



Europe's Carnivores

information for educators



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Introduction



The plight of carnivores in Europe is similar to that of tigers in Asia, but has received much less publicity. Human persecution, habitat destruction and the loss of prey species have all contributed to their decline. The Iberian lynx, found only in Spain and Portugal, is now the world's most endangered cat species. As other top predators, such as wolves, begin to expand their ranges, they face an upsurge in conflict with people. Carnivores are part of both our natural heritage and culture, and it is our responsibility to protect them. The fate of these top predators in Europe depends on our ability to accept their presence and learn to co-exist with them. We can be proud to take care of such splendid animals. **The Iberian lynx, now the world's most endangered cat species.**



C. RANKINE, WWF-UK

Glossary

* indicates inclusion in the glossary on page 26

Introduction

THREATS

Europe once provided a wide range of natural habitats* for its large carnivore* species*. Today they have been driven from many areas by persecution and loss of their habitats. Where large carnivores survive they live in pockets of their former ranges*, which are often highly fragmented.

Carnivores in Europe face many threats, particularly the larger species which are regarded as direct competitors with people. Major threats are habitat loss, often the result of deforestation and the spread of agriculture;

Fear and misunderstanding are perpetuated by popular fairy tales such as the Three Little Pigs, Goldilocks and Little Red Riding Hood.

reduction of natural prey* species; and over-hunting, which populations* cannot sustain. Roads lead to fragmentation of habitats and deaths caused by traffic accidents. Some carnivores are also threatened by pollution*. Others run the risks of becoming inbred through the loss of genetic variation as populations become too small and isolated. Livestock predation is the major trigger for killing some large carnivores, such as wolves,

but this is linked to current methods of managing livestock. For instance, nowadays flocks are often allowed to roam without the protection of dogs. Agricultural policy is another important factor: the Common Agricultural Policy*, for example, has encouraged intensive farming* resulting in the loss of wildlife habitats.

Human attitudes pose the greatest threat to the survival of large carnivores in Europe, where these creatures have been persecuted for centuries. All too often Europe's top predators* suffer from a bad image. Fear and misunderstanding are perpetuated by popular fairy tales such as the Three Little Pigs, Goldilocks and Little Red Riding Hood. Many children still grow up with these stories, but making the big bad wolf good in their eyes is vital if large carnivores and people are to live together in Europe.

The reputation of carnivores as merciless killers of humans and livestock is grossly exaggerated. For example, there are no records of any human deaths from wild wolf attacks in Europe in the last 50 years. People have been the predators, killing countless wolves and destroying much of their habitat.

The Iberian lynx faces a real threat of extinction in less than 50 years. The world population of tigers is around 5,000, but less than 800 Iberian lynx remain in isolated pockets of Spain and Portugal. The Eurasian lynx has also disappeared from much of its historical range. Brown bear populations are dangerously small and highly fragmented in southern, central and western Europe. Wolf populations face intense human pressure throughout most of their range and wolverines number around just 500 outside Russia.

In the UK, large carnivores such as bears and wolves were persecuted to extinction several centuries ago. A number of medium-sized carnivores remain in much reduced numbers. Otters are making a comeback after many years of hunting and pollution of their river habitats. The wild cat of Scotland is endangered, and while pine martens and polecats are expanding from their main ranges in Scotland and Wales respectively, their expansion will inevitably lead to conflict with people.

NATURAL HERITAGE

Carnivores are part of Europe's natural heritage and culture and it is our responsibility to protect them. We should be proud to take care of these splendid and often beautiful animals.

It is important that large carnivores survive in sufficient numbers to maintain themselves in Europe.

They need large areas of suitable habitat with plenty of prey species and can therefore serve as useful barometers of the health of their natural environment*.

They are Europe's equivalent of tigers. Their presence in healthy numbers is a measure of regional biodiversity* and of Europe's contribution to global biodiversity. By conserving them, we can also safeguard the many other species that share their habitats.

Introduction

European carnivores are charismatic species. They can act as fantastic figurehead species for conservation* in the same way as tigers do in Asia. If they are lost, incentives to conserve their habitats and other species will be seriously reduced.

LIVING TOGETHER

Nowadays Europe is so crowded with people that there is not enough room to set aside protected areas of suitable size where our top predators can flourish. The only future for these large carnivores is to co-exist with people.

The animals have shown that they can survive living close to people in Europe. Whether people are willing to share that space is the key to their recovery. In the Carpathian mountains of Romania, large populations of people, sheep and large carnivores live close together successfully. With an understanding and acceptance of carnivores as part of our countryside, this example of co-existence could be repeated throughout Europe.

It is important to act now to conserve Europe's carnivores. In the case of the Iberian lynx effective conservation action is urgent. Public attitudes towards carnivores are beginning to change and this softening of opinion has allowed some large carnivores, such as wolves and bears, to return to parts of Europe where they were wiped out a hundred years ago. This beginning of their return to former haunts brings us hope, but has led to increased conflict with humans.

Public support for carnivores is needed now, otherwise these top predators will be the losers.

The future of Europe's large carnivores depends upon co-operation between nations across their borders as, well as on managing interactions with people at a local level. Recent political changes in Europe are creating new and promising opportunities. The partial breakdown of national borders and more unified legal and planning requirements can all help the management of large carnivore populations. Even so, the support of local people is vital for success.

LARGE CARNIVORE INITIATIVE FOR EUROPE

In 1995, WWF and partner organisations and experts in 17 European countries, established a Large Carnivore Initiative for Europe. This focuses on five species: the European brown bear, Iberian lynx, Eurasian lynx, wolverine and wolf.

The Initiative's mission is to, 'maintain and restore, in co-existence with people, viable populations of large carnivores as an integral part of ecosystems* and landscapes across Europe.' The Initiative is working on four main levels:

- protecting large carnivores and their habitats;
- integrating large carnivores with local development;
- supporting large carnivores through legislation and policies;
- gaining human acceptance for the existence of large carnivores.

Conservation organisations such as WWF, international organisations such as the Council for Europe, local communities, biologists and a huge range of partner organisations across Europe are working together to conserve large carnivores. This co-operation is vital as issues are often complex.

In the UK, WWF is helping the conservation of carnivores by:

- lobbying for better protection of wildlife;
- pushing for reform of the Common Agriculture Policy, especially schemes that benefit wildlife;
- ensuring that the European Habitats and Species Directive* is put into practice;
- implementing biodiversity action plans* for carnivores, such as otters, and their habitats.

WWF's Campaign for Europe's Carnivores was launched in February 1999 and is building on these important activities. It aims to raise awareness of the problems facing carnivores and challenge peoples' negative views of wild predators. While the plight of Asia's tigers is widely known, the threats facing Europe's own top predators have received much less publicity. The Campaign will also raise money for a range of priority conservation activities in the UK and Europe.

