BIAZA

BRITISH & IRISH ASSOCIATION OF ZOOS & AQUARIUMS

Top Ten Mammal Species Reliant on Zoos

2013

Compiled by: Andrew R. Marshall, Scott Wilson, Nicky Needham and the BIAZA Field Programmes Committee

Introduction

This report is the culmination of seven months of planning and data compilation to find the ten mammal species most reliant on zoos for their future existence on the planet. The report is the second in a series of reports, following a similar initiative in 2012, that highlighted the top ten species from all animals and plants. While developing the 2012 initiative, we quickly realised that there were many more species and projects that would benefit from greater exposure, hence our decision to expand the work to 2013 and beyond.

In order to qualify for a position in the top ten mammal list, a species has to be associated with an ongoing field initiative by a BIAZA member zoo. Preference has been given to species for which zoos are playing an active conservation management role, and to projects which include habitat management, education and/or human livelihood development. In order to make this list, species must also be classified as Endangered, Critically Endangered or Extinct in the Wild on the IUCN Global Red-List of threatened species. Sub-species nominations were considered in exceptional cases, but full species have been given priority. We have also aimed to select species which represent the diverse range of projects undertaken by zoos, and hence we have avoided repeating species from any one project or geographic region.

And of course, any species on the list must be a mammal. These vertebrate animals are all united in having hairy bodies, giving birth to live young, and an ability to control blood temperature (i.e. “warm-blooded”). Of all animal groups, mammals are particularly threatened, because they typically require large areas of habitat for survival. Hence, while they may be worth conserving because they are often beautiful, charismatic species, they are also often representative of ecosystems packed full of thousands of other creatures.

As always, the compilers appreciate comments, suggestions and debate, with the hope that this initiative will continue to lead to more field conservation of our earth’s living wonders.

Amur Leopard (Panthera pardus orientalis)

- One of the most endangered large cats in the world with less than 50 individuals remaining in the wild.
- One of the last remaining northern subspecies of leopard.
- Around 220 individuals in zoos and sanctuaries provide a vital "safety-net".
- The Global Species Management Plan is currently discussing plans for reintroduction with the Russian Government.
- This subspecies would very likely be extinct without fundraising and awareness work, plus direct field involvement, on the part of zoos from the mid-1990s onward.

This Critically Endangered subspecies stands at less than 50 animals in the wild, but this tiny population is at least stable – or even slightly increasing – thanks to concerted efforts supported by zoos and other groups. Threats include poaching, forest fires and habitat loss to development.

There are 220 individuals in a global conservation breeding programme in zoos around the world, which generates many kinds of conservation support. Substantial funding has been provided by zoos for field work via the Amur Leopard and Tiger Alliance (ALTA), which is coordinated by the Zoological Society of London (ZSL). European zoos have provided over £280,000 to ALTA partners since 2004, with another £100,000 from North American zoos. They have also raised public awareness of this leopard, partly through sparking media interest, e.g. through television documentaries. Field work funded and carried out by ALTA includes anti-poaching patrols, outreach work, camera trapping, radio-telemetry and wildlife health research. Support from zoos also includes training in UK zoos for vets carrying out radio-telemetry and veterinary sampling in the field.

A reintroduction programme is currently in the planning stage with zoos involved on a number of levels, including providing animals for release. This will be the first big cat reintroduction using zoo-bred individuals.

Key Contact: Sarah Christie, Head of Regional Programmes, Zoological Society of London, UK

Blue-eyed Black Lemur (Eulemur flavifrons)

- Critically Endangered due to large-scale habitat loss and hunting.
- Restricted to a very small area of ~ 2,700km^2 in northwest Madagascar and only a small population of a few thousand remains.
- The main organisation working to conserve this species is a consortium of European zoos and universities.
- Large level of community involvement.
- Research projects both in Madagascar and in zoos.
- Rice-growing competitions are being used to promote sustainable farming techniques.

