animals do not receive sufficient protection.

Can wolf-induced stress lead to stillbirths in pregnant sheep, goats, cows or mares?

Yes. An attack by a wolf (or dog) can create enough stress to trigger miscarriages in animals.

Can wolves transmit diseases to grazing livestock?

Though wolves can transmit rabies, the main vectors are foxes and raccoon dogs in rabies endemic countries. Most other pathogens of concern to grazing livestock – salmonella, pseudorabies – do not pass from carnivores such as wolves, foxes, dogs and cats to grazing animals.

Cattle coccidiosis is caused by single-cell organisms that are common in nature. Young cattle in particular are susceptible to pasture-dwelling parasites (which is why cattle coccidiosis is often referred to as “calf diarrhea”). Virtually all wild mammals can spread these pathogens.

Does stress weaken cattle and make them more susceptible to disease?

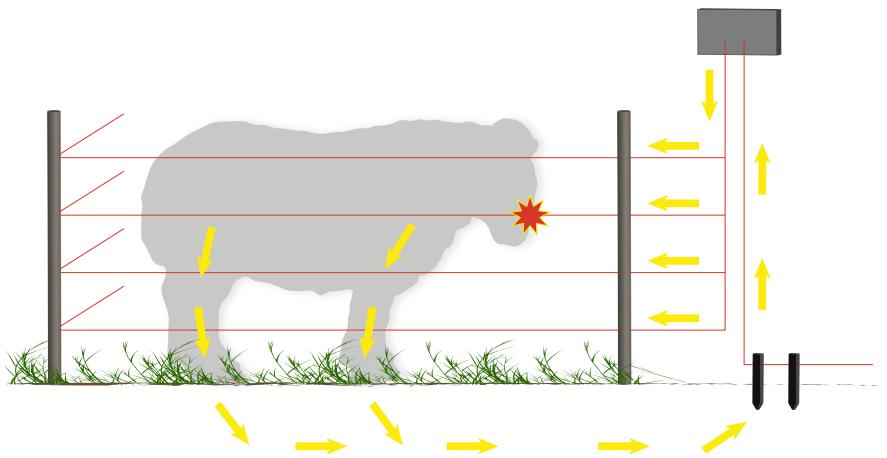
If the stress is chronic, then the answer is yes. But wolf attacks cause only temporary peaks in stress. Hence, individual attacks on a herd of cattle are unlikely to affect the animals' development and body weight. In any case, there has yet to be any scientific evidence in support of this, and specific studies remain to be carried out.

Many farmers also keep poultry or pets, such as cats. Is this still possible when wolves are in the area?

Yes, provided they receive appropriate protection. These animals should not roam free, especially at night. Cats could fall victim to a wolf if they don't reach safety in a tree or on a building. However, cats are not the preferred prey of wolves.

Can I still leave grazing animals on pastures at night?

Only with the appropriate protection.



Farm animals require effective protection. The above diagram shows how an electric fence works. The lowest wire should not be more than 20 cm from the ground. The voltage should not exceed 4,000 volts, or 5 joules. Uneven ground and structures such as water ditches must also be fenced in. Electric wires must be kept tight and the ground vegetation cut to prevent voltage loss. Electric fencing needs to be inspected daily.

Are animals grazing on pastures also in danger during the day?

Yes, especially during poor visibility, i.e. in fog, heavy rain or at dusk.

Can alpine pastures be used for grazing when wolves are in the area?

It depends. The costs necessary for sufficient protection can make alpine pasture management unprofitable with some types of terrain. The burden this creates for a farm can mean that grazing on alpine pastures no longer pays off in individual cases. At any rate, the time, material, dogs and personnel required to protect alpine pastures must not be borne unilaterally by their farmers and operators. A pasture farm is a commercial enterprise and follows a certain pasture system comprised of various well coordinated elements. When new elements are added (such as wolves and herd protection), the system must change accordingly, which includes grazing patterns and internal farm operations. Farmers who are unable to adapt may have to abandon their alpine pastures.

Is it okay to keep calves outdoors in an igloo?

Calf igloos are transportable pens with a small run to keep calves outside the stall in the fresh air. They are usually placed directly next to the stalls. Whether they offer sufficient protection in the case of a wolf attack has not yet been studied. Hence, the box and run should not be accessible for wolves. The area around an igloo can be secured with a portable electric fence.

Can wolves break into mountain huts, say at night?

This is very unlikely if doors and windows are closed. Users of alpine huts should by no means feed the wolves.

Are herders in danger of being attacked by wolves or wolf packs?

There are no known cases of this happening, even in areas inhabited by wolves – apart from the exceptions described in part 1 (sick wolves or provoked wolves).

What should I do if I encounter a wolf with a wounded animal or a carcass?

Usually the wolf will leave. As a rule, leave the scene and report the carcass.

What should I do if I find a wolf in a stall or in a barn?

