



Conservation

Secondary - Activity pack

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Details of Walled Garden

Background Information

In 1964, the International Union for the Conservation of Nature (IUCN) created the **Red List of Threatened Species** (IUCN Red List or Red Data List).

Various countries have their own lists, however the IUCN list is the main classification of endangered species on a global level. The red list is created by various scientists and specialist organisations from around the world.

Organisms (plants, animals, fungi, etc.) are assessed based on a number of criteria including: rate of decline, population size, geographic distribution, degree of population fragmentation and current risks. Based on assessment, organisms are assigned to one of the red-list categories (detailed on next slide).

The list is regularly reviewed and species can move up (become more endangered) or down the list (no longer threatened) based on new data. Many people refer to all 'threatened category' animals as endangered.

For instance, here at Cotswold Wildlife Park we have a pair of Wrinkled Hornbills, which are currently classed as endangered on the IUCN Red List. We support the conservation of this species through the Hornbill Nest Monitoring Project.

IUCN Red List - explained

NE

DD

Not Evaluated (NE) - Not yet been evaluated against the criteria

Data Deficient (DD) - Inadequate information to make an assessment

Extinct | Threatened | Least Concern

EX EW CR EN VU NT LC

Least Concern (LC) - Lowest risk. Widespread and abundant taxa are in this category.

Extinct | Threatened | Least Concern

EX EW CR EN VU NT LC

Near Threatened (NT) - Low risk. Likely to qualify for a threatened category soon.

Extinct | Threatened | Least Concern

EX EW CR EN VU NT LC

Vulnerable (VU) - Threatened. Considered to be facing a high risk of extinction in the wild.

Extinct | Threatened | Least Concern

EX EW CR EN VU NT LC

Endangered (EN) - Threatened. Considered to be facing a very high risk of extinction in the wild.

Extinct | Threatened | Least Concern

EX EW CR EN VU NT LC

Critically Endangered (EN) - Threatened. Facing an extremely high risk of extinction in the wild.

Extinct | Threatened | Least Concern

EX EW CR EN VU NT LC

Extinct in the Wild (EW) - Only survives in captivity.

Extinct | Threatened | Least Concern

EX EW CR EN VU NT LC

Extinct (EX) - The last individual of the population has died. The species is no longer alive anywhere.

Background Information - Causes

Why animals become endangered is important to understand, especially since humans are a major cause. The main causes include:

- Habitat Loss (Destruction and Fragmentation)
- Invasive Species
- Pollution
- Poaching
- Overuse Habitat Loss (Destruction and Fragmentation)

The destruction of habitats is one of the most serious threats to wildlife across the world, and many habitats are affected.

Habitat loss happens when humans convert the habitat into a different land use. With this new use, the animals have nowhere to live. Some of the reasons habitat is lost include: houses (space to build homes and cities), roads, tourist resorts, farming, mining, factories, grazing pastures, and timber industries. Commercial and illegal logging as well as forest clearing for agriculture are the top reasons for habitat loss worldwide, especially problematic with rainforest animals.

Invasive Species (Alien Species, Introduced Species)

In their natural habitat, every animal has a specific role (a niche). The natural ecosystem always stays in balance, populations of specific animals or plants might change but will return to a natural balance. However, when animals or plants that do not belong in the habitat are introduced into the environment they can disturb this balance. Animals are sometimes moved on purpose, or sometimes accidentally transported. Rats have been introduced to most of the world, and will eat almost anything. Rats cause a lot of problems on islands, especially islands with ground nesting birds, as they eat the chicks and eggs.

Pollution

Pollution is anything that doesn't belong in the natural environment. Physical and chemical pollution can damage the quality of water, air and soil. One type of pollution is chemicals to control insects and plants (herbicides, pesticides and fertilisers). These can directly poison animals, and can cause food chains to collapse.

Litter is another type of pollution. Some litter (food products) can biodegrade relatively quickly and return to things found in nature. Other types of litter, such as plastic, do not biodegrade. Plastic is inert, and if dropped somewhere, will stay there for hundreds or even thousands of years. Without a way to remove plastic, it accumulates in rivers and flows to the sea. All the oceans of the world now have giant patches of floating plastic rubbish mainly caused by people dropping it on land.

Air pollution is a major cause of problems for humans and animals. Chemicals in the air make it hard for animals to breathe. Noise and light pollution are also a major cause of death in birds, who fly into lit windows and the noise from boats and sonar confuses whales and results in them getting beached.