Grey wolf

DISTRIBUTION

The grey wolf was once one of the most widely distributed mammals in the world, found throughout the Northern Hemisphere from the Arctic almost to the Equator. When humans were hunter/gatherers, the wolf was respected and worshipped in mythology and religion. But once humans started herding, domestic animals fell prey to it and the wolf became a villain. Both in Roman times and after the Norman conquest in Britain, wolf skins were taken as rent or tribute from feudal landholders. Wolves were hunted in community wolf drives, by the use of pits and snares, and even the breeding of the huge Irish wolfhound. Under such pressure, wolves became extinct* in England by about 1500 and in Scotland and Ireland by the end of the 18th century. By the 19th century, wolves were exterminated from all central and northern European countries.

Today the species is starting to recover naturally in several parts of Europe and is returning to its old



C. PROMBERGER

haunts in France, Switzerland and Germany. This is partly because of a change in some peoples' attitudes in favour of wolves, and changes in human population density and activities in mountain and rural areas. The wolf is now fully protected in many countries.

The largest populations are found in eastern Europe, particularly Romania, Poland and bordering countries. There are between 15,500 and 18,000 wolves in Europe today, nearly all of which occur in remote areas.

BIOLOGY

With its intelligence and complex social structure, the grey wolf is one of the most fascinating of the world's great carnivores. It is the second largest predator in Europe after the brown bear. Wolves are the size of a large Alastian dog. The adult male weighs an average 40 kg and measures up to 150 cm in length. Contrary to popular belief, the wolf is timid by nature and avoids contact with humans.

The wolf in Europe lives in many different habitats, from the plains of central Spain to the tundra of Finland and the forests of Lithuania. They have even been found scavenging in a Romanian city. The wolf habitat has been described as everywhere that humans do not kill the species and where there is something to eat.



Grey wolf



Wolves are highly social animals and live in packs that co-operate in hunting, reproducing and defending their territories*. Under natural conditions wolves have to work very hard for a living. They commonly hunt unsuccessfully for several days between kills. Each of their prey species has its own very effective defence. This is not so surprising, otherwise wolves would quickly kill all their prey and leave themselves nothing to eat!

Wolves eat a wide range of prey: large animals such as moose, deer and wild boar; or small prey including rodents, hares, rabbits, marmots, birds, lizards, snakes, fish and even insects. The young, old or sick are generally hunted. They will also eat carrion* and vegetable matter.

The wolf pack is based on a family group and averages seven wolves.

Strong social bonds maintain the pack. The dominant female and male are usually the only wolves in the pack to breed. The birth of pups is an occasion of great interest and excitement for all adults and yearling wolves of the pack. They are eager to take care of the young as soon as the mother will allow it and often compete for the chance to babysit, feed or play with the pups. Pups leave the den some time between six and eight weeks old and begin to follow the pack and learn to hunt for themselves.

The wolf's howl is often described as "blood-curdling", reinforcing human fears of wolves. But the howl is a call of greeting, of searching for contact with its own kind and often it is a howl of sheer happiness and excitement, expressing pleasure in companionship. When wolves howl together it may be to announce the

limit of their territories. After gathering near the den they frisk about with much tail wagging, sniffing, pawing, hugging and finally howling together before departing to hunt.

THREATS

The wolf has for centuries suffered from a negative image, based largely upon fear, misunderstanding and the fact that it kills livestock. In some countries there is unrestricted hunting of wolves. In others, licences are issued without any biological understanding. Although wolves do prey on domestic animals, the numbers of sheep or cattle taken are, as a percentage, very low. Human encroachment is a significant threat to wolf habitat. The wolf is a very adaptable species and can live close to humans, but needs safe retreat areas. This is not considered in land planning in wolf areas and the small, fragmented populations in western Europe can result in animals moving into unsuitable habitat where they conflict with humans.



What does this cartoon and the story of Little Red Riding Hood tell you about the nature and behaviour of the wolf? How much of this is true?

CONSERVATION SOLUTIONS

What lessons can be learned from the following two projects that will help wolves and people to live close together elsewhere in Europe?

A LESSON IN LIVING TOGETHER

The Carpathian Mountains are probably the last place in Europe where high concentrations of people and large predators co-exist. Bears are nightly visitors to the rubbish bins of Brasov where wolves also mingle with the 350,000 city folk. One wolf pack actually lives within the limits of the city, relying heavily upon it for food.

The Romanian Carpathians cover only 1.4 per cent of the land surface of Europe, but they are home to 43 per cent of all

Europe's bears, 30 per cent of our wolves west of Russia, and a significant proportion of lynxes. The mountains are home to traditional prey species including red deer, roe

deer, wild boar and chamois (an agile goat antelope). They also support hundreds of thousands of sheep and almost five million people.

Since 1994 an international research and conservation project supported by WWF has been operating in the area around Piatra Craiului Mountain, close to the castle of the count who supposedly inspired Dracula. The researchers are investigating the behaviour of wolves, brown bears and lynxes. They aim to help people appreciate and accept that wolves and other large predators on their doorsteps need not be a source of fear.



It is important to understand how these predators survive, so animals are trapped, fitted with radio collars and released. Researchers then track them to find out where they go, what they eat and how they interact with each other.

The study revealed some unexpected information about the wolves' behaviour. Shepherds had repeatedly reported to the researchers that wolves were making nightly visits

into the nearby city of Brasov to forage for food, but it seemed unthinkable to the team that wolves

would leave the safety of the forest and approach a built-up urban area. To the researchers' surprise, they were soon tracking a female wolf, Timish, up to ten kilometres from the forest. It became clear that

Timish and her pack had discovered an ample source of food in the city's suburbs. Rubbish heaps were scavenged and the dumps' other nocturnal* visitors including cats, small dogs and rats, also provided easy prey for the wolves. Timish was seen boldly walking around the city at sunrise. She threaded her way between cars and people – just like any other streetwise city dweller. One researcher had a close encounter with her. "I was lying flat on the ground and could see her ears through the grass, as she came closer and closer. Three metres in front of me she stopped, snuffled, and suddenly noticed my hiding



A wolf is anaesthetised while a radio collar is fitted.

C. PROMBERGER

place. She jumped to one side, lolloped, almost like a hare, around me and continued on her way."

This admirable ability of wolves to adapt to their surroundings is bringing them into ever closer and more frequent contact with humans. This increases the likelihood of conflict and local hostility towards the animals, although the researcher's encounter with Timish shows that wolves usually avoid humans. The team soon realised that their research programme could do little towards solving the problems of large carnivores while the people of the region felt negatively about them.

