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EDUCATIONAL MATERIAL

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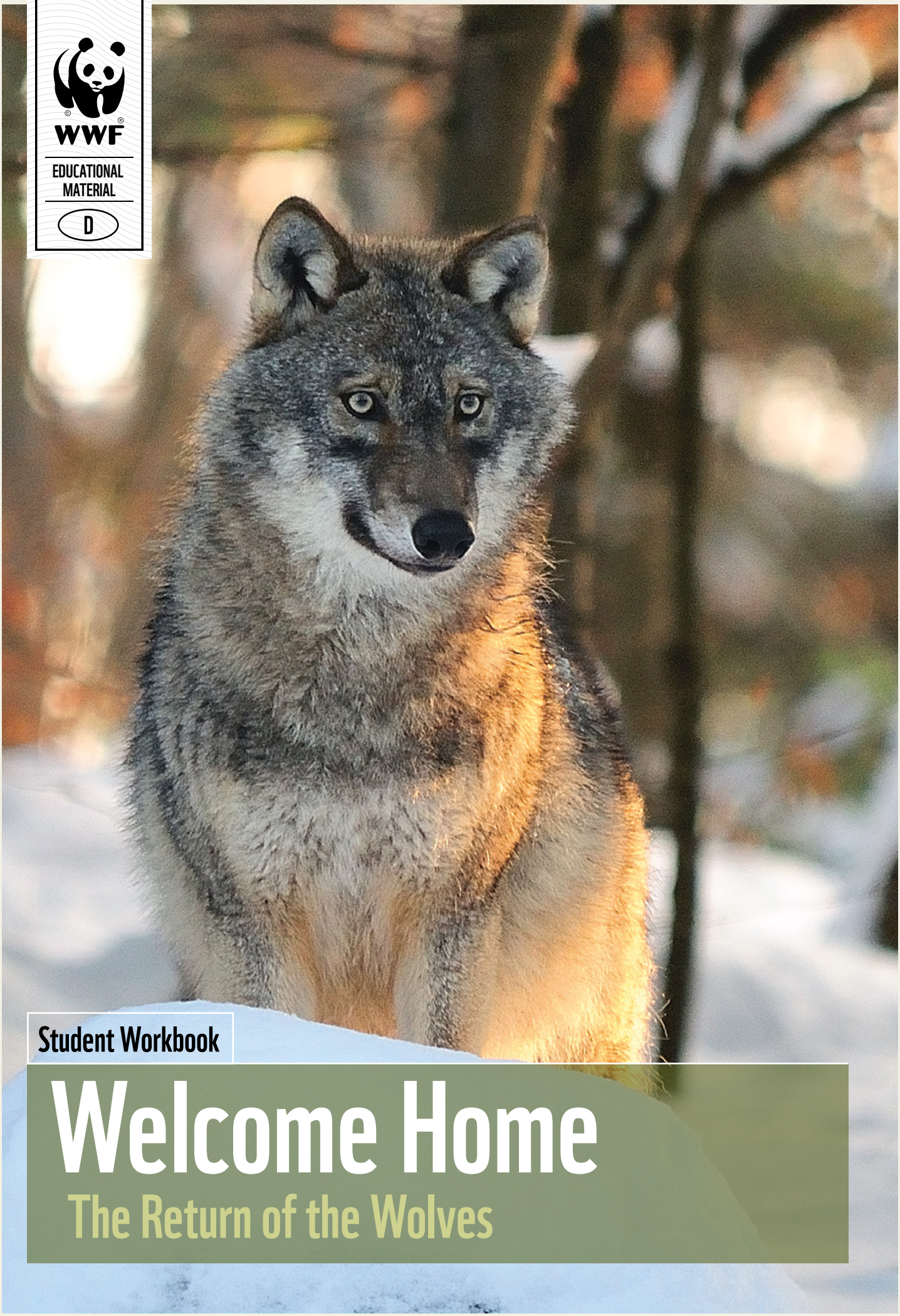

Student Workbook

Welcome Home

The Return of the Wolves

Contents

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Dear students,

Moritz Klose
Wolf expert,
WWF Germany

Bettina Münch-Epple
Head of education department

For over one hundred years wolves were absent from the German landscape. Within the lifetime of your great-great-grandparents, packs of wolves could still be seen in the country‘s forests. Unfortunately these wild creatures were then hunted to extinction in Germany.

Occasionally individual wolves have crossed the Polish border into Germany throughout the last century. But their wanderings usually came to an abrupt and lethal end in road accidents or encounters with hunters.

Wolves across Europe started to recover after they were put under strict proctection in several countries. Hunting, trapping and poisoning wolves is now strictly forbidden in Germany. Wolves have been able to cross the border from Poland to establish packs in Germany’s eastern regions. They came here to find food, mates, and suitable habitat to establish their own territories and families. Close to forty wolf packs live throughout Germany now and their numbers are increasing.

