



# Conservation Student Pack

This pack is aimed for students who require in depth information for course work and also for teachers to aid in their visit to Colchester Zoo.



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# Why Wildlife Needs Help

The majority of species are threatened with extinction due to human influence. The major threats are (in no particular order):

- Habitat loss
- The Bushmeat trade
- Fur and skin trade
- The pet trade
- Traditional medicine trade
- Invasive species
- Ivory trade
- Over use
- Pollution
- Climate change

When a species is threatened with extinction they become classed as endangered. Species that are classed as endangered are put on a list called The Red List, which is maintained by The World Conservation Union (IUCN)



Endangered is the broad term used to describe any animal that is threatened in the wild. While this is suitable when talking about a wide range of animals, it becomes less informative when used in individual case studies. In fact IUCN actually has nine separate categories ranging from extinct to not evaluated, which it uses to illustrate the status of any species.

## **EXTINCT (EX):**

A species where there is no reasonable doubt that the last individual has died.

## **EXTINCT IN THE WILD (EW):**

A species where it is known only to survive in captivity or are managed outside their natural range.

## **CRITICALLY ENDANGERED (CR):**

A species that is considered to be facing an extremely high risk of extinction in the wild.

## **ENDANGERED (EN):**

A species that is considered to be facing a very high risk of extinction in the wild.

## **VULNERABLE (VU):**

A species that is considered to be facing a high risk of extinction in the wild.

## **NEAR THREATENED (NT):**

A species that does not qualify for any other category, but is close to qualifying for a threatened category in the near future.

## **LEAST CONCERN (LC):**

A species that does not qualify for any other category and is widespread and numerous.

# Human—Animal Conflict

Human—animal conflict refers to when interactions between humans and animals results in a negative situation and can effect human economic and social life as well as conservation work in the area.



As human populations increase, resulting in larger settlements and an increased demand for resources, humans and animals increasingly come into conflict over space and resources such as food. For example, in India there were 120.4 million hectares of cropland in 1970 and as of 2010 this has increased to 140.1 million hectares. In 1970 urban areas in India covered 1.02 million hectares, that has increased to 2.04 million hectares as of 2010.

Many species have been identified as animals involved in human – animal conflict. In India 88 species are involved in human – animal conflict and range from elephants and leopards to hares and peacocks.

In Botswana between 1994 and 2006 there were 19776 reported elephant – human conflict incidents including crop damage and loss, as well as loss of livestock.

Farming is often the cause of this conflict. From elephants in Africa to rhinos in Asia destroying crops and European wolves to baboons in Namibia killing livestock, farmers often take measures that mean wildlife loses out and are either killed or pushed further into conflict with humans.

Animals that are involved are often killed in retaliation and to prevent such incidences occurring again.

There are techniques used to manage human-animal conflict. Historically this has been lethal control, however now relocation of problem animals to areas with less human activity is more common. Behavioural change in humans through education is also done to help people understand animal behaviour to minimise interactions.

Investment in better fencing, compensation for farmers and environmental support are also techniques used.

Research into more cost effective controls and methods that are less harmful to animals is now being done.

It has been discovered that elephants show a dislike to chilli pepper plants and actively avoid them, this has led to farmers planting these plants around the perimeter of the crops. Elephants also avoid bees and several farmers now use bee hives as a fence line to keep elephants away. Using bee hives also provides the farmers with a second source of income as they can harvest the honey and sell it.

# Human - Predator Conflict

A common source of conflict with animals are with farmers and predators. Predators have long been prosecuted due to fear they will kill and eat livestock, this was the case for the Tasmanian tiger, also known as the thylacine, who were thought to be responsible for sheep deaths. In the 1800's bounties were offered to anyone who brought a dead Tasmanian tiger. For adult Tasmanian tigers, people were offered up to the equivalent of £100 in today's money per animal.

Another example of this form of conflict are the gray wolves from Yellowstone in the United States of America. The native gray wolves were eradicated in the 1920's, however the loss of the wolves caused the population of elk to increase quickly, causing over grazing and killing off young brush and trees.

By the 1930's there were growing concerns about the rate at which Yellowstone was degrading and worries that more plant species would decline and result in more soil erosion. The loss of tree species also caused the song bird populations to crash, as well as beavers who had lost their food source and weren't able to create dams, which in turn made streams erode making them deeper rather than wider, which prevented plants, mainly willows from establishing. In 1996 a programme was established to reintroduce wolves back in Yellowstone.

This proposal was met with concern from farmers who kept livestock along the boundaries of Yellowstone, who feared the wolves would prey on their livestock. After several decades, starting in the 1960's, a 'wolf compensation fund' was to be put in place to pay the market value of any livestock lost. This fund was established by Defenders of Wildlife who use donations to fund the scheme.

Since the reintroduction in 1996 there have been cases of wolf packs preying on livestock. Most cases equate to a small amount of the wolves natural diet, and many packs ignore the livestock. However some packs persistently prey on livestock. The compensation fund has allocated \$1,400,000 to farmers and private land owners who can prove loss of livestock due to wolves.

In most countries a compensation scheme is not possible, due to limited funds. A charity called N/a'an Ku sê Carnivore Conservation Research Project in Namibia, Africa, works to stop farmers shooting these animals. Their focus is reducing farmer and cheetah conflict as well as with leopards and hyenas. They have two aims, first to solve and reduce conflict through researching behaviours, habitat use and population studies. They also work with farmers to try and improve prevention methods by looking at protective measures and include effective fencing, guardian animals, bio-boundary repellents and herders.

Their second method is tracking and relocation of problem animals. If all other methods haven't worked, the animal is trapped and fitted with a GPS tracker, which allows the charity to monitor the animal movements, allowing them to inform the farmer so they can move their livestock. For a few animals the final step is complete relocation to a new area that can support them and is distant from livestock farms. They are then intensely monitored.

To date, they have responded to 698 human-carnivore conflict calls from landowners and collared 84 carnivores. The project impact area has increased from 8% of Namibian commercial farmland in 2008, to 60% in 2016. The number of requests for support is also growing 15 – 20% per year. Farmers are now more likely to contact this charity rather than shoot the animal and has changed people's attitude towards the native predators.

# International Treaties

CITES stands for the Convention on International Trade in Endangered Species

CITES is an international agreement between governments and aims to ensure that trade in wild animals and plants does not threaten their survival. CITES is one of the largest conservation agreements in existence with 175 member countries.

Annually, international wildlife trade is estimated to be worth billions of dollars and to include hundreds of millions of plants and animals, ranging from live specimens to derived products such as food, leather goods, timber, tourist curiosities and medicines. Trade in some species, together with other factors, is heavily depleting their populations and bringing them close to extinction. The agreement ensures the sustainability of these resources for the future. Today CITES accords varying protection to more than 30,000 species of animals and plants, whether traded as live specimens, fur coats or dried herbs.

The species covered by CITES are listed according to the degree of protection they need. Below is a summary of the appendices:

- Appendix I includes species threatened with extinction. Trade in these animals is permitted only in exceptional circumstances.
- Appendix II includes species whose trade must be controlled to ensure sustainability.
- Appendix III contains species that are protected in at least one country, which has asked CITES for assistance in controlling the trade.

For more information about CITES and full descriptions of the appendices, follow the below link:  
<http://www.cites.org>



# What is Conservation?

Conservation is the act of protection and the maintenance of the environment such as water, minerals and wildlife.

There are a number of national and international groups as well as organisations that coordinates and support conservation work. The main global organisation is the IUCN.

The IUCN is the Worlds Conservation Union and is the world's largest and oldest environmental network. It includes, 1066 non-government organisations, 16151 experts across the world, 217 state and government agencies and 1300 other member organisations. The IUCN also has 950 staff across the world.