If this happens, back off and allow the wolf to escape. The next step is to determine how the wolf got in. The wolf may return, so farmers should be watchful.

Do wolves sneak in animal stalls?

Wolves usually shy away from entering closed rooms, but windows with no bars or open doors do not present an obstacle. There is much more documented evidence of lynxes, bears and foxes entering buildings.

If a wolf breaks into a game enclosure, will it kill all the animals?

It may kill several animals, but it is fairly unlikely that all animals will fall victim to an attack, unless the enclosure is small and contains only a few animals.

Can I expect compensation for losses if animals injure themselves in a panic by, say, running into a fence?

Proof is needed to receive compensation or payment. And in some cases an expert will have to examine the carcass. Regulation and management plans vary across Europe and define their own procedures for making claims. In some states, the process can be quite lengthy or for all intents and purposes has not been implemented.

Who pays for the damage and catches the animals when they escape from an enclosure in a panic?

In most cases, no compensation is paid for damage to an enclosure. As a rule, the owners themselves must catch the animals. Similar to damage caused by feral dogs, individual states have their own regulations about who can be held liable for such damage. In some areas, liability insurance or a joint damage fund has worked well to handle claims for damage by large predators. The details are specified in their respective management plans.

Is compensation paid if the animals have to be herded back earlier, resulting in non-use of alpine or other contractual nature conservation pastures?

At issue here are not the direct consequences of relocating the herd to the valleys, such as the cost of feed. Subsidies from EU programmes may be cut if pasture areas are grazed less often. This is why the best possible protection and grazing strategies need to be developed at the local levels so that grazing livestock can do its “job”. The EU must also adopt regulations that promote efficient pasture use.



Wild animals that stand together in denser groups at feeders, in pens or, as shown here, in a winter enclosure, tend to attract the wolf's attention.

Is compensation paid for the personnel and material costs of recapturing escaped animals on pastures?

The regulation of the costs, which include the cost of the veterinarian's travel to and from the inspection, vary from country to country, some are more satisfactory than others. It makes sense to factor in these costs when designing compensatory regulations.

Can livestock guardian dogs help protect against wolf attacks?

Yes! Trained dogs do a good job at guarding flocks of sheep and herds of other farm animals. However, the dogs must be carefully trained and guided. Experts need to assess the dogs on a regular basis for signs of undesirable behaviours. Furthermore, it is necessary to adapt the enclosures and grazing system of sheep and other farm animals to ensure that the dogs can be used effectively. For individual small herds, the use of dogs is usually not cost-effective.



Guardian dogs watch over herds and fend off wolf attacks.

Who pays for the purchase, maintenance, care and insurance of livestock guardian dogs?

Local areas need to develop solutions that satisfy local conditions. In some states, the government or nature conservation groups provide support for the purchase of livestock guardian dogs. But generally these dogs make economic sense only when used with larger herds of animals.

Can livestock guardian dogs be kept on the farm in winter?

Generally, yes. Guardian dogs should be kept together with the sheep under the supervision of experienced dog handlers. The dogs are very alert, and usually bark every time someone passes, which can be a nuisance if the farm is located near other residences. The dogs must be trained to ignore unfamiliar people and dogs and in some cases may be better off at more suitable farms during the winter months.

Can livestock guardian dogs be used in heavily touristed areas?

Generally yes, if you know how to handle the dogs and prepare them for their work. It is important that the dogs have a calm temperament and interact with other dogs, tourists, children, mountain bikers, etc. Some countries are developing suitability assessments and tests for livestock guardian dogs. This ensures that, as with other working dogs, only capable animals are used for breeding and practical tasks. These kinds of tests should be commonplace in countries that wolves inhabit. There is still much to do in this area. In particular, rules of conduct for tourists are needed in areas with free-grazing livestock, livestock guardian dogs and wolves.

Can donkeys or llamas in a sheep herd scare off wolves?

Donkeys are watchful and defensive animals with a natural aversion to all canine species and are effective deterrence against dogs, lynxes and single wolves in some circumstances. Though donkeys are good at giving warnings, they do not play a defensive role. Llamas have also proven effective against smaller predators like lynxes. But they are not recommended for wolves.

Can livestock guardian dogs protect farm animals other than sheep?

Yes, the dogs were originally trained to protect entire farms and shepherd camps along with all their animals. After becoming acquainted with the new herd, guardian dogs begin to live together with the animals and protect them from harm as they would a flock of sheep.

Are livestock guardian dogs the only way to protect grazing livestock from wolf attacks?

No. There are several ways to protect grazing animals. Depending on the species, enclosures, terrain, etc., electric fences may suffice. The number of dogs will depend on the size of the herd and the terrain. Sometimes it is inevitable that shepherds and their herding dogs – usually accompanied by livestock guardian dogs – care for the herd. The use of professional shepherds has a number of advantages: the herd is well looked after because the shepherd can lead them to suitable pastures; overgrazing and undergrazing are avoided; and shepherds can look after resting sheep, young lambs and sick and injured animals. Shepherds are trained animal husbandry professionals who possess highly specialised knowledge and skills.