The WWF campaigns for the return of wolves to Germany and undertakes practical work to support this goal. In the times when wolves were still common in Germany, farmers and sheep farmers knew how to protect their livestock from these predators. In ideal cases, farmers had trained livestock guardian dogs and employed shepherds to watch over their flocks.

However, agricultural practice has changed significantly since the extinction of wolves, and much of the knowledge related to traditional methods of livestock protection has been lost. Today, the WWF works with farmers and shepherds to develop appropriate methods of protecting livestock. Modern solutions such as electric fencing enable farmers and wolves to coexist.

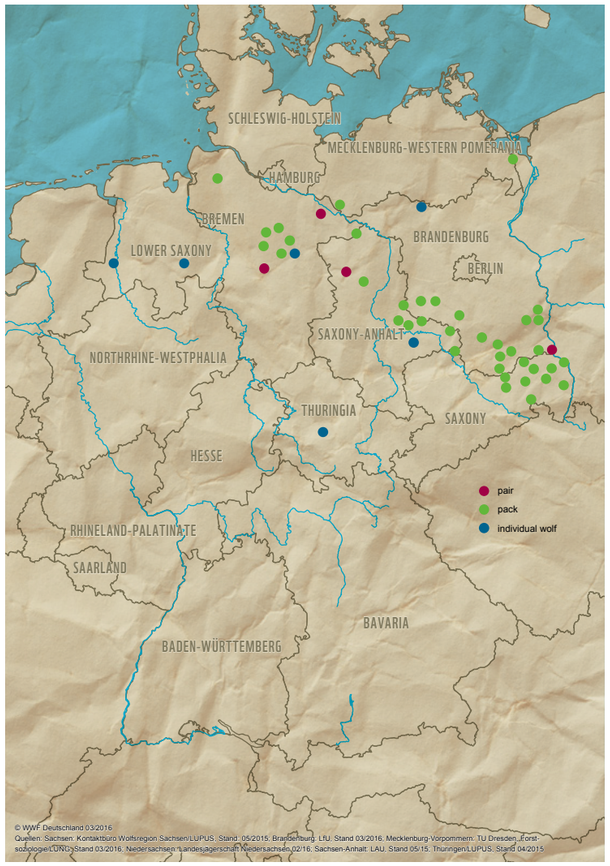
Moritz Klose
Wolf expert, WWF Germany

Bettina Münch-Epple,
Head of education department

Wolves in Germany

Most of the wolves living in Germany are located in the states of Saxony and Brandenburg, close to the Polish border. They frequently establish territories in abandoned or active military training grounds, where – except for occasional military exercises – they are largely undisturbed. Some wolves wander northwards in the direction Mecklenburg-Western Pomerania, with some continuing onward as far westward as Lower Saxony, Schleswig-Holstein and Hesse. Almost 40 wolf packs are believed to have settled in Germany to date.

Many people are delighted to know that these beautiful and fascinating wild animals have returned to the German landscape. Others view their return with scepticism. Unlike other countries, where wolves never completely vanished, here in Germany we will need to learn to live alongside wolves once more.



Did you know?

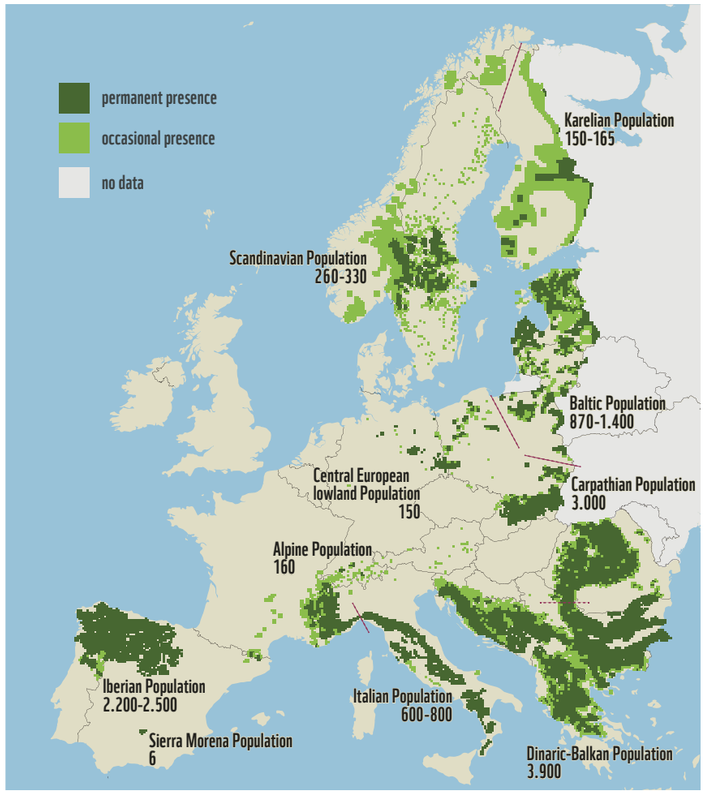
Wolves don't require wilderness to survive. They can also live in close proximity to humans. All they need is sufficient prey and a safe place to raise their pups.