Poaching

Poaching is simply illegal hunting. Hunting of endangered animals is illegal in many countries. However, because there is a lot of money in the illegal wildlife trade, people still hunt these animals. This includes hunting for fur, horns, ivory, medicine, etc.

Overuse (Over exploitation)

Overuse is when too much is taken from the natural environment. This includes overfishing, over-grazing, over-logging, harvesting coral, harvesting plants, taking guano, capturing animals for pets, etc. This is unsustainable, especially if the species reproduces slowly.

How Zoos Can Help

Historically, zoos were simply places to display animals, but in the past 50 years zoos have changed their goals and purposes. Zoos can be accredited and become members of organisations such as BIAZA (British and Irish Association of Zoos and Aquaria), which is in turn a member of EAZA (European Association of Zoos and Aquaria), which is in turn a member of WAZA (World Association of Zoos and Aquaria). These organisations ensure that zoos maintain high standards of care, and work towards the same four main goals: conservation, education, research and recreation.

Conservation

Zoos are directly involved in conservation through research, captive breeding and re-introduction programmes. Zoos are indirectly involved in conservation through supporting in-situ projects and participating in training or education. Cotswold Wildlife Park set up its own charity, The Cotswold Wildlife Trust, as well as working with several other conservation projects and charities to help protect endangered species and environments. Some of these include The White Stork Project, Tusk Trust and Project Bamboo Lemur and Helpsimus.

Education

Most zoos have education opportunities for school groups and informative signage around enclosures. This sort of information sparks interest, which leads to respect – if people respect animals they are less likely to abuse them or buy endangered animal products, and are more likely to support conservation efforts, reduce pollution etc.

How Zoos Can Help

Research

Research is ongoing in zoos in areas such as enclosure enrichment, veterinary care, reproductive behaviour and nutrition. This knowledge benefits the captive animals and their wild counterparts. There are many specific techniques that have been perfected in zoos and then applied to wild populations. These include: in vitro fertilisation, freezing eggs and sperm, artificial insemination, embryo sexing, cross fostering, embryo transfer, artificial and surrogate incubation and contraception. Drug dosages, disease diagnosis, individual identification and monitoring devices, such as radio collars, are other techniques developed in zoos and applied to the conservation efforts for wild populations.

Recreation

Zoos need people to visit them and enjoy the visit. These visitors provide valuable money which help zoos run daily and provide zoos with funding for their other goals (Conservation, Education and Research). The goal for zoos by attracting more visitors is to educate them about species they may not have heard of before or species that are particularly endangered. Zoos also provide the chance to get up close and personal to some of the animals through experiences and Junior Keeper days for children; in turn, creating more interest and respect for the animals that we work to protect.

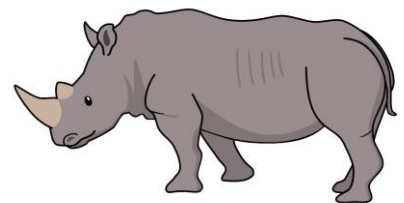
Pre-visit activities

Below are some ideas for activities linked to conservation.

1. Learn the vocabulary words from the list on the next page. Make it fun and interesting – you could create word clouds, use sticky notes, vocabulary spirals, hangman or pictionary!



2. Research an endangered species. Using this information, campaign for your species: design posters, hand out informational pamphlets, have a fund-raiser (donate money to a wildlife organization), write letter to government officials and local newspapers.



3. Create food chains showing connections between endangered animals and other animals in the same ecosystem. You will need to research animal diets and ecosystems.

Vocabulary

Captivity	Kept in a controlled environment
Camouflage	Colours and patterns that help an animal blend in to its surroundings
Carnivore	An animal that mainly eats meat
Deforestation	Removal of forest trees to use the land for something else eg: farming
Ecosystem	The complex community of interacting plants and animals in a specific habitat
Endangered	Very few left/faces major threats and might become extinct.
Extinct	The species no longer exists (died out)
Extirpated	A species which is extinct in one area but still found elsewhere in the world eg: wolves are extirpated from the UK
Habitat	The type of place an animal lives eg: rainforest, desert
Herbivore	An animal that mainly eats plants
Invasive Species	An animal removed from its native environment and placed in a new environment where it takes over
Omnivore	An animal that eats both meat and plants
Pesticides	Chemicals used to kill various pests (typically insects)
Poaching	The illegal hunting of animals
Pollution	Anything that doesn't belong in nature and is put there eg: light, chemicals, sound, litter etc.
Predator	An animal that hunts and eats other animals
Prey	An animal that is hunted and eaten by other animals
Scavenger	An animal that feeds on dead animals
Species	A group of animals that have similar characteristics and can produce offspring

For Teachers: Pre-Visit Activity Extinction Timeline

To learn how and why different animals and plants have gone extinct through time.