Their mission is to influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable. Also to monitor the worlds ecosystems and aid in focusing conservation work.

As it is a global network of skilled scientists and experts, the IUCN develops conservational science with a large focus on biodiversity and ecosystems. They explore how humans interact with the environment in both positive and negative ways.

With regards to wildlife conservation there are two forms. In-situ conservation and ex-situ conservation.

## **In-situ conservation**

This is conservation work that takes place in the natural habitat, such as:

- Forming and maintain nature reserves
- Animal rescue and rehabilitation
- Education in local communities
- Laws and regulations
- Funding work in the wild
- Management of invasive species
- Population management
- Re-introductions programmes

## **Ex-situ conservation**

This is conservation work that takes place outside of the natural habitat, such as:

- Raising money for charities
- Raising awareness
- Education
- Encourage behaviour change in people
- Promoting sustainable practice
- Research
- Practical support
- Captive breeding programmes

# In-situ Conservation: Nature Reserves

The term nature reserve refers to an area that is protected in order to preserve the biodiversity of the region as much as possible and to control and/or limit any human activity in the area. Other names are used depending on the country or region such as, preservation, wilderness areas and nature conservation areas.

The IUCN has different categories for nature reserves depending on the level of protection the area has. Below are the different categories along with their descriptions.

## IUCN Categories for Protected Areas

### 1.1 Category Ia — Strict Nature Reserve

An area which is protected from all but light human activity to allow the preservation of the geological features of the region along with the biodiversity.

### 1.2 Category Ib — Wilderness Area

Similar to a strict nature reserve, but generally larger in area and have less stringent controls on human activity.

### 1.3 Category II — National Park

Similar to a wilderness area with regards to size and still has the main objective of protecting the habitat. However, national parks tend to allow human visits (i.e. tourism) and activity, as well as allow the placement of infrastructure i.e. roads and power supplies.

### 1.4 Category III — Natural Monument or Feature

Encompasses a smaller area that is formed to protect monuments and surrounding habitats.

### 1.5 Category IV — Habitat/Species Management Area

This is similar to a natural monument or feature, but focuses on specific areas of interest for conservation for a identifiable species or habitat that requires continuous protection.

### 1.6 Category V — Protected Landscape/Seascape

This covers an entire body of land or ocean with a set conservation plan, but usually allows a range of profit making activities.

### 1.7 Category VI — Protected Area with sustainable use of natural resources

An area that has human involvement to manage the area and use any resources in a sustainable way, however developments are not large or involve wide scale industrial activity.

Nature reserve can be controlled and funded by government bodies or by private individuals and organisations.

In the U.K. there are 215 national nature reserves and 1,050 local nature reserves in England and 73 nature reserves in Scotland.

The U.S.A has 2,205 government and private nature reserves.



# In-situ Conservation: Nature Reserves

Colchester Zoo has two nature reserve, Umphafa Private Nature Reserve in South Africa and a local nature reserve within the Zoo's grounds.

The nature reserve within Colchester Zoo is situated next to the ancient roman river covering area of 1.2 hectares and has been designed to encourage native plants and animals to establish themselves in the area. The area is now home to turtle doves, grass snakes and a variety of terrestrial and aquatic invertebrates. Colchester Zoo works closely with several natural history societies from Colchester and across Essex to monitor the area as well as providing the opportunity for research and increase awareness of native fauna and flora to the Zoo's visitors.



The UmPhafa Private Nature Reserve, situated in KwaZulu Natal, South Africa, is a 6,000 hectare reserve comprised of a selection of farms previously managed for cattle and encompasses a wide range of habitats from acacia savannah to mountainous terrain. Colchester Zoo manages the reserve through their charity Action for the Wild.

The aim of Action for the Wild is to rehabilitate UmPhafa as an example of the region's previous natural condition. Although some mammal populations had remained and have thrived since the reserve was established, many more species have been released. Action for the Wild translocate species onto the reserve to recreate the historical animal assemblage and to help secure the future of these species.

UmPhafa is now home to a wide range of fauna including white rhino, giraffe, kudu, impala, common reedbeek, mountain reedbeek, zebra, blesbok, red hartebeest, wildebeest, waterbuck, nyala, warthog, aardvark and porcupine - to name only some. Leopard and spotted hyena have more recently returned to the area naturally and are regularly recorded through camera trapping and tracking. Small to medium sized carnivores such as black-backed jackal, caracal, serval, genet, and several species of mongoose are also common.

UmPhafa was established entirely as a site for conservation, education and research and as such its management is not defined by other influences. Without the reliance upon general tourism, wildlife can be maintained at natural equilibrium for the environment. Numerous research projects have been undertaken on the site to better understand the local ecosystems and the animals which live there. UmPhafa works closely with the local community for management and research as well as to deliver an educational alongside the work on the reserve in order to the values of the reserve and to ensure the long-term sustainability of the project.



# In-situ Conservation: Conservation Charities

Zoos assist in the conservation of wild animals by supporting many in-situ projects by providing funds to these charities. This then funds projects to educate and supporting the local community, to pay for rangers, fund research, create reserves and aid in the rehabilitation of rescued animals. Colchester Zoo offers financial support to many conservation organisations through its Action for the Wild charity.

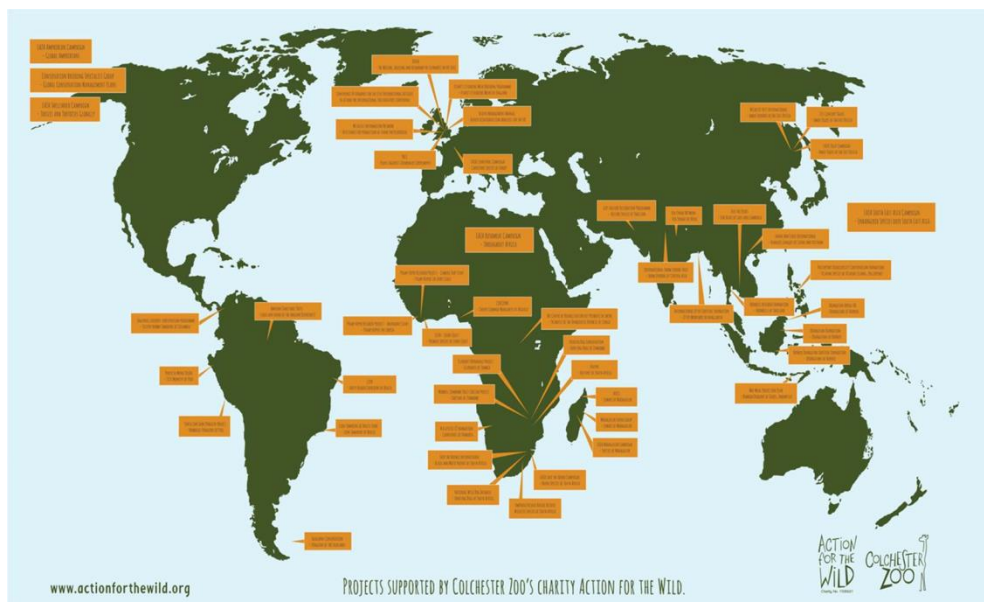
Action for the Wild aims to provide financial assistance and technical advice to national and overseas in-situ projects in order to support the conservation of endangered species and their habitats.

Action for the Wild aims to provide habitat and survival aids for native species and support of nature projects across the world. In co-operation with other bodies, it aims to establish protected areas, implement habitat management and be involved in breeding and translocation of threatened flora and fauna.