Exercises

1. Name the federal states where wolves have established families or packs.
2. Describe the type of landscape in which wolves live. Use an atlas to help you.
3. In which federal states have sightings of individual wolves been confirmed?

Wolves in Europe

Wolves were once common throughout Europe, but over the centuries they were driven to the brink of extinction in Western and Central Europe. They were only able to survive in Eastern and South-eastern Europe as well as some parts of Spain and Italy. Today wolves are slowly returning from these safe havens to the rest of Europe, where they are now widely protected. There are currently roughly 20,000 wolves living in Europe, most of them in European Russia.
The map below shows the approximate number of adult wolves in each population.



Did you know?

In Spain, some wolf packs are known to live in grain fields, while in northern Italy some packs have settled just 50 km from the city of Turin! In Romania, the city of Brasov is located within a wolf territory, and wolves are known to move unseen through villages at night.

Exercises

1. Study the map of Europe and mark any locations which you have visited on holiday. Are any of these locations home to wolves?
2. Which areas were formerly occupied by wolves? Compare this to their present distribution. You can find some clues online: www.wwf.de/wolf

Wolves in profile

Species lat. *Canis lupus*
There are many different subspecies of wolf around the world.
Europe is home to the European grey wolf.

Family Their closest relatives are dogs, coyotes, golden jackals and foxes

Weight 30–75 kg

Head-body length 100–150 cm

Tail length 30–50 cm

Shoulder Height 60–90 cm

Jaws 42 teeth, strong jaws, suitable for consuming flesh and bones

Lifespan 8–13 years in the wild, up to 20 years in captivity

Population approx. 170,000 worldwide,
roughly 20,000 in Europe
Around 300 wolves live in Germany

Female wolves are somewhat smaller and lighter than their male counterparts. European wolves are roughly the same size as a German shepherd dog, but with shorter ears and significantly longer legs in relation to their body size. The subspecies of wolf prevalent in Europe and Germany is known as the Grey Wolf due to the colouration of its fur.

Social life
Wolves live in packs comprised of a mating pair and its offspring. On average, four to eight animals make up a wolf pack. Wolves communicate with using highly sophisticated body language – they "speak" with their bodies through posture, facial expressions and a range of vocalisations including growls, whines and howls.

Each wolf has its own unique "call". Howling helps the wolf pack to strengthen their bonds, demarcate territory and locate mates. Younger wolves leave the pack at the age of one or two years in order to find new territory and establish their own family.

Colouration
The colouration of the various subspecies varies from region to region. Close to the Arctic Circle, most wolves have white fur. In North America wolves are grey-brown or even black, while in Europe their coats range from different shades of grey through to a brownish colour. It is not uncommon for pups from the same litter to vary in colour.

Habitat
Wolves do not need untouched wilderness to flourish. They can survive almost anywhere and adapt quickly provided they have enough to eat and access to fresh water.

Nutrition
Wolves prefer to prey on red deer, roe deer and wild boar. In addition, they also prey on elk, reindeer, birds and small mammals such as hares and mice. Occasionally wolves also feed on fruit, berries and carrion. Wolves will hunt whatever they can find. They generally prey upon sick animals or weak animals that are either young or elderly. Wolves typically hunt in packs and work together to bring down their prey. On average, an adult wolf consumes 3 kg of meat per day, but can consume up to 9 kg of meat in a single meal.

Reproduction
Pairs of adult wolves mate in February. The gestation period lasts two months. Pups are born in late April/early May. Most litters consist of four to six pups. All of the family members help to raise and "educate" these young animals.

Senses
Wolves have powerful sensory organs. Their sense of smell and hearing are highly developed and have a range of several kilometres. The wolf's most important sensory organ is its sense of smell.

Territory
Individual territories vary in size depending on the abundance of prey. In Germany, territories extend across approximately 250 to 350 square kilometres.

Strength in numbers

Wolf packs consist on average of four to eight animals: the parents, newborn pups and their siblings of one/two years. Individual packs may require larger territories, sometimes 250 to 350 square kilometres of land depending on the abundance of prey in that area. It is amazing that such an area is equivalent in size to that of large cities such as Münster or Leipzig – that's 40,000 Football fields!

Wolves are very cooperative animals. A single wolf would have big problems to bring down larger and more formidable prey such as large stags and wild boar. Instead the older siblings help their parents to hunt prey and feed younger pups.