This Critically Endangered lemur species (also known as Sclater's black lemur) is found in primary and secondary sub-humid forest fragments, in a very small area of about 2700km² in northwestern Madagascar. There is only a small population remaining, which is in decline. There has been a huge reduction in their habitat due to slash-and-burn agriculture, logging and forest fires. They are also hunted for food and sometimes kept locally as pets. Unlike most primate species the male and female blue-eyed black lemurs are different colours, although both have the same distinctive blue eyes.

The main organisation working to conserve this species is the Lemur Conservation Association, AEECL (Association Européenne pour l'Etude et la Conservation des Lémuriens). This is a consortium of European zoos and universities, whose board members all work for European zoos, including BIAZA members Banham Zoo, Africa Alive and Bristol Zoo. The AEECL works with local universities to study the ecology of the region, including providing support to Madagascan PhD students. Studies have so far assessed species' forest usage and nutritional requirements, biodiversity of the forest and much more. Research has also been carried out on lemurs in AEECL member zoos, including nutritional and breeding studies.

The AEECL also plays a huge role in education, for example by providing salaries and resources for teachers. They also help to organise festivals to increase local awareness of conservation and train villagers in sustainable rice-growing and in the creation of fire breaks to reduce burning of the lemur's forest habitats. Support from the community can be seen from high turn-outs to events, and in the maintenance of the firebreak around Ankarafa Forest by more than 200 villagers.

Other species that have recently also been studied by AEECL in this region of Madagascar are the newly discovered Sahamalaza sportive lemur (*Lepilemur sahamalazensis*) and the northern giant mouse lemur (*Mirza zaza*) as well as various bird species.

Key Contact: Dr. Christoph Schwitzer, Head of Research, Bristol Zoo Gardens, UK; Executive Secretary, AEECL
NB Christoph will be in Germany but is available via mobile or email.

Grevy's Zebra (Equus grevyi)

- The largest of all zebra species, this Endangered equid is today only found in small and isolated populations in Ethiopia and Northern Kenya.
- As a flagship species, their conservation also benefits habitats, other wildlife and local communities.
- British and European zoos have been essential to the conservation of Grevy's zebra since the year 2000, supporting and contributing to monitoring, research, disease investigation and the development of local infrastructure and education.
- Marwell Wildlife sits on the Grevy's Zebra Technical Committee with a mandate from the Kenya Wildlife Service to coordinate, plan and execute conservation and research activities for this species, and helps to rally other zoos to this cause.

According to the IUCN Equid Specialist Group Action Plan and the Kenya Wildlife Service (KWS) Grevy's Zebra Strategy, the Grevy's zebra has experienced one of the largest reductions in range and numbers of any African mammal. While hunting led to their initial decline, it was habitat degradation, lack of accessible water sources and ever increasing competition with livestock for sparse resources that fuelled the downward trend. The global population declined further with numbers dipping below 2000 individuals in 2004. At this point conservation organisations including UK zoos, land owners and scientists got together in workshops to develop a co-ordinated effort to preserve this species. The Grevy's Zebra Technical Committee was formed and approved by the KWS. Marwell Wildlife, as a representative of zoo's supporting Grevy's zebra conservation, is part of this group that is today spearheading planning and decision making.

In January 2006 northern Kenya experienced an outbreak of anthrax triggered by one of the worst droughts for decades. The disease threatened to spread throughout the reserves where the most important remaining Grevy's zebra populations occur. The KWS called for funds to vaccinate up to 1000 wild Grevy's zebras to safeguard them against the disease. The international zoo community came to the rescue and within two weeks funding was in place and the fast and unprecedented action on the ground averted a potentially disastrous outcome for the species. It is suspected that close to 5% of Grevy's zebra succumbed to the disease, but vaccinations prevented a greater loss that could have pushed the species to the brink.

The Marwell Research Camp in the Lewa Wildlife Conservancy at the foot of Mount Kenya has become a base for monitoring and surveillance trips to the north. The European zoo community provides capacity-building in the form of funding for training of scientists, scouts and conservancy managers, as well as the creation of a new disease investigation laboratory for Grevy's zebra. Development of a national Grevy's zebra database and fitting radio collars to key animals to monitor large scale movements and population connectivity have only been possible through the financial support of zoos. In 2007 the first ever national conservation strategy for Grevy's zebra set out a five-year plan for the activities required to halt the decline and increase the population of this species. Five years on, Grevy's zebra conservation is now managed by a strong network of cooperating organisations on the ground, including Marwell Wildlife, and supported through regular funding from the zoo community.