Action for the Wild aims to raise awareness and respect for nature through formal and informal education programmes. It also aims to encourage and support scientific and quantitative research from which conservation and animal welfare benefits can accrue.

Conservation projects are funded and assessed on their own merit taking into consideration the principle species or habitats involved, and the in-situ work that is to be carried out. As Colchester Zoo evolves, Action for the Wild intends to assess in-situ conservation projects and find projects to fund, with respect to major exhibits and species additions to the Colchester Zoo collection.

Since its establishment in 2004, Action for the Wild has raised £2 million for conservation charities all over the world. Below is a map of the projects that have been supported by Action of the Wild.



A full list of our projects can be found on our charity website: [www.actionforthewild.org](http://www.actionforthewild.org)  
The following pages are about some of the charities Action for the Wild support.

# In-situ Conservation: Conservation Charities

## Wae Wuul Nature Reserve Rehabilitation Project

The Wae Wuul protection plan was developed to protect the remnant Komodo dragon population in Wae Wuul and avoid expansion of habitat encroachment. The project has four main components: community awareness, patrolling and law enforcement, involvement of the local community in protection and conservation and capacity building.



The training of staff in wildlife monitoring techniques is an essential part of the project. This data helps to produce estimates of Komodo dragon and ungulate population size and density. To collect data on Komodo dragons, staff are trained on how to use baited aluminium cages for trapping them, marking them with microchips and on the collection of blood samples. Collection of this data will give a deeper understanding into the current population size, survival rates and age structure of Komodo dragons on the reserve.

Patrolling activities represent an important component of the Komodo dragon conservation programme in the Wae Wuul nature reserve. The patrolling programme is conducted by members of BBKSD and selected members of the local community. Patrolling is conducted across the reserve to monitor and control arson in the savannah and grassland, control the occurrence of feral dogs, wood harvesting and halt illegal hunting of deer. The project during its recent patrolling activities has also tested a new monitoring technique, using cameras and bait to attract wildlife. The hope is this could be used as an alternative to live caging for Komodo dragon population density estimates.

In 2007, the non-governmental organisation Komodo Survival Program (KSP) was established to secure a long-term collaboration with the Flores branch of the Indonesian Department of Forest Protection and Nature Conservation (BBKSDA) and the Komodo National Park (KNP) authority. Poaching has gradually been reduced in the reserve and between 2010 and 2012 no records of organized hunting were reported. In 2007, the NGO Komodo Survival Program (KSP) was established and a 5-year Memorandum of Agreement (MoA) was signed with Indonesian Central Bureau for the Conservation of Nature Resources (Balai Besar Konservasi Sumber Daya Alam -BBKSDA).



The establishment of such an agreement was an important achievement for KSP to act as consultant and co-supervisor of BBKSDA in wildlife and habitat protection in western Flores, and particularly for Komodo dragon management and conservation in the Wae Wuul nature reserve. Between 2010 and 2011, a first draft of a new MoA was submitted and signed, the MoA is for 2011-2015 conservation work on Flores.

# In-situ Conservation: Conservation Charities

## Centre for conservation in Punta San Juan, Peru

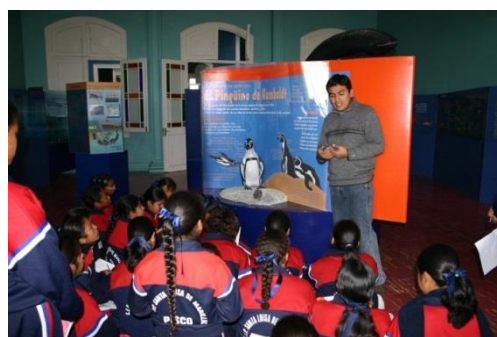
The role of the Humboldt Penguin Conservation Centre is firstly to initiate the transition of Punta San Juan from a guano reserve to a marine reserve. Support will also be provided to improve Peruvian fisheries management and increase awareness of marine conservation issues. Finally the centre will facilitate the incorporation of Punta San Juan as a Marine Reserve and ensure the proper implementation of the new reserve.



The Humboldt Penguin is found along the desert coasts of Chile and Peru. It is presently listed as vulnerable by the IUCN. The largest and reproductively most successful Peruvian population is found in Punta San Juan. Approximately 4,500 birds call Punta San Juan home. This single population represents 50% of the entire Peruvian population.

In the past, penguin populations have been severely threatened by human invasion into the area, as people seek the guano, which they harvest and use for fertiliser. In addition, both human and feral animal populations raid the area for eggs. The highest priority of the Punta San Juan Conservation Centre is protection of this site. Without this protection, the last major stronghold of the Humboldt penguin in Peru would be jeopardized.

Punta San Juan has had a continuous scientific presence since 1982. The Wildlife Conservation Society (WCS) supported biological monitoring and facilitated some fundraising for the maintenance of the wall and support of staff until 2002. Since then, biological programmes, maintenance of the wall and employment of biological staff and guards have been supported by Saint Louis Zoo's Centre for Conservation of the Humboldt Penguin in Punta San Juan, Peru and its conservation partners.



The total number of penguins recorded during 2012's census was 5,593 individuals. Most penguins were recorded between PSJ and San Juanito (4,370 individuals). A second count was carried out in these areas on the 3rd February and even higher numbers were recorded, totalling 5,787 penguins.



# In-situ Conservation: Conservation Charities

## Wildlife Vets International (WVI)

This project is part of a wider effort to assess the health of wild and captive leopards and their prey base in the wild. The ultimate aim is to provide comprehensive disease screening of both wild and captive Amur Leopards so a second population can be released into the wild.



The Amur Leopard is the rarest big cat and is listed by the IUCN as Critically Endangered. There are less than 60 individual Amur leopards in the wild, which live in a small area of the Russian Far East in mosaics of deer farms; areas designated for hunting, and in protected areas. Habitat change, forest fires, depletion of prey species, trade and a very small gene pool are the main threats that could lead to its extinction in the wild. The pressure is even greater now that the Chinese border has been opened up and already there has been a drop in Amur Tiger numbers



As well as looking at Amur leopard populations the project will now include the Amur tiger in its analysis, seen as they share the same habitat and are vulnerable to the same diseases. The reintroduction programme for the Amur leopard must be subject to rigorous disease control, in order to save this species.

This data will then be considered when reintroducing a second population of Amur leopards to ensure new pathogens are not being introduced into the area; that any pathogens present will not detrimentally affect captive born leopards planned for release; and that the right leopards are chosen for release.

John Lewis, the Amur Leopard EEP veterinary advisor, as well as the vet for Colchester Zoo, is acting as consultant to this project. He will provide professional training to Russian vet students and veterinarians in combating wildlife diseases through training in wildlife epidemiology, knowledge of main wildlife diseases, and workshops for remote darting, capture systems, anaesthesia, animal relocation and humane euthanasia.



# In-situ Conservation: Conservation Charities

## VulPro

VulPro is a multi-faceted organisation which deals with every aspect of vulture conservation, aiming to advance knowledge, awareness and innovation in the conservation of African vulture populations. Activities include rescuing and rehabilitating injured and poisoned vultures, restoring and monitoring colonies, community outreach and education as well as research initiatives.



VulPro is the only organisation in South Africa undertaking concise and continuous monitoring of several of the Cape Vulture colonies making up an estimated 60% of the total population. However, comprehensive, regular, long-term monitoring of the total number of active breeding pairs at each and every Cape Vulture breeding colony in the region has not been achieved so far and is logistically challenging. The most feasible way to estimate the trend in Cape Vulture numbers is to examine information from the relatively few breeding colonies monitored on a regular basis over an adequate time period.