Time: 30 minutes—1 hour research, longer to share results with the class

Subjects: Science, Citizenship

Materials Required: images of different extinct species.

Before this activity, discuss what Extinction means with your pupils. Explain that animals, as well as plants, have been going extinct for millions of years. Look at how humans have impacted on the world and have caused many things to go extinct in a very short space of time.

Split the pupils into pairs and provide each with an image of an extinct animal (e.g. a Velociraptor, a mammoth, a Quagga, a dodo etc.) Have them research their chosen animals, focusing on the following: **Where**— Where did these animals used to live? **When**— In what time period did these animals go extinct? **What**— What things were happening on the planet this time? (e.g. dramatic changes in climate, human evolution, western exploration) **How** and **Why**— Was their extinction a natural process, or was it the fault of humans?

Once the pupils have finished researching their chosen animal, have them arrange themselves along a time line (this will have to be carefully structured as obviously the dinosaurs went extinct millions of years ago). Get the pupils to discuss the different patterns and trends they see in the timeline. Why did so many things go extinct millions of years ago? What effect has climate change had on the planet? What has happened since modern humans have inhabited the planet?

For Teachers: Pre-Visit Activity The Aliens have Arrived

To learn about the threat of invasive animals with reference to animals not native to Britain and their impact on local species.

Time: 30 minutes—1 hour research, longer to share results with the class

Subjects: Science, Citizenship

Materials Required: an invasive species data sheet for each student, several natural history guides on plants and animals. Animals and plants introduced into Britain by humans often cause problems.

These invaders can often take over food, shelter and space of native species. The Eastern Gray Squirrel has taken over habitat from native squirrels, and even worse, it carries squirrel pox, deadly to native species. Canada Geese pollutes waterways with its waste, creating nitrogen blooms which kill off many freshwater species.

Rhododendron out competes native plants while providing little habitat value for native animals, even worse, it produce a toxin which stunts the growth of nearby native species. Other potential invasive species to research include: American mink, black rat, European rabbit, black bullhead, common carp, rainbow trout, and various deer species. Have students work independently or in small groups to research an invasive species. If possible, allow students the opportunity to observe their species in the wild, either on a school trip, in the school yard, or through pictures and videos on-line.

Have students complete their data sheets, and gather any other additional material. Students or groups should present their findings to the class. This is a great way to introduce basic scientific paper writing, or having them design and create scientific research posters. Extension activity: take part in an invasive species removal community project as a group (i.e. removing Rhododendron bushes)

Invasive Species Notes

Species: _____

Scientific Name: _____

Specimen Location (where did you observe it?) _____

Specimen description: _____

Origin of my specimen (where it came from): _____

Immigration information (how did it get here?) _____

Current status (what is its effect on the community? Has it taken over? Is it a serious pest? Does it provide any positive benefits?)

Reasons for its success: _____

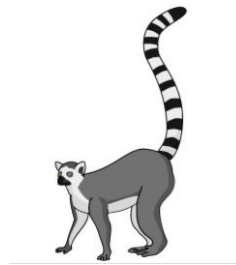
How to stop it: _____

At the Park

Below are some ideas for things you can do or be looking for during your visit.

1. Attend the public talks and have take notes. Often the keepers are available after to answer questions if you want to learn more.

(We currently have two public talks: Penguins and Lemurs)



2. Observe the enclosures to determine what makes a good home for an animal. Pay attention for anything that looks like it's entertain to the animals, zookeepers call they things enrichment. Enrichment for animals includes: wrapped boxes, toys, interesting smells, strange things (e.g. wellington boots, old brooms, etc.).