While the mother wolf stays in a sheltered den with the newborn pups during their first weeks, the rest of the pack will hunt together to feed them. Once the pups have grown, they will leave their nursery (often a small hollow beneath a tree) and move to a new and well-hidden meeting place. Often another member of the pack will remain close by to protect the pups. By the time they reach six months of age, the pups will know what they can eat, how to behave on the hunt and, perhaps most importantly, how to communicate with other wolves through gestures and howls.

Young wolves leave their packs at the age of one to two years to roam the countryside in search of new territory and eventually to establish new pack. During this time young wolves can cover distances of up to 1,000 kilometres!

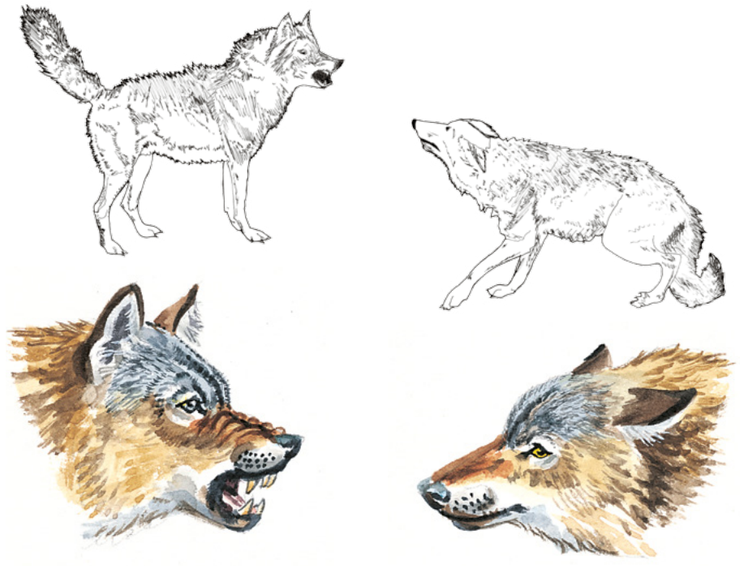
Exercises

Read the text and write down at least three things that young wolf pups learn.

Talk to me!

Within a wolf pack, body language plays an important role. Like dogs, wolves use body language to communicate their emotions. When they are at ease, wolves have relaxed postures, upright ears, closed or slightly open muzzles and lowered tails. Aggressive, fearful or submissive wolves change their posture to reflect their emotions.

Conflicts do arise within wolf packs and their displays of aggression – including growling and snarling – look very fearsome. However they are seldom seriously injured during these family conflicts. Incursions into a pack's territory by individual wolves or even entire packs can on the other hand lead to vicious fights.



Aggressive		**Submissive/Frightened**
wide open, staring	**eyes**	narrowed
raised and pointing forward	**ears**	pulled back and laid flat against the head
open, teeth bared	**muzzle**	closed initially, open wide if especially frightened, corners of the mouth are pulled down
growling	**vocalisation**	whining
high body posture, legs tense, hackles raised	**posture**	back low, legs bent; wolves will roll on their backs and expose their abdomen if especially frightened
initially raised to impress, then held in a horizontal position to attack	**tail**	lowered or even held between the wolf's legs

The wolf and its relatives

Many different species have evolved in the course of natural history. Biologists use family trees to illustrate the origins and relationships between different species. The wolf (*canis lupus*) is a distinct species and belongs to the carnivorans and the family of Canids, that dogs belong to as well.

There are 15 different families of carnivorans including dogs, cats, bears, hyenas, martens and more. These mammals are typically carnivorous and possess a range of adaptations such as claws and teeth which they use to catch and kill their prey. In the course of their evolution, many of these mammals have developed specialized hunting techniques, including stalking and endurance hunting.