Each year the same team visits the colony three times, the first count (May-June) to measure the number of pairs attempting to breed that season, the second count (July-August) measures the number of pairs breeding and the number of chicks produced and the last count (October) measures the number of successful pairs (number of fledglings produced). VulPro are now starting to see trends with regards to one of the colonies but are still working towards investigating trends at the others.

VulPro have started monitoring power lines in the vicinity of the surveyed colonies to determine the usage of powerline structures by vultures and the degree of threat these structures present to the vultures. Data from these surveys help offer recommendations to the electricity utility company in line with already approved and recognised 'bird-friendly' structures.



It is hoped that by using the Cape vulture as a flagship species, VulPro can promote and implement appropriate conservation actions for the benefit of vultures and enhance the public profile of vulture conservation.

VulPro is currently implementing a child specific education campaign to increase vulture conservation awareness. VulPro's success in all aspects of their conservation and research endeavours relies on a solid understanding and responsible use of social awareness and media campaigns.



# In-situ Conservation: Conservation Charities

## Red Panda Network

The Red Panda Network is committed to the conservation of wild red pandas and their habitat through the education and empowerment of local communities.



The red panda is classed as endangered by the IUCN Red List. Human populations are leading to greater exploitation and fragmentation of the red panda's forest home. The Red Panda GSMP (Global Species Management Plan) Team decided at their workshop in 2012 that they would promote red panda conservation in the wild, as well as cooperating on the global captive management of the species. It was agreed that this conservation goal was to be achieved by supporting the work of the Red Panda Network, an organisation that uses community conservation to protect red pandas in Nepal. This is a win-win situation; it brings employment to remote villages, it protects the local community forests that have no state protection, it makes people proud of their natural heritage, it raises awareness and it provides good information on the status of the pandas.

These forest guardians hold the key to the future of the red panda. They work within their respective communities to create a Community Forest Network, which empowers local people to protect their forests. Forest guardians are trained as professional forest stewards and local conservation ambassadors who conduct regular monitoring of red panda populations and habitat, as well as awareness-building activities. Therefore the Red Panda Network Forest Guardian sponsorship not only helps protect the red panda in its natural habitat, but it helps support a family at the same time.



The Panchthar-Ilam-Taplejung (PIT) corridor is home to 25 percent of the red panda population of Nepal and plays a vital role in linking protected areas of Nepal and India. This community-based red panda conservation programme has been extended throughout all 27 Village Development Committees (VDCs) within red panda range of the corridor. 54 local people have now been trained and European Zoos are currently supporting six of them; providing their wages and providing training courses in activities such as monitoring techniques, nature guide training and anti-poaching investigation.



# In-situ Conservation: Conservation Charities

## Centre de Rehabilitation des Primates de Lwiro (CRPL)/Lwiro Primate Sanctuary

Their mission is to provide the best possible care for orphaned primates in the Democratic Republic of Congo, while working to ensure their protection in the wild.

The Parc National de Kahuzi-Biega (PNKB), a UNESCO World Heritage Site in Danger, is seriously affected by degradation, along with the local populations who, for reasons of survival, have depended more on natural resources in protected areas and their surrounding forests.



The Centre de Rehabilitation des Primates de Lwiro (CRPL) is a Pan African Sanctuary Alliance accredited primate sanctuary for chimpanzees and monkeys, located just outside the border of Parc National de Kahuzi Biega (PNKB). As the only sanctuary in the region, they play a crucial role in supporting conservation measures in the Park and the eastern DRC.

Not only is CRPL a key step in applying laws against illegal wildlife trade by accepting confiscated animals, the CRPL is also open to visitors to raise awareness of the of the species in their care. CRPL aims to strengthen convictions to join protection and conservation efforts; this will hopefully in turn lead to a reduction in the numbers of primates being hunted, killed or arriving at CRPL. CRPL are also supporting the local community by injecting more than \$4000 per month into the community, by purchasing food for all their animals and workers from local markets, and by providing long-term job positions for 43 local workers.

The short term goals of the CRPL are to ensure the welfare of the primates in their care and to increase the holding capacity of the sanctuary for future government confiscations. The ultimate goal of all partners at the CRPL is to see the release of all able-bodied animals back into the wild. They will also work towards a continuous reduction in the number of primates being killed, therefore reducing the number of new arrivals to CRPL, and ensuring local wild populations remain stable through habitat protection and improved attitudes toward their protective status through education and public awareness campaigns.





# In-situ Conservation: Conservation Charities

## International Otter Survival Fund (IOSF)

The aim is to protect otters so that future generations can enjoy one of the world's most charming, elusive and enjoyable mammals

Otters are one of the most overlooked, medium sized mammal species in Asia. They are an important ambassador to the health of the environment, using both aquatic and terrestrial environments. Asian otters are under threat through loss of their wetland habitat, loss of their food sources, the pet trade and hunting for their fur. In some parts of the world, otters are beginning to make a comeback after serious declines in numbers, but sadly the story in Asia is different and otter populations are in sharp decline, along with their wetland habitats.



Current threats to Asian otters include habitat destruction, pesticide use, water pollution, over fishing and hunting and trade in furs, body parts and live otters. Yet, otters remain relatively low profile species and receive little conservation attention in Asia. In some areas they are disappearing almost without anyone noticing. They are at the forefront of the wildlife trade, with tigers and leopards. Indeed, for every tiger skin found, there are at least 10 otter skins and one haul in Tibet had 778 otter skins, including some from the rare hairy-nosed otter.

IOSF has been working to provide a series of workshops to train students from Asia. The first workshop was held in February 2009 in Cambodia. In March 2013 another workshop was held in Indonesia.

The aims of the workshop is to work with the communities and centre on fishing villages as Bangladesh has a long tradition of using smooth-coated otters to help them to catch fish. The otters are well kept and in fact they breed easily in this environment. It is therefore proposed to work with the communities to captive breed smooth-coated otters for release to restore wild populations. This will involve the people in conservation and reduce any otter/fisherman conflict and also provide a potential source of added income through financial support for the programme.



# In-situ Conservation: Conservation Translocations

(Formally known as Reintroduction Programmes)

In 1988 the Species Survival Commission of the IUCN established the Reintroduction Specialist Group (RSG) to join the expertise and information on reintroduction projects worldwide. The RSG stores information and data on hundreds of reintroductions that have taken place over the past 20 years. The process of a species reintroduction is a hard and expensive one and because it is still fairly “new”, it has had some failures, but also some successes. The information collected so far has led to a series of guidelines being drawn up to help prevent these mistakes being repeated. In 2017 the programme was redefined as Conservation Translocations.

## What is a Conservation Translocation?

Conservation translocation is the deliberate movement and release of organisms from one location to another. It must result in having conservational benefit to more than just the translocated organism. i.e. restoring ecosystem functions.

Conservation translocations consist of:

- Population restoration which consist of: Reinforcement and Reintroduction, which are within a species' historical and natural range.
- Conservation introductions, which are the assisted colonisation and ecological replacement, outside of the organisms historical and natural range.

## Population Restoration

**Reinforcement** is the movement and release of an organism into an existing population of the same species. This is sometimes referred to as re-stocking.

The aims of reinforcements is to enhance population viability, which can be done by increasing population size, by increasing genetic diversity, or by increasing the representation of specific groups or life cycle stages.

**Reintroduction** is the movement and release of an organism inside its historical and natural range from which it has disappeared.

The aims of reintroductions to re-establish a viable population of the species within its historical and natural range.

## Conservation Introductions

Conservation introduction is the movement and release of an organism outside its historic and natural range.

There are two types of conservation introduction, assisted colonisation and ecological replacement.

**Assisted colonisation** is the movement and release of an organism outside its historic and natural range to avoid extinction.