As more and more people asked to come and visit them, the researchers hit on the idea that wolves could be "marketed" to attract more tourists to the area. The team was behind the opening of the first guest house in the small town of Zarnesti, just five kilometres from the Project's field research cabin, in spring 1998. It was so successful in its first year that it was enlarged and other guest houses have opened. Other local services, such as buses, guides and transport by horses and carts, have received a boost. Traditional woollen

CONSERVATION SOLUTIONS continued

jumpers decorated with wolf and bear paw motifs are being sold to tourists. Plans are in the pipeline for wolf-cheese, bear-honey and carnivore-inspired embroidery. Animals that once brought only fear and suspicion are now bringing money into the area – over £55,200 has been spent in Romania through the Carpathian Large Carnivore Projects scheme. The people of Zarnesti see the benefits that wolves and bears can bring and are eager to be involved in their conservation.

The team found that the Carpathian people had something to teach them as well. Throughout history, shepherds have learned to live with carnivores and the Carpathians are one of the few places where traditional livestock guarding methods are still used. Virtually everywhere else in Europe, large carnivores have been exterminated or reduced to low densities and rural people have lost the knowledge of how to cope with them. In the Carpathians, herds of up to 1,000 sheep are accompanied by three to six shepherds and up to ten dogs. These animals are extremely fierce and are protected against wolves and bears by wearing huge hand-made spiked collars. Sheep are usually penned at night, further reducing wolf and bear kills. The team discovered that once wolves had made several unsuccessful attacks on a herd they usually gave up.

A large part of the project in Romania is centred on public awareness. A variety of methods are used to show that carnivores are part of the mountains' natural ecology. These include educational visits by schools and tour groups, publicity in the media, and the distribution of leaflets. Myths are beginning to be dispelled and replaced with real information.



An Abruzzo mastiff watches over his flock.

A DOG FOR THE CONSERVATION OF LARGE CARNIVORES

Today there is an increase in the wolf and bear populations in Italy. This has created problems for shepherds who are no longer used to dealing with these predators. Over the years, livestock guarding techniques such as using fences and the constant presence of shepherds and dogs have been abandoned. This means that wolves, bears and lynxes have been able to raid the flocks unchecked. Livestock owners have reacted by shooting or poisoning the carnivores. The populations of wolves, bears and lynxes are small and unable to sustain these killings.

In 1998 an initiative was launched to try and stop the conflict between shepherds and carnivores. Sheep are now protected by electric fences at night. If livestock are taken the shepherds are rapidly paid for their loss. The use of guard dogs to protect livestock is also being encouraged. WWF is promoting the breeding of Abruzzo mastiffs, the traditional guard dogs of Italian shepherds. These dogs are noted for their size, courage, loyalty and dependability. They are also very tough and can work in harsh weather conditions. The white shaggy dogs are raised with the sheep from being puppies and grow up thinking they are part of the flock. They sleep with the sheep at night and follow the shepherds during the day. At present ten puppies are being trained in a National Park where there are known to be wolves. It is important for the dogs to get used to defending the sheep against wolves early on. These dogs will have 10 to 12 months training and then pairs of young dogs will be allocated to shepherds who have learnt how to work with the dogs. It is hoped the pairs of dogs will breed and create tight family units which will work together to defend the sheep.

Iberian Lynx

DISTRIBUTION

The Iberian lynx is now the most threatened of all cat species and is in real danger of extinction in the first half of the 21st century. It was once widespread in Spain and Portugal, but its range has contracted by 80 per cent in just thirty years between 1960 and 1990 and is reduced to isolated pockets. The population size has decreased even faster and there are now less than 800 left in the wild.

BIOLOGY

Little was known about the Iberian lynx until very recently and even now many aspects of its biology are still being researched. It is a powerfully built and beautiful cat, about half the size of the Eurasian lynx, with long sturdy legs, a very short tail, triangular ears and a heavily spotted coat.

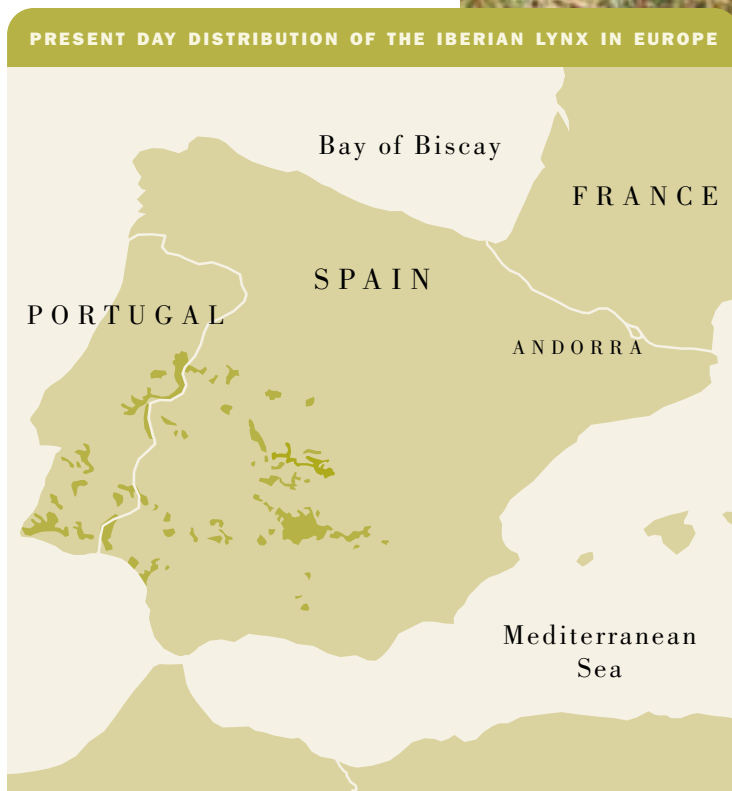
The Iberian lynx has special habitat needs and is only found in scrubland interspersed with open areas. It feeds almost entirely on European rabbits, although it sometimes eats rodents, hares and birds. Although the lynx can move at any time of the day, it is most active in the twilight, when rabbits are most likely to be about. Unlike

the Eurasian lynx it has a relatively small home range* between four and 20 km².

Like many other cat species, the Iberian lynx is solitary and the female raises the kittens alone. Usually three kittens are born in April and are independent when 10-11 months old.