Wolves and hunters

Hunters must always be aware of wild animals while hunting. When wolf territories overlap with game lands, hunters need to adapt. This section addresses some of their questions and concerns based on what we know today.

Do wolves kill only weak and sick animals?

No. Wolves go for easy prey, which is why sick and weak animals account for a large part of their diet. But they also eat healthy animals. For more information, see pages 26–34.

Do wolves focus on one game species in particular?

Not usually. Possible exceptions could be wild animals that have few natural defences or whose defence strategies are unsuitable for a certain area. One example is the mouflon, a small, wild sheep originally found only on Corsica and Sardinia, but which has since spread to many other parts of Europe. Often, wolves do have preferences for certain species, that are either particularly common or particularly easy to catch. These preferences may change over the course of a year or from region to region. Wolves also learn certain behaviours that enable them to be particularly successful with certain prey, which can give rise to specific preferences or hunting strategies.

Can wolves also injure or kill large, healthy and mature animals?

Yes, if circumstances permit.

*Left: Over time, wild animals adapt to the presence of wolves.
Hunters must adapt as well.*

Is game killed by wolves counted towards the hunting quota during hunting season?

Statistically, the carcasses of animals killed by wolves are considered natural deaths. Whether or not they also count towards the hunting quota for a given area depends on local hunting laws. A certain allotment for wolf prey could be factored into hunting quotas. Ideally, this allotment would be based on the ratio of animals killed by hunters to those killed by wolves and on comparable experiences in other countries.

Will I be compensated for losses for game killed by wolves?

No. Under existing hunting laws, wild animals are “ownerless”. Hunters have the right to utilize wild game but may not assert a claim to ownership.



This young wild boar hardly stands a chance against three wolves.

Will the growth of game populations change when wolves move into the area? Must I plan on hunting less game?

The reappearance of wolves in Saxony, Germany has not decreased the population sizes of red deer, roe deer and wild boar. Studies with red deer and wolves fitted with GPS collars show that game adjusts relatively quickly to the presence of wolves. Studies in Scandinavia, Slovenia and Italy indicate that wolves have no significant influence on the dynamics of local prey populations, but the findings vary from region to region and from species to species.

In North America, studies have found that wolves can limit the number of individual species such as moose in the Canadian Yukon. Wild species, habitat and other factors, especially human influence, help determine how wolves can affect prey populations. The presence of feeders, refuge fencing or other man-made structures may also play a role, though further studies are needed to know for certain. At any rate, hunting quotas should reflect the number of game animals in a given area and the number of kills caused by large predators.

Do wolves always kill their prey immediately or do injured animals have a chance to escape?

It depends on the wolf's hunting skills and how strong the prey animal is. As a rule, wolves will pursue an injured animal unless it is crowded close together with other animals, in an enclosure, say.

Do I need to dispose of killed game and report all carcasses?

Game killed by wolves should not be disposed of, as the wolves may still eat from it (saving them from having to kill more prey). However, killed farm animals must be reported to local authorities and must be disposed of in accordance with the EU hygiene regulation. Proposed legislative, changes designed to support predators and scavengers are currently under discussion.

Do wolves also hunt at night?

Yes. Wolves hunt whenever their prey is active. In areas of intense hunting, many wild animals have shifted their peak activity time to dusk and night hours, which is why wolves are also active at this time.

Can wolves drive wild animals out of my hunting grounds into neighbouring areas?

Yes. In response to wolves, game may seek out new habitats, at least temporarily. This issue requires further study.

Are the numbers I report in spring still usable in autumn, or is game constantly on the move when wolves are present?

As soon as wolves are present in a certain area, wild animals will keep to areas where they feel safe. This may require hunters or game wardens to change the way they record the number and composition of the prey population. The growth and mortality rate of the prey population may also change. All of this data should be considered when determining hunting quotas. Generally, further study is needed in this area.

Will more animals die from stress caused by wolves and will winter losses increase?

This is rather unlikely. Wolves do not cause ongoing stress in wild animals; they stress potential prey only during the relatively short period of chase and attack. If animals have been under long-term stress for other reasons, however predators add to the physical and mental pressure they face.

Wolves tend to benefit the general health of the game population. Evidence suggests that wolves encourage natural selection, slow the spread of disease and reduce winter losses by killing weaker animals that would otherwise slowly starve to death. But more research is needed to understand the effect of their presence on other wild animals.

Can I feed game when food is scarce or will this attract wolves?

Feeding wild animals is justifiable in places where habitats have been lost or are no longer accessible. In addition, feeders keep herbivores away from young trees and other sensitive plants. To be certain, feeders can also attract wolves, but whether and how often they do, appears to depend on various factors requiring further study.

Can wolves be kept away from winter feeders?

No. To a certain extent, wolves can be prevented from entering a winter enclosure, but they cannot be kept away from-open access winter feeders.