Key Contact: Tanya Langenhorst, Acting Head of Conservation Biology, Marwell Wildlife, UK; EEP Coordinator and International Studbook Keeper for Grevy's zebra

Livingstone's Fruit Bat (Pteropus livingstonii)

- The Livingstone's fruit bat is one of the largest bat species in the world.
- Found only on the two islands of Anjouan and Mohéli in the Comoro archipelago in the Western Indian Ocean.
- Classed as Endangered, although with less than 1100 individuals remaining in the wild, and a decreasing popultion trend, it may well be re-classified as Critically Endangered.
- The islands native trees are being cleared for agricultural expansion and timber, removing essential food sources (such as fig and kapok trees), as well as the limited number of roosting sites.
- A European Endangered Species Programme, managed by Durrell Wildlife Conservation Trust, provides an essential "safety-net" population of approximately sixty individuals in four collections.

Bristol Conservation Science Foundation (Bristol Zoo) and Durrell Wildlife Conservation Trust (DWCT) run a comprehensive field conservation programme in the Comoro Islands, focusing on the Livingstone's fruit bat, working with local people to find ways to conserve the bats in very challenging development conditions.

A bat population census undertaken in 2012 (by Bristol and DWCT) identified 23 roosts on the two islands and a total population estimated at around 1100 bats. The main threat was identified as loss of forest habitat, which is used by the bats for feeding and roosting sites. The Comoro Islands have the highest rate of national deforestation in the world, with 9.3% of the remaining forests being lost per year. This is more than double the rate of forest loss of the country with the second highest deforestation rate. Agricultural expansion and clearance for timber are the main causes of encroachment, driven by a combination of poverty, a lack of alternative economic options, increasing population pressure, a lack of governance mechanisms and unsustainable agricultural methods.

Among 18 Livingstone's fruit bat roosts discovered on Anjouan Island, three had been abandoned, six were under immediate threat of clearance for agricultural land or timber, and four were damaged by severe weather such as high winds or landslides which can destroy large tracts of vegetation. The 2012 census therefore underlined the critical state of the species.

BIAZA members are funding and implementing a pilot scheme which ensures local landowners and farmers are paid to to carry out sustainable agricultural practices and tree-planting schemes around key roost sites. This aims to ensure that conservation actions are economically viable for the local people. Work is also being undertaken at a national level to integrate conservation into policy and legislation, which together with continuing survey and monitoring work provides comprehensive action to support this species.

Key Contact: Neil Maddison, Head of Conservation Programmes, Bristol Conservation and Science Foundation, Bristol Zoo Gardens, UK.

Pied Tamarins (Saguinus bicolor)

- Pied tamarins are the most threatened Amazonian primate, and are found in a very small region of the Brazilian rainforest.
- They are threatened by habitat loss due to urbanisation, and competition with the golden-handed tamarin.
- Only a few thousand pied tamarins are thought to remain in the wild in a highly fragmented habitat with numbers decreasing rapidly.
- A European zoo endangered species breeding programme has been established and is managed by Durrell Wildlife Conservation Trust. Expertise developed in husbandry, veterinary care and breeding has been transferred to the conservation project in Brazil.
- Funds from BIAZA zoos have been used to support rescue, re-introduction and education work in Brazil.

The pied tamarin is found in a very small area surrounding the rapidly growing city of Manaus in the Brazilian Amazon. Many of the remaining pied tamarins now only survive in small highly degraded forest patches around housing estates in the suburbs of the city. Tamarins are forced into ever-smaller pockets of forest, which have reduced their food and genetic resources to an unsustainable level. In addition, their increasingly urban lifestyle has resulted in animals being killed on power lines, on the roads and by dogs. Some tamarins are also caught for pets. Furthermore, another more adaptable tamarin species, the golden-handed tamarin *(Saguinus midas),* is moving into the area, competing with the pied tamarins for valuable habitat and food.