C RANKINE, WWF-UK



Iberian Lynx

THREATS

Loss of its scrubland habitat was the most important reason for its sharp decline between 1960 and 1990. The spread of intensive agriculture* and road building continue to threaten vital lynx habitats. In the past Iberian lynxes have been viewed as valuable hunting trophies or as vermin. They received protection against hunting in the 1970s and since then hunting has dropped off, but a significant number are still killed by hunters or in traps set for smaller animals. Another important factor in its decline has been the drop in rabbit numbers. Over-hunting, habitat changes, myxomatosis and more recently Rabbit Viral Disease have reduced rabbit numbers to just 5 per cent of those in the 1950s. The danger of death on the road has added to the lynx's plight.

CONSERVATION SOLUTIONS

Conservation action for the Iberian lynx is urgently needed. At a political level it would be highly embarrassing for us to allow the first extinction in many centuries of a cat species which is endemic* to Europe. If this were to happen we could hardly demand that less developed countries of the world, which have far fewer resources than we do, save their own wildlife. An increasing number of people are now working to change current trends for the Iberian lynx and we can only hope they are successful.

One of the first needs is to designate core "lynx areas" where conservation measures will take priority. In these areas laying traps and poisons should be prohibited and shooting should be stopped through awareness campaigns.

Land uses that allow the development of scrubland should be encouraged. More research on the lynx is also needed to prepare action plans for the animal's future.

WWF is lobbying for sufficient habitat in Spain to be protected to maintain Iberian lynx populations in the long-term as required by the European Union Habitats and Species Directive. This law requires that countries in the European Union maintain or restore threatened wild species and natural habitats and set up areas called Special Areas of Conservation (SACs) where conservation action is taken to save them.

A total of 59 areas for lynx conservation have been identified in Spain. These include 11 *potential* expansion areas and "corridors" that link areas together. Without these corridors, lynx communities will become isolated rather than coherent ecological networks. Over 35 of these areas are currently under threat from motorways, dams or unsuitable management. WWF Spain believes that conservation of the Iberian lynx will provide an important test case of the effectiveness of the Habitats Directive in the European Union.



Eurasian Lynx

DISTRIBUTION

The Eurasian lynx is one of the widest ranging of all cat species and was once found throughout Russia, central Asia and Europe and also occurred in Britain. Human persecution, deforestation, the spread of agriculture, and a decrease in wild prey led to the decline of the lynx. In Europe only about 8,000 are left, but the good news is that lynx populations are beginning to recover in the north and east.

BIOLOGY

The Eurasian lynx is around a metre long and is the largest of the world's four lynx species. It has large paws, almost as big as a wolf's, with fur between the pads to act as snowshoes during the winter. The lynx roams large home ranges of between 100-500 km². Forest is typical lynx habitat, but it also

occurs in the tundra of northern Europe. It prefers to eat roe deer and reindeer and also takes rabbits, other small mammals and birds. There are no reports that lynx have attacked humans and they rarely attack sheep. You would be very lucky to see a lynx as it is secretive, very wary and nocturnal*. It climbs, runs and jumps well.

THREATS

Although the Eurasian lynx is not endangered, humans are still a major threat through persecution, loss of habitat and prey, and by building roads that cause traffic accidents.

CONSERVATION SOLUTIONS

Suitable habitat and prey are essential for its continued survival in Europe. Local people need to be encouraged to take part in planning for lynx conservation in their area.



D LAWSON, WWF-UK

Brown bear



P. HENRY, OXFORD SCIENTIFIC FILMS

FORMER DISTRIBUTION OF THE BROWN BEAR IN EUROPE



PRESENT DAY DISTRIBUTION OF THE BROWN BEAR IN EUROPE



DISTRIBUTION

The brown bear is found more widely than any other bear, occurring in Europe, Asia and North America, although its range is now greatly reduced. Today Europe only has about 14,000 bears.

BIOLOGY

The brown bear is a large animal – some males weigh as much as 320 kg. Compare that to your own weight! It is actually an omnivore (ie it eats plants and animals). Its diet ranges from nuts and fruit to insects, honey and meat (live or dead prey). Bears have huge home ranges, living in deciduous and coniferous forests as well as steppes and tundra. In late autumn they hibernate for between three and seven months in dens dug in the ground or under rocks. Brown bears are generally very shy. Although they are active by day and night, human persecution has led to nocturnal* behaviour in some areas.

THREATS

The brown bear faces many threats. People feel negatively towards bears, partly because they fear

attack. Predation on livestock is increasing as bears lose their habitats and food sources. Given the opportunity, bears will take unprotected livestock, even where other food is plentiful. The best bear habitat has already disappeared in Europe. Roads fragment remaining habitats and lead to traffic casualties. The increased demand for bear parts in Asia for use in traditional Chinese medicine has also led to a massive increase in poaching in Russia.

CONSERVATION SOLUTIONS

International legislation that protects bears from poaching and illegal trade needs to be enforced. Key bear areas and corridors need to be identified and protected. Good forest management can benefit bears. Farmers need to be encouraged to use traditional livestock guarding techniques. Compensation schemes for livestock lost to bears need to be introduced. People in bear areas need to be made aware of bear ecology and human safety.

Wolverine

DISTRIBUTION

As well as occurring in eastern Siberia and North America, wolverines were once found throughout the European part of Russia, Norway, Lithuania and north-east Poland. In Europe they have disappeared from the south and are now only found in small areas of Scandinavia and in Russia, with a total population of around 2,000. Outside Russia the wolverine is very scarce indeed, numbering about 500.

BIOLOGY

Although the wolverine looks rather like a bear and sounds as if it is related to the wolf, it is in fact the largest member of the weasel family. It is powerfully built for the harsh conditions in which it lives. Long, curved claws are used for digging and climbing. Huge paws act as snowshoes in winter. Rather like badgers, they live in an underground den. Wolverines like to live alone. Their home ranges are huge, varying between 200 and

1,500 km² in alpine, tundra and northern forest habitats. They could be called the hyenas of the north as they scavenge on remains left by other predators, such as lynx and wolf, and animals that have died from accidents or disease. However, wolverines can also prey heavily on sheep and semi-domestic reindeer and occasionally animals as large as the moose, as well as smaller prey including hares and rodents.

THREATS

Persecution, deforestation and human development caused the wolverine's decline in Europe and continue to threaten it today. Human encroachment has resulted in the loss of natural prey, so wolverines increasingly take domestic animals instead, worsening human/wolverine

conflicts. In Norway farmers no longer use traditional farming techniques which help stop predation. The annual number of wolverines that are legally taken in Norway is very high in relation to population estimates made by scientists.

CONSERVATION SOLUTIONS

WWF aims to encourage farmers to use livestock guarding methods that avoid killing wolverines. A new compensation scheme for reindeer herders in Sweden pays farmers who identify wolverine dens on their range. Local communities are being encouraged to take part in conservation management. Hunting allowed by government needs to be properly managed so that small populations are avoided. Illegal killing should be stopped.