What happens if a wolf enters a winter enclosure? Will it stay until it has all the animals?

No, but it may injure or even kill several animals. This depends on the size of the enclosure, the number of animals it contains and the ability of the animals to hide and escape. More experience and research are needed.

Will damage caused by game increase when wolves are present?

Damage may increase or decrease. The findings are still inconclusive. To date, several studies have been carried out in various wolf areas. Though each very different from the other, they have shown that the scope of damage along with its definition and toleration depends on many factors. Moreover, it seems that wolves are only partly to blame for it.

Are blood hounds in danger of being attacked by wolves?

In areas with wolves, dogs are indeed at increased risk. At close range, it is unlikely that hunting dogs will encounter a wolf. If they do encounter a wolf during or after the chase – and the hunter is still at a distance – they may be chased away or attacked.

Will it be more difficult to hunt game?

This is possible, while wild game is still adapting to the presence of wolves, though it will ultimately depend on the game land conditions. Whether the overall hunt will become more difficult also depends on the behaviour of hunters, whether they are willing to change their hunting style and whether they are given the chance to do so by hunting legislation. More experience with and studies on Central European and alpine conditions are sorely needed.

Will the rutting process of ungulates change?

The rutting areas for red deer, ibex and chamois are based on the habitat preferences of the females. Hence, it is conceivable that changes may occur. A study of red deer fitted with GPS collars in a German wolf area showed that the wolves had no permanent effect on the rutting process. However, even without wolves, there are sometimes significant changes in the progression and duration of deer rutting every year. Under normal circumstances, the rutting males are too large and defensive to be attacked by wolves. Further investigations in other European wolf areas would also be useful here.

Is it still possible to hunt from a raised hide or a hunting tower or will the wolf take everything?

Hunting from a hide or tower is still possible. This form of hunting is also practised in other regions with wolf populations. However, certain adjustments to location, strategy and timing may be necessary.

How dangerous are driven hunts for beaters and dogs?

Beaters are not in danger unless they force a wolf into a corner or attack it. If a dog encounters wolves while hunting on its own over a large area, it can be dangerous. The more people there are in the area, the higher the probability that wolves will retreat. Waiting briefly to unleash the dogs will give wolves a chance to retreat.

The wolf is an internationally protected species. Is it possible that restrictions will be imposed in my hunting ground or that hunting will be prohibited because of its effects on wolves?

This could be the case if hunting actually affects the lives of wolves. For example, any disturbance close to the den must be avoided when the wolf is raising its young. Hunting has no other long-term effects on wolves.

Do areas with high game density attract wolves?

Wolves spread out over large territories. Where game density is high their territory is generally smaller than in areas where food is scarce. Large concentrations of prey, unprotected flocks of sheep and artificial food sources can all attract wolves and influence the size of their territory. Detailed studies of these issues are necessary for conditions in Central Europe and the alpine regions.

Can wolves reduce large populations of roe deer, red deer, chamois and wild boar (ungulates)?

The impact of wolves on their prey populations is context dependent. Neither in eastern Germany, Italy, Slovenian or Slovakia has a direct link between the density of ungulates, hunting success and wolf occurrence been established. Similar studies in Scandinavia also show that the densities of large prey animals are not automatically lowered by wolves. In parts of North America however, there have been cases where game populations have declined. Here, wolves regulate the moose population in some regions.

However, the density of a game population is always influenced by many different factors, the most important of which is food supply. Large wildlife populations can be found when food supplies are abundant. This can occur naturally, such as when storms damage large areas of forest, allowing new plants to grow, or in warm years when many beechnuts and acorns, a favourite of wild boars, are produced. Artificial food sources or certain farming practices can also increase the density of herbivores. To be certain, wolves may change the habitats, retreats and behaviour of prey animals. But there are still more questions than answers, which is why further study of Europe's central and alpine regions is needed.



Hunting is and will remain a legitimate and important pursuit, even in areas where the wolf has returned.

Will the number of animals hunters kill decline after wolves enter an area?

This depends how close a wildlife population is to being overhunted. In most of the areas studied in Central Europe and the Alps, the number of animals taken by hunters did not significantly decrease after wolves returned. While hunters prefer large, healthy animals, wolves tend to prey on weaker and sicker animals, which can be caught with less effort. However, wolves can significantly lower the populations of some sensitive game species. Mouflon sheep is one example. Many factors affect the number of animals killed in a given hunting season, not least of which is the hunter's own motivation to hunt.

If game density is low, will more grazing livestock be killed?

If the grazing livestock is inadequately protected, yes. If prey is scarce, wolves will turn to garbage and food leftovers if available. If the ratio of wolves to wild animals increases, the tendency of wolves to go after grazing livestock increases. If grazing animals are protected from wolves, the predators will expand their territory until they have enough to eat.

Right: Roe deer is a frequent prey species for wolves



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Wolves and forestry

Forest workers and foresters also move through the wolf's habitat. This is reason enough to examine their influence on wolves.