A dedicated team at the Federal University of Amazonas have formed the 'Projeto de Saium Coleira' – the Pied Tamarin Project. Supported by BIAZA members this project aims to address the species' rapid decline through rescue, translocation and reintroduction, assessment of the physical and genetic health of the remaining population and studying the relationship between the two rival species. Animals confiscated by the authorities go through a period of assessment and rehabilitation before they are deemed fit enough to be released; if not suitable they become part of the zoo population, which is genetically managed and could in the future be used to augment the wild population. Staff trained at the Durrell Conservation Academy are also carrying out vital work through the Instituto de Peguisas Ecologicas to look at the impact of human disturbance on the tamarin.

Early genetic studies have shown that fragmented populations are starting to show the effects of inbreeding, with reduced genetic diversity. Key fragments of forest will have to be protected and the connections between these forests will be vital if a healthy, genetically diverse wild population is to survive.

A vital "safety-net" population of pied tamarins has been established within European and American zoos. These animals are used to develop management techniques to improve the health, welfare and reproductive success of this and other endangered tamarin species. Capacity-building workshops will aim to share these management techniques to improve husbandry success in Brazilian zoos. The European EEP Programme is managed by Durrell Wildlife Conservation Trust. BIAZA members holding pied tamarins contribute financially to this conservation work.

Key Contact Dominic Wormell, Head of Mammals, Durrell Wildlife Conservation Trust, Jersey, UK.

San Martin Titi Monkey (Callicebus oenanthe)

- The San Martin Titi Monkey is Critically Endangered and is one of the 25 most endangered primate species in the world.
- It is only found in a small area of forest in the Peruvian Andes.
- It is endangered through massive deforestation and to a lesser extent hunting and the illegal pet trade.
- BIAZA zoos are vital partners in the only conservation initiative working to protect this species.
- This species is not kept in zoos but the Red Titi Monkey *(Callicebus cupreus)*, a closely related, but more common species, is used as an "Ambassador" to communicate and promote conservation of endangered primates.

In 2009, European zoos joined forces with Peruvian graduates from the National University of San Martin to create Proyecto Mono Tocón. This project aims to conserve Peru's biodiversity with emphasis on conservation of the San Martin titi monkey. This has been adopted as the conservation program of the European Endangered Species red titi breeding program (EEP), which is managed by Blackpool Zoo.

Focussing on research and education, Proyecto Mono Tocón has assisted local authorities and communities with the creation and management of new conservation reserves to protect small areas of the San Martin Titi's habitat. The project also works closely with a number of community conservation concessions, providing technical advice, training workshops and education sessions to assist local people with management of their own land for the benefit of wildlife, alongside sustainable tourism and agricultural practices. This work has extended the habitat available to the San Martin Titi monkey by over 5,000 hectares.

An education programme run through schools within local communities teaches children about environmental and conservation issues. Practical projects such as planting school gardens with vegetables grown using the compost made from the village household waste brings the students closer to nature, while also improving their daily nutrition. The project also supports local community groups in making handicrafts, from which handmade jewellery is being sold in the gift shops of supporting European zoos.

For 2013, Proyecto Mono Tocón has scheduled extensive studies on the density, habitat use and connectivity of different titi monkey groups in and around the protected area of the valley. However, due to continuing deforestation this population is becoming isolated from other populations. Forest fragments around the protected area will be identified for future creation of corridors to link these fragments. Proyecto Mono Tocón is supported by BIAZA members including Blackpool Zoo, Twycross Zoo, Shaldon Wildlife Trust, Belfast Zoo and the Zoological Society of London (ZSL).

Key Contact: Nicky Needham, Zoo Biologist, BIAZA, Regents Park, London, UK.

Scimitar-horned Oryx (Oryx dammah)

- Extinct in the wild, so completely dependent on conservation breeding and reintroduction for its continued survival.
- Successful reintroductions to fenced protected areas in Tunisia and free-ranging releases proposed for Chad.
- British zoos have contributed to the development of a global conservation and reintroduction strategy.
- Habitat management in conjunction with reintroductions for this species has seen an increase in general biodiversity.
- BIAZA institutions have been involved in the conservation of this species for over 30 years.