**Ecological replacement** is the movement and release of an organism outside its historic and natural range to perform a specific ecological function.

This is used to re-establish an ecological function lost through extinction, and will often be the most suitable existing sub-species, or a close relative of the extinct species within the same genus.

# In-situ Conservation: Conservation Translocations

(Formally known as Reintroduction Programmes)

## Designing Conservation Translocations

A successful conservation translocations involves the following:

- Long term planning.
- The release of a large number of animals.
- The involvement of the local people.

The design of each conservation translocations is unique to each species. For different animals, different approaches are necessary. In general there are two types of releases:

- **Hard Release:** This is where the animals are released and have to fend for themselves.
- **Soft Release:** This is a more gradual process. The animals are provided with food and/or shelter until they are able to cope on their own in the wild. This is a more time consuming and expensive process, but usually the most appropriate method of release.

## Costs of Conservation Translocations

Conservation translocations can be expensive, due to the conservation translocations doing more than just releasing the animals. For example the release programme for the Golden lion Tamarins in Brazil, the budget not only covered the release but also, education within the local community, management and reforestation, translocation, studies of other flora and fauna of the area, internships for students and other long term field studies of the wild population. Funding for such programmes comes from donations from local and international conservation groups via fund raising, from funding by zoos and also via publicity and the interest generated by this.

## How Long does it Take?

A project can be considered successful once a reintroduced population can sustain itself in the wild. It may take several generations until this can be made certain and results do vary between species. Other factors such as securing the land, working with government departments, breeding a healthy release population and raising the funds all adds time to any realise project. Some projects can take over 100 years.

## Factors to Consider During a Conservation Translocations

There are many factors that need addressing before a conservation translocations is to take place.

The following are the main factors in the wild that need to be investigated before the conservation translocations is to take place:

- **Security:** the reason why the animal become extinct in its natural range must be removed and prevented to occur again
- **Biology:** habitat preference, social and feeding behaviour, home range, predators, disease, migratory areas, what effect the reintroduced animals will have on the ecosystem
- **Social economic and legal requirements:** long term commitment of financial and political support

After the conservation translocations has taken place:

- Monitor how well all animals are doing directly or indirectly and also to evaluate the success of the reintroduction and technique used.

Animals that are part of conservation translocations and are starting to increase in numbers are:

**The Przewalski's horse:** was classed as extinct in the wild, now has over 300 individuals. **The Arabian Oryx:** was classed as extinct in the wild, now has over 1000 individuals. **The golden lion tamarin:** had 150 left in the wild in 1969, now numbers over 1000 individuals.

# In-situ Conservation: Conservation Translocations

(Formally known as Reintroduction Programmes)

Colchester Zoo is part of a breeding programme, reinforcement and assisted colonisation conservation translocation for a rare moth found only along a very small area on the North-East Essex coast. The Fisher's Estuarine moth is a rare and highly threatened species and therefore, is of a high conservation priority and is legally protected under the Conservation of Habitats and Species Regulations 2010, as well as listed in the British Red Data Book and has an Essex Biodiversity Action Plan (BAP).



The moth is completely reliant on Hog's Fennel as its sole larval food plant; a plant species which is also threatened. It is also reliant on long coarse grass species to fulfil its egg laying requirements. Favoured grasses for egg laying include Cock's-foot and False oat-grass. In the UK Hog's Fennel is limited to two main localities; the north Essex coast and the north Kent coast. Suitable habitat for the plant is dwindling, due to rising sea levels along the coast line, mowing of the plant and trampling by walkers.

In 2006, a project was set up to plant up a sustainable landscape-scale network of Hog's fennel sites. To date, over 20 sites have been created along the Essex coast line.

In 2008, Colchester Zoo teamed up with Tendring District Council, Natural England and Writtle College to initiate the captive breeding programme for the Fisher's Estuarine Moth at Colchester Zoo. This will enable the species to be established at the newly created sites of Hog's fennel. The breeding programme provide a readily available supply of moths that will ensure the sustainability of the programme for the long-term.



Initially, 40 breeding cages were established in an off show location at Colchester Zoo, a rabbit proof mesh was built around the nets and a Hog's fennel plant and grass species were placed in each cage, to fulfil the moths life history requirements. Eggs were collected under licence from Skipper's Island Nature Reserve, an Essex Wildlife Trust site. The caterpillars subsequently hatch in April and are immediately placed onto a Hog's fennel plant, where they remain feeding throughout the summer until pupation. Adult moths then emerge in September and Colchester

Zoo keepers ensure unrelated pairs are mixed for mating. Resulting eggs are then used for the following year's captive breeding programme and any additional eggs are released into the newly created sites. To date, eggs have been released annually since 2009.

Since the release of the eggs into the wild, signs of caterpillar feeding and adult moths have been seen at the new sites. In addition to this work, surveys conducted by Tendring District Council have also shown a high number of moths recorded at an existing sites, evidence of the spread of the moths within such sites and even sightings of the caterpillar feeding signs and of an adult moth on Hog's fennel plants away from existing colonies, which had not been populated by the breeding programme. This news shows the moth is capable of extending its range naturally.

# National and International Organisations

Many zoos in the U.K. are members of national and international organisations. Below are the groups Colchester Zoo are members of. These groups coordinate and support in-situ and ex-situ conservation work, education and breeding programmes.



BIAZA is a conservation, education and scientific wildlife charity, that ensure the principles and practices of animal management are practiced at a high standard. Also aids in increasing knowledge with in the zoological community.

<http://www.biaza.org.uk/>



EAZA coordinate conservation work and breeding programmes across Europe. Also aids in increasing knowledge with in the zoological community.

<http://www.eaza.net/>



WAZA provide leadership and support for zoos, aquariums, and partner organisations of the world in animal care and welfare, conservation of biodiversity, environmental education and global sustainability.

<http://www.waza.org/en/site/home>

# Ex-situ Conservation: Raising Awareness

One in ten people will visit a zoo or an aquarium, which provided zoos and aquariums with an opportunity to raise the profile of conservation issues and aid in building support as well as giving the collections a chance to start behaviour change to reduce the negative impact humans can have on the planet.

This is done in through education and zoos in the U.K. offer a number of educational opportunities in several formats. These range from informal meet the keepers, animal talks to public engagement activities and school sessions.



A Colchester Zoo educator at a college talking about sustainable alternatives.

Formal education sessions can be done at the zoo or at the school or college. Colchester Zoo offer 52 educational sessions for Reception to Post 16 students.



A Colchester Zoo educator talking about the rainforest to a school visiting the zoo.



Pond dipping at Colchester Zoo's nature reserve with zoo visitors learning about pond fauna.

Visitor activities allows the visitor to get up close to nature as well as learning new skills to help build an appreciation towards wildlife.



Visitors learning about native animal and looking at their tracks.



An educational stall about the threats orangutans face in the wild and how they can be helped.

Information and activities can focus visitors on a particular conservation issue and can aid in raising money for the cause as well as promote it.



Touch tables allow visitors to get hands on with objects they won't come across before.

# Ex-situ Conservation: Raising Awareness

The use of signage at enclosure are also a common and easy way to inform all visitors about the animal as well as information on the habitat and any conservation concerns and work.

Below are some examples of signage used at Colchester Zoo.



Signage at the Chimpanzee's looking at their intelligent.



Signage at the Humboldt's penguins about the threats they face in the wild.



Signage at the sun bear's about conservation work.



Signage at the smooth coated otters about Asian cultures as well as conservation work.

Public talks and encounters are also used to help build an understanding and respect for the animals and raise the profile of conservation work that may be taking place. They offer the visitor the opportunity to meet the keepers as well as get closer to the animal in certain situations.