Should I expect restrictions on forestry work when wolves live in a forest?

The wolf is protected through the EU Habitats directive (FFH*). Yet, restrictions are anticipated only in the area around dens where disturbances must be prevented when the wolves are raising their young. In addition, laws do not restrict the standard use of agricultural land or forests where wolves live. When building fences, it should be ensured that dens with pups are not fenced in.

Will there be more damage caused by ungulates when wolves inhabit an area?

It's possible. But so is the opposite. The question of forest damage is largely dependent on the forest structure and other factors including game species, disturbances, food supply, and composition of flora and fauna.

If I can't find any gamekeepers to lease my land because of wolves, will I be compensated?

No, there's no legal basis for this. High levels of damage caused by game and low hunting revenues can reduce the value of a hunting ground. The situation in some Alpine regions that see heavy snow and generally unfavourable conditions in the winter and in addition have a high percentage of protective forests, need to be examined in more detail.

*FFH stands for "fauna flora habitat" and refers to the EU directive protecting natural habitats and wildlife in EU countries for the preservation of biodiversity. See also chapter "Wolf and Politics".



Wolves and forestry – some additional questions answered.

How safe is a forest worker walking alone through the forest?

Safe, provided that wolves are not being fed. Wolves even tend not to defend their pups and dens against humans. They would rather wait for an opportunity to take their pups to a new hiding spot.



Wolves and tourism

Landscape and nature are the basis of regional tourism. Accordingly, a new wildlife species like the wolf with its high media profile also affects regional tourism.

Are hikers on trails in danger from wolves?

No. Dangers for hikers, mountain bikers or touring skiers are very low in all known wolf areas of Europe.

Can we still hold events outside of villages or residential areas without exposing visitors to danger?

The answer is an unconditional yes.

Are local authorities and tour operators liable if an accident occurs with a wolf on one of the hiking trails they designated and signposted?

No. This is the same as accidents involving other wild animals. Moreover, the probability of accidents with wolves on hiking trails is extremely low. There is no duty to ensure safety.

Geocaching is quite popular. Is this still safe to do?

Wolves – like all other wild animals – should not be disturbed in the areas they seek refuge especially when they are raising their pups. Geocachers should, therefore, stay out of these areas.

Left: The presence of large predators can also benefit tourist operators in Alpine regions.

Should local authorities and tourism companies draw the attention of visitors to possible dangers posed by wolves in, say, brochures, websites or informational signs?

People should be made aware of the danger to dogs off leashes. Providing general information about the behaviour of regional wild animals and treatment of them is generally advisable. This information should also include a list of contacts to whom wolf sightings should be reported.

There is no direct danger from wolves, but the general rule is to avoid recreational activities when wild animals are present. Recreational sports belong on designated trails and in designated areas. When people go off the beaten track through wild animal refuges, they themselves can become a danger to wild animals.

Is it possible that we will need to close certain trails or routes because they might disturb wolves?

That would be unusual, but closures are possible in areas where rare and protected species raise their young. This could be a grouse as well as a wolf.

Will the presence of wolves prompt visitors, especially those with young children, to avoid our region?

This could be the case initially if visitors and locals are not offered good, factual information and education at an early stage.

Are we still allowed to advertise off-road tourism activities such as skiing?

Wolves pose no direct danger. However, these kinds of activities should be practiced only in areas designated for recreational sports where wild animals are not present. If people move through habitats off the beaten track during winter or during mating and breeding seasons, they can generally become a danger for wild animals.

Are there tourism regions with wolf populations that still attract large numbers of visitors?

Yes, successful tourism in wolf regions is possible. This has been proven by many examples in German Saxony, the western French Alps, the High Tatras in Slovakia, tourist areas in Slovenia and well-developed regions of the Carpathians in Romania. However, these areas are never entirely used by tourists, who usually concentrate in certain zones. A wolf territory extends beyond that. If wolves are disturbed by tourist activity, they will pass through to other regions.

Is the presence of wolves also a source of revenue for tourism?

Absolutely. Many visitors will be interested in taking part in “wolf hikes” or “tracking”. The wolf offers regional tourism an additional, attractive selling point. Under no circumstances, however, should wolves be specifically attracted or fed for tours. Tracking fresh wolf tracks is also grossly negligent. On the other hand professionally led hikes and classes about the wolf and its role as a keystone species are an excellent opportunity to draw visitors’ attention to the needs of wild animals and to raise awareness about the responsible treatment of nature and tradition-rich areas.



Wolves and nature conservation

The wolf is a protected species. Its presence will affect the composition of the fauna and the relationships between animals. Generally speaking, ecosystems balance themselves when a new species enters. The aim of nature conservation is to consider all the ways that wolves might impact the natural environments in which they have reappeared.

Does the wolf affect rare species such as the grouse and other ground-nesting birds?