The scimitar-horned oryx was declared Extinct in the Wild in 2000 and therefore depends completely on conservation breeding and reintroduction for its continued survival. The causes of its extinction in the wild include over-hunting for meat, hides and trophies, civil unrest, drought and habitat degradation, and competition with domestic livestock.

BIAZA zoos including Marwell Wildlife, Edinburgh Zoo, ZSL and Fota Wildlife Park, have been involved in the release of scimitar horned oryx in parks and reserves in Tunisia since 1985. This included providing animals to be reintroduced. There are now approximately 200 oryx back in their natural habitat in their historical range in four fenced parks and reserves in Tunisia. Capacity building, training of rangers, community engagement, education, surveying, post-release monitoring and management are being carried out by Marwell Wildlife and ZSL, and supported by a number of other BIAZA institutions, in particular Dublin Zoo. Zoos also provide funding and support to the Sahara Conservation Fund, an NGO working for the conservation of wildlife right across the Sahelo-Saharan region. A programme of fencing and habitat restoration by the Tunisian authorities in preparation for the reintroduction of the oryx has seen the re-establishment of native flora and with it insect, bird, reptile, amphibian, and small mammal diversity.

The Royal Zoological Society of Scotland (Edinburgh Zoo), ZSL and Marwell have also contributed to the development of a global conservation and reintroduction strategy for the species. The strategy has led to a national workshop in N'Djamena early in May 2012, and a second workshop in Abu Dhabi in December 2012, to assess the feasibility of a large scale release of free-ranging oryx in Chad, the country where the last significant population lived in the wild in the late 1980s.

Key Contact:

Dr Tania Gilbert, Conservation Biologist, Marwell Wildlife, UK;
Scimitar-horned oryx EEP Coordinator and International Studbook Keeper

Sumatran Tiger (Panthera tigris sumatrae)

- The Sumatran tiger is found only in the forests of the Indonesian island of Sumatra. There are just 300-400 Sumatran tigers in the wild.
- The Sumatran tiger is Critically Endangered due to habitat loss, particularly for development of palm oil plantations, poaching for the skins and the Chinese medicine trade, and killings resulting from wildlife-human conflicts.
- Zoos fund a large proportion of targeted tiger conservation activities on Sumatra. During 1998-2005, 60% of funds for non-governmental Sumatran tiger conservation came from or through zoos.
- The zoo conservation breeding programmes provides a vital "safety-net" for the species.
- A Global Species Management Plan (GSMP) including Australasia, Europe, North America, Japan and Indonesia, co-ordinated by ZSL, has been developed to maximise international zoo support for Sumatran tiger conservation.

BIAZA zoos (including those participating in the European EEP for Sumatran tigers) contribute significant funds to Sumatran tiger conservation, much of it through the tiger conservation initiative "21st Century Tiger". 21st Century Tiger is hosted and its administration funded by zoos. It raises funds from zoos, the public and corporate donors, and has donated over £700,000 to Sumatran tiger conservation since 1997, the majority of this raised directly from zoos. These funds have mostly been focused on anti-poaching and have been instrumental in ensuring that tigers persist in Sumatra.

Work by ZSL Indonesia has influenced policy for avoiding destruction of forests particularly for palm oil plantations. A plan to finance long-term protection of the forests in and around Berbak National Park via linking tiger conservation to carbon sequestration is under way, and habitat connections are being maintained between protected areas by engaging relevant businesses (plantations, mining) in habitat management in Jambi Province. Sumatran tigers are being monitored by camera-traps in Berbak and Sembilang National Parks. Berbak National Park has been shown to have a satisfyingly high density of tigers for Sumatra; while monitoring has only just begun in Sembilang National Park.