R ANDERSON, WWF



Carnivores in the UK

In the UK large carnivores were persecuted to extinction several hundred years ago in order to protect livestock from predation. This has led to imbalances in our ecosystems. For example, the number of red deer have greatly increased and today Scotland's hills are overstocked and overgrazed.

During the era of large sporting estates in the 19th and early 20th centuries, all carnivores were treated as vermin. For some, such as the fox and stoat, this meant only a short-term decline in numbers; but for others, like the polecat and pine marten, it led to them nearly disappearing altogether.

Nowadays as people have a greater understanding of how we can co-exist with carnivores, several medium-sized carnivores, such as the pine martin, polecat and otter, are slowly increasing and their ranges are expanding. Because they can only survive in favourable conditions, their spread through the countryside can help us to judge the health of our environment. They need feeding areas that support adequate prey, and safe breeding territories with resting areas free from disturbance. Here we look at two of these predators.

Otter

DISTRIBUTION

Once widespread in the UK, otter populations dramatically declined from the late 1950s. By the 1980s they were absent from most of England, surviving only in the south-west and on the borders of Wales and Scotland. They remained in Northern Ireland, Scotland and Wales, but with much reduced numbers in the latter. But in recent years, otters have spread out from their strongholds and in 1999 they are now found in one in four places where they once lived. Indeed they are using rivers which pass through up to 30 of our major UK cities, from Edinburgh to Plymouth. The UK otter population is internationally important, since the species has declined across much of its western European range.

BIOLOGY

The otter is adapted for living in the water and on land: the feet are webbed, the thick sleek coat protects otters from cold and their broad tails can propel them through the water at speeds of up to 10 kph. Otters eat mainly fish (especially eels) and occasionally also small mammals, water birds and frogs. Their long whiskers are sensitive to touch and play an important role in helping otters to capture prey. Excellent swimmers, otters can dive for as long as seven minutes at a time. Usually they are active from dusk to dawn, but where they are undisturbed, such as in parts of Scotland, they can be seen throughout the day. Otters live on the banks of rivers, lakes and also coasts where they have access to fresh water. Home ranges may include up to 40 km of waterside that they mark with their droppings, or spraints as they are called, to keep in contact with their



SOURCE: THE WILDLIFE TRUSTS (1999)
SPLASH BACK/THE RETURN OF THE OTTER

neighbours. They make tunnels into the bank with an entrance under water and with a ventilation shaft. Natural holes in banks and holes of other animals are also refuges for otters. They are very fond of play and make slides on the bank and, in winter, also in the snow.



HUGH CLARKE, WWF-UK

Otter

DISTRIBUTION OF THE OTTER IN THE UK 1997



THREATS

Today the otter is one of the most popular British mammals. This was not always so. In earlier days it was considered to be the aquatic equivalent of the 'crafty' fox and was trapped, shot and hunted for sport using packs of hounds. The sharp decline of the otter in the 1950s and 1960s was caused through water pollution by chlorinated hydrocarbon pesticides*. These chemicals build up in food chains* and particularly affect top predators. They have been shown to affect the ability of otters to reproduce and to resist disease. The chlorinated hydrocarbons accumulate in the otter's tissue, poisoning it slowly when stored body fat is broken down, especially in winter. With the phasing out of chlorinated hydrocarbon pesticides in the UK, and boosted by a national plan for their recovery, the otter is returning to its former haunts.

Although the otter is recovering it is still threatened by a number of

factors. Death on the roads is a major hazard to expanding otter populations. Synthetic pyrethroids, chemicals used in sheep-dips, are a potential threat to otters and are of particular concern. Recent research has shown that where these chemicals are not disposed of safely, they wipe out aquatic life in rivers and streams. Destruction of habitat and poor water quality are continuing threats. Major causes are housing and road developments, land drainage and intensive agriculture. Removing too much water from rivers to irrigate fields can cause low water flows and a concentration of pollutants.

CONSERVATION SOLUTIONS

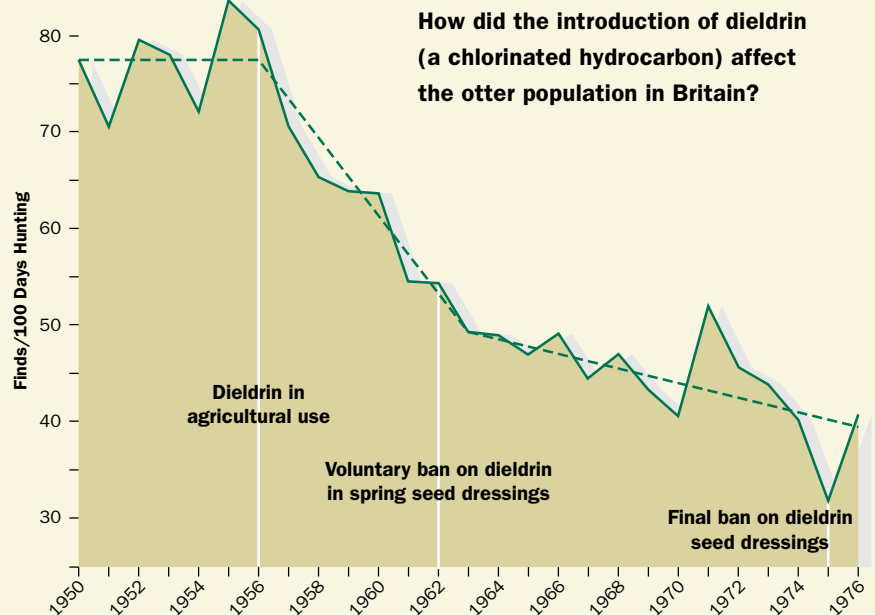
The otter is a fantastic flagship species for water conservation. The species can thrive close to people provided it is not persecuted and has clean water and sufficient cover along waterways in which to hide.

Otters are now legally protected.

In 1995 the Government included the species in its Biodiversity Action Plan document. The challenge is to maintain and expand existing otter populations, and by 2010 to restore breeding otters to all river systems and coastal areas where they have been recorded since 1960.

In some areas 'otter havens' have been established and artificial otter homes have been built to encourage otters to breed. WWF and the Worcestershire Wildlife Trust are currently working together on an area of the River Avon to recreate a wetland that will provide good habitat where otters can breed. Two Special Areas of Conservation have been proposed for the otter. WWF and the Wildlife Trusts are lobbying to establish many more protected habitat sites suitable for otters. National surveys are being carried out every five to seven years and local surveys are looking at present distribution and the potential for future spread.

PROJECT WORK



SOURCE: STRACHAN, R. AND JEFFERIES, D. J. (1996) OTTER SURVEY OF ENGLAND 1991-1994. VINCENT WILDLIFE TRUST, LONDON.