It is possible in some cases. However, wolves also eat other animals who prey on ground-nesting birds and other rare species such as foxes, jackals, raccoons and raccoon dogs. In this way, wolves offset the rare prey they eat by reducing the number of smaller predators. As a rule, wolves prey on rare species only when they happen to cross paths, which occurs fairly infrequently.

Can the wolf cause species to become extinct?

At a local level, yes. This happens when a species's innate defenses cannot adapt to wolf predation (which is true of none of Europe's native species) or when a species has been resettled in a habitat unsuited to its innate defenses. Mouflon sheep are a good example. Native to rocky Mediterranean islands, they were introduced to Central Europe around one hundred years ago for the purpose of hunting. But many of the areas in Germany and Austria in which they now live contain little rocky terrain, where they would instinctively flee to safety when faced with predators. As a result, these sheep are particularly vulnerable to wolves.

Do wolves prefer to settle in nature conservation areas?

These areas are usually too small to attract wolves. However, they can serve as locations for dens for their litters or for mating. They are also suitable as “bridgeheads” linking distant habitats. Large undisturbed areas without hunting and other signs of human presence are attractive to wolves. But this is only thing that a habitat must have to meet the wolf’s needs.

Do wolves promote rare animal species?

This is possible if they keep smaller predators like fox, marten or badger in check. Overall, wolves can increase the biodiversity of a region.

What happens to FFH* areas and alpine pastures when sheep farming is abandoned in critical areas?

Controlled grazing of species-rich areas, in the valleys and alpine pastures, has created a high diversity of plant species. If these areas are grazed too little or too much, their biodiversity decreases. Various funding instruments in EU countries promote controlled grazing, while state authorities and local organisations require that these grazing areas are maintained as nature conservation sites. Feasible solutions for carrying out this work are still needed, however. One possibility is the use of herders. Not only can experienced herders ensure that grazing needs are adapted to local conditions; working in concert with guardian dogs, they can also effectively protect flocks of sheep from wolf predation.

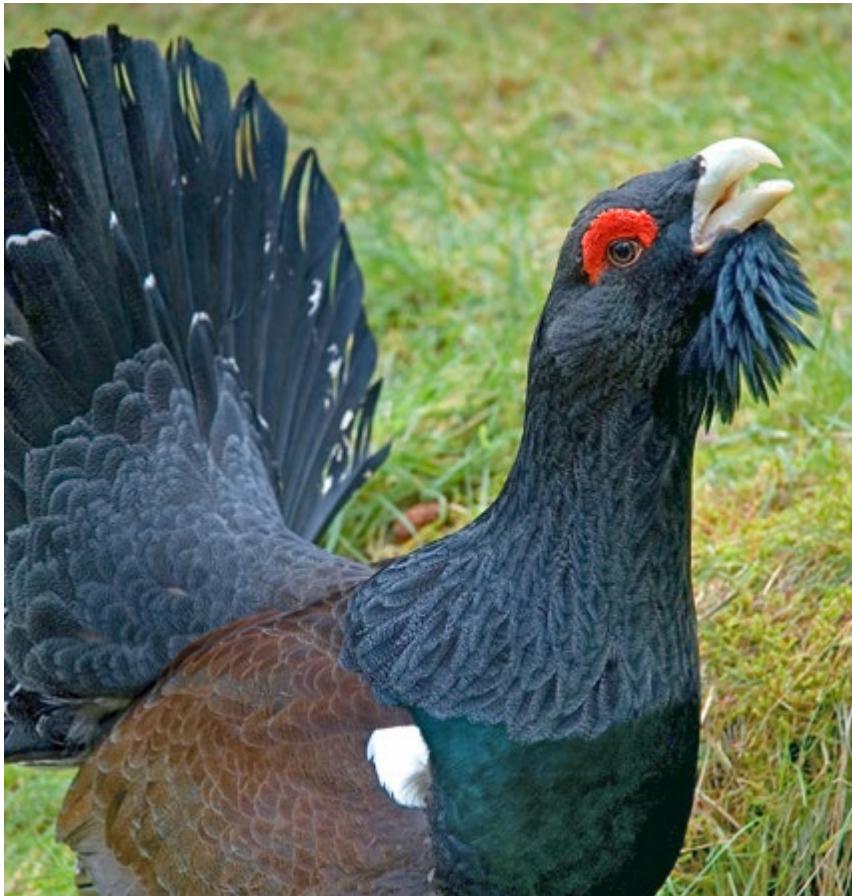
* FFH stands for “fauna flora habitat”. FFH areas are nature conservation zones protected by EU directive. See also chapter “Wolf and Politics”.

Can livestock pens change the species range of the area?

Yes, depending on the number of sheep per square metre and the duration of grazing in fenced-in areas.

May wolves be killed in dangerous situations?

Only if people are in an acute danger. Otherwise, killing a wolf requires a special permit and a thorough review.



As experience in other places have shown, endangered birds like the grouse may benefit from the presence of wolves.