ZSL also operates wildlife conflict and resolution teams in these national parks which remove snares, advise local villages how to avoid tiger conflicts and report intelligence on wildlife crime. The latest initiative here is the supply of purpose built crop-protection electric fencing to prevent deaths of tigers (and pigs, deer, and even people!) on mains or generator-powered electric wires set to exclude ungulates from farmland. The teams are seconded entirely from appropriate local authorities so that local capacity is being built when training is supplied, plus they have the authority to make arrests.

Zoos have also made a key contribution through the transmission of zoo-based expertise by undertaking training for tiger rescue. In 2012 ZSL obtained a grant from the UK Department of Environment, Food and Rural Affairs (DEFRA) to fund a four-day training workshop for vets from across Sumatra to learn how to deal with tiger rescue from snares, and transport for translocation to solve conflicts. The course resulted in the production of the world's first government endorsed tiger conflict resolution guidelines, including veterinary guidelines. The GSMP continues to develop this work in partnership with Taman Safari Indonesia (a large zoo on Java which runs the Indonesian zoo conservation breeding programme for Sumatran tigers) and the Indonesian government.

Key Contact: Sarah Christie, Head of Regional Programmes, Zoological Society of London, UK.

Western Lowland Gorilla – Gorilla gorilla gorilla

- Listed as Critically Endangered.
- Estimated global population of 50,000 – 80,000 individuals
- Found in six countries; all in central Africa (Cameroon, CAR, Congo, Equatorial Guinea, Angola, Gabon); previously found in DRC but now locally extinct
- Under threat of extinction from specialist hunting and habitat loss, with resulting orphans often being offered as pets, as well as diseases such as Ebola
- Orphaned gorillas have only a 50:50 chance of survival if found

This subspecies of gorilla is found throughout the Congo Basin. Two main issues threaten the Western lowland gorilla: hunting for meat, which can fetch luxury-food prices in the illegal markets; and loss of habitat caused by the rapid increase of the central African timber markets in the 1990s. Both are having a devastating effect on gorilla numbers; it is feared that between 1983 and 2000, Gabon lost half of its gorilla population due to hunting and loss of habitat.

Many zoos are working to protect the western lowland gorilla in the wild, supporting research and educational outreach programmes, while also providing equipment and funding for improving law enforcement to reduce both hunting and habitat damage and linking livelihood development to gorilla protection. In the year 2000, several international zoos contributed funds and staff to setting up the Pan African Sanctuary Alliance (PASA), a coalition of some twenty sanctuaries set up across Africa to house "bushmeat orphans". PASA aims not only to prevent poaching of endangered animals through conservation education, but also to attempt to rehabilitate confiscated animals, providing them with the best possible veterinary care and quality of life.

In 2002, EAZA zoos ran the first pan-European "Anti-bushmeat Campaign", which highlighted the threat of illegal hunting to all apes, and gorillas in particular. Through this co-ordinated campaign, the second largest petition ever handed to the EC was delivered on behalf of EAZA-zoo visitors. As a direct result of the petition, several million Euros were allocated to efforts to conserve animals in the wild, including great apes. In 2012, "Anti-bushmeat Campaign + 10" was launched, to keep the issue alive in the minds of zoo-visitors, as well as the politicians. With several zoos having apes in their emblems, zoos represent one of the last bastions of species champions, especially such charismatic species as the western lowland gorilla.

Key Contact: Neil Maddison, Head of Conservation Programmes, Bristol Conservation and Science Foundation, Bristol Zoo Gardens, UK.

White-naped Mangabey, Cercocebus atys lunulatus

- Classified as Endangered due to habitat loss and hunting.
- Population declining for 40 years, by 50% over the last 27 years.
- There are no sites where this species has not been hunted.
- 15% of original habitat remaining.
- Zoos are working to conserve these species in the wild, through a high level of community involvement.

The white-naped mangabey, (also known as the white-crowned mangabey) is now only found in the Upper Guinean Rainforest of eastern Ivory Coast and western Ghana (West Africa), and has been classified as Endangered by the IUCN, which states that the population has reduced by as much as 50% in the last 27 years.