The animal encounters allows visitors to get close to certain animals. This allows the visitor to see animals up close and help in being a connection towards either that animal or a more general connection. This can lead to wanting to learn more about them, which can then lead in want to help their wild counterparts and/or the habitat.

Keeper talks are a good way to use animals as ambassadors to help highlight threats their wild counterparts face. These talks also increase understanding and visitor knowledge and the keeper talks are a good way of building empathy for the animal which in turn makes it more likely the visitor will support conservation work. The picture on the left is a keeper doing the meerkat talk.



# Ex-situ Conservation: Research

## Ecology

Understanding of the natural environment as to where the species come from is important in order to provide them with a suitable captive environment which meets their behavioural and physical needs.

## Physiology

Research on how animals move as well as how their bodies function ensures the correct environment and diet are provided .

## Genetics

It is important all zoo collections are aware of the genetics of their animals. Zoos do not want to breed between two related individuals. This also aids in finding the best mate possible.

## Husbandry

Research is undertaken to address the way animals are managed. Investigations take place to ensure welfare needs are met; as such research is published, which allows all zoo collections to benefit and so it raises the standard of welfare which one can achieve.

With all research undertaken at the Colchester Zoo, it needs to be achieved in a way in which can it can be written up as a research document and be easily repeated by other institutes. To ensure this can be done, the data collected needs to be valid and reliable with no bias incorporated.

Past projects completed at Colchester Zoo can be found via the link below.

[www.colchester-zoo.com/conservation/research](http://www.colchester-zoo.com/conservation/research)





# Ex-situ Conservation: Research

The following is how research done within Colchester Zoo was used to aid the work of Wildlife Vets International with their work in the wild.

In order to assess the health of the wild Amur tigers and Amur leopards, they are sedated. However the equipment used to keep the animal sedated is large and heavy, making it difficult to transport around the mountainous and forested habitat.

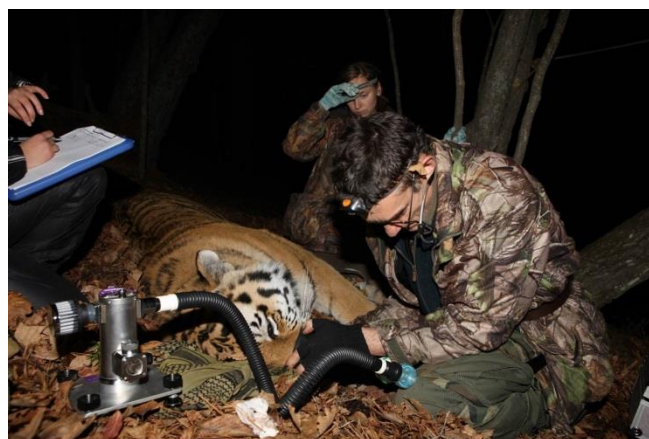
To overcome this, a much smaller and lighter sedation devise was developed. Before it could be used in the wild it had to go through tests in a safe and controlled situation due to the

Testing was done at a number of zoos, which included Colchester Zoo. When the tigers or leopards had to be sedated for any veterinary procedure, the new devise was used. This allowed the vets to run test on the devise. This controlled environment meant that the original equipment was available to be on stand-by to take over in case the new devise didn't work as expected or failed.

Below are two pictures of the new devise being used at Colchester Zoo during trials. The picture on the left is one of Colchester Zoo's Amur tigers and the picture on the right is one of Colchester Zoo's Amur leopards.



After several tests the new devise was approved for use in the wild, making it easier and faster to move around the terrain and allow for successful monitor the health of the wild Amur tigers and leopards.



# Ex-situ Conservation: Research

The following is an example of research completed at Colchester Zoo which looked at the Amur leopards heart beat pattern. There are only 100 Amur leopards left in the wild and part of the conservation work involves catching the leopards to perform health checks on them to ensure the wild population is healthy. After the checks the leopards are free to go. However the vets performing the health checks were find very leopard had an irregular heat beat and it was conclude it could be due to two possible reasons:



.It is a congenital heart condition that is present in the population and normal for the Amur leopard to have.

.The anaesthetic being used was causing the irregular heart beats and potentially harming the leopard.

In order to find out which it was the vets needed to hear the heart beat of a non-sedated leopard. To do this the vets turned to Colchester Zoo to train the Amur leopards at Colchester Zoo to accept a stethoscope whilst conscious.

The training of the leopards was successful and the vets were able to listen to the heart beat of the leopard whilst it was still conscious. The vets discovered that the captive leopards also had the irregular heart beat and thus it was concluded it is a congenital heart condition naturally found within the population.



# Ex-situ Conservation: Breeding Programmes

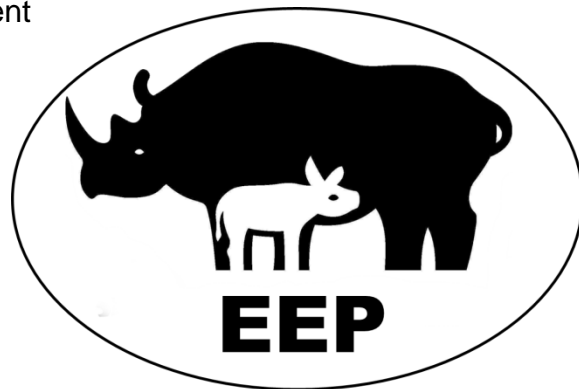
Captive breeding is essential to maintaining a healthy captive population. Colchester Zoo participates in the following breeding programmes.

## EEP: European Endangered Species Breeding Programme

The EEP is the most intensive type of population management for a species kept in EAZA (European Association of Zoos and Aquaria) zoos. Each EEP has a coordinator (someone with a special interest in and knowledge of the species concerned, who is working in an EAZA zoo or aquarium). He or she is assisted by a Species Committee.

The coordinator has many tasks to fulfil, such as collecting information on the status of all the individuals of the species which he or she is responsible for kept in EAZA zoos and aquaria, producing a studbook, carrying out demographical and genetic analyses, and producing a plan for the future management of the species.

Together with the Species Committee, recommendations are made each year on which animals should breed or should not breed, which individual animals should go from one zoo to another, and so on.



## ESB: European Stud Book

The ESB is less intensive than the EEP programme. The studbook keeper who is responsible for a certain ESB species collects all the data on births, deaths, transfers from all the EAZA zoos that keep the species in question. This data is entered into a computer software programme, which allows the studbook keeper to carry out analyses of the population of that species. EAZA zoos may ask the studbook keepers for recommendations on breeding or transfers.

By collecting and analysing all the relevant information on the species, the studbook keeper can judge if it is doing well in EAZA zoos, or if maybe a more rigid management programmes is needed to maintain a healthy population over the long term. In that case, the studbook keeper may propose that the species be managed as an EEP programme.

For a full list of species which are part of a breeding program at Colchester Zoo please refer page 29, Colchester Zoo Breeding Programmes.



# Breeding Programmes: Studbooks

Studbooks are a compilation and source of genealogical data of individual animals, which make up a particular captive population.

## History

They originated in the management of domestic stock to make selective breeding easier. Since the beginning of domestication, the difference between animals has been noted and often used to selectively improve the stock e.g. improve milk yield. The first official studbook was the “General Studbook for Thoroughbred Horses” set up in England 1771. By the nineteenth century there was an increased development in the planned breeding of many types of domestic animals with studbooks.

The first studbook for a wild animal in captivity was for the European Bison, published in 1932 by Heinz Heck. It was developed after a meeting at Berlin Zoo in 1923 where it was discovered that the species was becoming endangered and close to extinction.