Polecat

I CUSHING, OXFORD SCIENTIFIC FILMS

DISTRIBUTION

At the beginning of the 19th century, polecats were common and widespread in most of the UK. By the end of the 19th century numbers had dramatically dropped as the value of their fur increased, along with trapping by gamekeepers. In the 1910s they could only be found in a tiny area of Wales. Polecats have been increasing since the late 1950s and they are now well established in Wales and have spread from there into the West Midlands. Populations from re-introduced animals can be found in Cumbria, the East Midlands, the west Highlands and central southern England.

BIOLOGY

The polecat is a member of the weasel family and is about the size of a small cat, with a bushy tail. It is mainly solitary and nocturnal* and hunts on the ground, although it can swim and dive well. A wide range of animals are eaten including mice, rats, frogs, lizards and small birds, but polecats especially like rabbits. Prey is

mainly located by sound and scent, rather than by sight. Polecats need country with plenty of ground cover, such as woods, thickets and hedges. On average their home range is about one km². Their territories are often close to rabbit warrens and in winter they frequently occur in farm buildings where they can find shelter and plenty of rodent prey. They make a den amongst rocks, in tree roots and in rabbit holes.

THREATS

Polecats were historically threatened by persecution from gamekeepers and by fur trapping, but these pressures have declined in recent years. However, as polecats spread east from Wales they will not be able to recolonise areas with intensive agriculture. Moving into more populated areas will also lead to increased road deaths.

PRESENT DAY DISTRIBUTION OF THE POLECAT IN THE UK



They are often caught in traps set for other animals, or killed by poisons intended for rodents.

CONSERVATION SOLUTIONS

Gamekeepers can fix special devices to traps set for mice or rats, to stop polecats being caught in them accidentally. Farming less intensively would also help polecats by providing them and their prey with suitable habitats and by reducing pesticide use. Unnecessary persecution of polecats could be reduced by better legal protection.



Try writing your own poem about a European carnivore. It can take the form of a haiku, a word 'snapshot' or a longer descriptive piece. The following should give you some ideas. You might like to present your poems in a class book or display, illustrated with your own paintings or drawings.

1 A PICTURE IN WORDS

Poetry comes in all shapes and sizes, but even the shortest poems can create a picture in words. Just because a poem is short, it doesn't mean it is easy to write – sometimes it needs more thought to make it work. The haiku is a 3 line poem of 17 syllables: 5 in line 1; 7 in line 2, and 5 in line 3. Look at the examples below:

Wolf

still on his lone rock
stares at the uncaged stars and
cries into the night.

Judith Nicholls

A tail-swishing cat
Lies waiting in the bushes
Birds peck unaware

What do you feel about these poems? Do they give a glimpse of the creatures in question?

2 WORD SNAPSHOTS

'Word snapshots' can be created by asking a question and then answering it using several descriptive words linked by hyphens:

Did you ever see an otter?
Silvery-sided, fish-fanged, fierce-faced,
whiskered, mottled.

D H Lawrence¹

The 'technique' of joining descriptive words together can be used to build up a poem, for example:

My dog

Ankle-biter
Bone-cruncher
Nigh-howler
Rabbit-catcher

3 CAPTURING THE MOMENT

Longer descriptive pieces give us more chance to 'capture the moment'. Look at the poem "Otter" then answer the questions below:

Otter

His whiskers comb the moonlight,
Where the frosted bank
Is a village of voles.
His skin is an oily plush.*
A living bolt in the water,
He vanishes
Like a magician's assistant,
A reflection of mystic wonder,
Curving, curling,
A snake in the stream.
His slippery catch
Is still in a moment.

Ceri Witham, age 11²

* plush - a fabric with an even pile, longer and less dense than that of velvet.

- **What time of year do you think it is? How can we tell?**
- **Find an example of a simile.**
- **Find an example of a metaphor.**
- **Have you got a favourite line in this poem? Why?**
- **Is the poem an effective description of an otter and its actions?**

Notes

¹ D H Lawrence in *The Way to the Zoo – Poems about Animals* chosen by David Jackson, OUP, 1983.

² Ceri Witham in *Cadbury's Eighth Book of Children's Poetry*, Red Fox, 1990. Reproduced with kind permission of Cadbury Ltd.



1 ADAPT AND SURVIVE

Animals have evolved over a long period of time to become suited or adapted to where and how they live. Choose one of the European carnivores below and write down how each of the following adaptations helps the animals to survive.

	Adaptation	How this helps it to survive
Brown bear 	Hibernates in late autumn for 3-7 months	_____
	Shambles quickly for a short distance	_____
	Climbs and swims well	_____
	Usually shy and sometimes nocturnal	_____
	Eats almost anything	_____
Eurasian lynx 	Is nocturnal	_____
	Has excellent eyesight	_____
	Has excellent hearing	_____
	Eats deer, small mammals and birds	_____
	Found in different forest types, semi-desert and tundra	_____
Iberian lynx 	Active at any time	_____
	Has excellent eyesight	_____
	Has excellent hearing	_____
	Feeds almost entirely on rabbits	_____
	Only found in scrubland with open areas	_____
Otter 	Has a long streamlined body	_____
	Has a long broad tail	_____
	Is an excellent swimmer	_____
	Is usually nocturnal	_____
	Has webbed feet	_____
	Has a thick, sleek coat	_____
	Has long whiskers sensitive to touch	_____
Wolf 	Is a tireless runner	_____
	Lives in packs	_____
	Has sharp teeth	_____
	Eats a wide range of prey	_____
	Can live in many different habitats	_____

KEY QUESTIONS

- How is your chosen creature adapted to survive?
- What is threatening its survival?
- What can be done to protect it?



A PUZZLE

The Iberian lynx is the most endangered of all cat species and is in real danger of becoming extinct in the next 50 years. The closely related Eurasian lynx, although threatened in Europe, is not considered in danger of extinction. Why do you think the Eurasian lynx is more successful? You may find it useful to compare the adaptations of the two lynx species.



2

SURVIVAL SOLUTIONS

Find out all you can about one of the European carnivores listed below and complete the Survival Square. Further information can be found on the WWF-UK website at www.wwf-uk.org or your teacher may provide you with 'fact cards' taken from the 'European Carnivores Topic Brief'.

Cut out the name or picture of your chosen animal and stick it over the shape in the middle. Under 'Description', you should include words that relate not only to physical appearance but also to the characteristics of your chosen animal; for example wolves are social creatures with a strong hierarchy and sense of family bonding. The 'Threats' box is for threats to the carnivore from humans. It might be direct hunting, or habitat loss, or something else.