Deforestation is the greatest threat to the white-naped mangabey. According to a recent report, the Upper Guinean Forests have been reduced to a mere 15% of their original forest cover. Logging, agriculture, mining, and human population increases have left only fragmented remnants of the forest. An additional stressor to the vulnerable wildlife populations has been the extensive hunting of bushmeat. Estimates of the financial turnover of the bushmeat trade run as high as US$400 million per year in Ghana and US$500 million in Ivory Coast.

The West African Primate Conservation Action (WAPCA) initiative is managed and funded almost entirely by European Zoos (including Dublin Zoo and ZSL London Zoo) and works to conserve the white-naped mangabey and other highly endangered primate species in Ghana and Ivory Coast. The European zoo population of these mangabeys also plays a crucial role in providing funds to raise zoo visitors' awareness of the need for biodiversity conservation for the entire ecosystem of the Upper Guinean Forest. This region is one of the most biologically diverse ecosystems on the African continent, supporting over 1800 endemic plants, 31 endemic threatened birds, 35 endemic threatened mammals and 49 endemic threatened amphibians.

WAPCA undertakes field work in both Ghana and Ivory Coast such as primate surveys, as well as conservation and awareness campaigns targeting school children and whole villages across eight rural rainforest community areas. They help rural communities combat illegal activities in community-owned rainforests, and have developed a trans-border community managed rainforest project which aims to prevent further forest fragmentation and to create forest corridors to re-connect the last mangabey strongholds.

WAPCA also manages the Endangered Primate Breeding Centre in Ghana - a facility which houses monkeys as part of an internationally coordinated breeding program for endangered species. The world population of white-naped mangabeys in zoo-based breeding programmes consists of 76 individuals. Exchanges between Ghana and Europe are contributing to the genetic diversity of this population.

Key Contact: Andrea Dempsey, Senior Keeper, London Zoo, Zoological Society of London, UK.

Acknowledgements

This report was compiled by Dr. Andrew R. Marshall, Scott Wilson, Nicky Needham and the BIAZA Field Programmes Committee.

BIAZA Field Programme Committee
Scott Wilson (Chester Zoo) - Chair
Andy Marshall (Flamingo Land/York University) - Vice Chair
Sarah Christie (ZSL)
Dave Coles (Beale Park)
Maggie Essen (Chester Zoo)
Karl Hansen (The Living Rainforest)
Neil Maddison (Bristol Zoo)
Rebecca Perry (Colchester)
Roger Wilkinson (Chester Zoo)
Andrew Bowkett (Paignton Zoo)
Campbell Murn (Hawk Conservancy Trust)

Other contributors:
Tania Gilbert, Marwell Wildlife
Christoph Schwitzer, Bristol Zoo Gardens
Andrea Dempsey, ZSL London Zoo
Jo Cook, ZSL London Zoo
Tanya Langenhorst, Marwell Wildlife
Esther Conway, 21st Century Tiger

Photo credits:
Amur leopard: A. Porter, Wildlife Heritage Foundation
Blue eyed black lemur: C. Schwitzer, Bristol Zoo
Grevy's zebra: Marwell Wildlife
Livingstone's fruit bat: Chester Zoo
Pied tamarin: Birmingham Wildlife Centre
San Martin Titi: Proyecto mono tocon
Scimitar-horned oryx: Own Howells Photography. Manor House Zoo
Sumatran Tiger: Talvinder Chohan
Western lowland gorilla: Blackpool Zoo
White-naped mangabey: Joanne Iredale