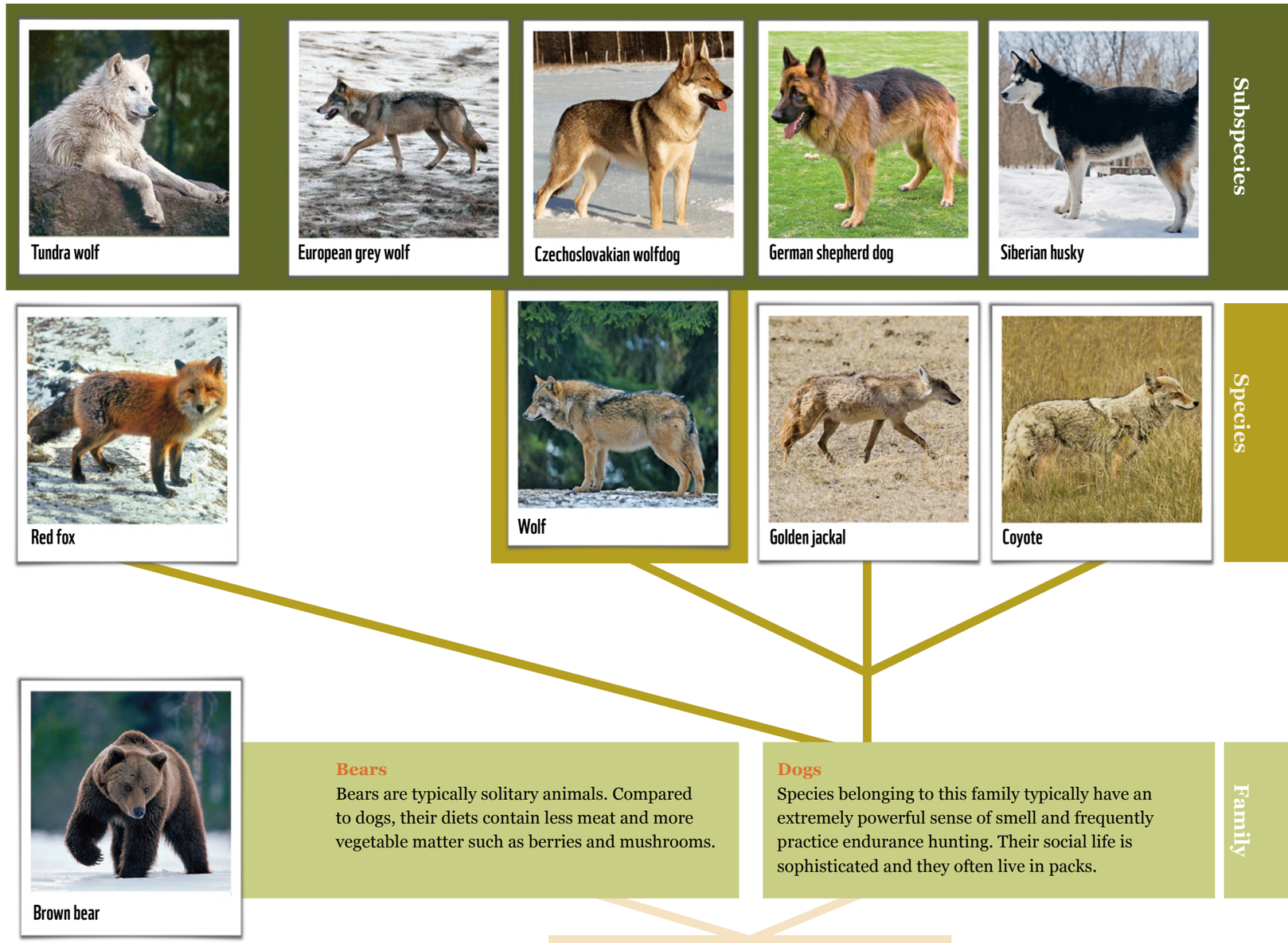
There are many different types of wolf. For example, Germany and Europe are home to the grey wolf, while the tundra wolf is common to North America. All these animals belong to the species *canis lupus*. Man's best friend, the domestic dog, with its many different breeds, also belongs to this species. The similarity between wild wolves and the domesticated dog is particularly apparent in some breeds. Although they usually have longer ears and shorter legs, some dogs that are used for shepherding bear a strong resemblance to the European grey wolf.

The terms dog, domestic dog and dog-like (caniform) can be a bit confusing. Usually when somebody talks about a "dog" they are referring to a pet. In zoology the canidae (dogs) are a family of carnivorans which includes wolves, foxes and coyotes etc. The caniformia (dog-like animals) are a larger group of carnivorans which includes a number of families such as dogs, bears, martens and other mammals. This family tree will help you to understand how these different animals are related.

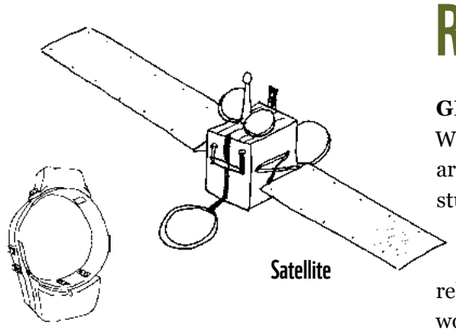
Exercises

1. Which other members of the dog family are most closely related to wolves?

2. Examine the family tree. Are wolves more closely related to the red fox or the golden jackal?



Research on wolves



Radio transmitter collar

GPS and text messaging
Wolves are generally shy and cautious animals, and sightings are infrequent. Wildlife biologists use modern technology to study their behaviour. Wild wolves are caught using cages, nets and special snares. Once the animal has been sedated, researchers attach a special radio transmitter collar before releasing the wolf back into the wild. Satellites pinpoint the wolf's exact location using GPS technology and transmit this data to the collar, which then relays this information to the wildlife biologist by text message.