Wolves and politics

The successful recovery of Europe's wolf populations and their return to previous habits would not have been possible without strict legal protection under international and national laws and regulations.

What is the global legal framework for wolf protection?

In the Bern Convention on the Conservation of European Wildlife and Natural Habitats, 51 countries and the European Union agreed to conserve and protect wild plants and animals and their habitats. The wolf is listed in Annex II (species in need of strict protection) of the Convention. The strictly protected species listed in Annex II "shall not be disturbed, captured, killed or traded". In 1997, the wolf was included in European law by Council Regulation 338/97 in Annex A.

The regulation is implemented by the Washington Convention on International Trade in Endangered Species of the Wild Fauna and Flora (CITES). The Washington Convention on International Trade in Endangered Species of Wild Fauna and Flora of 3 March 1973 was signed by 152 countries. It establishes guidelines for trade in protected animals and their products and restricts the import and export of animals or their parts (skins, skulls, bones...). The wolf is listed here in Annex II (endangered species). Some subpopulations are threatened with extinction and listed in Annex I.

Which regulation protects wolves in the European Union?

To fulfil its obligation as a contracting party, the European Union implemented the Bern Convention by adopting its Habitats Directive (Council Directive 92/43/EEC) in 1992. The directive seeks to ensure a supranational conservation of natural habitats and of wild fauna and flora. At present,

over 1,000 animal and plant species are included in the species databases and the directive's Annexes. Wolves are included in Annex IV, which lists species in need of strict protection. Since there is a risk that Annex IV species will be lost forever, their habitats are protected as well. The wolf is also listed in Annex II, which lists species requiring special areas of conservation.

What does the strict protection status of wolves prohibit?

The approximately 1,000 species protected under the Habitats Directive are listed in its annexes. The wolf is listed in Annex IV (species in need of strict protection) of the Habitats Directive for most countries of the EU. Article 12 obliges member states to establish a system of strict protection for animal species listed in Annex IV, prohibiting among other things:

- » All forms of deliberate capture or killing.
- » Deliberate disturbance, particularly during breeding, rearing and migration.
- » Deterioration or destruction of breeding sites or resting places.
- » The keeping, transport and sale or exchange of individuals taken from the wild.

Why is the wolf excepted from Annex IV in some regions or states?

The ten distinct wolf populations in Europe are not evenly distributed over member states and their sizes and trends vary considerably. The aim of the Habitats Directive is to allow all listed species (and habitats) to reach and maintain a favourable conservation status. Populations of a species that meets the conditions of favourable conservation status may, but need not always, be listed in Annex V (“Species whose taking and exploitation may be subject to management measures”) instead of in Annex IV. This accounts, say, for the Iberian wolf population north of the river Duero which is estimated to contain between 2,200 and 2,500 wolves. South of the river by contrast the isolated Sierra Morena population is in an especially critical condition and is therefore not listed in Annex IV.

Are wolf populations listed in Annex V less protected than those in Annex IV?

Species listed in either Annex are strictly protected. While differences exist depending on the Annex, the favorable conservation status¹ of the population or its achievement may not be compromised by management measures. To make sure of this, member states are required to undertake continuous monitoring of the conservation status (Article 11).

¹ Article 1 (i) of the Habitats Directive defines the conservation status as favourable when “population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a longterm basis.”

For species listed in Annex IV, national authorities can permit the (lethal) removal of single individuals for special reasons such as preventing serious damage to livestock and if there is no satisfactory alternative to removal of the animal concerned (Article 16). The option for selective removal (i.e. killing) of a wolf with undesirable behaviour as a measure of last resort is required to safeguard social acceptance and a balance of public interests.

A species or a particular population of a species listed in Annex V can be regulated by member states through, for example, hunting. However, indiscriminate means are prohibited (Article 15) and the maintenance of the favourable conservation status (a prerequisite for any Annex V species) has to be secured by controlling the area, time and methods of taking animals (Article 14).

Interestingly, wolves in Poland are listed in Annex V of the Habitats Directive, but Polish national law guarantees them full protection. Hunting wolves has not been legalized in Poland. This highlights the optional nature of Article 14.

In contrast, authorities in France and Sweden, where wolves are listed in Annex IV, have repeatedly permitted limited wolf hunts – despite the fact that neither population can be considered to have a favourable conservation status as defined in the Habitats Directive.

By the time it comes down to such exceptions, the importance of an effective monitoring system for wolf management becomes obvious. Close monitoring helps identify sources for undesirable wolf behaviour early on so that nonlethal management measures can be introduced. And it puts decisions regarding such exceptions on objective scientific footing.

Many of Europe's wolf populations have grown over the past ten years. Why should they still be protected?