## Modern Studbooks

The necessity of co-operative management of captive populations was released after the publication of the Zoological Society of London’s International Zoo yearbook in 1960. By 1966 there were 9 international studbooks and by 1993 there were 121. During the last 20 years there has been a massive increase in studbooks in response to the increasing number of species becoming threatened in the wild. As well as advances in identification of animals and sex determination, especially in birds and reptiles. The advances in computer software have also assisted record keeping and analysis. The type of data and how the studbook is managed is essentially the same whether it is international, national or regional. Information on the wild population, as well as the captive population, must be included in a studbook proposal.

The following information must also be provided:

- red data book status and/or officially recognised status.
- summary of reproductive history in captivity.
- husbandry problems and successes.
- any known inbreeding and/or hybridisation.

Other important aspects of a studbook proposal that must be submitted are:

- the credential/ experience of the petitioners.
- academic qualifications.
- other relevant information.
- statement of guarantee that the petitioner has institutional support and the necessary resources - financial and practical to maintain and publish the studbook.

# Breeding Programmes: Studbooks

## The Role of Studbooks

The key difference between the original studbooks for domestic stock and modern studbooks today, is the maintenance of the maximum genetic diversity and behavioural characteristics of a species, as opposed to the selective breeding that accentuated particular characteristics to the detriment of the species.

In order to present a comprehensive record of a species the studbook must contain details of every animal, living and dead, starting if possible with the original wild caught founders. This information is collected and collated by the studbook keeper, usually via questionnaires sent to all owners and collections. The complete studbook should be published every 3 years and there should be an annual update. Copies of the updates and studbooks are sent to owners and captive breeding co-operating bodies.

The type of information requested per animal includes:

- personal history
- scientific name
- individual house name
- sex
- unique studbook number
- identification number
- details of markings and other identification records
- date and place of birth
- date and place of death
- autopsy details
- information on disposal of body
- special medical note
- information on its ancestry and offspring's ancestry is also taken in great detail

The result is a complete history of all the living and dead animals that can be traced back, where possible, to their founders.

The studbook and the studbook keeper play a significant role in determining strategies for maintaining self-sustaining captive populations of endangered or rare species. The integrity of the studbook is crucial to the formation of such coordinated management policies.

# Finding A Balance

Conservation work is often more complex than it initially seems. Below is an example of how conservation work to protect the Bornean orangutan's rainforest habitat is not a simple action.

There are a number of reasons why the world's rainforests are cut down, including logging, mining, urban expansion and farming.

Many of these causes are global in nature due to world wide trade and demand. For example coltan mining in the African rainforest is to maintain the demand for this mineral, which is used in mobile devices.

Cocoa, soya, bananas, sugar, coffee, palm oil and beef, to name a few, are all farmed in rainforest areas. Brazil is the largest exporter of beef in the world with 70% of the Amazon rainforest being cut down to make space for cattle farming.

It is easy for people in a developed country such as the U.K. to say, "stop cutting down the rainforest". However in countries such as Borneo it is not that simple. The deforestation is happening in Borneo as a result of global actions along with several other factors, which is the same for most conservation issues.

The Bornean rainforest is being cut down for the wood and to grow palm oil. Palm oil is in 80% of products that are available to buy in the U.K. Not just in food but also cosmetics and cleaning products.

There are several groups that have an interest in the Bornean rainforest for different reasons.

**The conservationist would say,** "We need to protect the animals and their habitat!"

**The logging company would say,** "We provide jobs which helps the local people and our country make money!"

**Scientist in medical research would say,** "There might be medicinal cures in rainforest plants!"

**The manufactures would say,** "Palm oil is cheap, popular, sells products and makes profits"

**The governments would say,** "We need to encourage trade and industry so that people can have a good life"

**The local people would say,** "We need jobs! We need food! We need money!"

As a simplified example; if all deforestation was stopped in Borneo, international investors would no longer be injecting money into the economy and stop future investment. It would also lead to the logging companies and growers seizing work, thus making the workers unemployed. This would lead to high unemployment and an increase in people living in poverty and result in the countries economy collapsing.

Modern conservation needs to be able to find a balance between the different groups.

# Finding A Balance

One way a balance can be found is through responsible purchasing. This is something simple that anyone one in the U.K. can do and aid in active conservation. Presently there are 3 main groups that work at maintaining sustainable production on many items that come from rainforest areas.

These are the Rainforest Alliance, Forest Stewardship Council (FSC) and Fairtrade.



The Rainforest Alliance is a governmental organisation established in 1986 that works to conserve sustainable livelihoods by transforming land-use practices, business practices and consumer behaviour.

For further information visit the Rainforest Alliance website:  
<http://www.rainforest-alliance.org/>



The FSC is an international-profit, multi-stakeholder organisation established in 1993 to promote responsible management of the world's. This is done by standards products, along with certifying and labelling them as eco-friendly.

For further information visit the FSC website:  
<http://www.fsc-uk.org/en-uk>



The Roundtable on Sustainable Palm Oil (RSPO) is a non-profit organisation working towards establishing global standards for sustainable palm oil.

For further information visit the RSPO website:  
<https://rspo.org/>

# Finding A Balance - What is the Zoo doing?

Colchester Zoo also has a responsibility to monitor and reduce the impact the Zoo itself has on the environment. This is done through a number of ways as mentioned below.

## **Energy Efficient**

Colchester Zoo has a number of biomass boilers that have been installed to help reduce the Zoo's carbon emissions. These boilers run on pellets which are made from compressed sawdust shavings, left over from the wood industry. This energy source has a much lower carbon footprint because the emissions are the same as what the plant can absorb over its lifetime. It makes it much more eco-friendly than burning fossil fuels. A biomass boiler can be seen at the Butterfly Glade exhibit.

Colchester Zoo has 7 biomass pellet boilers at various points around the Zoo and are used to heat animal enclosures, buildings and offices. The Zoo is also registered as a self-supplier with BSL, to use recycled wood from around the zoo as fuel.

Colchester Zoo has also installed solar panelling situated at two animal enclosures, which are used to heat and light the buildings; helping to reduce the Zoo's energy output.

## **Water Conservation**

As well as monitoring and creating energy, water use is also assessed. Currently the Zoo collects rainwater through water butts and roofs as well using natural water filtration systems where possible through reed bed systems. The Zoo also used grey water (clean but old water) for hosing down exhibits and toilet flushing.

## **Waste Reduction**

The Zoo has worked for many years to reduce the waste produced via the Zoo's visitors and recycle the contents of the bins. The Zoo is now also working to reduce its contribution to landfill.

After sorting for recycling, the Zoo waste is now going to go to produce energy-from-waste, where the waste is burnt at high temperatures to reduce its volume and to create heat energy which is then converted into electrical power.

In waste to energy technologies, nearly all of the carbon content in the waste is emitted as carbon dioxide to the atmosphere. If the waste went to landfill, the amount of methane generated via decomposition of the biodegradable part of the waste would have a higher global warming potential than the carbon dioxide produced by this combustion.

## **Responsible Produce & Packaging**

All of food served at the Zoo is sourced as locally as possible and work is done to ensure that any ingredients do not conflict with any of the Zoos conservation policies.

This includes using sustainable palm oil, Rainforest Alliance coffee, tea and chocolate and Red Tractor assured ingredients.

The Zoo has also introduced paper straws as well as Birchwood cutlery in all the Catering outlets. As well as using recycled plastic water bottles and sourcing the bottled water from a company who do not transport their water outside the U.K. further reducing the carbon footprint.



# Colchester Zoo Breeding Programmes

The tables on the following pages list the species at Colchester Zoo that are part of European international Breeding Programs as well as stating their IUCN status and if they are covered by CITES.

Below is a table of the number of species kept at Colchester Zoo as of 2016.