Camera trap

Image from a camera trap: wolf at night

Camera traps
Camera traps are another clever method of observing wolves. Wildlife biologists position these special cameras at sites where wolf tracks have been found or where wolves are likely to pass. An approaching animal will trigger a motion sensor and cause the camera to take a photograph. Wolves are primarily nocturnal creatures, and so most of the images shot by camera traps are taken at night.

Wolf tracks

Tracking wolves
Wolf experts are able to recognise wolf tracks. Many dogs leave tracks similar to those of wolves, which makes reading their tracks a difficult task. Biologists have to follow their tracks for some distance in order to figure out which tracks are which. Wolves have a particular way of trotting and tend to move in a straight line to save energy. They also place their hind paws in the depressions left by their forepaws, creating distinctive double prints.

This can lend their tracks the appearance of a string of pearls, and they are often referred to as a 'pearl necklace'. This gait is typical of wolves and rarely adopted by dogs. A careful examination of the remains of prey can also provide valuable clues as to which predator made the kill. Wolves generally kill their prey by biting its throat, but when dogs kill an animal, they inflict numerous wounds across their prey's entire body. Biologists can tell a lot about the diet of a particular wolf by examining its droppings. They can even determine the sex of a wolf and its origins through genetic tests.

Exercises

1. What methods are used to research wolves in Germany? Name at least five.

Protecting livestock

Wolves are predators and meat is a primary component of their diet. They do not distinguish between "acceptable" prey such as wild boar and deer, and animals which are "off limits" such as sheep and goats. Because of this it is very important to protect livestock held on pastures in areas inhabited by wolves. Livestock can make very easy prey for wolves. Protecting sheep from wolves can be a difficult, costly and labour intensive task. In Germany, farmers in some federal states can apply for compensation if they lose livestock to wolf predation.

Flags in the wind
So-called fladry fences are a simple method of protecting livestock. These barriers are made by attaching rags at intervals along a thin rope. The swaying motion of the rags in the wind unsettles wolves and keeps them at bay. Unfortunately, wolves will disregard these barriers once they become accustomed to them.

Danger: electric fence!
Most shepherds find that electric fencing is the best method of protecting their flocks. Portable wire fences can be set up around flocks in the evening to protect them from attacking wolves. Wolves soon lose interest in livestock once they come into contact with an electric fence.

Man's best friend livestock guardian dogs provide good protection against wolves. Dogs have been especially bred for this purpose for centuries. Some breeds are so large and spirited that they are quite capable of fending off an aggressive wolf. But their primary purpose is to deter wolves, not to fight them. Bloody clashes between wolves and guard dogs are a rarity. Some shepherds even use donkeys as guard animals because they are such alert animals, and sound the alarm as soon as wolves draw near.

Did you know?

You might occasionally read in the newspaper about wolves killing large numbers of sheep in a single attack. This is not a matter of "bloodlust" and only occurs when prey animals fail to flee. When they feel threatened, sheep draw together and do not flee. Wolves are not accustomed to this behaviour as their prey normally attempts to flee, allowing them to catch just a single animal. In this situation their prey drive is triggered repeatedly by the continued presence of live prey, leading to a high number of widespread animal deaths.

The WWF in action

A wolf, photographed by a camera trap

Livestock guard dogs

A green bridge

The World Wide Fund For Nature (WWF) was founded to support the protection of wild animals. As part of this mission, the WWF actively supports the reintroduction of wolves into Germany. There is plenty of space and abundant prey for wolves in Germany – but only if humans are willing to accept the risk of potential conflict between themselves and wolves, conflicts which sometimes can arise in populated areas. Providing information and developing appropriate methods of protection is therefore an important part of the WWF's work.

Helping through donations
Sheep farmers in particular often worry about the return of the wolf, as their flocks make such easy prey. WWF Germany helps farmers by providing them with expertise and support, including monetary donations which enable farmers to purchase electric fencing and to train livestock guard dogs.

Research and planning
WWF Germany also supports scientific research on wolves. The WWF helps wildlife biologists to equip wolves with transmitters and set up camera traps at suitable locations in order to determine migratory routes and wolf population levels.

Sadly, many wolves are killed by motor vehicles. The WWF is also involved in the planning of "green bridges" in an effort to change this. Instead of traffic lanes, these bridges are covered in vegetation and enable animals to cross major roads.

Education and lobbying
Many people still have strong reservations about wolves. Promoting public awareness about them is therefore central to the work carried out by WWF Germany. It is important that people understand that wolves are not a threat to humans and that they have a right to live in the same places as humans do. WWF experts participate in public education campaigns and visit schools in areas in which wolves have resettled.

Exercises

If you wanted to help educate people about wolves, what would you tell them?

A future for wolves?

There is an abundance of prey and sufficient suitable habitat for wolves in Germany, and they may well enjoy a bright future here. Almost forty wolf packs and a few single wolves currently live in Germany, but this population is too small to guarantee the population's survival.