Zoos Supporting 'Top Ten' Species

Species	*Taxonomy*	*Country*	*Order*	*Holding zoos*	*Supporting Zoos*
Amur leopard (*Panthera pardus orientalis*)	Carnivore	China, Russia, Korea	Critically Endangered	Yorkshire Wildlife Park, Colchester Zoo, Edinburgh Zoo, Wildlife Heritage Foundation, Marwell Wildlife, Twycross Zoo, Thrigby Hall Wildlife Garden.	ZSL, Colchester Zoo, Edinburgh Zoo, Marwell Wildlife, Paradise Wildlife Park, Twycross Zoo, Wildlife Heritage Foundation, Thrigby Hall Wildlife Garden, Yorkshire Wildlife Park
Blue-eyed black lemur (*Eulemur flavifrons*)	Primate	Madagascar	Critically Endangered	Banham Zoo, Edinburgh Zoo, Africa Alive.	Africa Alive, Bristol Zoo Gardens, Banham Zoo, Colchester Zoo, Edinburgh Zoo, Shaldon Wildlife Trust
Scimitar-horned oryx (*Oryx dammah*)	Ungulate	Tunisia, Morocco, Senegal	Extinct in the Wild	Dublin Zoo, Fota Wildlife Park, Chessington Zoo, Chester Zoo, Knowsley Safari Park, Longleat Safari and Adventure Park, Flamingoland, Manor House Wildlife Park, Marwell Wildlife, ZSL Whipsnade Zoo, Woburn Safari Park.	Marwell Wildlife, Flamingo Land, Chester Zoo, Chessington Zoo, ZSL, Manor House Wildlife Park, Knowsley Safari Park, Longleat Safari and Adventure Park, Dublin Zoo, Fota Wildlife Park
Sumatran tiger (*Panthera tigris sumatrae*)	Carnivore	Indonesia (Sumatra)	Critically Endangered	Belfast Zoo, West Midland Safari Park, Chessington Zoo, Chester Zoo, Welsh Mountain Zoo, Dudley Zoo, Edinburgh Zoo ,Wildlife Heritage Foundation, ZSL	ZSL, Blackpool Zoo, Shepreth Wildlife Park, Chester Zoo, Belfast Zoo, Chessington Zoo, Dublin Zoo, Dudley Zoo, Edinburgh Zoo, Paignton Zoo, Thrigby Hall Wildlife Gardens, Yorkshire Wildlife Park, Paradise

				London Zoo, Flamingoland, Paignton Zoo, Thrigby Hall Wildlife Gardens, Dublin Zoo.	Wildlife Park, Dartmoor Zoo, Banham Zoo
San Martin titi monkey **(*Callicebus atys oenanthe*)**	Primate	Peru	Critically Endangered	None	Blackpool Zoo, Belfast Zoo, Colchester Zoo, ZSL, Shaldon Wildlife Trust, Twycross Zoo
Grevy's zebra **(*Equus grevyi*)**	Ungulate	Ethiopia, Kenya, perhaps South Sudan.	Endangered	Banham Zoo, West Midland Safari Park, Chessington Zoo, Chester Zoo, Edinburgh Zoo, Marwell Wildlife, ZSL Whipsnade Zoo, Woburn Safari Park.	Marwell Wildlife, Banham Zoo, Chester Zoo, ZSL
Livingstone's fruit bat **(*Pteropus livingstonii*)**	Chiroptera	Comoros	Endangered	Durrell Wildlife Conservation Trust, Bristol Zoo Gardens, Chester Zoo.	Bristol Zoo Gardens, Durrell Wildlife Trust
Pied tamarin **(*Saguinus bicolor*)**	Primate	Brazil	Endangered	Birmingham Nature Centre, Durrell Wildlife Conservation Trust, Chester Zoo, Colchester Zoo, ZSL London Zoo, Newquay Zoo, Paignton Zoo, Shaldon Wildlife Trust, Belfast Zoo	Durrell Wildlife Conservation Trust, Shaldon Wildlife Trust
White-naped mangabey **(*Cercocebus atys lunulatus*)**	Primate	Ghana, Cote d'Ivoire	Endangered	ZSL London Zoo, Flamingoland, Dublin Zoo	ZSL, Dublin Zoo

Western lowland gorilla **(*Gorilla gorilla gorilla*)**	Primate	Angola, Cameroon, Central African Republic, Congo; Equatorial Guinea, Gabon Nigeria	Critically Endangered	Belfast Zoo, Blackpool Zoo, Chessington Zoo, ZSL London Zoo, Longleat Safari and Adventure Park, Paignton Zoo, Twycross Zoo, Bristol Zoo gardens, Durrell Wildlife Conservation Trust , Dublin Zoo	ZSL, Bristol Zoo Gardens, Twycross Zoo, Dublin Zoo