SURVIVAL SQUARE

DESCRIPTION	HABITATS
THREATS	SOLUTIONS

Brown bear

Iberian lynx

Eurasian lynx

Grey wolf

Otter

Polecat

Wolverine



1 LEARNING TO LIVE TOGETHER

Read the two case studies, *A lesson in living together* and *A dog for the conservation of large carnivores* (your teacher will need to photocopy these from pages 6 and 7 of the *European Carnivores Topic Brief*) and then write a newspaper article for a local Italian newspaper persuading farmers to protect their sheep flocks against wolves without harming the wolves. In your article include:

- three different ways of protecting the sheep
- why it is better to protect the sheep in these ways rather than shoot the wolves
- reasons why the farmers need not be afraid of the wolves.

2 THE ANIMAL WITHIN...

In the story *Wolf* by Gillian Cross¹, Cassy is staying with Goldie, her mother, in a squat. Her mother's boyfriend Lyall and his son Robert present theatrical performances in schools. Their latest production is called "Wolf" and Moongazer is Lyall's stage name.

Cassy looked away, towards the untidest pile of all. Different-sized pieces of paper were shuffled together, and they all seemed to be drawings. Some in ink, some in pencil, some in felt pen. She bent and picked up the top picture, trying to make sense of it. A huge black circle had been scrawled in the very centre of the paper and roughly shaded in. Round the edge of the circle were jagged triangular shapes, some pointing inwards and some pointing outwards. The triangles had been drawn so fiercely that, in one or two places, the pen had gone right through the paper.

'That's Lyall's favourite,' Robert said. It would be, Cassy thought. She shook her head. 'I must be stupid. I can't even see what it's meant to be.'

'Wolf, of course.'

'Wolf?' Cassy looked at him, to see whether he was joking. 'But it's nothing like a wolf.'

'Not a wolf,' Robert said patiently.

'We got lots of photographs of those.'

This is something quite different.

Lyall said "Wolf" – and then he got people to draw the picture that came into their head. Goldie drew that one – the big gaping mouth with the terrible teeth. Lyall was thrilled to bits.'

'Oh, it's Goldie's is it.'

Cassy put it to the bottom of the heap and went on leafing through. There were about thirty pictures. Wolves running or leaping or baying at the moon. Long-muzzled wolves that belonged in cartoons, and long-legged wolves that looked more like horses. She picked out the most sensible one she could find. A proper wolf, with a head and a body and a tail, and four legs. Shaded in pencil so that you could almost feel its fur.

'That's what a wolf looks like,' she said, holding it up for Robert to see.

He frowned. 'You haven't really got the

idea.' He slid a paper-clip onto the cuttings he was sorting and put them on the floor. 'Earl did that drawing – our friend from the Wandsworth squat. He's a painter and he does a lot of work for Moongazer. Lyall was looking forward to his wolf picture. He was furious when Earl gave him that.'

'Furious?'

'He said, "You're holding out on me, Earl. That's just a wolf from the zoo you've drawn. Not the wolf inside you."'

'The what?' Cassy snorted and put the drawings down on the floor again.

'That's just nonsense. Wolves are wolves and people are people.'

'It's not quite as simple as that.'

Robert looked earnest and pompous, as if he were giving a lecture. 'The way we think about wolves is twisted up with the way we think about ourselves. We've been linked for thousands of years. Perhaps for millions.'

- What does Robert mean when he says '...the wolf inside you?'
- How do you picture the wolf?
- Why do you picture the wolf in this way?
- Is there a wolf inside you? How does it shape your behaviour?
- Are there other creatures inside you? If so, how do they shape your behaviour?

Investigate the language of the wolf.

- How many words and phrases associated with wolves can you discover?
- Are the characteristics we often associate with wolves or the words we use to describe them fair or accurate? Why do you think this might be?

1 *Wolf*, Gillian Cross, *Oxford Children's Modern Classics*, 1998



3 LEARNING TO LIVE TOGETHER

In "Mountain Lion", D H Lawrence says "Men! The only animal in the world to fear!" Use this as the starting point for an essay exploring your thoughts about humankind's relationship to European carnivores in particular and the environment in general. Consider the traditional antipathy of humans to carnivores – where are the points of conflict? Settlement and agriculture – particularly stock-rearing are obvious ones, but perhaps there is something much deeper, that goes back to a time when we shared the forests with many creatures, and had to compete directly with the carnivores, and perhaps we were prey for carnivores. Your essay should include a detailed description of one European carnivore of your choice; where they live, some explanation of why they are under threat and an idea of what can be done to help them.



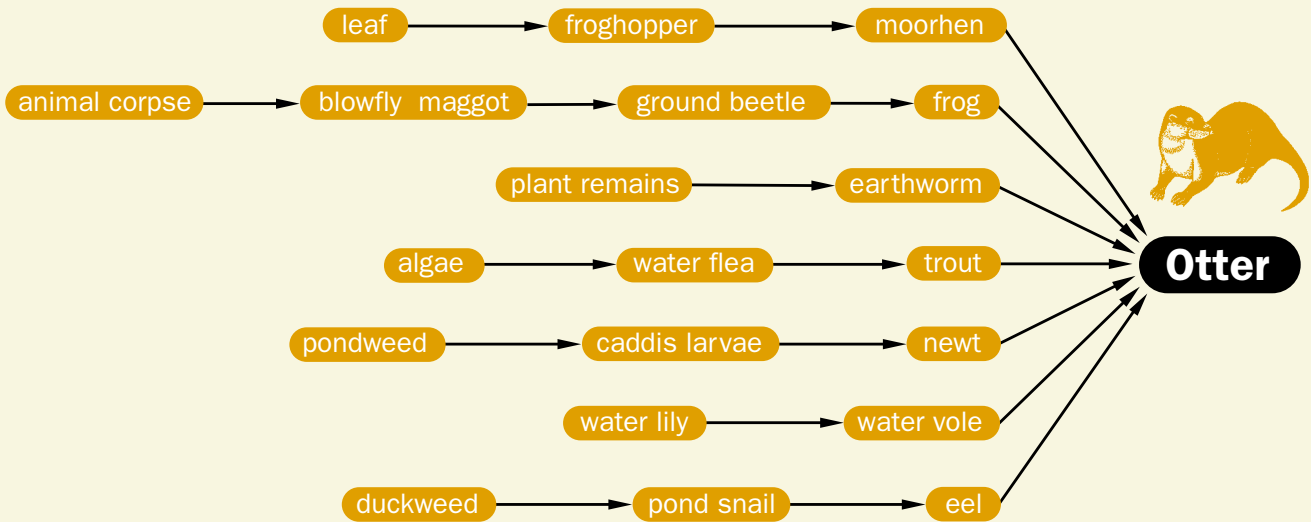


1

CONNECTIONS - AN OTTER FOOD WEB

Animals usually eat more than one type of plant or animal, so they feed in more than one food chain. Consequently we find that there are many connections between food chains. In the diagram below some of the connections are drawn in. Using the information below, try to draw in the rest of the connections.