Motor vehicles and illegal killings pose the main threat to the future of the wolves. Over 120 wolves have been killed in road accidents and deliberately by humans in recent years. In other incidents wolves have been illegally shot and killed. Another threat to this small population is the possibility of wolves interbreeding with roaming domestic dogs. Domestic dogs and wolves can and do mate successfully. But their offspring are not pure wolves.

Did you know?

Germany and a number of other European countries have developed wolf management plans with research, public education, livestock protection and compensation programmes. Experts hope that these wolf management plans will enable wolves and humans to coexist peacefully in future.

Exercises

1. What threats do wolves face in Germany? Name three threats.

2. Explain the meaning of the term 'wolf management' and name several examples.

The cycle of life

On the hunt
Hunting and killing prey is hard work. The first challenge is finding suitable prey. After accomplishing this task, wolves still have to catch their prey and kill it. In Germany wolves prey mostly on roe deer, young red deer and wild boar. Whenever possible, wolves will avoid attacking larger animals which are capable of putting up a fight. On average, a fully matured wolf consumes roughly three kilogrammes of meat each day. But interestingly, wolves do not need to eat every day, and can easily go without food for several days before they need to find new prey.

The young, the old and the infirm first
Like many other predators, wolves improve their chances of success by preying on elderly, weak or otherwise infirm animals which are easier to catch. It seems paradoxical, but this practice actually benefits these species. Preying on weak and infirm animals allows stronger and healthier animals to thrive, contributing to the overall health and preservation of the species by privileging the reproduction of stronger specimens. With their highly attuned sense of smell and sharp eyes, wolves have little trouble identifying young, weak, old or infirm prey.

Nature unbalanced
Many of the species on which wolves prey, such as roe and red deer, are herbivores. Their favourite foods are fresh young shoots and the bark of deciduous trees such as oaks, beech, ash and rowan trees. That wouldn't be a problem here in Germany if there weren't so many roe and red deer, and so few predators to check the growth of wild game populations. Unfortunately their natural enemies – wolves – are missing. This development has consequently disturbed the natural balance in our forests.

Effects on the forest
This lack of wolf population frequently results in unnatural forest composition and the harmful effects of high concentrations of wild game. Herbivores prefer to graze on deciduous foliage rather than needles, causing conifers to flourish while deciduous trees struggle to survive. Older trees become susceptible to pests when their bark is damaged by game. These harmful effects don't just affect the forest – eventually wild game animals also go hungry as a result. Hunters are not always able to shoot sufficient numbers of wild game. The presence of wolves can help to limit game population growth and keep forests healthy.

Exercises

1. Explain the link between wolves and deer, and deer and plants.
2. Why is the line between the wolf and its habitat a dashed line?

Legends, fables, superstitions

The wolf is a common element in many legends and fairy tales. Some cultures in Central Asia believe that they are descended from wolves. In North America, some Indian tribes view wolves as sacred totem animals (spiritual guardians). There is even a famous European legend about wolves according to which the founders of Rome, the twins Romulus and Remus, were rescued and suckled by a she-wolf after they were abandoned in the wilderness. The wolf has been the symbol of Rome ever since.

Who's afraid of the big bad wolf?
Thousands of years ago, when most people still lived in hunter-gatherer societies, humans and wolves shared a common habitat without any major conflicts. Later humans adopted a sedentary lifestyle focussed on arable and livestock farming. Humans soon came to view wolves as a threat because it was easier for them to hunt and kill sheep and goats than wild prey. Wolves were demonised in folk tales as "evil creatures" that lurked in the shadows awaiting an opportunity to eat little children. In reality, however, wolves are very shy and shun contact with humans. In many parts of the world wolves were hunted and persecuted almost to the point of extinction.

Werewolves
In popular folklore and superstition, a "werewolf" is a human with the ability to assume the form of a wolf at the time of the full moon. Legends of werewolves are widespread in Europe. In modern times they have made frequent appearances in horror films. Naturally werewolves are just a folk belief with no basis in reality. But the existence of this belief illustrates the extent to which humans have demonised wolves as evil and baneful creatures.

Exercises

1. What stories do you know in which wolves play an important role? Write the titles of these stories in your workbook.

2. Do you know of any animals which are attributed human characteristics in legends and fables? If so, which ones?

9 tips for wolf encounters

1 **Stay calm and remain still. Make sure the wolf has an escape route.**

2 **If you want to scare the wolf away, clap your hands, wave your arms in the air and shout loudly.**

3 **Wolves are wild animals. Never try to touch or pet a wolf! Never approach a wolf pup!**

4 **Never attempt to follow a wolf – this will only make it nervous.**

5 **Enjoy this unique opportunity to observe a wolf in its natural environment.**

6 **Do not run away if you are frightened. Retreat slowly, without turning your back to the wolf, in order to set a safe distance between you and the wolf.**

7 **Always keep your dog on a leash in areas inhabited by wolves. Wolves may react aggressively if they perceive an unleashed dog as an intruder.**

8 **Never feed a wolf!**

9 **If you encounter a wolf, please notify a local conservation authority.**

Exercises

Form groups and try to mime these tips.