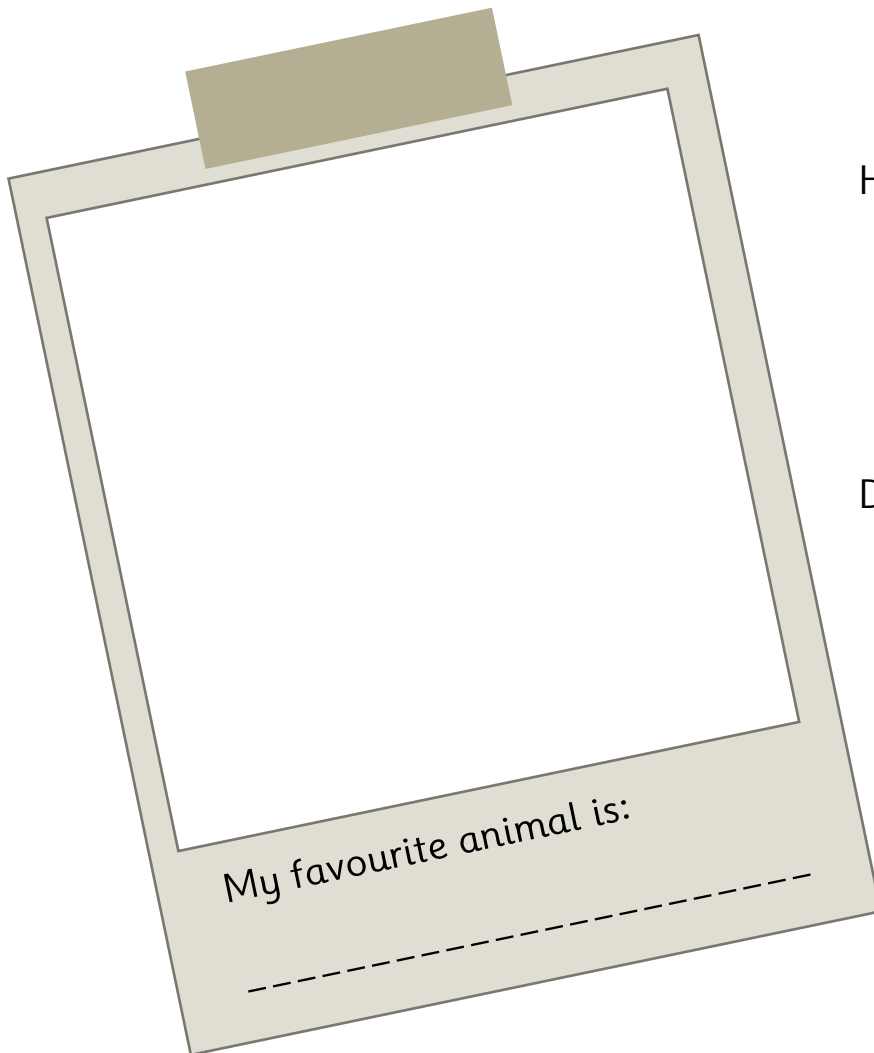
3. Divide into groups and have each group record down the name and threats of endangered animals they see (information is on all the enclosures). Which group can find the most endangered animals?

At the Park

Animal description

It's conservation status is (circle one):

Least concern Near Threatened Vulnerable Endangered Critically Endangered



My favourite animal is:

Habitat:

Diet:

Adaptations:

Main threats:

At the Park

Observing Animal Behaviour

Species I am observing:

Observe your animal for 10 minutes and make a mark every time it does one of the following:

Walks/runs	Eats	Drinks	Lies down
Sleeps	Yawns	Looks at people	Plays

How can you identify your animal from others in their group?

.....
.....

Is there a group leader? How can you tell?

.....
.....

What do you think the animal's behaviour is showing you – is it hungry, tired, bored etc? Why do you think that?

.....
.....

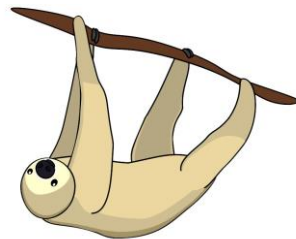
Is there anything in the enclosure to keep your animal active? Either physically, mentally or both?

.....
.....

Post-visit activities

Below are some ideas for classroom activities that will support the students' learning around conservation.

1. Choose a specific endangered animal you saw and conduct in-depth research based on what they observed.
2. Draw food webs for endangered species and discuss what will happen if the endangered species becomes extinct.



3. Design posters to help endangered species you saw at the Park. Include lots of facts they learned as well as make it eye-catching and decorative.
4. Take actions to help the environment and endangered species. Possible actions include: create a wildlife garden on school ground construct and install bird boxes, hold a tree planting day, hold a 'clean up' day at your school or nearby location, etc.

Post-visit activities

Extinction is Forever

Pupils think about what extinction means and what people choose to protect.

Time: 30–40 minutes

Subjects: Science, Literacy

Materials Required: Extinction is Forever worksheet on next slide

Before this activity, learn about extinct animals and what extinction means. Have a group discussion about what extinction means and what they think extinction really means. Focus not on the literal (species gone forever) but more on the theoretical and emotional (why do we care when a species goes extinct).

Hand out the, Extinction is Forever worksheets to each pupil. Have them read the famous quotes. Certain words are bold in each quote, indicating the important words. Ask the pupils if they agree the bold words are the most important. Have them underline what they think are the most important words in the quote.