	NO. OF SPECIES IN INVENTORY 2016
MAMMALS	77
BIRDS	41
REPTILES	29
AMPHIBIANS	9
FISH	73
INVERTS	32
<b>TOTAL</b>	<b>261</b>

## Code Descriptions

Code	Description
LC, NT, VU, EN, CR, EW	<b>IUCN Red List Categories</b> LC = Least Concern NT = Near Threatened VU = Vulnerable EN = Endangered CR = Critically Endangered EW = Extinct in the Wild
EEP	European Endangered Species Programme
ESB	European Studbook
1,2 or 3	<b>CITES Appendices I,II or III</b> As assigned by the Convention on the International Trade of Endangered Species

Species (Common name, Scientific name)	Status	Program	CITES Appendix listing
<b>Vertebrates</b>			
<b>Class: Mammals</b>			
Aardvark ( <i>Orycteropus afer</i> )	LC	ESB	Not Listed
African elephant ( <i>Loxodonta africana</i> )	VU	EEP	2
African hunting dog ( <i>Lycaon pictus</i> )	EN	EEP	3 (pending)
Amur leopard ( <i>Panthera pardus orientalis</i> )	CR	EEP	1
Amur tiger ( <i>Panthera tigris altaica</i> )	EN	EEP	1
Binturong ( <i>Arctictis binturong</i> )	VU	EEP	3
Black & white ruffed lemur ( <i>Varecia variegata variegata</i> )	CR	EEP	1
Buffy-headed capuchin ( <i>Sapajus xanthosternos</i> )	CR	EEP	2
Cherry-crowned mangabey ( <i>Cercocebus torquatus torquatus</i> )	VU	ESB	2
Colombian black spider monkey ( <i>Ateles fusciceps robustus</i> )	CR	EEP	2
Common chimpanzee ( <i>Pan troglodytes</i> )	EN	EEP	1

Species (Common name, Scientific name)	Status	Program	CITES Appendix listing
<b>Vertebrates</b>			
<b>Class: Mammals</b>			
Common squirrel monkey ( <i>Saimiri sciureus</i> )	LC	EEP	2
Eastern black and white colobus ( <i>Colobus guereza</i> ) <i>caudatus</i> )	LC	ESB	2
Fennec fox ( <i>Vulpes zerda</i> )	LC	ESB	2
Gelada baboon ( <i>Theropithecus gelada</i> )	LC	EEP	2
Geoffroy's marmoset ( <i>Callithrix geoffroyi</i> )	LC	EEP	2
Giant anteater ( <i>Myrmecophaga tridactyla</i> )	VU	EEP	2
Giraffe ( <i>Giraffa camelopardalis</i> )	VU	EEP	Not Listed
Golden lion tamarin ( <i>Leontopithecus rosalia</i> )	EN	EEP	2
Golden-headed lion tamarin ( <i>Leontopithecus chrysomelas</i> )	EN	EEP	2
Greater kudu ( <i>Tragelaphus strepsiceros</i> )	LC	ESB	Not Listed
Kirk's dik dik ( <i>Madoqua kirkii</i> )	LC	ESB	Not Listed

Species (Common name, Scientific name)	Status	Program	CITES Appendix listing
<b>Vertebrates</b>			
<b>Class: Mammals</b>			
L'hoest's monkey ( <i>Cercopithecus lhoesti</i> )	VU	EEP	2
Linne's two toed sloth ( <i>Choloepus didactylus</i> )	LC	ESB	Not Listed
Lion-tailed macaque ( <i>Macaca silenus</i> )	EN	EEP	2
Malayan sun bear ( <i>Helarctos malayanus</i> )	VU	ESB	1
Mandrill ( <i>Mandrillus sphinx</i> )	VU	EEP	1
Orang-utan ( <i>Pongo pygmaeus</i> )	CR	EEP	1
Patagonian sea lion ( <i>Otaria byronia</i> )	LC	ESB	Not Listed
Patas monkey ( <i>Erythrocebus patas</i> )	LC	ESB	2
Pied tamarin ( <i>Saguinus bicolor</i> )	EN	EEP	1
Pileated gibbon ( <i>Hylobates pileatus</i> )	EN	EEP	1
Pygmy hippopotamus ( <i>Hexaprotodon liberiensis</i> )	EN	EEP	2

Species (Common name, Scientific name)	Status	Program	CITES Appendix listing
<b>Vertebrates</b>			
<b>Class: Mammals</b>			
Red panda ( <i>Ailurus fulgens</i> )	EN	EEP	1
Red river hog ( <i>Potamochoerus porcus</i> )	LC	EEP	Not Listed
Red titi monkey ( <i>Callicebus cupreus</i> )	LC	EEP	2
Red-bellied lemur ( <i>Eulemur rubriventer</i> )	VU	EEP	1
Ring tailed lemur ( <i>Lemur catta</i> )	EN	ESB	1
Rock hyrax ( <i>Procavia capensis</i> )	LC	ESB	Not Listed
South African Cheetah ( <i>Acinonyx jubatus jubatus</i> )	VU	EEP	1
Southern tamandua ( <i>Tamandua tetradactyla</i> )	LC	ESB	Not Listed
Spotted hyena ( <i>Crocuta crocuta</i> )	LC	ESB	Not Listed
Visayan spotted deer ( <i>Rusa alfredi</i> )	EN	ESB	Not Listed
Visayan warty pig ( <i>Sus cebifrons negrinus</i> )	CR	EEP	Not Listed

Species (Common name, Scientific name)	Status	Program	CITES Appendix listing
<b>Vertebrates</b>			
<b>Class: Mammals</b>			
Warthog ( <i>Phacochoerus africanus</i> )	LC	ESB	Not Listed
White rhinoceros ( <i>Ceratotherium simum</i> )	NT	EEP	1
<b>Class: Birds</b>			
Andean condor ( <i>Vultur gryphus</i> )	NT	EEP	1
Blue crane ( <i>Anthropoides paradiseus</i> )	VU	ESB	2
Eurasian griffon vulture ( <i>Gyps fulvus</i> )	LC	ESB	2
Humboldt penguin ( <i>Spheniscus humboldti</i> )	VU	EEP	1
King vulture ( <i>Arcoramphus papa</i> )	LC	ESB	2
Lesser rhea ( <i>Rhea pennata</i> )	LC	ESB	2
Moluccan cockatoo ( <i>Cacatua moluccensis</i> )	VU	EEP	1 & 2
Rhinoceros Hornbill ( <i>Buceros rhinoceros</i> )	NT	EEP	2

Species (Common name, Scientific name)	Status	Program	CITES Appendix listing
<b>Vertebrates</b>			
<b>Class: Birds</b>			
Ruppell's vulture ( <i>Gyps rueppellii</i> )	CR	EEP	2
Southern ground hornbill ( <i>Bucorvus leadbeateri</i> )	VU	ESB	Not Listed
Victoria crowned pigeon ( <i>Goura victoria</i> )	NT	ESB	2
<b>Class: Reptiles</b>			
African pancake tortoise ( <i>Malacochersus tornieri</i> )	VU	ESB	2
Cuban crocodile ( <i>Crocodylus rhombifer</i> )	CR	ESB	1
Giant Asian pond turtle ( <i>Heosemys grandis</i> )	VU	ESB	2
Komodo dragon ( <i>Varanus komodoensis</i> )	VU	EEP	1
Madagascan tree boa ( <i>Sanzinia madagascariensis</i> )	LC	ESB	1
Radiated tortoise ( <i>Geochelone radiata</i> )	CR	ESB	1
Rhinoceros iguana ( <i>Cyclura cornuta</i> )	VU	ESB	1