To stabilize wolf populations in the long run it is necessary to establish a European metapopulation encompassing discrete healthy populations of wolves, that can exchange individuals, for example, through dispersal. This reduces the risk of inbreeding and the loss of genetic variation and improves the chances for the long-term survival of the species in Europe. At present, there are populations that have, from an ecological perspective, only recently been founded, such as those in the Alpine regions, in the lowlands of Central Europe, and in Scandinavia. While other regions of Europe still lack wolves, they will play a crucial role in connecting already existing populations. At the same time, it is crucial that existing populations grow beyond favourable conservation status, so that they can provide source populations for other areas of Europe as young wolves leave their packs and start their own.

Because wolf territories often span borders, wolf offspring tend to travel long distances and wolves are large-bodied predators, they naturally occur at low densities. Accordingly, neighbouring countries must coordinate wolf protection policies. Ideally, coordinated policy ensures that the sum of legal exceptions does not have a detrimental effect (Linnell, Salvatori and Boitani, 2007).

Would it help livestock owners if the EU allowed a limited hunt on wolves everywhere?

This is rather unlikely. There are no indications for a significant long-term reduction or livestock losses where wolves are hunted compared with regions or times when they are not. On the contrary, wolf hunting can hurt populations when parent animals are shot and unexperienced adolescents get out on their own. Indeed, there is evidence that inexperienced adolescents tend to target livestock because of its easy accessibility.

The complete elimination of local wolf packs is not in line with the Habitats Directive. Besides, such actions would only temporarily lift pressure on livestock. Due to their long migrations during adolescence, it is only a matter of time, before the next wolf passes by.

The expansion of wolves comes with conflicts that can lead to heated public debates. How does the European Union help mitigate existing conflicts?

Livestock depredation is a major point of conflict in places where wolf populations are present. Unprotected and insufficiently protected livestock is at a considerably higher risk of depredation than that of protected livestock (see “Wolves and Agriculture”). As a consequence, international experiences indicate high depredation losses in areas recently recolonized by wolves where traditional protection measures were abandoned after wolves vanished. The losses, and the attendant conflicts, usually decrease when tried and tested livestock protection measures are taken. However, the necessary changes in farming practice are often costly. Some member states make use of existing European Union fundings to support livestock owners financially in adopting good practice protection measures and in compensating losses due to wolves. Unfortunately, there is no distinct European financing instrument for the support of livestock protection. Current wolf-related aids are highly bureaucratic and strictly limited per farm. Regardless of large carnivore livestock conflicts, many grazing livestock owners face economic challenges.

The exact wording of the Directive and the corresponding laws at EU and federal level can be found on the following websites:

http://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm

Living with wolves



The “costs” caused by wolves are not evenly distributed. While some people shrug their shoulders others complain of damage and suffer losses. They lose livestock and have to change farming practices. Others can look forward to the return of the large predator. In the long term, wild animals only have a chance to live in peace with us if we are willing to share our habitat with them. The survival of the wolves requires our acceptance and a willingness to bear all of the associated costs. To ensure that the costs and benefits of wild animals, be they wolves or red deer, are equally distributed, a clear framework and policy direction are needed. The aims should be to enable the wolf’s return, minimise conflict, promote nature conservation, and take into account the interests of farmers, hunters and other land users.

Appropriate action is needed at three levels:

- » Open and honest communication with all affected parties.
- » Effective structures for immediate action in affected regions.
- » Long-term measures that will help us remain flexible in the future.

Information and communication - transparent, open, honest

- » Objective, technical information and education about wolves (and other wildlife) must be easily accessible.
- » Management plans must include detailed evaluation criteria for different behavioural patterns of wolves and place these criteria in the public domain.
- » Dialogue and discussions need to be initiated with representatives of all stakeholders between regions and countries.
- » These working groups must be goal-oriented with facilitation by independent and experienced persons.

Immediate measures - practical, fast, unbureaucratic

Adequate preventive measures must be implemented in the affected regions to prevent damage. These include:

- » Measures to protect grazing livestock.
- » Establishment of a contact point to report damages and provide information on mitigation tools
- » Information and advice on possible prevention measures and financial support for these measures as well as advice on compensation and help with filing damage claims.
- » Prevention and compensation payments updated with as little bureaucracy as possible for kills, consequential injuries, the hours spent looking for escaped animals, the loss of trained hunting dogs etc.

Long-term measures adjusted regularly in view of future developments

- » Adjust the grazing systems of vulnerable livestock.
- » Adjust how wild animals are handled and hunted.

- » Adjust maintenance measures for protected areas alongside extensive outdoor sheep farming.
- » Adjust maintenance measures in steep mountain regions in order to avoid erosion and avalanche hazards and preserve habitats.
- » Increase accompanying research in all affected areas.
- » Introduce accompanying educational programmes:
 - » Include information sessions on dealing with large carnivores diverse group of stakeholders.
 - » Integrate information on large carnivores into school curriculum.
- » Establish necessary structures for professional monitoring in which the distribution, use of space and behaviour of the wolves are monitored and kills and losses are recorded on an ongoing basis.



All stakeholders including the public at large must be involved. Open communication is the key to effective wolf management.

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