After deciding on the important words, have them select their own important words and make a quote about their opinion on extinction. After they have all written their opinion, have the group share what they think.

Extinction is Forever

Subjects: Science; Literacy

Read each of these famous quotes about extinction. Certain words are bolded for emphasis, do you think they are the right ones? Underline the words in each quote you think are most important. After reading them create your own opinion about what extinction means.

"**Extinction** is the rule. Survival is the **exception**." ~ Carl Sagan

"An animal that is **very abundant**, before it gets extinct, it **becomes rare**. So you don't lose abundant animals. **You always lose rare animals**. Therefore, they're **not perceived as a big loss**." ~ Daniel Pauly

"We **don't know** for sure **how many species** there are, **where** they can be found or how fast they're **disappearing**. It's like having **astronomy without** knowing where the **stars** are." ~ Edward O. Wilson

"**Destroyed buildings** can be **rebuilt**; destroyed works of **art** may possibly be **replaced** by new creations; but every animal and every flower which becomes **extinct is lost forever** in the most absolute of all deaths." ~ Joseph Wood Krutch

"For millions of years, on average, **one species** became **extinct every century**...We are now heaving more than a **thousand different species** of animals and plants off the planet every year." ~Adams

"There are 23 species [of crocodile]. Seventeen of those species are rare or endangered. **They're on the way out**, no matter what anyone does or says..." ~ Steve Irwin

"People are **not going to care** about **animal conservation** unless they think that **animals are worthwhile**." ~ David Attenborough

WHAT I THINK ABOUT EXTINCTION:

Post-visit Activities: Rainforest Impact Quiz

Test pupils knowledge of the rainforest while learning about the impacts of deforestation.

Time: 20–30 minutes

Subjects: Science

Materials Required: Rainforest Impact Quiz on next slide

Hand out the Rainforest Impact Quiz to each student. Have them write true or false next to each statement. After completing the quiz, they can switch quizzes with a partner to mark it. As you go over the answers, make sure to explain the ones that are false/true. This activity makes a nice introduction to talking about endangered rainforests and what we can do to help the rainforests.

ANSWERS:

- Cutting down the rainforest changes wind patterns around the world. **TRUE**
- Cutting down the rainforest changes rainfall patterns around the world. **TRUE**
- The rainforests are the lungs of the planet, they recycle carbon dioxide into oxygen. **TRUE**
- If the rainforests are completely gone, it won't affect us here in the UK. **FALSE** (as above)
- Across the world, 20 football pitches of rainforest are cut down every minute. **FALSE** Across the world an area the size of 90 football pitches is cut down in the rainforest every minute
- At current rates of deforestation the world's rainforests will be gone in 40 years. **FALSE** It is estimated that the rainforests could be gone by 2030!
- Rainforests are found on every continent. **FALSE** There are no rainforests in Antarctica.
- Rainforests cover over 50% of the earth's surface. **FALSE** Rainforests cover less than 2% of the earth's surface (most of the surface is covered by the oceans!)
- The Amazon Rainforests contains 1/5 of the world's freshwater in its rivers. **TRUE** Remember that the ocean's aren't fresh water; most of the rest is in the ice caps and glaciers with a little in large lakes
- There used to be 15 million km² of rainforest around the world. **TRUE**
- Now there is just 10 million km² of rainforest around the world. **FALSE** There are only 6 million km² of rainforest around the world over half the world's rainforest have been cut down.

Post-visit Activities: Rainforest Impact Quiz

TRUE or **FALSE**

1. Cutting down the rainforest changes wind patterns around the world. _____
2. Cutting down the rainforest changes rainfall patterns around the world. _____
3. The rainforests are the lungs of the planet, they recycle carbon dioxide into oxygen. _____
4. If the rainforests are completely gone, it won't affect us here in the UK. _____
5. Across the world, 20 football pitches of rainforest are cut down every minute. _____
6. At current rates of deforestation the world's rainforests will be gone in 40 years. _____
7. Rainforests are found on every continent. _____
8. Rainforests cover over 50% of the earth's surface. _____
9. The Amazon Rainforests contains 1/5 of the world's fresh water in its rivers. _____
10. There used to be 15 million km² of rainforest around the world. _____
11. Now there is just 10 million km² of rainforest around the world. _____

Conservation



We hope you enjoy your visit to Cotswold Wildlife Park and that you find some of these activities useful for your class.

We always enjoy seeing examples of students using the resources we have provided and the learning evident, so if you would like to send us some photos of their finished work, please email activities@cotswoldwildlifepark.co.uk

Thank you