- Moorhens feed on land and aquatic insects, worms and spiders and on plant material.
- Frogs eat a variety of small animals such as insects and worms.
- Trout feed on sticklebacks, aquatic insects and dead insects and spiders that live on land, but fall into the water.
- Newts eat both land and aquatic insects, worms and spiders.



Add another plant or animal to the food web and draw in the connections.

If the otter died of pesticide poisoning what would happen to the numbers of:

- trout
- water fleas
- ground beetles

Remember several animals feed on water fleas and ground beetles!

Removing one animal or plant will affect the numbers of other organisms, but it is often not possible to predict the result because of all the interconnections. So if we humans attempt to manage an ecosystem it rarely works out exactly as we would like!

Links with the Curriculum

European Carnivores is a useful topic for teaching the following sections of the Curriculum in Science and Geography. It is also an interesting stimulus for teaching the Curriculum in English, Art, Music and Modern Foreign Languages.

THE CURRICULUM IN ENGLAND, WALES AND NORTHERN IRELAND

SCIENCE

Key Stage 2

Living things in the environment: Adaptation.

- Feeding relationships.

Key Stage 3

Living things in the environment: Adaptation

- Feeding relationships
- Competition.

Key Stage 4

Living things in the environment: Adaptation

- Competition.

GEOGRAPHY

Key Stage 2 Thematic Study

Environmental change:

- a) how people affect the environment;
- b) how and why people seek to manage and sustain their environment.

Key Stage 3

Environmental issues:

- c) how consideration of sustainable development, stewardship and conservation affect environmental planning and management.

ENGLISH

Key Stages 2, 3 and 4

Speaking and Listening.

Reading.

Writing.

- Creative writing and discussion about threatened European carnivores.
- Presenting reasoned arguments on environmental aspects relating to European carnivores.

ART

Key Stages 2 and 3

Investigation and making.

Drawing, painting and three-dimensional work.

Design and work with a range of materials.

MODERN FOREIGN LANGUAGES

Key Stages 2,3 and 4

Use of material on European carnivores to practise language skills.

MUSIC

Key Stages 2 and 3

Performing and composing.

Listening and appraising.

Links with the Curriculum

THE CURRICULUM IN SCOTLAND

European carnivores provide opportunities for teaching the following sections of the 5-14 Curriculum.

1. ENVIRONMENTAL STUDIES

Developing informed attitudes and values relating to the care and conservation of the environment.

1.1 Science

- Living things and the process of life.
- Interdependence of living things with each other and the environment.
- Conservation and care of living things.
- Adaptations to the environment.

1.2 Social subjects

- People in the past – studying people, events and societies in the past in a variety of local, national European and world contexts.
- People in society – conflict and decision-making in society.

2. RELIGIOUS AND MORAL EDUCATION

- Exercise care and responsibility towards plants and animals in the school and its environment.
- Show awareness of particular environmental issues and human responsibility for them.
- Reflect on human dependence on the natural world and human responsibility for planet earth.

3. EXPRESSIVE ARTS

- Development of an aesthetic awareness and sensitivity to the natural environment.
- European carnivores can provide inspiration for creativity, especially in art and music.

4. ENGLISH LANGUAGE

Work on European carnivores provide opportunities for work on: Listening; Talking; Reading; Writing.

5. MODERN EUROPEAN LANGUAGES

- Use of material on European carnivores can be used to practise language skills.



Glossary & Bibliography

GLOSSARY

Biodiversity covers the whole range of variation in living things: genetic variation, species variation and ecosystem variation, in other words – the variety of life.

Biodiversity Action Plans Blueprints for action to save endangered species and threatened habitats in the UK, launched by the Government.

Carnivore meat-eater.

Carrion dead flesh.

Common Agricultural Policy is the main mechanism for creating a common market for food and agricultural products within the European Union, for regulating production and trade, and for channelling aid to farmers.

Conservation (of nature) the active management of the earth's natural resources and environment to ensure their quality is maintained and that they are wisely used.

Ecosystem the living communities of an area together with their non-living environment.

Endemic confined to a particular region or island.

Environment all the factors (physical, chemical and biological) which affect an organism.

Extinct no longer in existence; no longer living.

Food chain chain of organisms in a community through which energy (and food) flows.

Habitat the place or type of site where a plant or animal occurs.

Habitats and Species Directive The full title is the EC Council Directive on the Conservation of Natural Habitats of Wild Fauna and Flora. It requires the maintenance or restoration of natural habitats and wild species.

Home range the area over which an animal normally travels in search of food.

Intensive agriculture system where as much use is made of the land as possible, using fertiliser to maximise yields.

Nocturnal active at night.

Pesticide substance which kills pests.

Pollution the presence of abnormally high concentrations of harmful substances in the environment, often put there by people.

Population a group of organisms of the same species within a particular area.

Predator animal that hunts or kills another animal for food.

Prey animal hunted or killed by another animal for food.

Range (of animals) the limits of the geographical distribution of a species or group.

Species a group of organisms formally recognised as distinct from other groups; the basic unit of biological classification.

Territory an area within the home range occupied more or less only by an animal or group of animals of the same species, and held through defence, display or advertisement.

BIBLIOGRAPHY

Bears: Status Survey and Conservation Action Plan, ed. C. Servheen, S. Herrero and B Peyton (IUCN/SSC, Gland, Switzerland, 1999).

Field Guide to the Mammals of Britain and Europe, D MacDonald (Harper Collins, London, 1993).

Foxes, Wolves and Wild Dogs of the World, 2nd edition. D Alderton (Blandford, Poole, Dorset, 1998).

The Handbook of British Mammals, 3rd edition. Corbet, G. B. and Harris, S. (Black Scientific/Mammal Society, Oxford, 1991)

The Natural History of Wild Cats, A. Kitchener (Christopher Helm, London, 1991).

Otters, P Chanin (Whittet British Natural History Series, London, 1993).

Stoats and Weasels, Polecats and Martens, P. Sleeman (Whittet British Natural History Series, London, 1999).

Wild Cats: Status Survey and Conservation Action Plan, ed. K. Nowell and P. Jackson (IUCN/SSC, Gland, Switzerland, 1996).

Wild Cats of the World, D. Alderton (Blandford, Poole, Dorset, 1998).

Wild Dogs of the World, L. E. Bueler (Constable, London, 1974).



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