For wolf trackers

These are the tracks of several different wild species – wolves, wild boar, lynx, deer and bears. There are no wild bears in Germany today, and both lynx and wolves are especially rare. While their tracks are seldom found in the wild in Germany, they have been included here because they are fascinating wild animals and part of our natural heritage. Roe deer and wild boar, on the other hand, are common throughout most parts of Germany.

Hind paw

Like cats, wolves are digitigrades – that means they walk on their toes. When they run they use their claws as spikes. Mature wolves leave oval-shaped tracks with clearly recognisable claw marks. Their paw prints feature four toe pads and are at least 8 cm long (excluding the claw marks). Individual wolf tracks can be very difficult to distinguish from those of dogs as their paw prints are very similar.

Like cows, camels, goats and sheep, wild boar are cloven hoofed animals (artiodactyla). Their tracks consist of two large depressions caused by the fore hooves of each leg – also known as cleaves – and a smaller, softer depression that is created by their dew claw. Experts can estimate the approximate age and weight of an animal just by studying its hoof marks. As a rule of thumb, experts calculate 10 kilogrammes in weight for each centimetre in length. For instance, a wild boar with a hoof print measuring 5 centimetres from end to end would weigh roughly 50 kg.

Fore paw

Lynx are digitigrades. Lynx retract their claws to keep them razor sharp for hunting when they run. Their tracks do not feature any claw marks because of this, but their four toes are clearly recognisable. Lynx paws are heavily furred in the middle and around the edges. This protects their paws from the cold and creates a larger surface area so that they can use their paws like snow shoes. The paw print of a mature lynx is about the size of a human palm – approximately 7 cm.

Roe deer are cloven hoofed animals. Their hooves leave a distinctive heart-shaped impression that is easily recognised on soft ground or in snow. Deer tracks are most likely to be found on the fringes of forests where they emerge to graze.

Like humans, bears are a plantigrade species and walk on their entire foot. Bears have five toes on each foot. Their long, sharp claws are evident in their paw prints. The forepaw of a bear leaves a short, broad print. Their hind paws leave longer prints and often the entire sole is clearly recognisable. In the case of the European brown bear, this print is roughly 30 cm in length.

Exercises

1. Read the text and highlight the important characteristics of each species. Examine the tracks and find out which track belongs to which respective species.

2. How can you make a distinction between the tracks of a lynx and those of a wolf?

Find more interesting tracks and games at www.wwf.de/yp/tracks

Hidden in the forest

The signal transmitted by the wolf is strongest at 75°. The wild boar is hidden somewhere at 40°. According to the compass, the roe deer is located at 100°.

The wolf is transmitting from a location at 300°. The boar is located at 305°. The deer is located at 275°.

Exercises

A wolf, a wild boar and a roe deer are hiding somewhere in the forest. Each animal is wearing a radio transmitter collar. Two scientists are receiving their signals. You can determine their location with the aid of the signals from their transmitter collars. Use a ruler to draw a line from the middle of the compass at each of the specified degrees. The hidden animal will be located at the intersection of the two lines. Tick the correct answer:

The wolf is hidden ☐ in the forest below the scientist ☐ on the small hillside slope to the left ☐ on the mountain slope.

Wolves in Germany

Hunting, trapping and poisoning wolves is now strictly forbidden in Germany. Wolves have been able to cross the border from Poland to establish packs in Germany's eastern regions. Close to forty wolf packs live throughout Germany now and their numbers are increasing.

100% RECYCLED

WOLF SIGHTINGS

A striking resemblance: European wolves are roughly the same size as a German shepherd dog, but their legs are much longer in relation to their body size.

PARDON?

Body language plays an important role within wolf packs. Like dogs, wolves use body language to communicate their emotions.

40,000 FOOTBALL FIELDS

Wolves need enough wildlife to prey upon and dens to shelter their pups. Some wolf territories in Germany are as big as a city the size of Münster or Leipzig.
That's an area the size of 40,000 football fields.

PREVENTING CONFLICTS

Protecting livestock is important: conflicts frequently arise when wolves kill livestock such as sheep or goats for prey. Poorly protected livestock is easy prey for a pack of wolves.

WWF

Why we are here
To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.

wwf.de | info@wwf.de

WWF Deutschland
Reinhardtstraße 18
10117 Berlin | Germany

Tel.: +49 (0)30 311 777-700
Fax: +49 (0)30 311 777-888

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